ArevaEPRDCPEm Resource

From: NOXON David (AREVA) [David.Noxon@areva.com]
Sent: Friday, May 24, 2013 3:05 PM
To: Snyder, Amy; Ford, Tanya
Cc: DELANO Karen (AREVA); LEIGHLITER John (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); WILLS Tiffany (AREVA); HONMA George (EXTERNAL AREVA); WILLIFORD Dennis (AREVA); LENTZ Tony (EXTERNAL AREVA); GUCWA Len (EXTERNAL AREVA)
Subject: Advanced Response to U.S. EPR Design Certification Application FINAL RAI No. 578, FSAR Ch. 9
Attachments: RAI 578 Advanced Response Q 09.04.03-7 US EPR DC.pdf

Amy,

Attached is an Advanced Response for RAI 578 Question 09.04.03-7 in advance of the June 28, 2013 final date.

To keep our commitment to send a final response to this question by the commitment date, we need to receive all NRC staff feedback and comments no later than **June 14, 2013**.

Please let me know if NRC staff has any questions or if this response can be sent as final.

Sincerely,

David Noxon for
Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

David B. Noxon
AREVA Licensing
704-805-2232

From: NOXON David (RS/NB)
Sent: Friday, May 24, 2013 2:55 PM
To: Amy.Snyder@nrc.gov; tanya.ford@nrc.gov
Cc: DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLS Tiffany (CORP/QP); HONMA George (EXT); WILLIFORD Dennis (RS/NB); LENTZ Tony (External RS/NB); GUCWA Len (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application FINAL RAI No. 578, FSAR Ch. 9, Supplement 1

Amy,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to the one question in RAI 578 on April 15, 2013.

The schedule for a technically correct and complete final response to this question has been changed as provided below.

Question #	Advanced Response Date	NRC Comment Request Date	Final Response Date
RAI 578 — 09.04.03-7	May 24, 2013	**June 14, 2013**	**June 28, 2013**

Sincerely,

David Noxon for
Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
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David B. Noxon
AREVA Licensing
704-805-2232

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, May 23, 2013 4:00 PM
To: NOXON David (RS/NB)
Subject: FW: Response to U.S. EPR Design Certification Application FINAL RAI No. 578, FSAR Ch. 9 (Tier 1 and 2 from Rev 4 Review)

From: RYAN Tom (RS/NB)
Sent: Monday, April 15, 2013 8:12 AM
To: Snyder, Amy
Cc: DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLS Tiffany (CORP/QP); HONMA George (EXT); WILLIFORD Dennis (RS/NB); LENTZ Tony (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application FINAL RAI No. 578, FSAR Ch. 9 (Tier 1 and 2 from Rev 4 Review)

Amy,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 578 Response US EPR DC.pdf," provides a schedule since a technically correct and complete response to the one question cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 578 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 578 — 09.04.03-7	2	3

The schedule for technically correct and complete response to this question is provided below.

Question #	Response Date
RAI 578 — 09.04.03-7	June 4, 2013

Sincerely,

Tom Ryan
Project Engineer
Regulatory Affairs
AREVA NP
An AREVA and Siemens company
7207 IBM Drive - CLT2B
Charlotte, NC 28262
Phone: 704-805-2643, Cell : 704-292-5627
Fax: 434-382-6657

From: Snyder, Amy [mailto:Amy.Snyder@nrc.gov]
Sent: Friday, March 15, 2013 10:49 AM
To: ZZ-DL-A-USEPR-DL
Cc: ODriscoll, James; McKirgan, John; Hearn, Peter; Segala, John
Subject: U.S. EPR Design Certification Application FINAL RAI No. 578, FSAR Ch. 9 (Tier 1 and 2 from Rev 4 Review)

Attached please find the subject request for additional information (RAI). An advanced RAI was provided to you on March 8, 2013. On March 15, 2013, you informed us that the advanced RAI does not contain proprietary information and that the advanced RAI is clear and no clarification is needed. As result, no changes were made to the advanced RAI.

The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs,. For any RAIs that cannot be answered **within 30 days or April 15, 2013**, it is expected that a date for receipt of this information will be provided to the staff within the 30-day period so that the staff can assess how this information will impact the published schedule.

Thank You,

Amy
Amy Snyder, U.S. EPR Design Certification Lead Project Manager
Licensing Branch 1 (LB1)
Division of New Reactor Licensing
Office of New Reactors
U.S. Nuclear Regulatory Commission

☎ Office: (301) 415-6822
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Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 4498

Mail Envelope Properties (47A0F4DB5FF7324BA4BE270D3C6CA7780E0D84)

Subject: Advanced Response to U.S. EPR Design Certification Application FINAL RAI No. 578, FSAR Ch. 9
Sent Date: 5/24/2013 3:05:02 PM
Received Date: 5/24/2013 3:06:31 PM
From: NOXON David (AREVA)

Created By: David.Noxon@areva.com

Recipients:
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>
Tracking Status: None
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Tracking Status: None
"Ford, Tanya" <Tanya.Ford@nrc.gov>
Tracking Status: None

Post Office: FUSLYNCMX03.fdom.ad.corp

Files	**Size**	**Date & Time**
MESSAGE	5144	5/24/2013 3:06:31 PM
RAI 578 Advanced Response Q 09.04.03-7 US EPR DC.pdf	4444645	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Advanced Response to

Request for Additional Information No.578, Question 09.04.03-7

3/15/2013
U.S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.04.03 - Auxiliary and Radwaste Area Ventilation System
Application Section: 9.4.6, 9.4.9
SRSB Branch

Question 09.04.03-7:

Based on review of U.S. EPR FSAR Tier 1 and Tier 2, Revision 4, dated November 15, 2012, the staff noted several design changes related to the ventilation systems and has made the following observations on the revision. The staff requests clarification on the following items in Revision 4:

1) The staff noted that the design of the Electrical Division of Safeguard Building Ventilation System (SBVSE) described in FSAR Tier 2 Section 9.4.6 was changed. This system provides HVAC to safety related EQ equipment in the Switchgear Rooms, I&C Equipment Rooms Battery Room Cold Mechanical Areas, Emergency Feedwater Pump rooms and Component Cooling Water Pump Rooms in the Safeguard Buildings. The staff noted these changes:

   a. The system is described as capable of controlling humidity in these areas from 10-60 percent relative humidity. Previously the system controlled humidity from 30-60 percent relative humidity. The staff notes that the design description has been changed to remove the nonsafety related humidifiers. Previously the system included two nonsafety related air humidifiers, connected to the PSWS and NIDVS. Explain the functioning of this system, as described in Rev 4 of the FSAR, that enables it to control the humidity in this room between 10 and 60 percent with the new design.

   b. The staff noted inconsistent information between the system description and the associated drawings in Tier 2. Revision 4 of the FSAR shows the humidification equipment in the system in Tier 2, Figure 9.4.6-1, and in Tier 1 figure 2.6.7-1.

   c. The staff noted that Revision 4 is inconsistent with the normal operating humidity environment for the Electrical Areas of Safeguard Buildings, as described in Tier 2 Table 3D-4. (30 to 60 percent relative humidity)

   For the above items, clarify the FSAR appropriately.

2) The staff noted that the design of the Emergency Power Generating Building Ventilation System (EPGVS), described in FSAR Tier 2 Section 9.4.9 was changed. This system provides HVAC to the EDGs and associated safety-related electrical controls located in the electrical room of the Emergency Power Generating Buildings. The staff noted these changes:

   a. The system is described as controlling temperature in electrical room between 40°F and 113°F. Previously, the system controlled temperature in this area between 59°F and 95°F. Please clarify if and how the area heater, located in the Main Tank Room can serve to provide heating to the Electrical room and the Diesel room, which are in separate areas of the building. The staff noted that the heater that would be needed to ensure the temp in the electrical room does not drop below 40°F has been removed from the design as shown in FSAR Tier 2, Revision 4 Figure 9.4.9-1.

   b. The system is described as being capable of controlling humidity in the electrical room between 35 to 70 percent relative humidity. However the humidification equipment (humidifier) has been removed from the design from the HVAC quipment. Explain the function of the system as described in Rev 4 of the FSAR, that enables it to control humidity in this room between 35 and 70 percent with the new design.

c. The staff noted that Revision 4 is inconsistent with the normal operating temperature environment for the Emergency Power Generating Buildings, as described in Tier 2 Table 3D-4 (59-95°F for the Electrical Room).

For the above items, please clarify the FSAR appropriately.

3) The staff noted that footnotes in various Tier 2 Ventilation System Figures state “Tier 1”. Please revise accordingly.

4) The staff noted that FSAR Tier 1 Section 2.6.6, ITAAC 7.5a, which pertains to the Safeguard Buildings Controlled Area Ventilation System incorrectly references the CRACS system. Please revise Tier 1 accordingly.

5) The staff noted that the Tier 1 design function of the Safeguard Building Electrical Building Ventilation system, as described in FSAR Tier 1 Section 2.6.7 to maintain hydrogen concentration to “less than 1% by volume” is not also stated in Tier 2 section 9.4.6.

6) The staff noted that the design function of the Emergency Power Generating Building Ventilation System, as described in FSAR Tier 1 Section 2.6.9 has been changed to remove the design function to control humidity in the Emergency Power Generating Buildings. The staff notes that Humidity Control is still listed as a design function of the system in Tier 2. Clarify Tier 1 and Tier 2 information in this regard.

Response to Question 09.04.03-7:

1) U.S. EPR FSAR Tier 2, Section 9.4.6.1 and Tier 1, Section 2.6.7-1 will be revised as follows:

a. The humidifiers and the potable water supply (GKB) to the humidifiers were removed from the safeguard building ventilation system since humidifiers are non-safety related and not required for the safe shutdown of the plant. Humidifiers are not required for safe operation of the safeguard building ventilation system equipment (SBVSE).

Removal of humidifiers was based on the following additional reasons:

– Maintaining a minimum of 30 percent relative humidity in the Safeguard Building is not required since the electrical and instrument & control components located inside the Safeguard Building are designed to operate with humidity as low as 5 percent.

– Lowering the humidity to 10 percent will have minimal impact on personnel comfort since the personnel work within the Safeguard Building environment for a short duration of time.

– The safeguard building air conditioning system cooling unit supplies cool dry air to all areas of the Safeguard Building. These cooling units remove excessive moisture and reduce the humidity to less than 60 percent and maintaining dry bulb temperature between 41°F to 104°F.

b. U.S. EPR FSAR Tier 2, Figure 9.4.6-1 and U.S. EPR Tier 1, Figure 2.6.7-1 will be revised to show removal of humidification equipment.

c. U.S. EPR FSAR Tier 2, Table 3D-4 will be revised to show the humidity range of 10-60 percent.

2) U.S. EPR FSAR Tier 2, Section 9.4.9 will be revised as follows:

a. There are four fan heaters (30SAD14 AH001/002/003/004) located in the diesel hall as shown in the updated U.S. EPR FSAR Tier 2, Figure 9.4.9-1.

The emergency diesel generator (EDG) control/electrical room temperature is maintained by a cooling unit which is cooled by the essential service water (ESW) system. The ESW cooling water design temperature is between 40°F and 113°F.

The ESW cooling water temperature drops to a minimum temperature of 40°F during winter; therefore, the minimum design temperature of the control/electrical room is lowered from 59°F to 40°F. The minimum design temperature in the control/electrical room does not go below 40°F since ESW cooling water maintains the minimum design temperature. The instrumentation and electrical components located within this room are designed to operate at this new low design temperature. This design change allows removing the electrical heaters located on the air supply duct for the control/electrical rooms.

b. The Emergency Power Generating Building (EPGB) electrical room humidity will be revised from 35-70 percent to 10-60 percent. Removal of humidifiers from the emergency power generating building ventilation system will allow the humidity to drop down to ten percent. This will have minimal impact on the personnel comfort since the personnel work in the EDG electrical room environment for short duration of time. The equipment function is not affected by the low humidity.

The EPGBVS cooling unit supplies cool dry air to all areas of the EDG electrical room to remove excessive amount of moisture and reduce the humidity to less than 60 percent.

c. U.S. EPR FSAR Tier 2, Table 3D-4 will be revised to show the EPGB electrical room temperature 40-113°F, and humidity 10-60 percent.

3) Ventilation System figure footnotes will be revised to reference Tier 2.

4) U.S. EPR FSAR Tier 1, Section 2.6.6, ITAAC 7.5a has been revised.

5) U.S. EPR FSAR Tier 2, Section 9.4.6.1 includes the statement that the hydrogen concentration is maintained below the maximum allowable limit of RG 1.128 and IEEE Std 484. The SBVSE maintains hydrogen concentration levels in the battery rooms below one percent by volume. The SBVSE also ventilates the safety chilled water system (SCWS) rooms during normal and station blackout (SBO) conditions to maintain the refrigerant concentration below the maximum allowable limits.

U.S. EPR FSAR Tier 1, Section 2.6.7, Paragraph 1.0 states: "Ventilates the battery rooms and safety chilled water system rooms in the Safeguard Building to maintain the hydrogen concentration and the refrigerant concentration below allowable limits."

6) U.S. EPR FSAR Tier 1, Section 2.6.9, Paragraph 1.0 states that acceptable ambient conditions are maintained in the electrical room and main tank room. The U.S. EPR FSAR Tier 2, Section 9.4.9 will be revised to list the humidity 10-60% in the electrical room. There are no humidity control functions since there are no humidifiers for addition of moisture. The moisture is removed by the moisture separators to maintain humidity less than 60 percent (also see Response 2.b).

U.S. EPR FSAR Tier 1, Sections 2.6.1 through 2.6.15, U.S. EPR FSAR Tier 2, Sections 6.2.3, 6.4, 6.5, 8.3.1.1.5, 8.4.1.4, 9.2.4, 8.2.8, 9.4.1 through 9.4.15, 14.2, Chapter 16, Section 3.07 and Bases 3.07, Table 1.1-1, 3.2.2-1, 3.10-1, 3.10-2, 3.11-1, 3D-4, 3D-5, 3D-7, 8.4-1, 8.4-2, 8.4-3, 8.4-4, and Figures 12.3-72, 12.3-73, 12.3-74 will be revised to incorporate design changes affecting HVAC systems.

FSAR Impact:

U.S. EPR FSAR Tier 1, Sections 2.6.1 through 2.6.15 will be revised as described in the response and indicated on the enclosed markups.

U.S. EPR FSAR Tier 2, Sections 6.2.3, 6.4, 6.5, 8.3.1.1.5, 8.4.1.4, 9.2.4, 8.2.8, 9.4.1 through 9.4.15, 14.2, Chapter 16, Section 3.07 and Bases 3.07, Table 1.1-1, 3.2.2-1, 3.10-1, 3.10-2, 3.11-1, 3D-4, 3D-5, 3D-7, 8.4-1, 8.4-2, 8.4-3, 8.4-4, and Figures 12.3-72, 12.3-73, 12.3-74 will be revised as described in the response and indicated on the enclosed markups.

U.S. EPR Final Safety Analysis Report Markups

2.6 HVAC Systems

2.6.1 Main Control Room Air Conditioning System

Design Description

1.0 System Description

The main control room air conditioning system (CRACS) supplies air to the control room envelope (CRE) area which includes the main control room (MCR) and associated rooms.

The CRACS controls the CRE area temperature and air change rate for personnel comfort, personnel safety, and equipment protection during normal plant operation. The CRACS provides cooling, heating, and ventilation for the CRE area to remove equipment heat, and heat generated from other sources. The CRACS also provides heat to maintain a minimum temperature in the CRE area. The CRACS provides a minimal air change rate for the CRE area and controls building pressurization to reduce spreading of contamination.

The CRACS maintains habitability of the CRE area in case of radioactive ~~or toxic gas~~ contamination of the environment. The CRACS also maintains a positive pressure in the CRE area to prevent infiltration of contaminated outside air. The CRACS operates in recirculation mode with fresh air makeup.

The CRACS provides the following safety-related functions:

- Maintains ambient temperature conditions inside the CRE area.
- Provides ~~carbon~~ filtration of outside air and recirculated air from within the CRE area.
- Maintains a positive pressure in the CRE area relative to the adjacent areas to prevent unfiltered in-leakage, upon receipt of a containment isolation signal (CIS) or high radiation alarm signal in the air intake ducts.

2.0 Arrangement

2.1 The functional arrangement of the CRACS is as described in the Design Description of Section 2.6.1, Tables 2.6.1-1—Main Control Room Air Conditioning System Equipment Mechanical Design and 2.6.1-2—Main Control Room Air Conditioning System Equipment I&C and Electrical Design, and as shown on Figures 2.6.1-1—Control Room Air Intake and CREF (Iodine Filtration) Train Subsystem Functional Arrangement, 2.6.1-2—Control Room Air Conditioning and Recirculation Air Handling Subsystem Functional Arrangement, and 2.6.1-3—CRE Air Supply and Recirculation Subsystem Functional Arrangement.

2.2 Deleted.

2.3 Physical separation exists between the CRACS fresh air intake, iodine filtration, and recirculation and air conditioning trains as listed in Table 2.6.1-1.

3.0 Mechanical Design Features

3.1 Deleted.

3.2 Class 1E dampers listed in Table 2.6.1-2 will function to change position as listed in Table 2.6.1-1 under normal operating conditions.

3.3 Equipment identified as Seismic Category I in Table 2.6.1-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.1-1~~.

3.4 Deleted.~~Equipment listed in Table 2.6.1-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~

3.5 Deleted.~~Equipment listed in Table 2.6.1-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~

3.6 Equipment listed in Table 2.6.1-1 as ASME AG-1 Code are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

4.0 I&C Design Features, Displays, and Controls

4.1 Displays listed in Table 2.6.1-2 are indicated on the PICS operator workstations in the main control room (MCR) and the remote shutdown station (RSS).

4.2 Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.1-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.1-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

5.0 Electrical Power Design Features

5.1 Equipment designated as Class 1E in Table 2.6.1-2 are powered from the Class 1E division as listed in Table 2.6.1-2 in a normal or alternate feed condition.

5.2 Deleted.

6.0 Equipment and System Performance

6.1 The CRACS maintains a positive pressure in the CRE area relative to the outside environment and adjacent areas, while operating in a design basis accident alignment.

6.2 Upon receipt of a containment isolation signal (CIS), the iodine filtration train will start automatically, outside air supply to the CRE area is diverted through the iodine filtration train, a minimum recirculation flowrate is established from the CRE area to the iodine filtration train, and a positive pressure is maintained in the CRE area relative to the adjacent areas.

6.3 The CRACS is capable of detecting smoke in the outside air inlet duct, and alerting operators to take manual actions.Deleted.

6.4 The CRE area ventilation unfiltered air in-leakage is minimized in order to maintain the MCR habitability.

6.5 The CRACS provides conditioned air to the CRE area to maintain the temperature within design limits of the CRE during normal operations, abnormal and accident conditions of the plant.cooling to maintain the design temperatures in the CRE area, while operating in a design basis accident alignment.

6.6 The CREF heaters protect the carbon adsorber from high humidity during operation of the CREF unit.

6.7 Upon receipt of a high radiation alarm signal in the air intake ducts, the iodine filtration train will start automatically, the outside air supply to the CRE area is diverted through the iodine filtration train, a minimum CRE recirculation flowrate is established from the CRE area to the iodine filtration train, and a positive pressure is maintained in the CRE area relative to the adjacent areas.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.1-3 lists the CRACS ITAAC.

Table 2.6.1-1—CRACS Equipment Mechanical Design
Sheet 1 of 5

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Fresh Air Intake Trains 30SAB01 and 30SAB04					
Motor Operated Dampers	30SAB01AA002 30SAB04AA002 ~~30SAB11AA001~~ ~~30SAB11AA003~~ ~~30SAB11AA004~~ ~~30SAB14AA001~~ ~~30SAB14AA003~~ ~~30SAB14AA004~~	Safeguard Building 2 Safeguard Building 3	Yes	Open	I
Electric Heaters	30SAB01AH001 30SAB04AH001	Safeguard Building 2 Safeguard Building 3	Yes	On / Off ~~(based on ambient conditions)~~	I
Motor Operated Dampers	30SAB01AA003 30SAB04AA003 30SAB01AA004 30SAB04AA004	Safeguard Building 2 Safeguard Building 3	Yes	Close	I
Prefilters	30SAB01AT001 30SAB04AT001	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
~~Manual Dampers~~	~~30SAB01AA006~~ ~~30SAB04AA006~~	~~Safeguard Building 2~~ ~~Safeguard Building 3~~	~~Yes~~	~~N/A~~	~~I~~
Motor Operated Dampers	30SAB01AA012 30SAB04AA012	Safeguard Building 2 Safeguard Building 3	Yes	Open / Close	I

Table 2.6.1-1—CRACS Equipment Mechanical Design
Sheet 2 of 5

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Iodine Filtration Trains 30SAB11 and 30SAB14					
Motor Operated Dampers (Recirculation from CRE)	30SAB11AA004 30SAB14AA004	Safeguard Building 2 Safeguard Building 3	Yes	Open	I
Motor Operated Dampers	30SAB11AA001 30SAB11AA003 30SAB14AA001 30SAB14AA003	Safeguard Building 2 Safeguard Building 2 Safeguard Building 3 Safeguard Building 3	Yes	Open	I
Electric Heaters	30SAB11AH001 30SAB14AH001	Safeguard Building 2 Safeguard Building 3	Yes	On / Off~~ (based on ambient conditions)~~	I
Prefilters	30SAB11AT001 30SAB14AT001	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
~~Upstream~~ HEPA Filters	30SAB11AT002 30SAB14AT002	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Carbon Adsorbers	30SAB11AT003 30SAB14AT003	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
~~Downstream HEPA~~Post Filters	30SAB11AT004 30SAB14AT004	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Moisture Separators	30SAB11AT005 30SAB14AT005	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Motor Operated Damper	30SAB11AA003 30SAB14AA003	Safeguard Building 2 Safeguard Building 3	Yes	Open	I
Supply Air Fans	30SAB11AN001 30SAB14AN001	Safeguard Building 2 Safeguard Building 3	Yes	Run	I

Table 2.6.1-1—CRACS Equipment Mechanical Design
Sheet 3 of 5

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Back-draft Dampers	30SAB11AA002 30SAB14AA002	Safeguard Building 2 Safeguard Building 3	Yes	Open / CloseN/A	I
Backdraft Dampers	30SAB11AA005 30SAB14AA005	Safeguard Building 2 Safeguard Building 3	Yes	Open / Close	I
Recirculation and Air Conditioning Trains 30SAB01 and 30SAB04					
Manual Dampers (recirculation from CRE)	30SAB01AA009 30SAB04AA009	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Manual Dampers (recirculation from CRE)	30SAB01AA010 30SAB04AA010	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Air Cooling Coils	30SAB01AC001 30SAB04AC001	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Moisture Separators	30SAB01AT004 30SAB04AT004	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Supply Air Fans	30SAB01AN001 30SAB04AN001	Safeguard Building 2 Safeguard Building 3	Yes	Run	I
HEPA Final Filters	30SAB01AT005 30SAB04AT005	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Back-draft Dampers	30SAB01AA011 30SAB04AA011	Safeguard Building 2 Safeguard Building 3	Yes	Open / CloseN/A	I
Recirculation and Air Conditioning Trains 30SAB02 and 30SAB03					
Manual Dampers (recirculation from CRE)	30SAB02AA009 30SAB03AA009	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Manual Dampers (recirculation from CRE)	30SAB02AA010 30SAB03AA010	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I

Table 2.6.1-1—CRACS Equipment Mechanical Design
Sheet 4 of 5

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Air Cooling Coils	30SAB02AC001 30SAB03AC001	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Moisture Separators	30SAB02AT004 30SAB03AT004	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Supply Air Fans	30SAB02AN001 30SAB03AN001	Safeguard Building 2 Safeguard Building 3	Yes	~~Stop~~ Run	I
~~HEPA~~ Final Filters	30SAB02AT005 30SAB03AT005	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Backdraft Dampers	30SAB02AA011 30SAB03AA011	Safeguard Building 2 Safeguard Building 3	Yes	~~N/A~~ Open / Close	I
Kitchen and Sanitary Exhaust 30SAB45					
Motor Operated Damper	30SAB45AA003	Safeguard Building 2	Yes	Close	I
~~Silencer~~	~~30SAB45BS001~~	~~Safeguard Building 2~~	~~Yes~~	~~N/A~~	~~I~~
~~Manual damper~~	~~30SAB45AA005~~	~~Safeguard Building 2~~	~~Yes~~	~~N/A~~	~~I~~
~~Exhaust fan~~	~~30SAB45AN001~~	~~Safeguard Building 2~~	~~Yes~~	~~Stop~~	~~I~~
Motor Operated Damper	30SAB45AA004	Safeguard Building 2	Yes	Close	I
Backdraft damper	30SAB45AA006	Safeguard Building 2	Yes	~~N/A~~ Close	I

Table 2.6.1-1—CRACS Equipment Mechanical Design
Sheet 5 of 5

Description	Tag Number[1]	Location	ASME AG-1 Code	Function	Seismic Category
MCR Air Supply 30SAB32					
Manual Dampers	30SAB32AA001 30SAB32AA002 30SAB32AA003 30SAB32AA006 30SAB32AA013 30SAB32AA015 30SAB32AA017	Safeguard Building 2	Yes	N/A	I
Electric Heaters	30SAB32AH001 30SAB32AH002 30SAB32AH003 30SAB32AH004 30SAB32AH005 30SAB32AH006 30SAB32AH007	Safeguard Building 2	Yes	On / Off (based on ambient conditions)	I
MCR Air Exhaust 30SAB42					
Motor Operated Dampers	30SAB42AA001 30SAB42AA002	Safeguard Building 2	Yes	Open	I
Manual Dampers	30SAB42AA006 30SAB42AA009 30SAB42AA011 30SAB42AA012 30SAB42AA014 30SAB42AA016	Safeguard Building 2	Yes	N/A	I

1. Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.6.1-2—CRACS Equipment I&C and Electrical Design
Sheet 1 of 5

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	PACS	MCR / RSS Displays	MCR / RSS Controls
Fresh Air Intake Train 30SAB01						
Motor Operated Damper	30SAB01AA002	Safeguard Building 2	Division 4[N] Division 3[A]	Yes	Position / Position	Open-Close / Open-Close
Electric Heater	30SAB01AH001	Safeguard Building 2	Division 1[N]	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30SAB01AA003	Safeguard Building 2	Division 1[N] Division 2[A]	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAB01AA012	Safeguard Building 2	Division 1[N] Division 2[A]	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAB01AA004	Safeguard Building 2	Division 1[N] Division 2[A]	Yes	Position / Position	Open-Close / Open-Close
Fresh Air Intake Train 30SAB04						
Motor Operated Damper	30SAB04AA002	Safeguard Building 3	Division 1[N] Division 2[A]	Yes	Position / Position	Open-Close / Open-Close
Electric Heater	30SAB04AH001	Safeguard Building 3	Division 4[N]	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30SAB04AA003	Safeguard Building 32	Division 4[N] Division 3[A]	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAB04AA012	Safeguard Building 3	Division 4[N] Division 3[A]	Yes	Position / Position	Open-Close / Open-Close

Table 2.6.1-2—CRACS Equipment I&C and Electrical Design
Sheet 2 of 5

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	PACS	MCR / RSS Displays	MCR / RSS Controls
Motor Operated Damper	30SAB04AA004	Safeguard Building 3	Division 4^N Division 3^A	Yes	Position / Position	Open-Close / Open-Close
Iodine Filtration Train 30SAB11						
Motor Operated Damper (Recirculation from CRE)	30SAB11AA004	Safeguard Building 2	Division 1^N Division 2^A	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAB11AA001	Safeguard Building 2	Division 1^N Division 2^A	Yes	Position / Position	Open-Close / Open-Close
Electric Heater	30SAB11AH001	Safeguard Building 2	Division 1^N Division 2^A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30SAB11AA003	Safeguard Building 2	Division 1^N Division 2^A	Yes	Position / Position	Open-Close / Open-Close
Supply Air Fan	30SAB11AN001	Safeguard Building 2	Division 1^N Division 2^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Iodine Filtration Train 30SAB14						
Motor Operated Damper (Recirculation from CRE)	30SAB14AA004	Safeguard Building 3	Division 4^N Division 3^A	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAB14AA001	Safeguard Building 3	Division 4^N Division 3^A	Yes	Position / Position	Open-Close / Open-Close
Electric Heater	30SAB14AH001	Safeguard Building 3	Division 4^N Division 3^A	Yes	On-Off / On-Off	Start-Stop / Start-Stop

Table 2.6.1-2—CRACS Equipment I&C and Electrical Design
Sheet 3 of 5

Description	Tag Number[1]	Location	IEEE Class 1E [2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Motor Operated Damper	30SAB14AA003	Safeguard Building 32	Division 4^N Division 3^A	Yes	Position / Position	Open-Close / Open-Close
Supply Air Fan	30SAB14AN001	Safeguard Building 3	Division 4^N Division 3^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation and Air Conditioning Train 30SAB01						
Supply Air Fan	30SAB01AN001	Safeguard Building 2	Division 1^N Division 2^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation and Air Conditioning Train 30SAB02						
Supply Air Fan	30SAB02AN001	Safeguard Building 2	Division 2^N Division 1^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation and Air Conditioning Train 30SAB03						
Supply Air Fan	30SAB03AN001	Safeguard Building 3	Division 3^N Division 4^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation and Air Conditioning Train 30SAB04						
Supply Air Fan	30SAB04AN001	Safeguard Building 3	Division 4^N Division 3^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Kitchen and Sanitary Exhaust 30SAB45						

Table 2.6.1-2—CRACS Equipment I&C and Electrical Design Sheet 4 of 5

Description	Tag Number[1]	Location	IEEE Class 1E [2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Motor Operated Damper	30SAB45AA003	Safeguard Building 2	Division 1^N Division 2^A	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAB45AA004	Safeguard Building 2	Division 4^N Division 3^A	Yes	Position / Position	Open-Close / Open-Close
MCR Air Exhaust 30SAB42						
Motor Operated Damper	30SAB42AA001	Safeguard Building 2	Division 1^N Division 2^A	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAB42AA002	Safeguard Building 2	Division 4^N Division 3^A	Yes	Position / Position	Open-Close / Open-Close
Instruments						
Differential Pressure across 30SAB11 Iodine Train Filters	30SAB11CP001	Safeguard Building 2	N/A	N/A	Press / Press	N/A
Differential Pressure across 30SAB14 Iodine Train Filters	30SAB14CP001	Safeguard Building 3	N/A	N/A	Press / Press	N/A
Differential Pressure between Main Control Room and Adjacent Rooms	30SAB32CP001 30SAB32CP002 30SAB32CP003	Safeguard Building 2	N/A	N/A	Press / Press	N/A
Iodine Filtration Train Flow	30SAB11CF001 30SAB14CF001	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Flow / Flow	N/A
Protective Switch-off Temperature for Electric Heaters	30SAB01CT002 30SAB04CT002	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A

Table 2.6.1-2—CRACS Equipment I&C and Electrical Design Sheet 5 of 5

Description	Tag Number[1]	Location	IEEE Class 1E [2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Temperature Downstream of Electric Heaters	30SAB01CT003/004 30SAB04CT003/004	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Main Control Room Temperature	30SAB32CT002 30SAB32CT003	Safeguard Building 2	N/A	N/A	Temp / Temp	N/A
Temperature Downstream of Iodine Train Heaters	30SAB11CT002 30SAB14CT002	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Temperature Upstream of Iodine Train Heaters	30SAB11CT001 30SAB14CT001	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Temperature Upstream of Electric Heaters	30SAB01CT001 30SAB04CT001	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Temperature Downstream of Carbon Adsorber	30SAB11CT003 30SAB14CT003	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Conditioning Trains Air Flow	30SAB01/02CF001 30SAB03/04CF001	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Flow / Flow	N/A

1. Equipment tag numbers are provided for information only and are not part of the certified design.
2. ^{N} denotes division the equipment is normally powered from, while ^{A} denotes division the equipment is powered from when alternate feed is implemented.

**Table 2.6.1-3—Main Control Room Air Conditioning System ITAAC
Sheet 1 of 9**

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the CRACS is as described in the Design Description of Section 2.6.1, Tables 2.6.1-1 and 2.6.1-2, and as shown on Figures 2.6.1-1, 2.6.1-2, and 2.6.1-3.	An inspection of the as-built CRACS functional arrangement will be performed.	The CRACS conforms to the functional arrangement as described in the Design Description of Section 2.6.1, Tables 2.6.1-1 and 2.6.1-2, and as shown on Figures 2.6.1-1, 2.6.1-2, and 2.6.1-3.
2.2	Deleted.	Deleted.	Deleted.

**Table 2.6.1-3—Main Control Room Air Conditioning System ITAAC
Sheet 2 of 9**

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.3	Physical separation exists between the CRACS fresh air intake, iodine filtration, and recirculation and air conditioning trains as listed in Table 2.6.1-1.	An inspection will be performed to verify that the as-built CRACS fresh air intake, iodine filtration, and recirculation and air conditioning trains are located in separate rooms of Safeguard Buildings 2 and 3.	Physical separation exists between the as-built CRACS fresh air intake, iodine filtration, and recirculation and air conditioning trains as follows: • The CRACS fresh air intake train 30SAB01, iodine filtration train 30SAB11, and recirculation and air conditioning train 30SAB01 as listed in Table 2.6.1-1 are located in room 2UJK31034 of Safeguard Building 2. • The CRACS fresh air intake train 30SAB04, iodine filtration train 30SAB14, and recirculation and air conditioning train 30SAB04 as listed in Table 2.6.1-1 are located in room 2UJK31034 of Safeguard Building 3. • The CRACS recirculation and air conditioning train 30SAB02 as listed in Table 2.6.1-1 is located in room 2UJK31035 of Safeguard Building 2. • The CRACS recirculation and air conditioning train 30SAB03 as listed in Table 2.6.1-1 is located in room 2UJK31035 of Safeguard Building 3.
3.1	Deleted.	Deleted.	Deleted.

Table 2.6.1-3—Main Control Room Air Conditioning System ITAAC
Sheet 3 of 9

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.2	Class 1E dampers listed in Table 2.6.1-2 will function to change position as listed in Table 2.6.1-1 under normal operating conditions.	Tests will be performed to verify the ability of Class 1E dampers to change position under normal operating conditions.	Class 1E dampers listed in Table 2.6.1-2 change position as listed in Table 2.6.1-1 under normal operating conditions.
3.3	Equipment identified as Seismic Category I in Table 2.6.1-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.1-1~~.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Table 2.6.1-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.6.1-1 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.6.1-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.1-1 including the time required to perform the listed function~~. b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.6.1-1, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.
3.4	Deleted.~~Equipment listed in Table 2.6.1-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~	Deleted.~~An analysis will be performed of ASME AG-1 Code Design Verification Reports.~~	Deleted.~~ASME AG-1 Code Design Verification Reports (AA-4400) conclude that the design of equipment listed as ASME AG-1 Code in Table 2.6.1-1 complies with ASME AG-1 Code requirements.~~
3.5	Deleted.~~Equipment listed in Table 2.6.1-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~	Deleted.~~An inspection of the as-built fabrication activities and documentation for ASME AG-1 Code equipment will be conducted.~~	Deleted.~~A report concludes that ASME AG-1 Code equipment listed in Table 2.6.1-1 are fabricated in accordance with ASME AG-1 Code requirements.~~

**Table 2.6.1-3—Main Control Room Air Conditioning System ITAAC
Sheet 4 of 9**

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.6	Equipment listed in Table 2.6.1-1 as ASME AG-1 Code are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.	An inspection of the as-built construction activities and documentation for ASME AG-1 Code equipment will be conducted.	A report concludes that ASME AG-1 Code equipment listed in Table 2.6.1-1 are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.
4.1	Displays listed in Table 2.6.1-2 are indicated on the PICS operator workstations in the MCR and the RSS.	a. Tests will be performed to verify that the displays listed in Table 2.6.1-2 are indicated on the PICS operator workstations in the MCR ~~by using test input signals to PICS~~. b. Tests will be performed to verify that the displays listed in Table 2.6.1-2 are indicated on the PICS operator workstations in the RSS ~~by using test input signals inputs to PICS~~.	a. Displays listed in Table 2.6.1-2 are indicated on the PICS operator workstations in the MCR. b. Displays listed in Table 2.6.1-2 are indicated on the PICS operator workstations in the RSS.
4.2	Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.1-2.	a. Tests will be performed using controls on the PICS operator workstations in the MCR. b. Tests will be performed using controls on the PICS operator workstations in the RSS.	a. Controls on the PICS operator workstations in the MCR perform the function listed in Table 2.6.1-2. b. Controls on the PICS operator workstations in the RSS perform the function listed in Table 2.6.1-2.
4.3	Equipment listed as being controlled by a PACS module in Table 2.6.1-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.	A test will be performed using test input signals to verify equipment controlled by a PACS module responds to the state requested and provides drive monitoring signals back to the PACS module.	Equipment listed as being controlled by a PACS module in Table 2.6.1-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

Table 2.6.1-3—Main Control Room Air Conditioning System ITAAC
Sheet 5 of 9

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
5.1	Equipment designated as Class 1E in Table 2.6.1-2 are powered from the Class 1E division as listed in Table 2.6.1-2 in a normal or alternate feed condition.	a. Testing will be performed by providing a test input signal in each normally aligned division.	a. The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in Table 2.6.1-2.
		b. Testing will be performed by providing a test input signal in each division with the alternate feed aligned to the divisional pair.	b. The test input signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E equipment identified in Table 2.6.1-2.
5.2	Deleted.	Deleted.	Deleted.
6.1	The CRACS maintains a positive pressure in the CRE area relative to the outside environment and adjacent areas, while operating in a design basis accident alignment.	A test will be performed using test input signals to verify that the CRACS maintains a positive pressure in the CRE area relative to the outside environment and adjacent areas, while operating in a design basis accident alignment.	The CRACS maintains a positive pressure of greater than or equal to 0.125 inches water gauge in the CRE area relative to the outside environment and adjacent areas, while operating in a design basis accident alignment.

**Table 2.6.1-3—Main Control Room Air Conditioning System ITAAC
Sheet 6 of 9**

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.2	Upon receipt of a containment isolation signal, the iodine filtration train will start automatically, outside air supply to the CRE area is diverted through the iodine filtration train, a minimum recirculation flowrate is established from the CRE area to the iodine filtration train and a positive pressure is maintained in the CRE area relative to the adjacent areas.	a. A test will be performed to verify, upon receipt of a containment isolation test input signal, that the iodine filtration train will start automatically; and the outside air supply to the CRE area is diverted through the iodine filtration train. A test will be performed separately for each iodine filtration train using test input signals.	a. Upon receipt of a containment isolation test input signal from the PACS module, the iodine filtration trains start automatically within 60 seconds and the outside air supply to the CRE area is diverted through the iodine filtration train.
		b. A test will be performed to verify that upon receipt of a containment isolation test input signal, a minimum recirculation flowrate is established from the CRE area to the iodine filtration train. A test will be performed separately for each iodine filtration train using test input signals.	b. Upon receipt of a containment isolation test input signal from the PACS module, a recirculation flowrate of greater than or equal to 3000 scfm is established from the CRE area to the iodine filtration train.
		c. A test will be performed using test input signals to verify that upon receipt of a containment isolation test input signal, the CRACS maintains a positive pressure in the CRE area relative to the adjacent areas.	c. Upon receipt of a containment isolation test input signal from the PACS module, the CRACS maintains a pressure of greater than or equal to 0.125 inches water gauge in the CRE area relative to the adjacent areas.
6.3	The CRACS is capable of detecting smoke in the outside air inlet duct, and alerting operators to take manual actions.~~Deleted.~~	A test of the CRACS smoke detection sensors and alarms will be performed.~~Deleted.~~	Upon receipt of a smoke detection signal, an alarm sounds in the MCR.~~Deleted.~~

Table 2.6.1-3—Main Control Room Air Conditioning System ITAAC
Sheet 7 of 9

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.4	The CRE area ventilation unfiltered air in-leakage is minimized in order to maintain the MCR habitability.	A test will be performed to measure the unfiltered air in-leakage inside the CRE area boundary.	The unfiltered air in-leakage inside the CRE area boundary is less than or equal to 40 scfm.
6.5	The CRACS provides conditioned air to the CRE area to maintain the temperature within design limits of the CRE during normal operations, abnormal and accident conditions of the plant.~~cooling to maintain the design temperatures in the CRE area, while operating in a design basis accident alignment.~~	a. Tests and analysis will be performed to verify the CRACS heating and cooling capability. ~~provides cooling to maintain design temperatures in the CRE area, while operating in a design basis accident alignment.~~ b. A test of the CRACS fans will be performed to verify that the ~~design~~ air flow is greater than the approved design requirement.	a. ~~Each~~ The CRACS system is capable of providing heating and cooling capacity sufficient to provide conditioned air to maintain the temperature within design limits of the CRE during plant normal operations, abnormal and accident conditions. ~~cooling coil is capable of providing design cooling capacity, while operating in a design basis accident alignment.~~ b. Each CRACS fan meets ~~is capable of meeting~~ the design air flow requirements during plant normal operations, abnormal and accident conditions.~~, while operating in a design basis accident alignment.~~
6.6	The CREF heaters protect the carbon adsorber from high humidity during operation of the CREF unit.	Tests and analysis of the CREF heaters will be performed to verify the CREF heaters protect the carbon adsorber from high humidity during operation of the CREF unit.	a. The CREF heaters energize during operation of the CREF unit and each CREF heater provides equal to or, greater than, its required design heating capacity. b. A report concludes that ~~The~~ CREF heaters protect~~are capable of protecting~~ the carbon adsorber from high humidity during operation of the CREF unit.

Table 2.6.1-3—Main Control Room Air Conditioning System ITAAC
Sheet 8 of 9

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
6.7	Upon receipt of a high radiation alarm signal in the air intake duct, the iodine filtration train will start automatically, the outside air supply to the CRE area is diverted through the iodine filtration train, a minimum CRE recirculation flowrate is established from the CRE area to the iodine filtration train, and a positive pressure is maintained in the CRE area relative to the adjacent areas.	a. A test will be performed to verify, upon receipt of high radiation alarm test input signal in the air intake duct, that the iodine filtration train will start automatically; and the outside air supply to the CRE area is diverted through the iodine filtration train. A test will be performed separately for each iodine filtration train using test input signals.	a. A separate test for each iodine filtration train confirms, upon receipt of high radiation alarm test input signal from the PACS module, that the iodine filtration train will start automatically within 60 seconds after receipt of a test input signal from the PACS module, and the outside air supply is diverted through the iodine filtration train.
		b. A test will be performed to verify, upon receipt of high radiation alarm test input signal in the air intake duct, that a minimum CRE recirculation flowrate for each iodine filtration train is achieved. A test will be performed separately for each iodine filtration train using test input signals.	b. A separate test for each iodine filtration train confirms, upon receipt of high radiation alarm test input signal from the PACS module, that a CRE recirculation flowrate of greater than or equal to 3,000 scfm is established from the CRE area to the iodine filtration train.
		c. A test will be performed using test input signals to verify, upon receipt of high radiation alarm test input signal in the air intake duct, that a positive pressure is maintained in the CRE area relative to the adjacent areas. A test will be performed separately for each iodine filtration train using test input signals.	c. A separate test for each iodine filtration train confirms, upon receipt of high radiation alarm test input signal from the PACS module, that a positive pressure of greater than or equal to 0.125 inches water gauge is maintained in the CRE area relative to the adjacent areas.

Table 2.6.1-3—Main Control Room Air Conditioning System ITAAC
Sheet 9 of 9

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.8	The CRACS provides heating to maintain design temperatures in the CRE area, while operating in a design basis accident alignment.	Tests and analysis of the CRACS heaters will be performed to verify CRACS provides heating to maintain design temperatures in the CRE area, while operating in a design basis accident alignment.	Each CRACS air inlet heater is capable of providing design heating capacity to maintain design temperatures in the CRE area, while operating in a design basis accident alignment.

Figure 2.6.1-1—Control Room Air Intake and CREF (Iodine Filtration) Train Subsystem Functional Arrangement

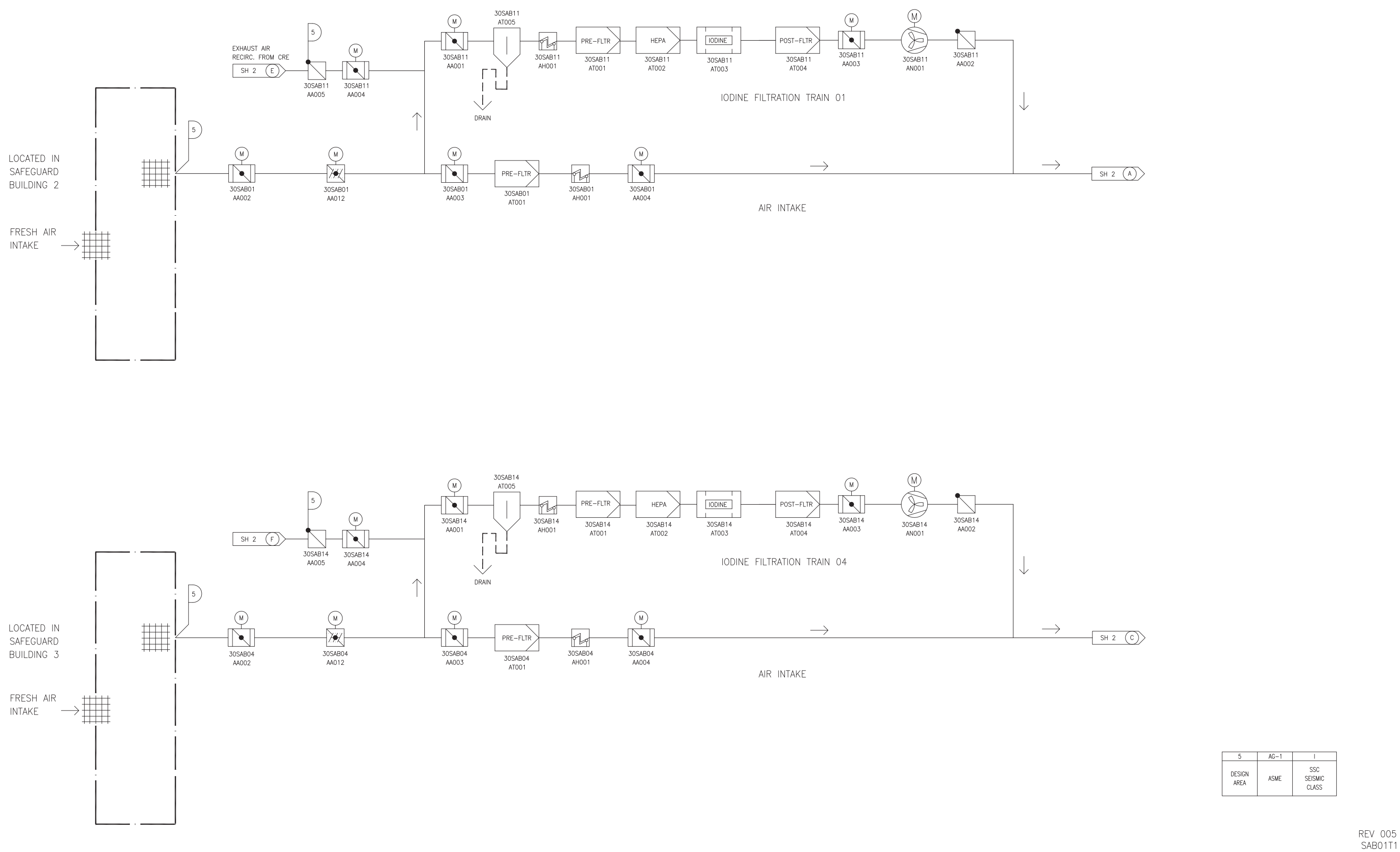


Figure 2.6.1-2—Control Room Air Conditioning and Recirculation Air Handling Subsystem Functional Arrangement

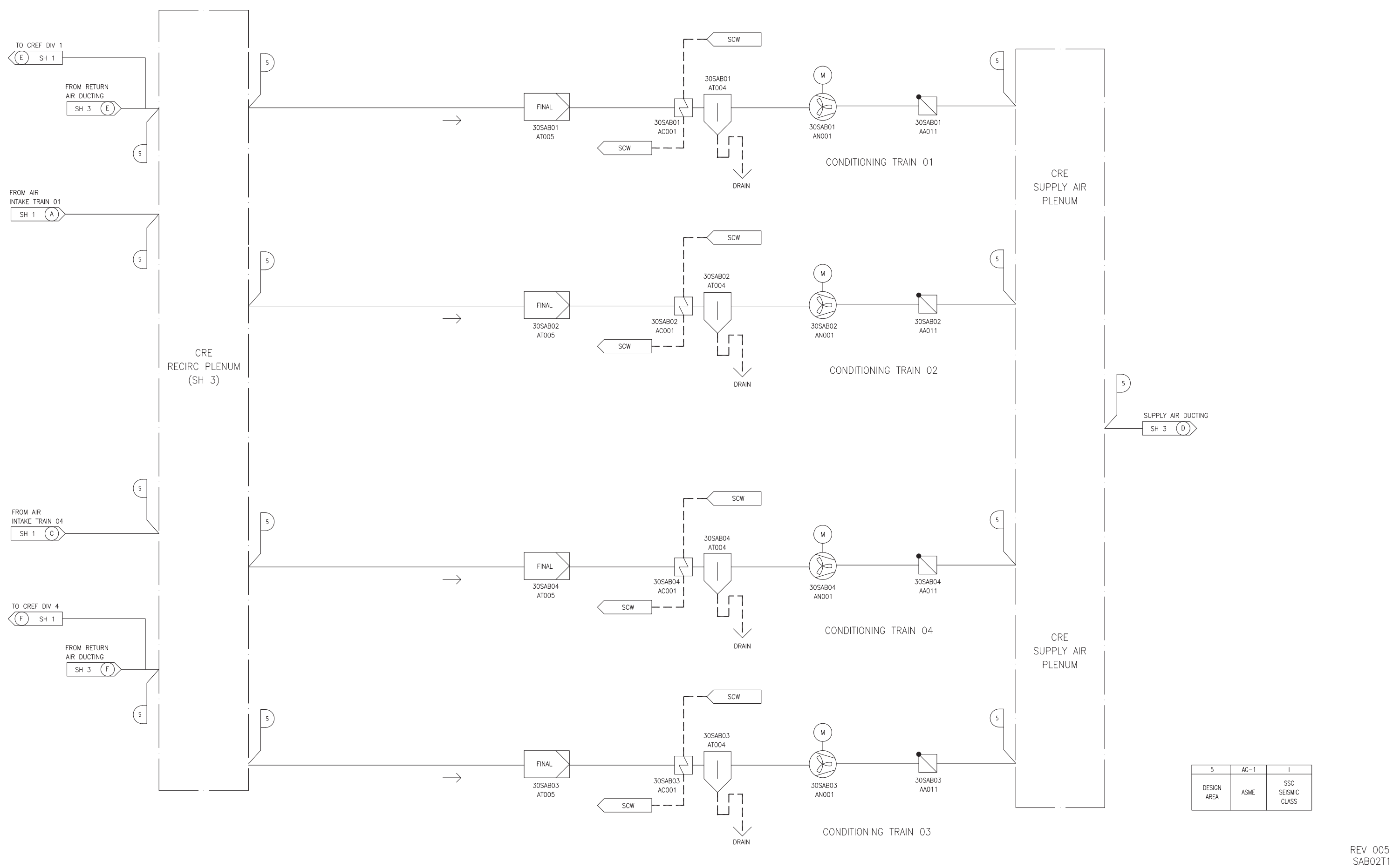
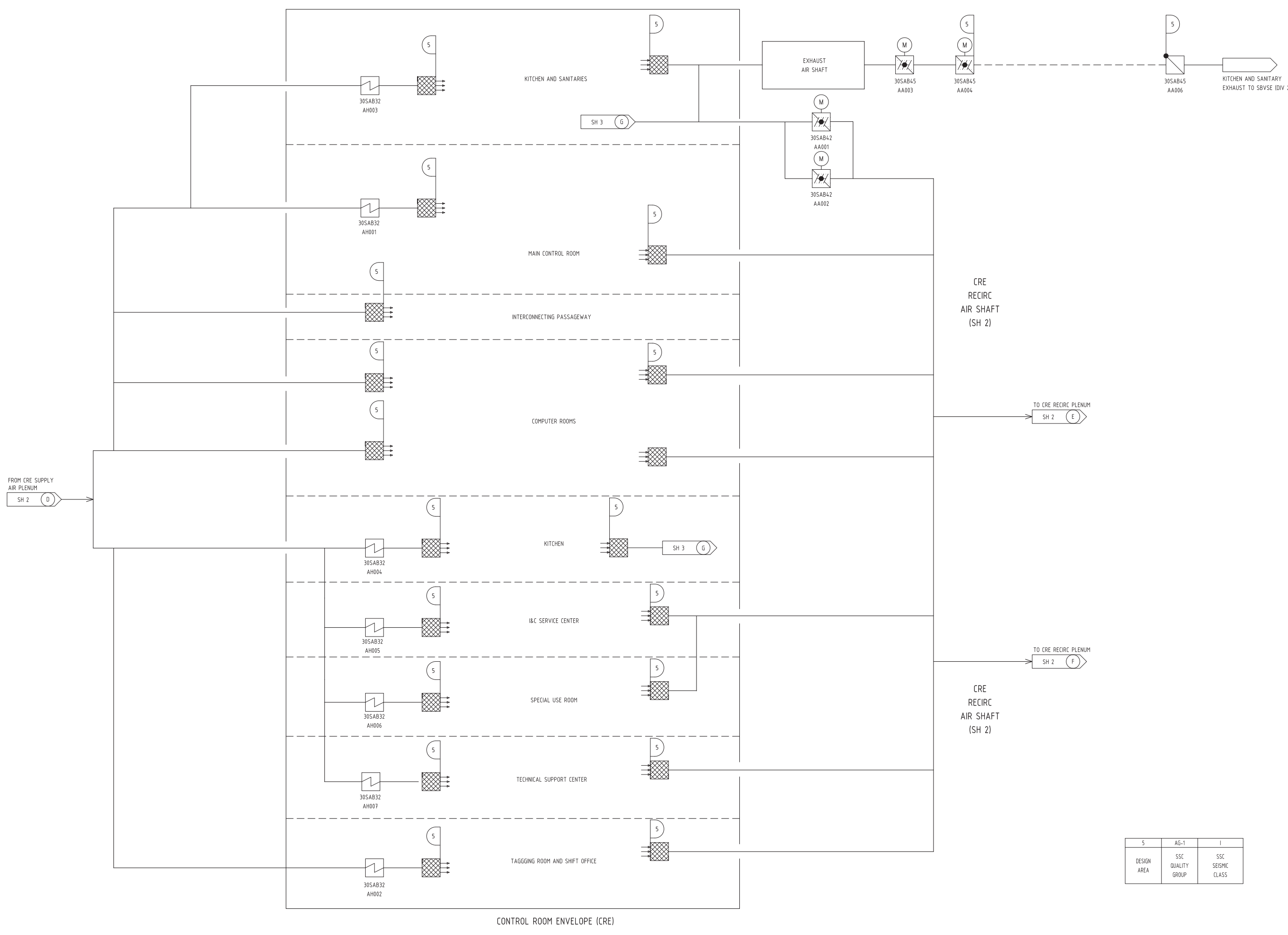


Figure 2.6.1-3—CRE Air Supply and Recirculation Subsystem Functional Arrangement



2.6.2 Access Building Ventilation System

There are no Tier 1 entries for this system.

2.6.3 Annulus Ventilation System

Design Description

1.0 System Description

The annulus ventilation system (AVS) maintains a negative pressure in the annulus to collect leaks from the Reactor Containment Building. The exhaust air is filtered before releasing to the environment via the vent stack.

The AVS consists of three trains, one for normal operation and two accident trains for abnormal plant operating conditions.

The AVS provides the following safety-related functions:

- Isolation of the secondary containment.
- Maintain a negative pressure in the annulus during accident operation.
- Collection of containment building leakage and removal of particulates from the contaminated air prior to release to the plant vent stack.

The AVS provides the following non-safety related functions:

- Maintain ambient air temperature in the annulus.
- Maintain a negative pressure in the annulus during normal plant operation.

2.0 Arrangement

2.1 The functional arrangement of the AVS is as described in the Design Description of Section 2.6.3, Tables 2.6.3-1—Annulus Ventilation System Equipment Mechanical Design and 2.6.3-2—Annulus Ventilation System Equipment I&C and Electrical Design, and as shown on Figures 2.6.3 1—Annulus Ventilation System Normal Operation Train Functional Arrangement and 2.6.3 2—Annulus Ventilation System Accident Filtration Train Functional Arrangement.

2.2 Deleted.

2.3 Physical separation exists between the AVS iodine filtration trains located in the Fuel Building as listed in Table 2.6.3-1 and as shown on Figure 2.6.3-1.

3.0 Mechanical Design Features

3.1 Deleted.

3.2 Class 1E dampers listed in Table 2.6.3-2 will function to change position as listed in Table 2.6.3-1 under normal operating conditions.

3.3 Equipment identified as Seismic Category I in Table 2.6.3-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.6.3-1.

3.4 Deleted.~~Equipment listed in Table 2.6.3-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~

3.5 Deleted.~~Equipment listed in Table 2.6.3-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~

3.6 Equipment listed in Table 2.6.3-1 as ASME AG-1 Code are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

4.0 I&C Design Features, Displays, and Controls

4.1 Displays listed in Table 2.6.3-2 are indicated on the PICS operator workstations in the MCR and the RSS.

4.2 Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.3-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.3-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

5.0 Electrical Power Design Features

5.1 Equipment designated as Class 1E in Table 2.6.3-2 are powered from the Class 1E division as listed in Table 2.6.3-2 in a normal or alternate feed condition.

5.2 Deleted.

6.0 Environmental Qualifications

6.1 Equipment designated as harsh environment in Table 2.6.3-2 will perform the function listed in Table 2.6.3-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.

7.0 Equipment and System Performance

7.1 The AVS maintains a negative pressure between the inner and outer containment walls, while operating in a design basis accident alignment.

7.2 Upon receipt of containment isolation signal, the following actions occur automatically:

- Isolation of the normal operation train by closing the isolation dampers listed in Table 2.6.3-1 for Normal Operation Train.
- Start of the accident filtration trains and opening of the dampers listed in Table 2.6.3-1 for Accident Filtration Train.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.3-3 lists the AVS ITAAC.

Table 2.6.3-1—AVS Equipment Mechanical Design
Sheet 1 of 2

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Normal Operation Train					
Motor Operated Supply Air Dampers	30KLB34AA002 30KLB34AA003	Fuel Building Fuel Building ~~30UFA21095~~ ~~30UFA21095~~	Yes	Close	I
Motor Operated Exhaust Air Dampers	30KLB44AA002 30KLB44AA003	Fuel Building Fuel Building ~~30UFA29054~~ ~~30UFA29054~~	Yes	Close	I
Accident Filtration Train					
Motor Operated Dampers	30KLB21AA003 30KLB24AA003	Fuel Building Fuel Building ~~30UFA17084~~ ~~30UFA17082~~	Yes	Open	I
Electric Heaters Two stage	30KLB21AH001A/B 30KLB24AH001A/B	Fuel Building Fuel Building ~~30UFA17084~~ ~~30UFA17082~~	Yes	On / Off	I
Prefilters	30KLB21AT001 30KLB24AT001	Fuel Building Fuel Building ~~30UFA17084~~ ~~30UFA17082~~	Yes	N/A	I
~~Upstream HEPA~~ Post Filters	30KLB21AT002 30KLB24AT002	Fuel Building Fuel Building ~~30UFA17084~~ ~~30UFA17082~~	Yes	N/A	I

Table 2.6.3-1—AVS Equipment Mechanical Design
Sheet 2 of 2

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Carbon Absorbers	30KLB21AT003 30KLB24AT003	Fuel Building Fuel Building ~~30UFA17084~~ ~~30UFA17082~~	Yes	N/A	I
~~Downstream HEPA~~ Post Filters	30KLB21AT004 30KLB24AT004	Fuel Building Fuel Building ~~30UFA17084~~ ~~30UFA17082~~	Yes	N/A	I
Motor Operated Dampers	30KLB21AA004 30KLB24AA004	Fuel Building Fuel Building ~~30UFA17084~~ ~~30UFA17082~~	Yes	Open	I
Exhaust Fans	30KLB21AN001 30KLB24AN001	Fuel Building Fuel Building ~~30UFA17083~~ ~~30UFA17081~~	Yes	Run	I
Backdraft Dampers	30KLB21AA006 30KLB24AA006	Fuel Building Fuel Building ~~30UFA17083~~ ~~30UFA17081~~	Yes	~~N/A~~Open / Close	I
Moisture Separators	30KLB21AT005 30KLB24AT005	Fuel Building Fuel Building	Yes	N/A	1

1. Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.6.3-2—AVS Equipment I&C and Electrical Design
Sheet 1 of 3

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Normal Operation Train							
Motor Operated Supply Air Damper	30KLB34AA002	Fuel Building	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Supply Air Damper	30KLB34AA003	Fuel Building	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Air Damper	30KLB44AA002	Fuel Building	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Air Damper	30KLB44AA003	Fuel Building	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Accident Filtration Train							
Motor Operated Supply Air Damper	30KLB21AA003	Fuel Building	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Supply Air Damper	30KLB24AA003	Fuel Building	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Air Dampers	30KLB21AA004	Fuel Building	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Air Dampers	30KLB24AA004	Fuel Building	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close

Table 2.6.3-2—AVS Equipment I&C and Electrical Design
Sheet 2 of 3

Description	Tag Number[1]	Location	IEEE Class 1E [2]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Exhaust Fan	30KLB21AN001	Fuel Building	Division 1[N] Division 2[A]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Exhaust Fan	30KLB24AN001	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Electrical Heater Two stage	30KLB21AH001A/B	Fuel Building	Division 1[N] Division 2[A]	Yes	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Electrical Heater Two stage	30KLB24AH001A/B	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Instruments							
Annulus Pressure	30KLB21CP001 30KLB24CP001	Fuel Building	N/A	Yes	N/A	Press / Press	N/A
Temperature Upstream of Heaters	30KLB21CT001 30KLB24CT001	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Temperature Limit Switch for Heaters	30KLB21CT002 30KLB24CT002	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Temperature Regulation for Heaters	30KLB21CT003 30KLB24CT003	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Temperature downstream of carbon adsorbers	30KLB21CT004 30KLB24CT004	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Pressure Limit Switch Exhaust Fans	30KLB21CP002 30KLB24CP002	Fuel Building	N/A	Yes	N/A	Press / Press	N/A

Table 2.6.3-2—AVS Equipment I&C and Electrical Design
Sheet 3 of 3

Description	Tag Number[1]	Location	IEEE Class 1E [2]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Accident Filtration Train Differential Pressure	30KLB21CP505 30KLB24CP505	Fuel Building	N/A	Yes	N/A	Press / Press	N/A
Accident Filtration Train Flow	30KLB21CF001A 30KLB21CF001B	Fuel Building	N/A	Yes	N/A	Flow / Flow	N/A

1. Equipment tag numbers are provided for information only and are not part of the certified design.
2. ^{N} denotes division the equipment is normally powered from, while ^{A} denotes the equipment is powered from when alternate feed is implemented.

Table 2.6.3-3—Annulus Ventilation System ITAAC
Sheet 1 of 6

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the AVS is as described in the Design Description of Section 2.6.3, Tables 2.6.3-1 and 2.6.3-2, and as shown on Figures 2.6.3-1 and 2.6.3-2.	An inspection of the as-built AVS functional arrangement will be performed.	The AVS conforms to the functional arrangement as described in the Design Description of Section 2.6.3, Tables 2.6.3-1 and 2.6.3-2, and as shown on Figures 2.6.3-1 and 2.6.3-2.
2.2	Deleted.	Deleted.	Deleted.
2.3	Physical separation exists between AVS iodine filtration trains located in the Fuel Building as listed in Table 2.6.3-1 and as shown on Figure 2.6.3-1.	An inspection will be performed to verify that the as-built AVS iodine filtration trains are located in separate rooms in the Fuel Building.	The AVS iodine filtration trains are located in separate rooms in the Fuel Building as listed in Table 2.6.3-1 and as shown on Figure 2.6.3-1.
3.1	Deleted.	Deleted.	Deleted.
3.2	Class 1E dampers listed in Table 2.6.3-2 will function to change position as listed in Table 2.6.3-1 under normal operating conditions.	Tests will be performed to verify the ability of Class 1E dampers to change position under normal operating conditions.	Class 1E dampers listed in Table 2.6.3-2 change position as listed in Table 2.6.3-1 under normal operating conditions.

Table 2.6.3-3—Annulus Ventilation System ITAAC
Sheet 2 of 6

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.3	Equipment identified as Seismic Category I in Table 2.6.3-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s)~~ listed in Table 2.6.3-1~~.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Table 2.6.3-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.6.3-1 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.6.3-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s)~~ listed in Table 2.6.3-1 including the time required to perform the listed function~~. b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.6.3-1, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.
3.4	Equipment listed in Table 2.6.3-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.	An analysis will be performed of ASME AG-1 Code Design Verification Reports.	ASME AG-1 Code Design Verification Reports (AA-4400) conclude that the design of equipment listed as ASME AG-1 Code in Table 2.6.3-1 complies with ASME AG-1 Code requirements.
3.5	Equipment listed in Table 2.6.3-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.	An inspection of the as-built fabrication activities and documentation for ASME AG-1 Code equipment will be conducted.	A report concludes that ASME AG-1 Code equipment listed in Table 2.6.3-1 are fabricated in accordance with ASME AG-1 Code requirements.
3.6	Equipment listed in Table 2.6.3-1 as ASME AG-1 Code are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.	An inspection of the as-built construction activities and documentation for ASME AG-1 Code equipment will be conducted.	A report concludes that ASME AG-1 Code equipment listed in Table 2.6.3-1 are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

Table 2.6.3-3—Annulus Ventilation System ITAAC
Sheet 3 of 6

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
4.1	Displays listed in Table 2.6.3-2 are indicated on the PICS operator workstations in the MCR and the RSS.	a. Tests will be performed to verify that the displays listed in Table 2.6.3-2 are indicated on the PICS operator workstations in the MCR ~~by using test input signals to PICS~~.	a. Displays listed in Table 2.6.3-2 are indicated on the PICS operator workstations in the MCR.
		b. Tests will be performed to verify that the displays listed in Table 2.6.3-2 are indicated on the PICS operator workstations in the RSS ~~by using test input signals inputs to PICS~~.	b. Displays listed in Table 2.6.3-2 are indicated on the PICS operator workstations in the RSS.
4.2	Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.3-2.	a. Tests will be performed using controls on the PICS operator workstations in the MCR.	a. Controls on the PICS operator workstations in the MCR perform the function listed in Table 2.6.3-2.
		b. Tests will be performed using controls on the PICS operator workstations in the RSS.	b. Controls on the PICS operator workstations in the RSS perform the function listed in Table 2.6.3-2.
4.3	Equipment listed as being controlled by a PACS module in Table 2.6.3-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.	A test will be performed using test input signals to verify equipment controlled by a PACS module responds to the state requested and provides drive monitoring signals back to the PACS module.	Equipment listed as being controlled by a PACS module in Table 2.6.3-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

**Table 2.6.3-3—Annulus Ventilation System ITAAC
Sheet 4 of 6**

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
5.1	Equipment designated as Class 1E in Table 2.6.3-2 are powered from the Class 1E division as listed in Table 2.6.3-2 in a normal or alternate feed condition.	a. Testing will be performed by providing a test input signal in each normally aligned division.	a. The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in Table 2.6.3-2.
		b. Testing will be performed by providing a test input signal in each division with the alternate feed aligned to the divisional pair.	b. The test input signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E equipment identified in Table 2.6.3-2.
5.2	Deleted.	Deleted.	Deleted.

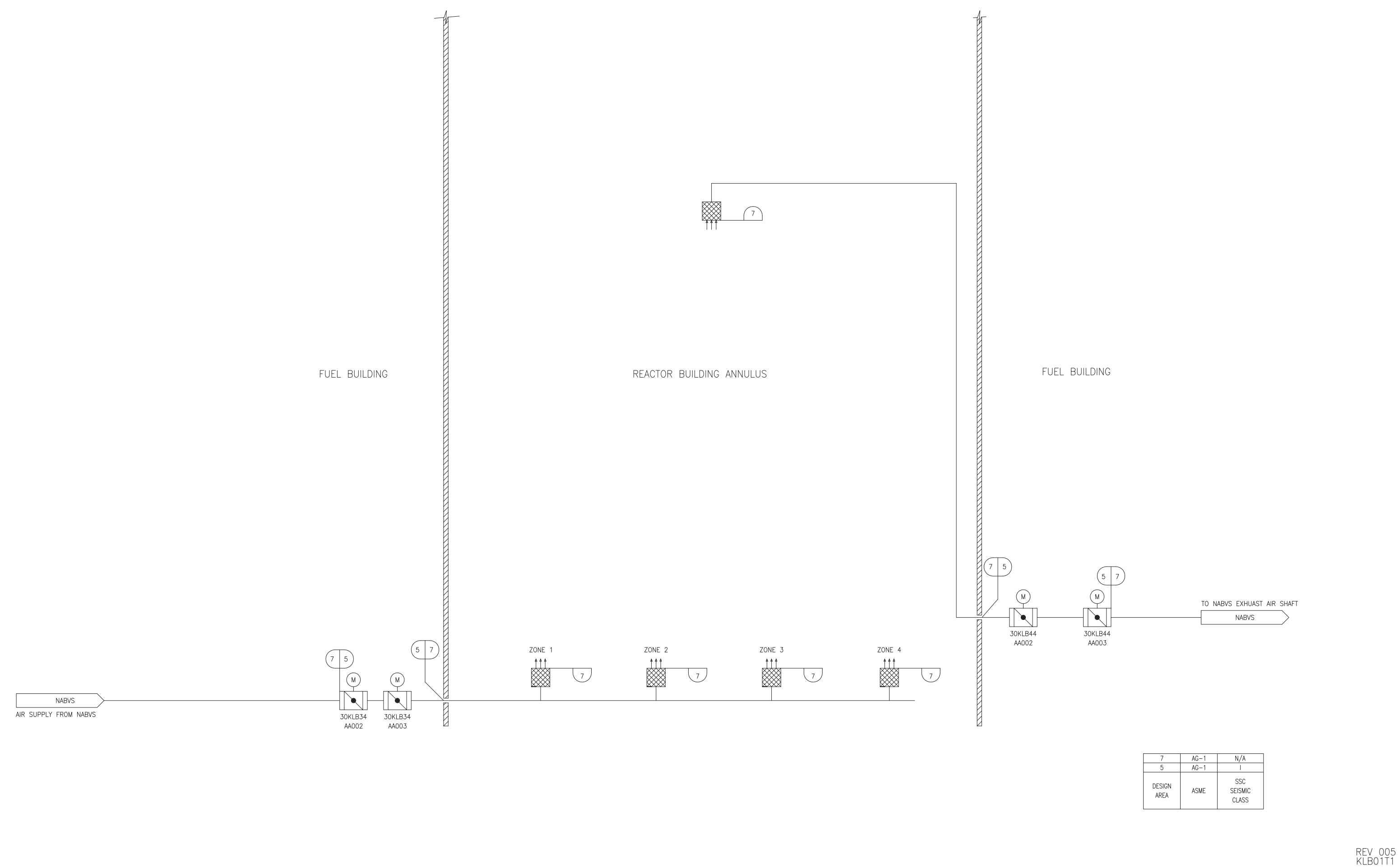
Table 2.6.3-3—Annulus Ventilation System ITAAC
Sheet 5 of 6

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.1	Equipment designated as harsh environment in Table 2.6.3-2 will perform the function listed in Table 2.6.3-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.	a. Type tests or type tests and analysis will be performed to demonstrate the ability of the equipment designated as harsh environment in Table 2.6.3-2 to perform the function listed in Table 2.6.3-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.	a. EQDPs conclude that the equipment designated as harsh environment in Table 2.6.3-2 can perform the function listed in Table 2.6.3-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions, including the time required to perform the listed function.
		b. An inspection will be performed of the as-built equipment designated as harsh environment in Table 2.6.3-2 to verify that the equipment, including the associated cables, wiring, and terminations located in a harsh environment, is bounded by the type test or combination of type tests and analyses.~~anchorage, are installed per the approved design requirements~~.	b. A report exists and concludes~~Inspection reports conclude~~ that the equipment designated as harsh environment in Table 2.6.3-2, including the associated cables, wiring, and terminations located in a harsh environment, is bounded by the type test or combination of type tests and analyses.~~anchorage, are installed per the approved design requirements~~.
7.1	The AVS maintains a negative pressure between the inner and outer containment walls, while operating in a design basis accident alignment.	A test will be performed using test input signals to verify the capability of the AVS to provide a negative pressure between the inner and outer containment walls, while operating in a design basis accident alignment.	The AVS maintains a negative pressure of less than or equal to -0.25 inches water gauge within 305 seconds after receipt of a test input signal from the PACS module, while operating in a design basis accident alignment.

Table 2.6.3-3—Annulus Ventilation System ITAAC
Sheet 6 of 6

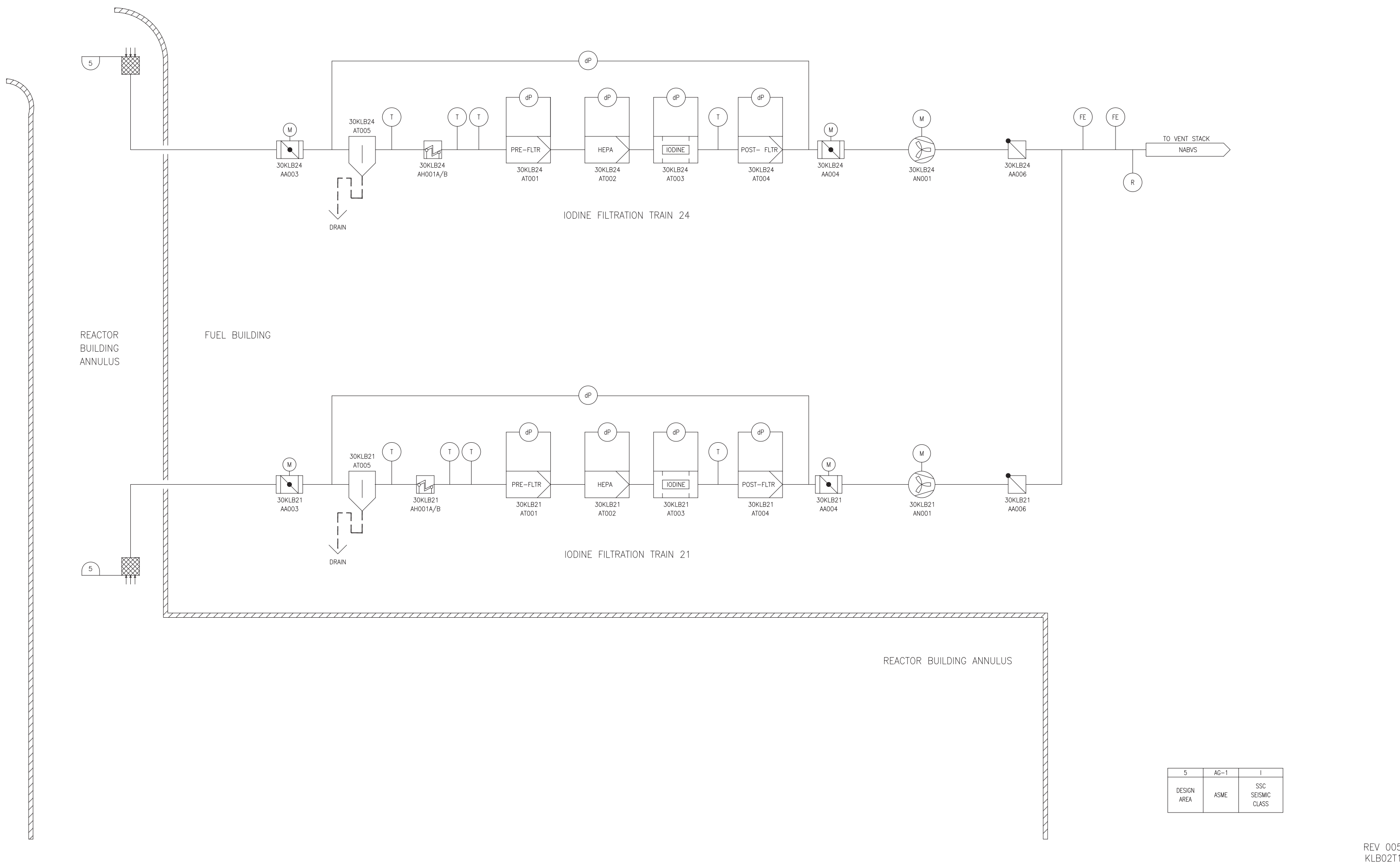
	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
7.2	Upon receipt of containment isolation signal, the following actions occur automatically: • Isolation of the normal operation train by closing the isolation dampers listed in Table 2.6.3-1 for Normal Operation Train. • Start of the accident filtration trains and opening of the dampers listed in Table 2.6.3-1 for Accident Filtration Train.	A test will be performed to verify that upon receipt of containment isolation test input signal, the following actions occur automatically: • The normal operation train isolates by closing the isolation dampers. • The accident filtration trains start, and the dampers for Accident Filtration Train to the iodine filtration train are aligned to the open position.	The following actions occur automatically within 60 seconds after receipt of an isolation test input signal from the PACS module: • The normal operation train is isolated by closing the isolation dampers listed in Table 2.6.3-1 for Normal Operation Train. • The accident filtration trains start, and the dampers listed in Table 2.6.3-1 for Accident Filtration Train are aligned to the open position.

Figure 2.6.3-1—Annulus Ventilation System Normal Operation Train Functional Arrangement



7	AG-1	N/A
5	AG-1	I
DESIGN AREA	ASME	SSC SEISMIC CLASS

Figure 2.6.3-2—Annulus Ventilation System Accident Filtration Train Functional Arrangement



2.6.4 Fuel Building Ventilation System

Design Description

1.0 System Description

The fuel building ventilation system (FBVS) receives the conditioned air supply from the nuclear auxiliary building ventilation system (NABVS). The exhaust from the FBVS is processed by the NABVS through a filtration train, and the exhaust air is directed to the vent stack.

The FBVS controls the Fuel Building temperature, humidity and air change rate for personnel comfort, personnel safety, and equipment protection during normal plant operation. The FBVS provides cooling, heating, and ventilation for the Fuel Building (FB) to remove equipment heat and heat generated from other sources. The FBVS also provides heat to maintain a minimum temperature in the building. The FBVS provides a minimal air change rate for the building and controls the building pressurization to reduce spreading of contamination.

The FBVS provides the following safety-related functions:

- Isolation of the FB from NABVS supply and exhaust on receipt of containment isolation signal. Bypass leakage from primary containment is captured and filtered by the safeguard building controlled area ventilation system (SBVS) iodine filtration trains before being released into the environment.~~The FB atmosphere is then processed through iodine filtration trains of the safeguard building controlled area ventilation system (SBVS).~~

- Heating of the rooms which have safety-related systems, structures, or equipment containing borated fluid and the rooms surrounding the extra borating system tanks to maintain minimum ambient room temperatures.

- Cooling of rooms which have the extra borating system pumps and the fuel pool cooling system pumps to maintain ambient conditions.

The FBVS provides the following non-safety related functions:

- Diverts the ventilation air flow to the NABVS iodine filter train on high radioactivity in the Fuel Building.

- Isolates the fuel handling area ventilation on high activity in the Fuel Building exhaust.~~Maintains the room ambient conditions for operation of equipment and to allow personnel access during normal operation.~~

- ~~Reduces spread of contamination from the contaminated rooms to less contaminated rooms during normal operation.~~

- ~~Reduces concentration of aerosols and radioactive gases from the room air.~~

- ~~Maintains a negative pressure within the Fuel Building with respect to outside atmosphere.~~
- ~~Isolation of the supply and exhaust airflow of the fuel handling hall.~~
- ~~Isolation of the supply and exhaust airflow of the hall in front of equipment hatch.~~
- ~~Isolation of the supply and exhaust airflow to the room in front of the emergency air lock.~~

2.0 Arrangement

2.1 The functional arrangement of the FBVS is as described in the Design Description of Section 2.6.4, Tables 2.6.4-12.6.4-1—Fuel Building Ventilation System Equipment Mechanical Design and 2.6.4-2—Fuel Building Ventilation System Equipment I&C and Electrical Design, and as shown on Figure 2.6.4-1—Fuel Building Ventilation System Functional Arrangement.

2.2 Deleted.

2.3 Physical separation exists between the FBVS ventilation trains located in the Fuel Building as listed in Table 2.6.4-~~1~~2 and as shown on Figure 2.6.4-1.

3.0 Mechanical Design Features

3.1 Deleted.

3.2 Class 1E dampers listed in Table 2.6.4-2 will function to change position as listed in Table 2.6.4-1 under normal operating conditions.

3.3 Equipment identified as Seismic Category I in Table 2.6.4-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.4-1~~.

3.4 Deleted.~~Equipment listed in Table 2.6.4-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~

3.5 Deleted.~~Equipment listed in Table 2.6.4-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~

3.6 Equipment listed in Table 2.6.4-1 as ASME AG-1 Code are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

4.0 I&C Design Features, Displays, and Controls

4.1 Displays listed in Table 2.6.4-2 are indicated on the PICS operator workstations in the MCR and the RSS.

4.2 Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.4-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.4-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

5.0 Electrical Power Design Features

5.1 Equipment designated as Class 1E in Table 2.6.4-2 is powered from the Class 1E division as listed in Table 2.6.4-2 in a normal or alternate feed condition.

5.2 Deleted.

6.0 Environmental Qualifications

6.1 Equipment designated as harsh environment in Table 2.6.4-2 will perform the function listed in Table 2.6.4-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.

7.0 Equipment and System Performance

7.1 Deleted. ~~Upon receipt of a containment isolation signal (CIS), the FBVS maintains a negative pressure in the Fuel Building relative to the outside environment.~~

7.2 Upon receipt of a containment isolation signal (CIS), the FBVS isolation dampers identified in Table 2.6.4-1 realign to exhaust air to the SBVS iodine filtration exhaust to the plant vent stack.

7.3 The FBVS provides cooling to maintain design temperatures in the pump rooms in the Fuel Building, while operating in a design basis accident alignment.

7.4 The FBVS provides heating to maintain design temperatures in the rooms with systems containing borated fluid in the Fuel Building, while operating in a design basis accident alignment.

7.5 Upon receipt of a high radioactivity signal in the FBVS, the FBVS diverts the ventilation air flow to the Nuclear Auxiliary Building Ventilation System (NABVS) iodine filter train.

7.6 Upon receipt of a high activity signal in the Fuel Building exhaust, the FBVS isolates the fuel handling area ventilation.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.4-3 lists the FBVS ITAAC.

Table 2.6.4-1—FBVS Equipment Mechanical Design
Sheet 1 of 4

Description	Tag Number[1]	Location	ASME AG-1 Code	Function	Seismic Category
Supply and Exhaust of Fuel Handling Hall					
Motor Operated Supply Damper	30KLL11AA002	Fuel Building 30UFA29045	Yes	Close	I
Motor Operated Supply Damper	30KLL14AA002	Fuel Building 30UFA29015	Yes	Close	I
Motor Operated Exhaust Damper	30KLL21AA002	Fuel Building 30UFA29015	Yes	Open	I
Motor Operated Exhaust Damper	30KLL24AA002	Fuel Building 30UFA29045	Yes	Open	I
Supply and Exhaust in front of Equipment Hatch					
Motor Operated Supply Damper	30KLL11AA001	Fuel Building 30UFA29090	Yes	Close	I
Motor Operated Supply Damper	30KLL14AA001	Fuel Building 30UFA29090	Yes	Close	I
Motor Operated Exhaust Damper	30KLL21AA001	Fuel Building 30UFA29090	Yes	Close	I
Motor Operated Exhaust Damper	30KLL24AA001	Fuel Building 30UFA29090	Yes	Close	I
Supply and Exhaust in front of Emergency Airlock					
Motor Operated Supply Damper	30KLL11AA003	Fuel Building 30UFA29005	Yes	Close	I
Motor Operated Supply Damper	30KLL14AA003	Fuel Building 30UFA29004	Yes	Close	I
Motor Operated Exhaust Damper	30KLL21AA003	Fuel Building 30UFA29005	Yes	Close	I

Table 2.6.4-1—FBVS Equipment Mechanical Design
Sheet 2 of 4

Description	Tag Number[1]	Location	ASME AG-1 Code	Function	Seismic Category
Motor Operated Exhaust Damper	30KLL24AA003	Fuel Building 30UFA29004	Yes	Close	I
Fuel Building Isolation					
Motor Operated Supply Damper (Cell 5)	30KLL34AA090	Fuel Building 30UFA24045	Yes	Close	I
Motor Operated Supply Damper (Cell 5)	30KLL31AA049	Fuel Building 30UFA24045	Yes	Close	I
Motor Operated Exhaust Damper (Cell 5)	30KLL41AA101	Fuel Building 30UFA24056	Yes	Close	I
Motor Operated Exhaust Damper (Cell 5)	30KLL44AA101	Fuel Building 30UFA24056	Yes	Close	I
Motor Operated Supply Damper (Cell 4)	30KLL34AA065	Fuel Building 30UFA24095	Yes	Close	I
Motor Operated Supply Damper (Cell 4)	30KLL31AA090	Fuel Building 30UFA24095	Yes	Close	I
Motor Operated Exhaust Damper (Cell 4)	30KLL41AA100	Fuel Building 30UFA29054	Yes	Close	I
Motor Operated Exhaust Damper (Cell 4)	30KLL44AA100	Fuel Building 30UFA29054	Yes	Close	I
Motor Operated Damper	30KLL21AA004	Fuel Building 30UFA39015	Yes	Open	I
Motor Operated Damper	30KLL24AA004	Fuel Building 30UFA39015	Yes	Open	I

Table 2.6.4-1—FBVS Equipment Mechanical Design
Sheet 3 of 4

Description	Tag Number[1]	Location	ASME AG-1 Code	Function	Seismic Category
Recirculation Cooling Units for the Extra Borating System Pump Rooms					
Air Cooling Coil	30KLL61AC001	Fuel Building 30UFA01038	Yes	N/A	I
Moisture Separator	30KLL61AT001	Fuel Building 30UFA01038	Yes	N/A	I
Recirculation Fan	30KLL61AN001	Fuel Building 30UFA01038	Yes	Run	I
Air Cooling Coil	30KLL64AC001	Fuel Building 30UFA01088	Yes	N/A	I
Moisture Separator	30KLL64AT001	Fuel Building 30UFA01088	Yes	N/A	I
Recirculation Fan	30KLL64AN001	Fuel Building 30UFA01088	Yes	Run	I
Recirculation Cooling Units for the Fuel Pool Cooling System Pump Rooms					
Air Cooling Coil	30KLL61AC002	Fuel Building 30UFA01026	Yes	N/A	I
Recirculation Fan	30KLL61AN002	Fuel Building 30UFA01026	Yes	Run	I
Air Cooling Coil	30KLL61AC003	Fuel Building 30UFA05082	Yes	N/A	I
Recirculation Fan	30KLL61AN003	Fuel Building 30UFA05082	Yes	Run	I
Air Cooling Coil	30KLL64AC002	Fuel Building 30UFA01076	Yes	N/A	I

Table 2.6.4-1—FBVS Equipment Mechanical Design
Sheet 4 of 4

Description	Tag Number[1]	Location	ASME AG-1 Code	Function	Seismic Category
Recirculation Fan	30KLL64AN002	Fuel Building ~~30UFA01076~~	Yes	Run	I
Air Cooling Coil	30KLL64AC003	Fuel Building ~~30UFA01077~~	Yes	N/A	I
Recirculation Fan	30KLL64AN003	Fuel Building ~~30UFA01077~~	Yes	Run	I
Moisture Separator	30KLL61AT002	Fuel Building ~~30UFA01026~~	Yes	N/A	I
Moisture Separator	30KLL61AT003	Fuel Building ~~30UFA05082~~	Yes	N/A	I
Moisture Separator	30KLL64AT002	Fuel Building ~~30UFA01076~~	Yes	N/A	I
Moisture Separator	30KLL64AT003	Fuel Building ~~30UFA01077~~	Yes	N/A	I
Electric Heaters for the Extra Borating System Pump Rooms and Pipe Chase					
Electric Heaters	30KLL61AH001/002	Fuel Building ~~30UFA01038~~	Yes	On/Off	I
Electric Heaters	30KLL61AH003/004	Fuel Building ~~30UFA06039~~	Yes	On/Off	I
Electric Heaters	30KLL64AH001/002	Fuel Building ~~30UFA01088~~	Yes	On/Off	I
Electric Heaters	30KLL64AH003/004	Fuel Building ~~30UFA06087~~	Yes	On/Off	I

1. Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.6.4-2—FBVS Equipment I&C and Electrical Design
Sheet 1 of 4

Description	Tag Number(1)	Location	IEEE Class 1E (2)	EQ – Harsh Env.	PACS	MCR/ RSS Displays	MCR/RSS Controls
Supply and Exhaust of Fuel Handling Hall							
Motor Operated Supply Damper	30KLL11AA002	Fuel Building	Division 1 N Division 2 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Supply Damper	30KLL14AA002	Fuel Building	Division 4 N Division 3 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Damper	30KLL21AA002	Fuel Building	Division 1 N Division 2 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Damper	30KLL24AA002	Fuel Building	Division 4 N Division 3 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Supply and Exhaust in front of Equipment Hatch							
Motor Operated Supply Damper	30KLL11AA001	Fuel Building	Division 1 N Division 2 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Supply Damper	30KLL14AA001	Fuel Building	Division 4 N Division 3 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Damper	30KLL21AA001	Fuel Building	Division 1 N Division 2 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Damper	30KLL24AA001	Fuel Building	Division 4 N Division 3 A	Yes	Yes	Position / Position	Open-Close / Open-Close

Table 2.6.4-2—FBVS Equipment I&C and Electrical Design
Sheet 2 of 4

Description	Tag Number[1]	Location	IEEE Class 1E [2]	EQ – Harsh Env.	PACS	MCR/ RSS Displays	MCR/RSS Controls
Supply and Exhaust in front of Emergency Airlock							
Motor Operated Supply Damper	30KLL11AA003	Fuel Building	Division 1 N Division 2 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Supply Damper	30KLL14AA003	Fuel Building	Division 4 N Division 3 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Damper	30KLL21AA003	Fuel Building	Division 1 N Division 2 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Damper	30KLL24AA003	Fuel Building	Division 4 N Division 3 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Fuel Building Isolation							
Motor Operated Supply Damper (Cell 5)	30KLL34AA090	Fuel Building	Division 4 N Division 3 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Supply Damper (Cell 5)	30KLL31AA049	Fuel Building	Division 1 N Division 2 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Damper (Cell 5)	30KLL41AA101	Fuel Building	Division 1 N Division 2 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Damper (Cell 5)	30KLL44AA101	Fuel Building	Division 4 N Division 3 A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Supply Damper (Cell 4)	30KLL34AA065	Fuel Building	Division 4 N Division 3 A	Yes	Yes	Position / Position	Open-Close / Open-Close

**Table 2.6.4-2—FBVS Equipment I&C and Electrical Design
Sheet 3 of 4**

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	EQ – Harsh Env.	PACS	MCR/ RSS Displays	MCR/RSS Controls
Motor Operated Supply Damper (Cell 4)	30KLL31AA090	Fuel Building	Division 1 [N] Division 2 [A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Damper (Cell 4)	30KLL41AA100	Fuel Building	Division 1 [N] Division 2 [A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Exhaust Damper (Cell 4)	30KLL44AA100	Fuel Building	Division 4 [N] Division 3 [A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLL21AA004	Fuel Building	Division 1 [N] Division 2 [A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLL24AA004	Fuel Building	Division 4 [N] Division 3 [A]	Yes	Yes	Position / Position	Open-Close / Open-Close
~~Fuel Building Ventilation System Gamma Activity Monitor~~	~~KLK38CR001~~	~~Fuel Building~~	~~Yes~~	~~No~~	~~Yes~~	~~Radiation Alarm/ Radiation Alarm~~	~~N/A~~
~~Fuel Building Ventilation System Gamma Activity Monitor~~	~~KLK38CR002~~	~~Fuel Building~~	~~Yes~~	~~No~~	~~Yes~~	~~Radiation Alarm/ Radiation Alarm~~	~~N/A~~
Recirculation Cooling Units for the Extra Borating System Pump Rooms							
Recirculation Fan	30KLL61AN001	Fuel Building	Division 1 [N] Division 2 [A]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fan	30KLL64AN001	Fuel Building	Division 4 [N] Division 3 [A]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop

**Table 2.6.4-2—FBVS Equipment I&C and Electrical Design
Sheet 4 of 4**

Description	Tag Number(1)	Location	IEEE Class 1E (2)	EQ – Harsh Env.	PACS	MCR/ RSS Displays	MCR/RSS Controls
Recirculation Cooling Units for the Fuel Pool Cooling System Pump Rooms							
Recirculation Fan	30KLL61AN002	Fuel Building	Division 1 N Division 2 A	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fan	30KLL61AN003	Fuel Building	Division 1 N Division 2 A	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fan	30KLL64AN002	Fuel Building	Division 4 N Division 3 A	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fan	30KLL64AN003	Fuel Building	Division 4 N Division 3 A	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Electric Heaters for the Extra Borating System Pump Rooms and Pipe Chase							
Electric Heaters	30KLL61AH 001/002/003/004	Fuel Building	Division 1 N Division 2 A	Yes	Yes	On-Off / On-Off	~~Start-Stop / Start-Stop~~ On-Off / On-Off
Electric Heaters	30KLL64AH 001/002/003/004	Fuel Building	Division 4 N Division 3 A	Yes	Yes	On-Off / On-Off	~~Start-Stop / Start-Stop~~ On-Off / On-Off

1. Equipment tag numbers are provided for information only and are not part of the certified design.
2. N denotes division the equipment is normally powered from, while A denotes division the equipment is powered from

Table 2.6.4-3—Fuel Building Ventilation System ITAAC
Sheet 1 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the FBVS is as described in the Design Description of Section 2.6.4, Tables 2.6.4-1 and 2.6.4-2, and as shown on Figure 2.6.4-1.	An inspection of the as-built FBVS functional arrangement will be performed.	The FBVS conforms to the functional arrangement as described in the Design Description of Section 2.6.4, Tables 2.6.4-1 and 2.6.4-2, and as shown on Figure 2.6.4-1.
2.2	Deleted.	Deleted.	Deleted.
2.3	Physical separation exists between the FBVS ventilation trains located in the Fuel Building as listed in Table 2.6.4-~~2~~1 and as shown on Figure 2.6.4-1.	An inspection will be performed to verify that the as-built FBVS ventilation trains are located in separate cells in the Fuel Building.	The FBVS ventilation trains are located in separate cells in the Fuel Building as listed in Table 2.6.4-1 and as shown on Figure 2.6.4-1.
3.1	Deleted.	Deleted.	Deleted.
3.2	Class 1E dampers listed in Table 2.6.4-2 will function to change position as listed in Table 2.6.4-1 under normal operating conditions.	Tests will be performed to verify the ability of Class 1E dampers to change position under normal operating conditions.	Class 1E dampers change position as listed in Table 2.6.4-1 under normal operating conditions.
3.3	Equipment identified as Seismic Category I in Table 2.6.4-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.4-1~~.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Table 2.6.4-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.6.4-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.4-1 including the time required to perform the listed function~~.

Table 2.6.4-3—Fuel Building Ventilation System ITAAC
Sheet 2 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
		b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.6.4-1 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed conditionper the approved design requirements.	b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.6.4-1, including anchorage, are installed in a condition bounded by the tested or analyzed conditionper the approved design requirements.
3.4	Deleted.Equipment listed in Table 2.6.4-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.	Deleted.An analysis will be performed of ASME AG-1 Code Design Verification Reports.	Deleted.ASME AG-1 Code Design Verification Reports (AA-4400) conclude that the design of equipment listed as ASME AG-1 Code in Table 2.6.4-1 complies with ASME AG-1 Code requirements.
3.5	Deleted.Equipment listed in Table 2.6.4-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.	Deleted.An inspection of the as-built fabrication activities and documentation for ASME AG-1 Code equipment will be conducted.	Deleted.A report concludes that ASME AG-1 Code equipment listed in Table 2.6.4-1 are fabricated in accordance with ASME AG-1 Code requirements.
3.6	Equipment listed in Table 2.6.4-1 as ASME AG-1 Code are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.	An inspection of the as-built construction activities and documentation for ASME AG-1 Code equipment will be conducted.	A report concludes that ASME AG-1 Code equipment listed in Table 2.6.4-1 are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

Table 2.6.4-3—Fuel Building Ventilation System ITAAC
Sheet 3 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
4.1	Displays listed in Table 2.6.4-2 are indicated on the PICS operator workstations in the MCR and the RSS.	a. Tests will be performed to verify that the displays listed in Table 2.6.4-2 are indicated on the PICS operator workstations in the MCR ~~by using test input signals to PICS~~. b. Tests will be performed to verify that the displays listed in Table 2.6.4-2 are indicated on the PICS operator workstations in the RSS ~~by using test input signals inputs to PICS~~.	a. Displays listed in Table 2.6.4-2 are indicated on the PICS operator workstations in the MCR. b. Displays listed in Table 2.6.4-2 are indicated on the PICS operator workstations in the RSS.
4.2	Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.4-2.	a. Tests will be performed using controls on the PICS operator workstations in the MCR. b. Tests will be performed using controls on the PICS operator workstations in the RSS.	a. Controls on the PICS operator workstations in the MCR perform the function listed in Table 2.6.4-2. b. Controls on the PICS operator workstations in the RSS perform the function listed in Table 2.6.4-2.
4.3	Equipment listed as being controlled by a PACS module in Table 2.6.4-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.	A test will be performed using test input signals to verify equipment controlled by a PACS module responds to the state requested and provides drive monitoring signals back to the PACS module.	Equipment listed as being controlled by a PACS module in Table 2.6.4-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

Table 2.6.4-3—Fuel Building Ventilation System ITAAC
Sheet 4 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
5.1	Equipment designated as Class 1E in Table 2.6.4-2 are powered from the Class 1E division as listed in Table 2.6.4-2 in a normal or alternate feed condition.	a. Testing will be performed by providing a test input signal in each normally aligned division. b. Testing will be performed by providing a test input signal in each division with the alternate feed aligned to the divisional pair.	a. The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in Table 2.6.4-2. b. The test input signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E equipment identified in Table 2.6.4-2.
5.2	Deleted.	Deleted.	Deleted.

Table 2.6.4-3—Fuel Building Ventilation System ITAAC
Sheet 5 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.1	Equipment designated as harsh environment in Table 2.6.4-2 will perform the function listed in Table 2.6.4-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.	a. Type tests or type tests and analysis will be performed to demonstrate the ability of the equipment designated as harsh environment in Table 2.6.4-2 to perform the function listed in Table 2.6.4-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions. b. An inspection will be performed of the as-built equipment designated as harsh environment in Table 2.6.4-2 to verify that the equipment, including <u>the associated cables, wiring, and terminations located in a harsh environment, is bounded by the type test or combination of type tests and analyses</u>~~anchorage, are installed per the approved design requirements~~.	a. EQDPs conclude that the equipment designated as harsh environment in Table 2.6.4-2 can perform the function listed in Table 2.6.4-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions, including the time required to perform the listed function. b. <u>A report exists and concludes</u> ~~Inspection reports conclude~~ that the equipment designated as harsh environment in Table 2.6.4-2, including <u>the associated cables, wiring, and terminations located in a harsh environment, is bounded by the type test or combination of type tests and analyses</u>~~anchorage, are installed per the approved design requirements~~.
7.1	<u>Deleted.</u> ~~Upon receipt of a containment isolation signal, the FBVS maintains a negative pressure in the Fuel Building relative to the outside environment.~~	<u>Deleted.</u> ~~A test will be performed using test input signals to verify that upon receipt of a containment isolation test input signal, the FBVS maintains a negative pressure in the Fuel Building relative to the outside environment.~~	<u>Deleted.</u> ~~Upon receipt of a containment isolation test input signal, the FBVS maintains a negative pressure of less than or equal to -0.25 inches water gauge in the Fuel Building relative to the outside environment.~~

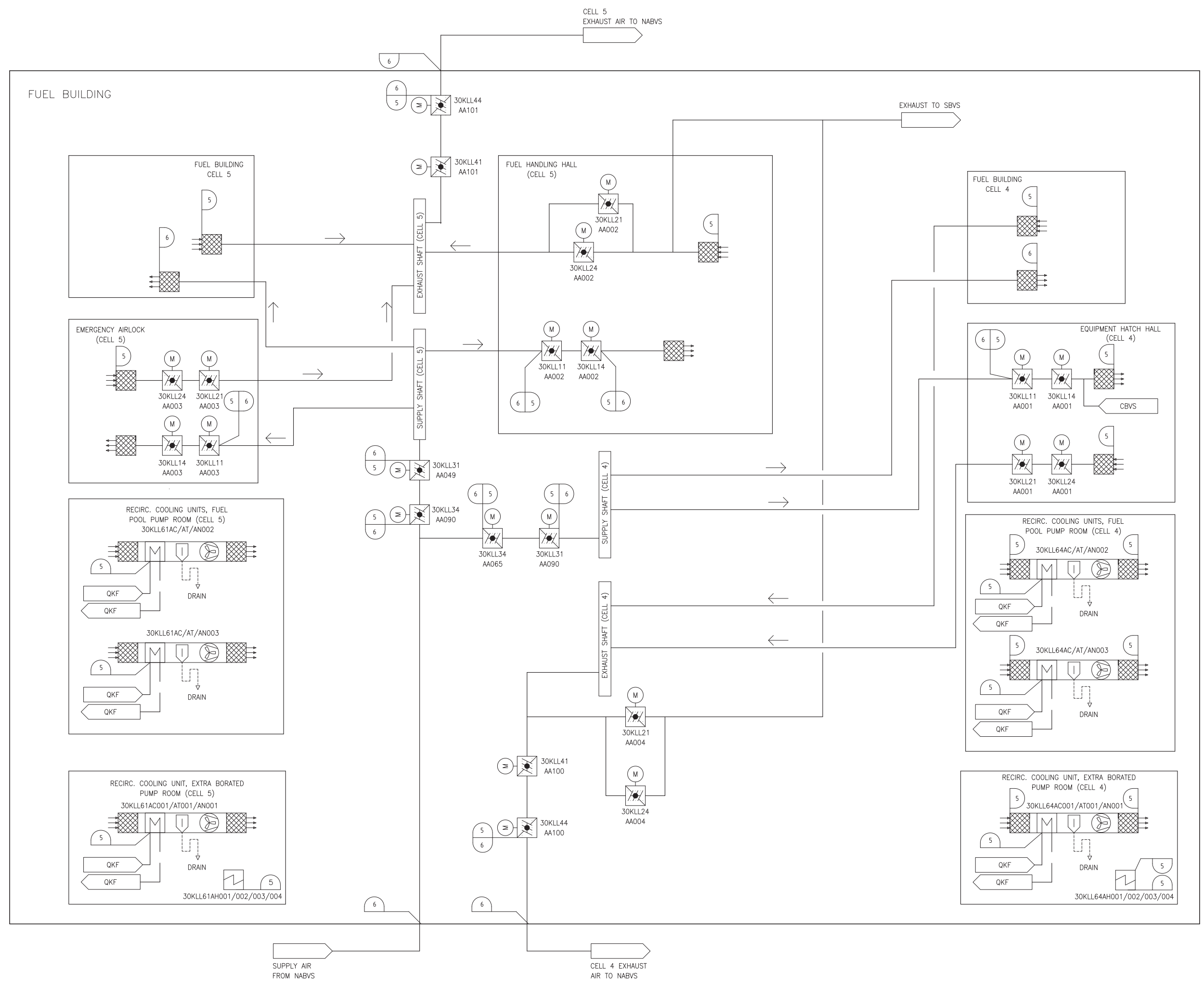
Table 2.6.4-3—Fuel Building Ventilation System ITAAC
Sheet 6 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
7.2	Upon receipt of a containment isolation signal, the FBVS isolation dampers identified in Table 2.6.4-1 realign to exhaust air to the SBVS iodine filtration exhaust to the plant vent stack.	A test will be performed using test input signals to verify that upon receipt of a containment isolation test input signal, the FBVS isolation dampers realign to exhaust air to the SBVS iodine filtration exhaust to the plant vent stack.	Within 60 seconds after receipt of a containment isolation test input signal from the PACS module the FBVS isolation dampers identified in Table 2.6.4-1 realign to exhaust air to the SBVS iodine filtration exhaust to the plant vent stack.
7.3	The FBVS provides cooling to maintain design temperatures in the pump rooms in the Fuel Building, while operating in a design basis accident alignment.	a. Tests and analysis will be performed to verify that the FBVS provides cooling to maintain design temperatures in the pump rooms in the Fuel Building, while operating in a design basis accident alignment. b. A test of the FBVS fans will be performed to verify that the ~~design~~ air flow is greater than the approved design requirement.	a. The FBVS provides the~~is capable of providing~~ design cooling capacity, while operating in a design basis accident alignment, and is capable of maintaining temperatures in the Fuel Building pump rooms. b. Each FBVS fan is capable of meeting the design air flow requirements, while operating in a design basis accident alignment.
7.4	The FBVS provides heating to maintain design temperatures in the ~~Fuel Building~~ rooms ~~for~~with systems containing borated fluid in the Fuel Building, while operating in a design basis accident alignment.	Tests and analysis of the FBVS heaters will be performed to verify that the FBVS provides heating to maintain design temperatures in the ~~Fuel Building~~ rooms ~~for~~with systems containing borated fluid in the Fuel Building, while operating in a design basis accident alignment.	a. Each FBVS heater energizes and provides equal to, or greater, than its required design heating capacity. b. ~~Each~~The FBVS heater is provides the required~~capable of providing design~~ heating capacity to maintain design temperatures in the rooms with systems containing borated fluid in the Fuel Building, while operating in a design basis accident alignment.

Table 2.6.4-3—Fuel Building Ventilation System ITAAC
Sheet 7 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
7.5	Upon receipt of a high radioactivity signal in the FBVS, the FBVS diverts the ventilation air flow to the NABVS iodine filter train.	A test will be performed to verify that upon receipt of a high radioactivity test input signal in the FBVS, the FBVS diverts the ventilation air flow to the NABVS iodine filter train.	Upon receipt of a high radioactivity signal in the FBVS, the FBVS diverts the ventilation air flow to the NABVS iodine filter train.
7.6	Upon receipt of a high activity signal in the Fuel Building exhaust, the FBVS isolates the fuel handling area ventilation.	A test will be performed to verify that upon receipt of a high activity test input signal in the Fuel Building exhaust, the FBVS isolates the fuel handling area ventilation.	Upon receipt of a high activity signal in the Fuel Building exhaust, the FBVS isolates the fuel handling area ventilation.

Figure 2.6.4-1—Fuel Building Ventilation System Functional Arrangement



6	AG-1	I I
5	AG-1	I
DESIGN AREA	ASME	SSC SEISMIC CLASS

REV 005
KLL01T1

Next File

2.6.5 Nuclear Auxiliary Building Ventilation System (NABVS)

Design Description

1.0 System Description

The nuclear auxiliary building ventilation system (NABVS) provides conditioned air to the Nuclear Auxiliary Building (NAB), Fuel Building (FB), Containment Building, and the annulus area between the Containment Building and the Shield Building.

The exhaust air from the NAB, FB, Safeguard Building (SB), Containment Building, and the annulus is processed through the NABVS filtration trains prior to release to the environment via the vent stack.

The NABVS is classified as a non-safety related and non-seismic system, except the backdraft damper located at the discharge into the vent stack.

The NABVS performs the following safety-related function:

- A safety-related Seismic Category I backdraft damper is located at the NABVS exhaust duct into the vent stack. This backdraft damper isolates the NABVS as required from other safety systems exhausting to the vent stack during accident operation.
- During accident conditions, the NABVS is shut down while the safety related systems SBVS and AVS operate. The backdraft damper shuts by a differential pressure between the vent stack and NABVS duct.

The remaining portions of the NABVS perform no safety-related function and the system is not required to operate during a design basis accident.

2.0 Arrangement

2.1 The functional arrangement of the NABVS exhaust backdraft damper at the vent stack is as described in the Design Description of Section 2.6.5, Table 2.6.5-1—Nuclear Auxiliary Building Ventilation System Equipment Mechanical Design, and as shown on Figure 2.6.5-1—Nuclear Auxiliary Building Exhaust Filtration Trains Subsystem Functional Arrangement.

2.2 Deleted.

3.0 Mechanical Design Features

3.1 The NABVS exhaust backdraft damper will function to change position as listed in Table 2.6.5-1 under normal and post-accident operating conditions.

3.2 Equipment identified as Seismic Category I in Table 2.6.5-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s)~~ listed in Table 2.6.5-1~~.

3.3 Deleted.~~Equipment listed in Table 2.6.5-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~

3.4 Deleted.~~Equipment listed in Table 2.6.5-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~

3.5 Equipment listed in Table 2.6.5-1 as ASME AG-1 Code are fabricated, inspected, and tested in accordance with ASME AG-1 Code requirements.

4.0 Equipment and System Performance

4.1 Upon receipt of a containment isolation signal, the NABVS is shut down, and the backdraft damper prevents the SBVS and AVS exhaust air flow from discharging into the NABVS.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.5-2 lists the NABVS ITAAC.

Table 2.6.5-1—NABVS Equipment Mechanical Design

Description	Tag Number	Location	ASME AG-1 Code	Function	Seismic Category
Backdraft Damper	30KLE50AA001	~~UFA~~Fuel Building	Yes	Close	I

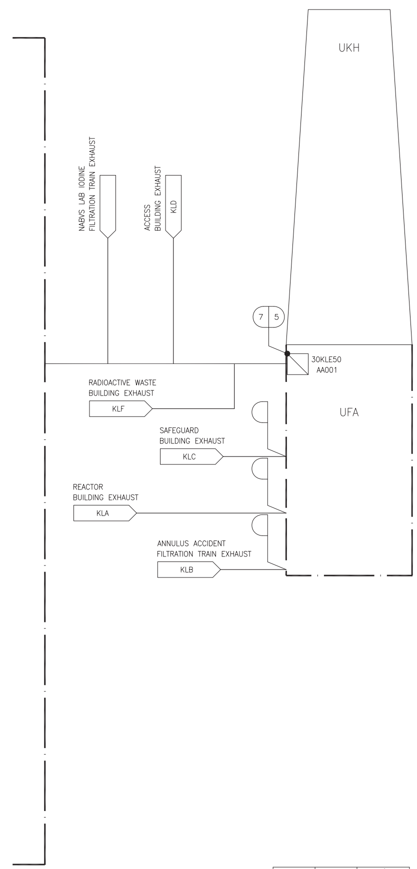
**Table 2.6.5-2—Nuclear Auxiliary Building Ventilation System ITAAC
Sheet 1 of 2**

	Commitment Wording	Inspection, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the NABVS exhaust backdraft damper at the vent stack is as described in the Design Description of Section 2.6.5, Table 2.6.5-1, and as shown on Figure 2.6.5-1.	An inspection of the as-built NABVS exhaust backdraft damper at the vent stack functional arrangement will be performed.	The NABVS exhaust backdraft damper at the vent stack conforms to the functional arrangement as described in the Design Description of Section 2.6.5, Table 2.6.5-1, and as shown on Figure 2.6.5-1.
2.2	Deleted.	Deleted.	Deleted.
3.1	The NABVS exhaust backdraft damper will function to change position as listed in Table 2.6.5-1 under normal and post-accident operating conditions.	Tests will be performed to verify the ability of the NABVS exhaust backdraft damper to change position under normal and post-accident operating conditions.	The NABVS exhaust backdraft damper changes position as listed in Table 2.6.5-1 under normal and post-accident operating conditions.
3.2	Equipment identified as Seismic Category I in Table 2.6.5-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.5-1~~.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Table 2.6.5-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.6.5-1 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.6.5-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.5-1 including the time required to perform the listed function~~. b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.6.5-1, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.

**Table 2.6.5-2—Nuclear Auxiliary Building Ventilation System ITAAC
Sheet 2 of 2**

	Commitment Wording	Inspection, Tests, Analyses	Acceptance Criteria
3.3	Deleted.~~Equipment listed in Table 2.6.5-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~	Deleted.~~An analysis will be performed of ASME AG-1 Code Design Verification Reports.~~	Deleted.~~ASME AG-1 Code Design Verification Reports (AA-4400) conclude that the design of equipment listed as ASME AG-1 Code in Table 2.6.5-1 complies with ASME AG-1 Code requirements.~~
3.4	Deleted.~~Equipment listed in Table 2.6.5-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~	Deleted.~~An inspection of the as-built fabrication activities and documentation for ASME AG-1 Code equipment will be conducted.~~	Deleted.~~A report concludes that ASME AG-1 Code equipment listed in Table 2.6.5-1 are fabricated in accordance with ASME AG-1 Code requirements.~~
3.5	Equipment listed in Table 2.6.5-1 as ASME AG-1 Code are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.	An inspection of the as-built construction activities and documentation for ASME AG-1 Code equipment will be conducted.	A report concludes that ASME AG-1 Code equipment listed in Table 2.6.5-1 are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.
4.1	Upon receipt of a containment isolation signal, the NABVS is shut down, and the backdraft damper prevents the SBVS and AVS exhaust air flow from discharging into the NABVS.	A test will be performed to verify that upon receipt of a containment isolation test input signal, that the NABVS is shut down and the backdraft damper prevents the SBVS and AVS exhaust air flow discharging into NABVS.	Upon receipt of a containment isolation test input signal from the PACS module, the NABVS is shut down and the backdraft damper prevents the SBVS and AVS exhaust air flow from discharging into the NABVS.

Figure 2.6.5-1—Nuclear Auxiliary Building Exhaust Filtration Trains Subsystem Functional Arrangement



DESIGN AREA	ASME	SSC SEISMIC CLASS
7	AG-1	N/A
5	AG-1	I

Next File

2.6.6 Safeguard Building Controlled-Area Ventilation System

Design Description

1.0 System Description

The safeguard building controlled-area ventilation system (SBVS) provides cooling, heating, and ventilation for the hot areas of the four divisions of the Safeguard Buildings to remove equipment heat and heat generated from other sources. The SBVS also provides heat to maintain a minimum temperature in areas of the Safeguard Buildings. The SBVS provides a minimal air change rate for the buildings and controls the building pressurization to reduce spreading of contamination.

The SBVS provides the following safety-related functions:

- Isolates the volume of the hot mechanical area of the Safeguard Buildings and confines this volume by maintaining a negative pressure and removing the iodine that might be released due to post-accident operation of the safety injection system (SIS).
- Removes heat generated by equipment of the safety injection / residual heat removal systems in the hot mechanical rooms to maintain ambient temperatures during accident conditions.
- Removes heat generated by piping and equipment of the component cooling water and emergency feedwater systems in the valve rooms to maintain ambient temperatures during accident conditions.
- Removes heat generated by equipment of the hydrogen monitoring and post accident atmosphere sampling systems to maintain ambient temperatures during accident conditions.
- Maintains a negative pressure in the Fuel Building (FB) and Safeguard Building (SB) mechanical areas to capture bypass leakage from the primary containment upon receipt of a containment isolation signal. The exhaust air is directed to the SBVS iodine filtration trains before being released into the environment. ~~to direct the air from the FB to the SBVS iodine filtration trains when the FB is isolated from the nuclear auxiliary building ventilation system (NABVS) on receipt of a containment isolation signal.~~

The SBVS provides the following non-safety-related functions:

- Diverts the ventilation air flow to the NABVS iodine filter train on high radioactivity in the Safeguard Buildings. ~~Ventilates the hot mechanical areas of the Safeguard Buildings and provides a minimum required air change rate during normal operation.~~
- ~~Maintains acceptable ambient conditions in the hot mechanical areas of the Safeguard Buildings during normal operation.~~

- ~~Maintains negative pressure and direction of flow with the supply air from the electrical division of safeguard building ventilation system (SBVSE), and exhaust air to the NABVS during normal operation.~~

- ~~Confines the volume of the fuel pool hall by maintaining negative pressure and removing iodine released in the event of a fuel handling accident in the Fuel Building.~~

- ~~Confines the volume of the containment by maintaining negative pressure and removing iodine released in the event of a fuel handling accident in the Reactor Building.~~

2.0 Arrangement

2.1 The functional arrangement of the SBVS is as described in the Design Description of Section 2.6.6, Tables 2.6.6-1—Safeguard Building Controlled-Area Ventilation System Equipment Mechanical Design and 2.6.6-2—Safeguard Building Controlled-Area Ventilation System Equipment I&C and Electrical Design, and as shown on Figures 2.6.6-1—Safeguard Building Controlled-Area Ventilation System Air Supply Functional Arrangement and 2.6.6-2—Safeguard Building Controlled-Area Ventilation System Exhaust Air Functional Arrangement.

2.2 Deleted.

2.3 Physical separation exists between the SBVS iodine filtration trains located in the Fuel Building as listed in Table 2.6.6-1 and as shown on Figure 2.6.6-1.

3.0 Mechanical Design Features

3.1 Deleted.

3.2 Class 1E dampers listed in Table 2.6.6-2 will function to change position as listed in Table 2.6.6-1 under normal and post-accident operating conditions.

3.3 Equipment identified as Seismic Category I in Table 2.6.6-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.6-1~~.

3.4 Deleted.~~Equipment listed in Table 2.6.6-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~

3.5 Deleted.~~Equipment listed in Table 2.6.6-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~

3.6 Equipment listed in Table 2.6.6-1 as ASME AG-1 Code are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

4.0 I&C Design Features, Displays, and Controls

4.1 Displays listed in Table 2.6.6-2 are indicated on the PICS operator workstations in the MCR and the RSS.

4.2 Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.6-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.6-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

5.0 Electrical Power Design Features

5.1 Equipment designated as Class 1E in Table 2.6.6-2 are powered from the Class 1E division as listed in Table 2.6.6-2 in a normal or alternate feed condition.

5.2 Deleted.

6.0 Environmental Qualifications

6.1 Equipment designated as harsh environment in Table 2.6.6-2 will perform the function listed in Table 2.6.6-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.

6.2 Deleted.

7.0 Equipment and System Performance

7.1 Upon receipt of a containment isolation signal, the SBVS maintains a negative pressure in the Fuel Building and the hot mechanical rooms of the Safeguard Buildings relative to the outside environment.~~adjacent areas.~~

7.2 Deleted.

7.3 Upon receipt of a high radiation signal in the Fuel Building or Reactor Building, both SBVS iodine filtration trains start automatically, the FB isolation dampers open, the SBVS isolation dampers close, iodine filtration banks isolation dampers open, and the accident air is directed through the SBVS iodine filtration trains.

7.4 Deleted.~~Upon receipt of a containment isolation signal, the SBVS maintains a negative pressure in the FB and SB relative to the outside environment.~~

7.5 The SBVS provides cooling to maintain design temperatures in the hot mechanical rooms in the Safeguard Buildings, while operating in a design basis accident alignment.

7.6 Upon receipt of a high radioactivity signal in the SBVS, the SBVS diverts the ventilation air flow to the Nuclear Auxiliary Building Ventilation System (NABVS) iodine filter train.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.6-3 lists the SBVS ITAAC.

Table 2.6.6-1—SBVS Equipment Mechanical Design
Sheet 1 of 9

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Air Supply Safeguard Building Division 1					
Motor Operated Dampers	30KLC11AA003 30KLC11AA004 30KLC11AA005 30KLC11AA007	Safeguard Building 1 31UJH05025 Safeguard Building 1 31UJH05025 Safeguard Building 1 31UJH05025 Safeguard Building 1 31UJH05006	Yes	Close	I
Motor Operated Damper	30KLC11AA008	Safeguard Building 1	Yes	Close	I
Air Supply Safeguard Building Divisions 2 And 3					
Motor Operated Dampers	30KLC12AA003 30KLC12AA004 30KLC12AA005 30KLC13AA003 30KLC13AA004 30KLC13AA005	Safeguard Building 2 32UJH01020 Safeguard Building 2 32UJH01020 Safeguard Building 2 32UJH01020 Safeguard Building 3 33UJH01020 Safeguard Building 3 33UJH01020 Safeguard Building 3 33UJH01020	Yes	Close	I

Table 2.6.6-1—SBVS Equipment Mechanical Design Sheet 2 of 9

Description	Tag Number[(1)]	Location	ASME AG-1 Code	Function	Seismic Category
Air Supply Safeguard Building Division 4					
Motor Operated Dampers	30KLC14AA003 30KLC14AA004 30KLC14AA005 30KLC14AA007	Safeguard Building 4 ~~34UJH05025~~ Safeguard Building 4 ~~34UJH05025~~ Safeguard Building 4 ~~34UJH05025~~ Safeguard Building 4 ~~34UJH05006~~	Yes	Close	I
Motor Operated Damper	30KLC24AA002 30KLC24AA003 30KLC24AA004	Safeguard Building 4 ~~34UJH10004~~ Safeguard Building 4 ~~34UJH05006~~ Safeguard Building 4 ~~34UJH01011~~	Yes	Close	I

**Table 2.6.6-1—SBVS Equipment Mechanical Design
Sheet 3 of 9**

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Operational Air Exhaust					
Motor Operated Dampers	~~30KLC21AA002~~ 30KLC21AA006 30KLC21AA007 30KLC21AA008 30KLC22AA006 30KLC22AA007 30KLC22AA008 30KLC23AA006 30KLC23AA007 30KLC23AA008 30KLC24AA006 30KLC24AA007 30KLC24AA008	~~31UJH10010~~ Safeguard Building 1 ~~31UJH10010~~ Safeguard Building 1 ~~31UJH10010~~ Safeguard Building 1 ~~31UJH10010~~ Safeguard Building 2 ~~32UJH10002~~ Safeguard Building 2 ~~32UJH10002~~ Safeguard Building 2 ~~32UJH10002~~ Safeguard Building 3 ~~33UJH10002~~ Safeguard Building 3 ~~33UJH10002~~ Safeguard Building 3 ~~33UJH10002~~ Safeguard Building 4 ~~34UJH10010~~ Safeguard Building 4 ~~34UJH10010~~ Safeguard Building 4 ~~34UJH10010~~	Yes	Close	I

Table 2.6.6-1—SBVS Equipment Mechanical Design
Sheet 4 of 9

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Motor Operated Dampers	30KLC21AA005 30KLC21AA010 30KLC24AA005 30KLC24AA010	Safeguard Building 1 ~~31UJH10004~~ Safeguard Building 1 ~~31UJH10004~~ Safeguard Building 4 ~~34UJH10004~~ Safeguard Building 4 ~~34UJH10004~~	Yes	Open/Close	I
Accident Air Exhaust					
Motor Operated Dampers	30KLC31AA001 30KLC31AA003 30KLC32AA001 30KLC32AA003 30KLC33AA001 30KLC33AA003 30KLC34AA001 30KLC34AA003	Safeguard Building 1 ~~31UJH10004~~ Safeguard Building 1 ~~31UJH10004~~ Safeguard Building 2 ~~32UJH10002~~ Safeguard Building 2 ~~32UJH10002~~ Safeguard Building 3 ~~33UJH10002~~ Safeguard Building 3 ~~33UJH10002~~ Safeguard Building 4 ~~34UJH10004~~ Safeguard Building 4 ~~34UJH10004~~	Yes	Open/Close	I

Table 2.6.6-1—SBVS Equipment Mechanical Design
Sheet 5 of 9

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Motor Operated Dampers	30KLC45AA001 30KLC45AA002 30KLC45AA003 30KLC45AA004 30KLC45AA005 30KLC45AA006	Fuel Building ~~30UFA21095~~ Fuel Building ~~30UFA21095~~ Fuel Building ~~30UFA29045~~ Fuel Building ~~30UFA29045~~ Fuel Building ~~30UFA24045~~ Fuel Building ~~30UFA24045~~	Yes	Open	I
Personnel Air Lock Area					
Motor Operated Damper	30KLC12AA009 30KLC12AA010	Safeguard Building 2 ~~32UJH10006~~ Safeguard Building 2 ~~32UJH10006~~	Yes	Close	I
Motor Operated Damper	30KLC22AA010	Safeguard Building 2 ~~32UJH10006~~	Yes	Close	I
Iodine Filtration Trains 30KLC41/42					
Motor Operated Dampers	30KLC41AA001 30KLC42AA001	Fuel Building ~~30UFA21082~~ Fuel Building ~~30UFA21084~~	Yes	Open	I
Electric Heaters (Two stage)	30KLC41AH001A/B 30KLC42AH001A/B	Fuel Building ~~30UFA21082~~ Fuel Building ~~30UFA21084~~	Yes	On / Off ~~(based on ambient conditions)~~	I

Table 2.6.6-1—SBVS Equipment Mechanical Design
Sheet 6 of 9

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Pre-filter/Moisture Separators	30KLC41AT001 30KLC42AT001	Fuel Building 30UFA21082 Fuel Building 30UFA21084	Yes	N/A	I
Upstream HEPA Filters	30KLC41AT002 30KLC42AT002	Fuel Building 30UFA21082 Fuel Building 30UFA21084	Yes	N/A	I
Carbon Absorbers	30KLC41AT003 30KLC42AT003	Fuel Building 30UFA21082 Fuel Building 30UFA21084	Yes	N/A	I
Downstream HEPA Post Filters	30KLC41AT004 30KLC42AT004	Fuel Building 30UFA21082 Fuel Building 30UFA21084	Yes	N/A	I
Motor Operated dampers	30KLC41AA002 30KLC42AA002	Fuel Building 30UFA21082 Fuel Building 30UFA21084	Yes	N/A	I
Moisture Separators	30KLC41AT005 30KLC42AT005	Fuel Building Fuel Building	Yes	N/A	I
Exhaust Fans	30KLC41AN001 30KLC42AN001	Fuel Building 30UFA21083 Fuel Building 30UFA21081	Yes	Run	I

Table 2.6.6-1—SBVS Equipment Mechanical Design
Sheet 7 of 9

Description	Tag Number[(1)]	Location	ASME AG-1 Code	Function	Seismic Category
Backdraft dampers	30KLC41AA003 30KLC42AA003	Fuel Building ~~30UFA 21083~~ Fuel Building ~~30UFA21081~~	Yes	Open / Close~~N/A~~	I
Recirculation Cooling Units Safeguard Building Divisions 1 and 4					
Air Cooling Coils	30KLC51AC001 30KLC51AC002 30KLC51AC003 30KLC54AC001 30KLC54AC002 30KLC54AC003	Safeguard Building 1 ~~31UJH05004~~ Safeguard Building 1 ~~31UJH10004~~ Safeguard Building 1 ~~31UJH10010~~ Safeguard Building 4 ~~34UJH05004~~ Safeguard Building 4 ~~34UJH10004~~ Safeguard Building 4 ~~34UJH10010~~	Yes	N/A	I
Moisture Separators	30KLC51AT001 30KLC51AT002 30KLC51AT003 30KLC54AT001 30KLC54AT002 30KLC54AT003	Safeguard Building 1 ~~31UJH05004~~ Safeguard Building 1 ~~31UJH10004~~ Safeguard Building 1 ~~31UJH10010~~ Safeguard Building 4 ~~34UJH05004~~ Safeguard Building 4 ~~34UJH10004~~ Safeguard Building 4 ~~34UJH10010~~	Yes	N/A	I

Table 2.6.6-1—SBVS Equipment Mechanical Design Sheet 8 of 9

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Recirculation Fans	30KLC51AN001 30KLC51AN002 30KLC51AN003 30KLC54AN001 30KLC54AN002 30KLC54AN003	Safeguard Building 1 ~~31UJH05004~~ Safeguard Building 1 ~~31UJH10004~~ Safeguard Building 1 ~~31UJH10010~~ Safeguard Building 4 ~~34UJH05004~~ Safeguard Building 4 ~~34UJH10004~~ Safeguard Building 4 ~~34UJH10010~~	Yes	Run	I
Recirculation Cooling Units Safeguard Building Divisions 2 and 3					
Air Cooling Coils	30KLC52AC001 30KLC52AC002 30KLC53AC001 30KLC53AC002	Safeguard Building 2 ~~32UJH05002~~ Safeguard Building 2 ~~32UJH10002~~ Safeguard Building 3 ~~33UJH05002~~ Safeguard Building 3 ~~33UJH10002~~	Yes	N/A	I
Moisture Separators	30KLC52AT001 30KLC52AT002 30KLC53AT001 30KLC53AT002	Safeguard Building 2 ~~32UJH05002~~ Safeguard Building 2 ~~32UJH10002~~ Safeguard Building 3 ~~33UJH05002~~ Safeguard Building 3 ~~33UJH10002~~	Yes	N/A	I

Table 2.6.6-1—SBVS Equipment Mechanical Design
Sheet 9 of 9

Description	Tag Number[(1)]	Location	ASME AG-1 Code	Function	Seismic Category
Recirculation Fans	30KLC52AN001 30KLC52AN002 30KLC53AN001 30KLC53AN002	Safeguard Building 2 ~~32UJH05002~~ Safeguard Building 2 ~~32UJH10002~~ Safeguard Building 3 ~~33UJH05002~~ Safeguard Building 3 ~~33UJH10002~~	Yes	Run	I

1. Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.6.6-2—SBVS Equipment I&C and Electrical Design Sheet 1 of 7

Description	Tag Number(1)	Location	IEEE Class 1E (2)	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Air Supply Safeguard Building Division 1							
Motor Operated Dampers	30KLC11AA003 30KLC11AA004	Safeguard Building 1 Safeguard Building 1	Division 1[N] Division 2 [A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC11AA005	Safeguard Building 1	Division 4[N] Division 3 [A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Dampers	30KLC11AA007 ~~30KLC11AA008~~	Safeguard Building 1 ~~Safeguard Building 1~~	Division 1[N] Division 2 [A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Air Supply Safeguard Building Division 2							
Motor Operated Dampers	30KLC12AA003 30KLC12AA004	Safeguard Building 2 Safeguard Building 2	Division 2[N] Division 1[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC12AA005	Safeguard Building 2	Division 3[N] Division 4[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Air Supply Safeguard Building Division 3							
Motor Operated Damper	30KLC13AA003 30KLC13AA004	Safeguard Building 3 Safeguard Building 3	Division 3[N] Division 4[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Dampers	30KLC13AA005	Safeguard Building 3	Division 2[N] Division 1[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Air Supply Safeguard Building Division 4							
Motor Operated Dampers	30KLC14AA003 30KLC14AA004	Safeguard Building 4 Safeguard Building 4	Division 4[N] Division 3[A]	Yes	Yes	Position / Position	Open-Close / Open-Close

Table 2.6.6-2—SBVS Equipment I&C and Electrical Design Sheet 2 of 7

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Motor Operated Damper	30KLC14AA005	Safeguard Building 4	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC14AA007	Safeguard Building 4	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Dampers	30KLC24AA002 30KLC24AA003 30KLC24AA004	Safeguard Building 4 Safeguard Building 4 Safeguard Building 4	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Operational Air Exhaust							
Motor Operated Dampers	30KLC21AA005 30KLC21AA006 30KLC21AA007	Safeguard Building 1 Safeguard Building 1 Safeguard Building 1	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC21AA008	Safeguard Building 1	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC21AA010	Safeguard Building 1	Division 2^N Division 1^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Dampers	30KLC22AA006 30KLC22AA007	Safeguard Building 2 Safeguard Building 2	Division 2^N Division 1^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC22AA008	Safeguard Building 2	Division 3^N Division 4^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Dampers	30KLC23AA006 30KLC23AA007	Safeguard Building 3 Safeguard Building 3	Division 3^N Division 4^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC23AA008	Safeguard Building 3	Division 2^N Division 1^A	Yes	Yes	Position / Position	Open-Close / Open-Close

Table 2.6.6-2—SBVS Equipment I&C and Electrical Design
Sheet 3 of 7

Description	Tag Number[1]	Location	IEEE Class 1E [2]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Motor Operated Dampers	30KLC24AA005 30KLC24AA006 30KLC24AA007	Safeguard Building 4 Safeguard Building 4 Safeguard Building 4	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC24AA008	Safeguard Building 4	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC24AA010	Safeguard Building 1	Division 2^N Division 1^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Accident Air Exhaust							
Motor Operated Damper	30KLC31AA001	Safeguard Building 1	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC31AA003	Safeguard Building 1	Division 2^N Division 1^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC32AA001	Safeguard Building 2	Division 2^N Division 1^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC32AA003	Safeguard Building 2	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC33AA001	Safeguard Building 3	Division 3^N Division 4^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC33AA003	Safeguard Building 3	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC34AA001	Safeguard Building 4	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close

Table 2.6.6-2—SBVS Equipment I&C and Electrical Design
Sheet 4 of 7

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Motor Operated Damper	30KLC34AA003	Safeguard Building 4	Division 3[N] Division 4[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC45AA001	Fuel Building	Division 1[N] Division 2[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC45AA002	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC45AA003	Fuel Building	Division 1[N] Division 2[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC45AA004	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC45AA005	Fuel Building	Division 1[N] Division 2[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC45AA006	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Personnel Air Lock Area							
Motor Operated Damper	30KLC12AA009	Safeguard Building 2	Division 2[N] Division 1[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC12AA010	Safeguard Building 2	Division 1[N] Division 2[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLC22AA010	Safeguard Building 2	Division 2[N] Division 1[A]	Yes	Yes	Position / Position	Open-Close / Open-Close

Table 2.6.6-2—SBVS Equipment I&C and Electrical Design
Sheet 5 of 7

Description	Tag Number(1)	Location	IEEE Class 1E (2)	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Iodine Filtration Train 30KLC41							
Motor Operated Damper	30KLC41AA001	Fuel Building	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Electric Heater (two stage)	30KLC41AH001A/B	Fuel Building	Division 1^N Division 2^A	Yes	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30KLC41AA002	Fuel Building	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30KLC41AN001	Fuel Building	Division 1^N Division 2^A	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Iodine Filtration Train 30KLC42							
Motor Operated Damper	30KLC42AA001	Fuel Building	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Electric Heater (two stage)	30KLC42AH001A/B	Fuel Building	Division 4^N Division 3^A	Yes	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30KLC42AA002	Fuel Building	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30KLC42AN001	Fuel Building	Division 4^N Division 3^A	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Cooling Units							
Recirculation Fans	30KLC51AN001 30KLC51AN002 30KLC51AN003	Safeguard Building 1 Safeguard Building 1 Safeguard Building 1	Division 1^N	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop

Table 2.6.6-2—SBVS Equipment I&C and Electrical Design
Sheet 6 of 7

Description	Tag Number(1)	Location	IEEE Class 1E (2)	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Recirculation Fans	30KLC52AN001 30KLC52AN002	Safeguard Building 2 Safeguard Building 2	Division 2^N	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fans	30KLC53AN001 30KLC53AN002	Safeguard Building 3 Safeguard Building 3	Division 3^N	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fans	30KLC54AN001 30KLC54AN002 30KLC54AN003	Safeguard Building 4 Safeguard Building 4 Safeguard Building 4	Division 4^N	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Instruments							
Exhaust Air Flow	30KLC45CF001 30KLC45CF002	Fuel Building Fuel Building	N/A	Yes	N/A	Flow / Flow	N/A
Medium Head SIS Pump Room Temperature	30KLC51CT001 30KLC51CT002 30KLC52CT001 30KLC52CT002 30KLC53CT001 30KLC53CT002 30KLC54CT001 30KLC54CT002	Safeguard Building 1 Safeguard Building 1 Safeguard Building 2 Safeguard Building 2 Safeguard Building 3 Safeguard Building 3 Safeguard Building 4 Safeguard Building 4	N/A	Yes	N/A	Temp / Temp	N/A
Low Head SIS Pump Room Temperature	30KLC51CT003 30KLC51CT004 30KLC52CT003 30KLC52CT004 30KLC53CT003 30KLC53CT004 30KLC54CT003 30KLC54CT004	Safeguard Building 1 Safeguard Building 1 Safeguard Building 2 Safeguard Building 2 Safeguard Building 3 Safeguard Building 3 Safeguard Building 4 Safeguard Building 4	N/A	Yes	N/A	Temp / Temp	N/A

**Table 2.6.6-2—SBVS Equipment I&C and Electrical Design
Sheet 7 of 7**

Description	Tag Number(1)	Location	IEEE Class 1E (2)	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
CCW & EFW Valve Room Temperature	30KLC51CT005 30KLC51CT006 30KLC52CT005 30KLC52CT006 30KLC53CT005 30KLC53CT006 30KLC54CT005 30KLC54CT006	Safeguard Building 1 Safeguard Building 1 Safeguard Building 2 Safeguard Building 2 Safeguard Building 3 Safeguard Building 3 Safeguard Building 4 Safeguard Building 4	N/A	Yes	N/A	Temp / Temp	N/A
Sampling System Room Temperature	30KLC51CT007 30KLC51CT008 30KLC54CT007 30KLC54CT008	Safeguard Building 1 Safeguard Building 1 Safeguard Building 4 Safeguard Building 4	N/A	Yes	N/A	Temp / Temp	N/A
Temperature Downstream of Iodine Filtration Heater	30KLC41CT001/002 30KLC42CT001/002	Fuel Building Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Temperature Downstream of Carbon Adsorbers	30KLC41CT003 30KLC42CT003	Fuel Building Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Differential Pressure across Iodine Filtration Trains	30KLC41CP001 30KLC42CP001	Fuel Building Fuel Building	N/A	Yes	N/A	Press / Press	N/A
Temperature Upstream of Iodine Filtration Trains	30KLC41CT004 30KLC42CT004	Fuel Building Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A

1. Equipment tag numbers are provided for information only and are not part of the certified design

2. ^{N} denotes division the equipment is normally powered from, while ^{A} denotes division the equipment is powered from when alternate feed is implemented.

Table 2.6.6-3—Safeguard Building Controlled-Area Ventilation System ITAAC Sheet 1 of 8

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the SBVS is as described in the Design Description of Section 2.6.6, Tables 2.6.6-1 and 2.6.6-2, and as shown on Figures 2.6.6-1 and 2.6.6-2.	An inspection of the as-built SBVS functional arrangement will be performed.	The SBVS conforms to the functional arrangement as described in the Design Description of Section 2.6.6, Tables 2.6.6-1 and 2.6.6-2, and as shown on Figures 2.6.6-1 and 2.6.6-2.
2.2	Deleted.	Deleted.	Deleted.
2.3	Physical separation exists between the SBVS iodine filtration trains located in the Fuel Building as listed in Table 2.6.36-1 and as shown on Figure 2.6.6-1.	An inspection will be performed to verify that the as-built SBVS iodine filtration trains are located in separate rooms in the Fuel Building.	The SBVS iodine filtration trains are located in separate rooms of the Fuel Building as listed in Table 2.6.6-1 and as shown on Figure 2.6.6-1.
3.1	Deleted.	Deleted.	Deleted.
3.2	Class 1E dampers listed in Table 2.6.6-2 will function to change position as listed in Table 2.6.6-1 under normal and post-accident operating conditions.	Tests will be performed to verify the ability of Class 1E dampers to change position under normal and post-accident operating conditions.	Class 1E dampers listed in Table 2.6.6-2 change position as listed in Table 2.6.6-1 under normal and post-accident operating conditions.

Table 2.6.6-3—Safeguard Building Controlled-Area Ventilation System ITAAC Sheet 2 of 8

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.3	Equipment identified as Seismic Category I in Table 2.6.6-1 can withstand seismic design basis loads without a loss of thesafety function(s) listed in Table 2.6.6-1.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Table 2.6.6-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.6.6-1 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed conditionper the approved design requirements.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.6.6-1 can withstand seismic design basis loads without a loss of thesafety function(s) listed in Table 2.6.6-1 including the time required to perform the listed function. b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.6.6-1, including anchorage, are installed in a condition bounded by the tested or analyzed conditionper the approved design requirements.
3.4	Deleted.Equipment listed in Table 2.6.6-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.	Deleted.An analysis will be performed of ASME AG-1 Code Design Verification Reports.	Deleted.ASME AG-1 Code Design Verification Reports (AA-4400) conclude that the design of equipment listed as ASME AG-1 Code in Table 2.6.6-1 complies with ASME AG-1 Code requirements.
3.5	Deleted.Equipment listed in Table 2.6.6-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.	Deleted.An inspection of the as-built fabrication activities and documentation for ASME AG-1 Code equipment will be conducted.	Deleted.A report concludes that ASME AG-1 Code equipment listed in Table 2.6.6-1 are fabricated in accordance with ASME AG-1 Code requirements.

Table 2.6.6-3—Safeguard Building Controlled-Area Ventilation System ITAAC
Sheet 3 of 8

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.6	Equipment listed in Table 2.6.6-1 as ASME AG-1 Code are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.	An inspection of the as-built construction activities and documentation for ASME AG-1 Code equipment will be conducted.	A report concludes that ASME AG-1 Code equipment listed in Table 2.6.6-1 are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.
4.1	Displays listed in Table 2.6.6-2 are indicated on the PICS operator workstations in the MCR and the RSS.	a. Tests will be performed to verify that the displays listed in Table 2.6.6-2 are indicated on the PICS operator workstations in the MCR ~~by using test input signals to PICS~~. b. Tests will be performed to verify that the displays listed in Table 2.6.6-2 are indicated on the PICS operator workstations in the RSS ~~by using test input signals inputs to PICS~~.	a. Displays listed in Table 2.6.6-2 are indicated on the PICS operator workstations in the MCR. b. Displays listed in Table 2.6.6-2 are indicated on the PICS operator workstations in the RSS.
4.2	Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.6-2.	a. Tests will be performed using controls on the PICS operator workstations in the MCR. b. Tests will be performed using controls on the PICS operator workstations in the RSS.	a. Controls on the PICS operator workstations in the MCR perform the function listed in Table 2.6.6-2. b. Controls on the PICS operator workstations in the RSS perform the function listed in Table 2.6.6-2.
4.3	Equipment listed as being controlled by a PACS module in Table 2.6.6-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.	A test will be performed using test input signals to verify equipment controlled by a PACS module responds to the state requested and provides drive monitoring signals back to the PACS module.	Equipment listed as being controlled by a PACS module in Table 2.6.6-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

Table 2.6.6-3—Safeguard Building Controlled-Area Ventilation System ITAAC Sheet 4 of 8

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
5.1	Equipment designated as Class 1E in Table 2.6.6-2 are powered from the Class 1E division as listed in Table 2.6.6-2 in a normal or alternate feed condition.	a. Testing will be performed by providing a test input signal in each normally aligned division.	a. The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in Table 2.6.6-2.
		b. Testing will be performed by providing a test input signal in each division with the alternate feed aligned to the divisional pair.	b. The test input signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E equipment identified in Table 2.6.6-2.
5.2	Deleted.	Deleted.	Deleted.

Table 2.6.6-3—Safeguard Building Controlled-Area Ventilation System ITAAC Sheet 5 of 8

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.1	Equipment designated as harsh environment in Table 2.6.6-2 will perform the function listed in Table 2.6.6-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.	a. Type tests or type tests and analysis will be performed to demonstrate the ability of the equipment designated as harsh environment in Table 2.6.6-2 to perform the function listed in Table 2.6.6-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.	a. EQDPs conclude that the equipment designated as harsh environment in Table 2.6.6-2 can perform the function listed in Table 2.6.6-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions, including the time required to perform the listed function.
		b. An inspection will be performed of the as-built equipment designated as harsh environment in Table 2.6.6-2 to verify that the equipment, including the associated cables, wiring, and terminations located in a harsh environment, is bounded by the type test or combination of type tests and analyses~~anchorage, are installed per the approved design requirements~~.	b. ~~Inspection reports~~ A report exists and concludes that the equipment designated as harsh environment in Table 2.6.6-2, including the associated cables, wiring, and terminations located in a harsh environment, is bounded by the type test or combination of type tests and analyses~~anchorage, are installed per the approved design requirements~~.
6.2	Deleted.	Deleted.	Deleted.

Table 2.6.6-3—Safeguard Building Controlled-Area Ventilation System ITAAC Sheet 6 of 8

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
7.1	Upon receipt of a containment isolation signal, the SBVS maintains a negative pressure in the Fuel Building and the hot mechanical rooms of the Safeguard Buildings relative to the outside environment. adjacent areas.	A test will be performed to verify that upon receipt of a containment isolation test input signal, the SBVS maintains a negative pressure in the Fuel Building and the hot mechanical rooms of the Safeguard Buildings relative to the outside environment.adjacent areas.	The SBVS maintains a negative pressure of less than or equal to 0.25 inches water gauge within 305 seconds in the Fuel Building and the hot mechanical rooms of the Safeguard Buildings relative to the outside environment after receipt of a containment isolation test input signal from the PACS module. Upon receipt of a containment isolation test input signal from the PACS module, the SBVS maintains a negative pressure of less than or equal to 0.25 inches water gauge in the hot mechanical rooms of the Safeguard Buildings relative to the adjacent areas.
7.2	Deleted.	Deleted.	Deleted.

Table 2.6.6-3—Safeguard Building Controlled-Area Ventilation System ITAAC Sheet 7 of 8

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
7.3	Upon receipt of a high radiation signal in the Fuel Building or Reactor Building, both SBVS iodine filtration trains start automatically, the FB isolation dampers open, the SBVS isolation dampers close, iodine filtration banks isolation dampers open, and the accident air is directed through the SBVS iodine filtration trains.	A test will be performed separately for each iodine filtration train to verify that upon receipt of a high radiation test input signal in the Fuel Building or Reactor Building, both SBVS iodine filtration trains start automatically, the FB isolation dampers (30KLC45 AA003/ AA004) open, the SBVS isolation dampers (30KLC45 AA001/AA002) close, iodine filtration banks isolation dampers (30KLC41 AA001/ AA002 and 30KLC42 AA001/ AA002) open, and the accident air is directed through the SBVS iodine filtration trains. ~~A test will be performed separately for each iodine filtration train to verify that upon receipt of a high radiation test input signal in the Fuel Building or Reactor Building, both SBVS iodine filtration trains start automatically, the FB isolation dampers, the SBVS isolation dampers close, iodine filtration banks isolation dampers open, and the accident air is directed through the SBVS iodine filtration trains.~~	Upon receipt of a high radiation test input signal from the PACS module, both SBVS iodine filtration trains start automatically, the FB isolation dampers (30KLC45 AA003/ AA004) open, the SBVS isolation dampers (30KLC45 AA001/AA002) close, iodine filtration banks isolation dampers (30KLC41 AA001/ AA002 and 30KLC42 AA001/ AA002) open, and the accident air is directed through the SBVS iodine filtration trains. The isolation dampers close or open within 60 seconds after receipt of a test input signal from the PACS module.~~Upon receipt of a high radiation test input signal from the PACS module, both SBVS iodine filtration trains start automatically, the FB isolation dampers open, the SBVS isolation dampers close, iodine filtration banks isolation dampers open, and the accident air is directed through the SBVS iodine filtration trains. The isolation dampers close or open within 60 seconds after receipt of a test input signal from the PACS module.~~

Table 2.6.6-3—Safeguard Building Controlled-Area Ventilation System ITAAC Sheet 8 of 8

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
7.4	Deleted. Upon receipt of a containment isolation signal, the SBVS maintains a negative pressure in the FB and SB relative to the outside environment.	Deleted. A test will be performed to verify that upon receipt of a containment isolation test input signal, the SBVS maintains a negative pressure inside the FB and SB relative to the outside environment.	Deleted. Upon receipt of a containment isolation test input signal from the PACS module, the SBVS maintains a negative pressure of less than or equal to -0.25 inches water gauge in the FB and SB relative to the outside environment.
7.5	The SBVS provides cooling to maintain design temperatures in the hot mechanical rooms in the Safeguard Buildings, while operating in a design basis accident alignment.	a. Tests and analysis will be performed to verify the SBVS provides cooling to maintain design temperatures in the hot mechanical rooms in the Safeguard Buildings, while operating in a design basis accident alignment. b. A test of the SBVS fans will be performed to verify that the design air flow is greater than the approved design requirement.	a. Each SBVS cooling coil provides the is capable of providing design cooling capacity, while operating in a design basis accident alignment, and is capable of maintaining design temperatures in the hot mechanical rooms in the Safeguard Buildings. b. Each SBVS fan is capable of meeting the design air flow requirements, while operating in a design basis accident alignment.
7.6	Upon receipt of a high radioactivity signal in the SBVS, the SBVS diverts the ventilation air flow to the NABVS iodine filter train.	A test will be performed to verify that upon receipt of a high radioactivity test input signal in the SBVS, the SBVS diverts the ventilation air flow to the NABVS iodine filter train.	Upon receipt of a high radioactivity signal in the SBVS, the SBVS diverts the ventilation air flow to the NABVS iodine filter train.

Figure 2.6.6-1—Safeguard Building Controlled-Area Ventilation System Air Supply Functional Arrangement

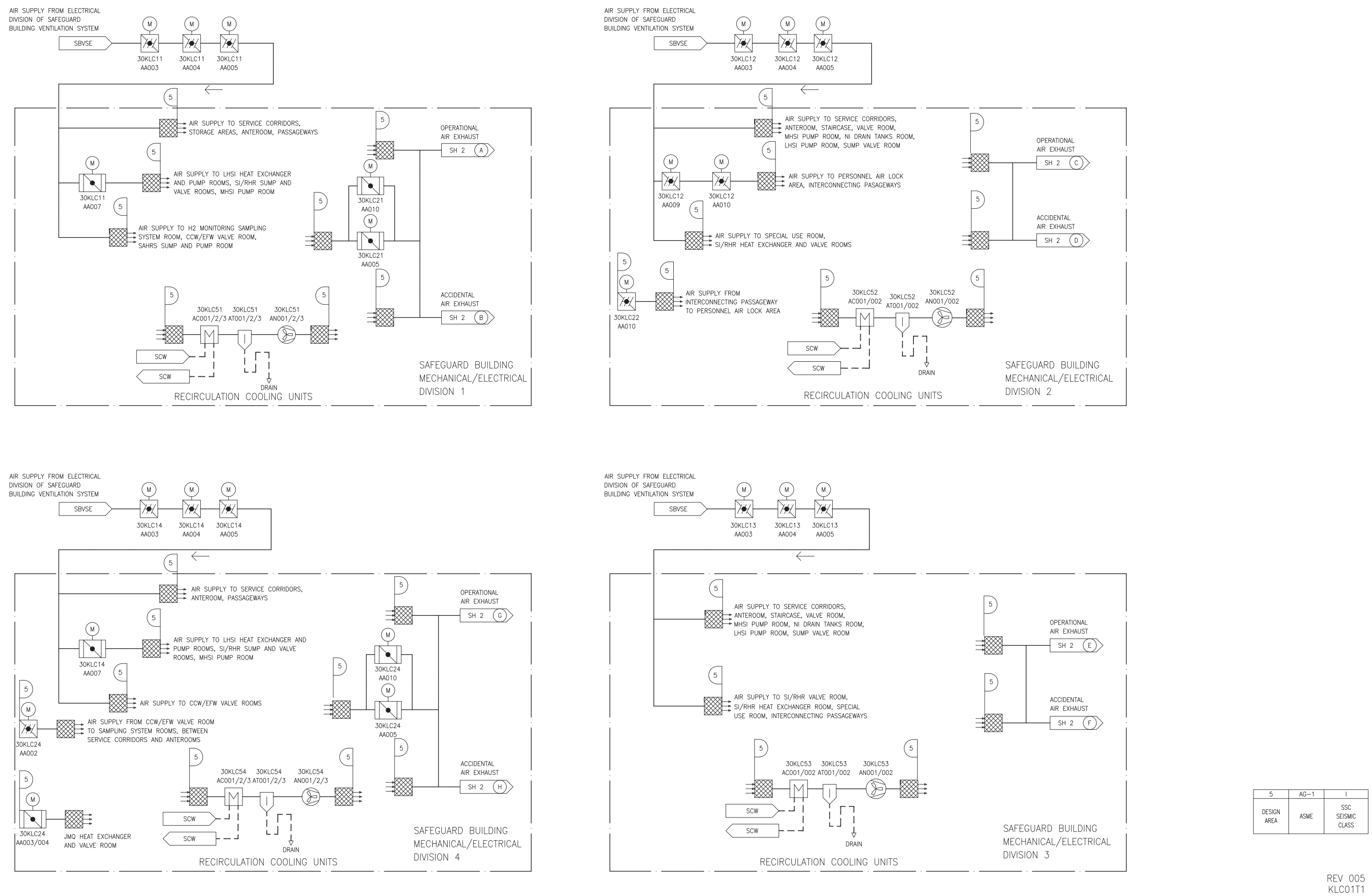
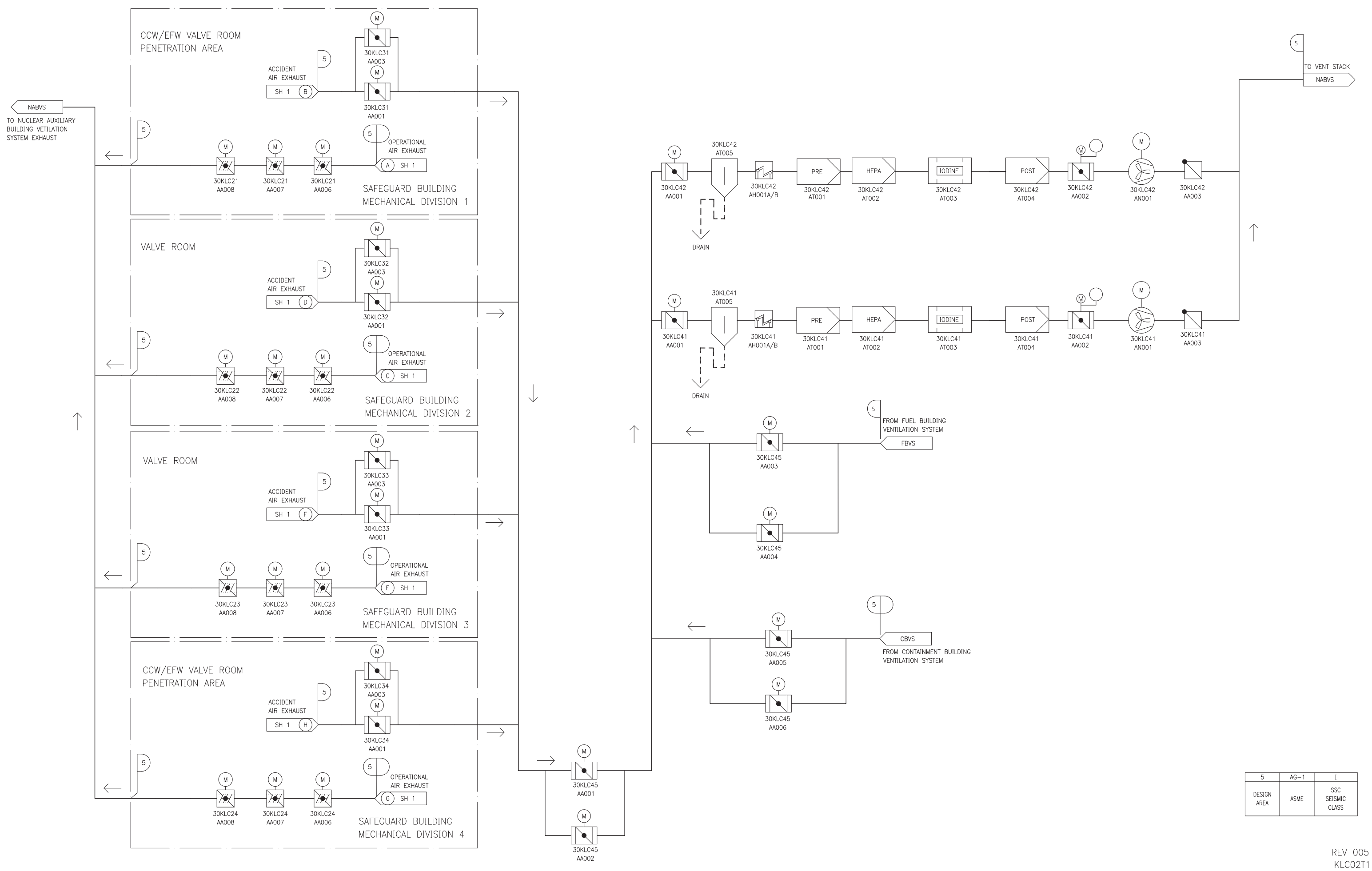


Figure 2.6.6-2—Safeguard Building Controlled-Area Ventilation System Exhaust Air Functional Arrangement



Next File

2.6.7 Electrical Division of Safeguard Building Ventilation System

Design Description

1.0 System Description

The electrical division of safeguard building ventilation system (SBVSE) provides ventilation of the electrical areas of Safeguard Buildings 1. 2, 3, & 4 to control the building ambient conditions for design basis accidents, personnel comfort, and equipment protection. The SBVSE provides cooling, heating, filtration, and ventilation for the electrical areas of the Safeguard Buildings to remove equipment heat and heat generated from other sources. The system is also capable of providing heat to maintain a minimum temperature in the buildings.

The SBVSE provides the following safety-related functions:

- Maintains ambient conditions for the safety related equipment in the electrical and I&C rooms of the Safeguard Buildings during accident conditions.
- Maintains ambient conditions inside the emergency feed water system pump rooms and component cooling water system rooms of the Safeguard Buildings during accident conditions.
- Ventilates the battery rooms and safety chilled water system rooms in the Safeguard Buildings to maintain the hydrogen concentration and the refrigerant concentration below allowable limits during accident conditions.

The SBVSE provides the following non-safety related functions:

- Maintains ambient conditions in the Safeguard Buildings for equipment operation and personnel comfort during normal plant operation and plant maintenance.
- Ventilates the battery rooms and safety chilled water system rooms in the Safeguard Building to maintain the hydrogen concentration and the refrigerant concentration below allowable limits during normal plant operation and plant maintenance.
- Supplies air to the safeguard building controlled area ventilation system (SBVS) during normal plant operation.

2.0 Arrangement

2.1 The functional arrangement of the SBVSE is as described in the Design Description of Section 2.6.7, Tables 2.6.7-1—Electrical Division of Safeguard Building Ventilation System Equipment Mechanical Design and 2.6.7-2—Electrical Division of Safeguard Building Ventilation System Equipment I&C and Electrical Design, and as shown on Figures 2.6.7-1—Electrical Division of Safeguard Building Ventilation System Division 1 and Division 4 Air Intake Functional Arrangement, 2.6.7-2—Electrical Division of Safeguard Building Ventilation System Division 1 and Division 4 Air Supply and

Exhaust Functional Arrangement, 2.6.7-3—Electrical Division of Safeguard Building Ventilation System Division 2 and Division 3 Air Intake Functional Arrangement, and 2.6.7-4—Electrical Division of Safeguard Building Ventilation System Division 2 and Division 3 Air Supply and Exhaust Functional Arrangement.

2.2 Deleted.

2.3 Physical separation exists between divisions of the SBVSE located in the Safeguard Buildings listed in Table 2.6.7-1 and as shown on Figure 2.6.7-1.

3.0 Mechanical Design Features

3.1 Deleted.

3.2 Class 1E dampers listed in Table 2.6.7-2 will function to change position as listed in Table 2.6.7-1 under normal operating conditions.

3.3 Equipment identified as Seismic Category I in Table 2.6.7-1 can withstand seismic design basis loads without a loss of safetythe function(s) listed in Table 2.6.7-1.

3.4 Deleted.Equipment listed in Table 2.6.7-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.

3.5 Deleted.Equipment listed in Table 2.6.7-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.

3.6 Equipment listed in Table 2.6.7-1 as ASME AG-1 Code are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

4.0 I&C Design Features, Displays, and Controls

4.1 Displays listed in Table 2.6.7-2 are indicated on the PICS operator workstations in the MCR and the RSS.

4.2 Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.7-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.7-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

5.0 Electrical Power Design Features

5.1 Equipment designated as Class 1E in Table 2.6.7-2 are powered from the Class 1E division as listed in Table 2.6.7-2 in a normal or alternate feed condition.

5.2 Deleted.

6.0 Equipment and System Performance

6.1 The SBVSE provides cooling to maintain design temperatures in the Electrical Division of the Safeguard Buildings, while operating in a design basis accident alignment.

6.2 The recirculation cooling units start and stop automatically in the emergency feedwater system (EFWS) and the component cooling water system (CCWS) pump rooms when the room temperature reaches preset maximum and minimum temperatures in the pump rooms.

6.3 The SBVSE maintains the hydrogen concentration levels in the battery rooms below one percent by volume.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.7-3 lists the SBVSE ITAAC.

Table 2.6.7-1—SBVSE Equipment Mechanical Design
Sheet 1 of 6

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Air intake Safeguard Building Division 1 and Division 4					
Electric Heaters	30SAC01AH001 30SAC04AH001	Safeguard Building 1 Safeguard Building 4	Yes	On / Off ~~N/A~~	I
~~Manual Isolation Dampers~~	~~30SAC01AA002~~ ~~30SAC04AA002~~	~~Safeguard Building 1~~ ~~Safeguard Building 4~~	~~Yes~~	~~N/A~~	~~I~~
Motor Operated Dampers	30SAC01AA003 30SAC04AA003	Safeguard Building 1 Safeguard Building 4	Yes	Open	I
Motor Operated Dampers	30SAC01AA004 30SAC04AA004	Safeguard Building 1 Safeguard Building 4	Yes	Open	I
Prefilters	30SAC01AT004 30SAC04AT004	Safeguard Building 1 Safeguard Building 4	Yes	N/A	I
Roughing Filters	30SAC01AT005 30SAC04AT005	Safeguard Building 1 Safeguard Building 4	Yes	N/A	I
Electric Heaters	30SAC01AH002 30SAC04AH002	Safeguard Building 1 Safeguard Building 4	Yes	On / Off ~~(based on ambient conditions)~~	I
Air Cooling Coils	30SAC01AC001 30SAC04AC001	Safeguard Building 1 Safeguard Building 4	Yes	N/A	I
Moisture Separators	30SAC01AT006 30SAC04AT006	Safeguard Building 1 Safeguard Building 4	Yes	N/A	I
Supply Air Fans	30SAC01AN001 30SAC04AN001	Safeguard Building 1 Safeguard Building 4	Yes	Run	I
Backdraft Dampers	30SAC01AA005 30SAC04AA005	Safeguard Building 1 Safeguard Building 4	Yes	Open / Close ~~N/A~~	I

Table 2.6.7-1—SBVSE Equipment Mechanical Design
Sheet 2 of 6

Description	Tag Number[(1)]	Location	ASME AG-1 Code	Function	Seismic Category
~~Manual Dampers~~	~~30SAC11AA001~~ ~~30SAC14AA001~~	~~Safeguard Building 1~~ ~~Safeguard Building 4~~	~~Yes~~	~~N/A~~	~~I~~
~~Manual Dampers~~	~~30SAC11AA004~~ ~~30SAC14AA004~~	~~Safeguard Building 1~~ ~~Safeguard Building 4~~	~~Yes~~	~~N/A~~	~~I~~
Manual Dampers	30SAC11AA005 30SAC14AA005	Safeguard Building 1 Safeguard Building 4	Yes	N/A	I
Manual Dampers	30SAC11AA003 30SAC14AA003	Safeguard Building 1 Safeguard Building 4	Yes	N/A	I
Manual Dampers	30SAC05AA002 30SAC08AA002	Safeguard Building 1 Safeguard Building 4	Yes	N/A	I
Air Intake Safeguard Building Division 2 and Division 3					
Electric Heaters	30SAC02AH001 30SAC03AH001	Safeguard Building 2 Safeguard Building 3	Yes	On / Off~~N/A~~	I
~~Manual Dampers~~	~~30SAC02AA002~~ ~~30SAC03AA002~~	~~Safeguard Building 2~~ ~~Safeguard Building 3~~	~~Yes~~	~~N/A~~	~~I~~
Motor Operated Dampers	30SAC02AA003 30SAC03AA003	Safeguard Building 2 Safeguard Building 3	Yes	Open	I
Motor Operated Dampers	30SAC02AA004 30SAC03AA004	Safeguard Building 2 Safeguard Building 3	Yes	Open	I
Prefilters	30SAC02AT004 30SAC03AT004	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Roughing Filters	30SAC02AT005 30SAC03AT005	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Electric Heaters	30SAC02AH002 30SAC03AH002	Safeguard Building 2 Safeguard Building 3	Yes	On / Off ~~(based on ambient conditions)~~	I

Table 2.6.7-1—SBVSE Equipment Mechanical Design
Sheet 3 of 6

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Air Cooling Coils	30SAC02AC001 30SAC03AC001	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Moisture Separators	30SAC02AT006 30SAC03AT006	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Supply Air Fans	30SAC02AN001 30SAC03AN001	Safeguard Building 2 Safeguard Building 3	Yes	Run	I
Backdraft Dampers	30SAC02AA005 30SAC03AA005	Safeguard Building 2 Safeguard Building 3	Yes	Open / Close ~~N/A~~	I
~~Manual Dampers~~	~~30SAC12AA001~~ ~~30SAC13AA001~~	~~Safeguard Building 2~~ ~~Safeguard Building 3~~	~~Yes~~	~~N/A~~	~~I~~
Manual Dampers	30SAC12AA005 30SAC13AA005	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Exhaust Train Safeguard Building Divisions 1 and 4					
~~Manual Dampers~~	~~30SAC31AA001~~ ~~30SAC34AA001~~	~~Safeguard Building 1~~ ~~Safeguard Building 4~~	~~Yes~~	~~N/A~~	~~I~~
Exhaust Fans	30SAC31AN001 30SAC34AN001	Safeguard Building 1 Safeguard Building 4	Yes	Run	I
Motor Operated Dampers	30SAC31AA002 30SAC34AA002	Safeguard Building 1 Safeguard Building 4	Yes	Open	I
Backdraft Dampers	30SAC31AA003 30SAC34AA003	Safeguard Building 1 Safeguard Building 4	Yes	Open / Close ~~N/A~~	I
~~Manual Dampers~~	~~30SAC31AA004~~ ~~30SAC34AA004~~	~~Safeguard Building 1~~ ~~Safeguard Building 4~~	~~Yes~~	~~N/A~~	~~I~~
Manual Dampers	30SAC35AA001 30SAC38AA001	Safeguard Building 1 Safeguard Building 4	Yes	N/A	I

Table 2.6.7-1—SBVSE Equipment Mechanical Design Sheet 4 of 6

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Manual Dampers	30SAC35AA004 30SAC38AA004	Safeguard Building 1 Safeguard Building 4	Yes	N/A	I
Exhaust Train Safeguard Building Divisions 2 and 3					
~~Manual Dampers~~	~~30SAC32AA001~~ ~~30SAC33AA001~~	~~Safeguard Building 2~~ ~~Safeguard Building 3~~	~~Yes~~	~~N/A~~	~~I~~
Exhaust Fans	30SAC32AN001 30SAC33AN001	Safeguard Building 2 Safeguard Building 3	Yes	Run	I
Motor Operated Dampers	30SAC32AA002 30SAC33AA002	Safeguard Building 2 Safeguard Building 3	Yes	Open	I
Backdraft Dampers	30SAC32AA003 30SAC33AA003	Safeguard Building 2 Safeguard Building 3	Yes	Open / Close ~~N/A~~	I
~~Manual Dampers~~	~~30SAC32AA004~~ ~~30SAC33AA004~~	~~Safeguard Building 2~~ ~~Safeguard Building 3~~	~~Yes~~	~~N/A~~	~~I~~
Manual Dampers	30SAC22AA001 30SAC23AA001	Safeguard Building 2 Safeguard Building 3	Yes	N/A	I
Battery / Safety Chilled Water Room Exhaust Train Safeguard Building Divisions 1, 2, 3, and 4					
~~Manual Dampers~~	~~30SAC51AA001~~ ~~30SAC52AA001~~ ~~30SAC53AA001~~ ~~30SAC54AA001~~	~~Safeguard Building 1~~ ~~Safeguard Building 2~~ ~~Safeguard Building 3~~ ~~Safeguard Building 4~~	~~Yes~~	~~N/A~~	~~I~~
Exhaust Air Fans	30SAC51AN001 30SAC52AN001 30SAC53AN001 30SAC54AN001	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	Yes	Run	I

Table 2.6.7-1—SBVSE Equipment Mechanical Design
Sheet 5 of 6

Description	Tag Number[(1)]	Location	ASME AG-1 Code	Function	Seismic Category
Backdraft Dampers	30SAC51AA002 30SAC52AA002 30SAC53AA002 30SAC54AA002	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	Yes	Open / Close~~N/A~~	I
Motor Operated Dampers	30SAC51AA003 30SAC52AA003 30SAC53AA003 30SAC54AA003	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	Yes	Open	I
Manual Dampers	30SAC51AA004 30SAC52AA004 30SAC53AA004 30SAC54AA004	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	Yes	N/A	I
Motor Operated Dampers	30SAC51AA006 30SAC52AA006 30SAC53AA006 30SAC54AA006	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	Yes	Open	I
Recirculation Cooling Units Safeguard Building Divisions 1, 2, 3, and 4					
Air Cooling Coils	30SAC61AC001 30SAC61AC002 30SAC62AC001 30SAC62AC002 30SAC63AC001 30SAC63AC002 30SAC64AC001 30SAC64AC002	Safeguard Building 1 Safeguard Building 1 Safeguard Building 2 Safeguard Building 2 Safeguard Building 3 Safeguard Building 3 Safeguard Building 4 Safeguard Building 4	Yes	N/A	I

Table 2.6.7-1—SBVSE Equipment Mechanical Design
Sheet 6 of 6

Description	Tag Number[1]	Location	ASME AG-1 Code	Function	Seismic Category
Moisture Separators	30SAC61AT001 30SAC61AT002 30SAC62AT001 30SAC62AT002 30SAC63AT001 30SAC63AT002 30SAC64AT001 30SAC64AT002	Safeguard Building 1 Safeguard Building 1 Safeguard Building 2 Safeguard Building 2 Safeguard Building 3 Safeguard Building 3 Safeguard Building 4 Safeguard Building 4	Yes	N/A	I
Recirculation Fans	30SAC61AN001 30SAC61AN02 30SAC62AN001 30SAC62AN002 30SAC63AN001 30SAC63AN002 30SAC64AN001 30SAC64AN002	Safeguard Building 1 Safeguard Building 1 Safeguard Building 2 Safeguard Building 2 Safeguard Building 3 Safeguard Building 3 Safeguard Building 4 Safeguard Building 4	Yes	Run	I

1. Equipment tag numbers are provided for information only and are not part of the certified design.

**Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design
Sheet 1 of 11**

Description	Tag Number(1)	Location	IEEE Class 1E(2)	PACS	MCR / RSS Displays	MCR / RSS Controls
Air Intake Safeguard Building Division 1						
Electric Heater	30SAC01AH001	Safeguard Building 1	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30SAC01AA003	Safeguard Building 1	Division 1[N] Division 2[A]	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAC01AA004	Safeguard Building 1	Division 1[N] Division 2[A]	Yes	Position / Position	Open-Close / Open-Close
Electric Heater	30SAC01AH002	Safeguard Building 1	Division 1[N]	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Supply Air Fan	30SAC01AN001	Safeguard Building 1	Division 1[N] Division 2[A]	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Air Intake Safeguard Building Division 2						
Electric Heater	30SAC02AH001	Safeguard Building 2	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30SAC02AA003	Safeguard Building 2	Division 2[N] Division 1[A]	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAC02AA004	Safeguard Building 2	Division 2[N] Division 1[A]	Yes	Position / Position	Open-Close / Open-Close
Electric Heater	30SAC02AH002	Safeguard Building 2	Division 2[N]	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Supply Air Fan	30SAC02AN001	Safeguard Building 2	Division 2[N] Division 1[A]	yes	On-Off / On-Off	Run-Stop / Run-Stop

Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design Sheet 2 of 11

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Air Intake Safeguard Building Division 3						
Electric Heater	30SAC03AH001	Safeguard Building 3	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30SAC03AA003	Safeguard Building 3	Division 3^N Division 4^A	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAC03AA004	Safeguard Building 3	Division 3^N Division 4^A	Yes	Position / Position	Open-Close / Open-Close
Electric Heater	30SAC03AH002	Safeguard Building 3	Division 3^N	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Supply Air Fan	30SAC03AN001	Safeguard Building 3	Division 3^N Division 4^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Air Intake Safeguard Building Division 4						
Electric Heater	30SAC04AH001	Safeguard Building 4	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30SAC04AA003	Safeguard Building 4	Division 4^N Division 3^A	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30SAC04AA004	Safeguard Building 4	Division 4^N Division 3^A	Yes	Position / Position	Open-Close / Open-Close
Electric Heater	30SAC04AH002	Safeguard Building 4	Division 4^N	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Supply Air Fan	30SAC04AN001	Safeguard Building 4	Division 4^N Division 3^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop

Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design
Sheet 3 of 11

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Exhaust Train, Safeguard Building Division 1						
Exhaust Fan	30SAC31AN001	Safeguard Building 1	Division 1^N Division 2^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Damper	30SAC31AA002	Safeguard Building 1	Division 1^N Division 2^A	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30SAC51AN001	Safeguard Building 1	Division 1^N Division 2^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Damper	30SAC51AA003	Safeguard Building 1	Division 1^N Division 2^A	Yes	Position / Position	Open-Close / Open-Close
Exhaust Train, Safeguard Building Division 2						
Exhaust Fan	30SAC32AN001	Safeguard Building 2	Division 2^N Division 1^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Damper	30SAC32AA002	Safeguard Building 2	Division 2^N Division 1^A	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30SAC52AN001	Safeguard Building 2	Division 2^N Division 1^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Damper	30SAC52AA003	Safeguard Building 2	Division 2^N Division 1^A	Yes	Position / Position	Open-Close / Open-Close
Exhaust Train, Safeguard Building Division 3						
Exhaust Fan	30SAC33AN001	Safeguard Building 3	Division 3^N Division 4^A	Yes	On-Off / On-Off	Run-Stop / Run-Stop

Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design
Sheet 4 of 11

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Motor Operated Damper	30SAC33AA002	Safeguard Building 3	Division 3[N] Division 4[A]	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30SAC53AN001	Safeguard Building 3	Division 3[N] Division 4[A]	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Damper	30SAC53AA003	Safeguard Building 3	Division 3[N] Division 4[A]	Yes	Position / Position	Open-Close / Open-Close
Exhaust Train, Safeguard Building Division 4						
Exhaust Fan	30SAC34AN001	Safeguard Building 4	Division 4[N] Division 3[A]	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Damper	30SAC34AA002	Safeguard Building 4	Division 4[N] Division 3[A]	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30SAC54AN001	Safeguard Building 4	Division 4[N] Division 3[A]	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Damper	30SAC54AA003	Safeguard Building 4	Division 4[N] Division 3[A]	Yes	Position / Position	Open-Close / Open-Close
Recirculation Cooling Units, Safeguard Building Divisions 1, 2, 3, and 4						
Recirculation Fan	30SAC61AN001	Safeguard Building 1	Division 1[N] Division 2[A]	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fan	30SAC61AN002	Safeguard Building 1	Division 1[N] Division 2[A]	Yes	On-Off / On-Off	Run-Stop / Run-Stop

Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design
Sheet 5 of 11

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Recirculation Fan	30SAC62AN001	Safeguard Building 2	Division 2^N Division 1^A	N/A	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fan	30SAC62AN002	Safeguard Building 2	Division 2^N Division 1^A	N/A	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fan	30SAC63AN001	Safeguard Building 3	Division 3^N Division 4^A	N/A	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fan	30SAC63AN002	Safeguard Building 3	Division 3^N Division 4^A	N/A	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fan	30SAC64AN001	Safeguard Building 4	Division 4^N Division 3^A	N/A	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fan	30SAC64AN002	Safeguard Building 4	Division 4^N Division 3^A	N/A	On-Off / On-Off	Run-Stop / Run-Stop
Instruments						
Battery Room Temperature	30SAC11CT002	Safeguard Building 1	Division 1	N/A	Temp/ Temp	N/A
Battery Room Temperature	30SAC11CT005	Safeguard Building 1	Division 1	N/A	Temp/ Temp	N/A
Battery Room Temperature	30SAC12CT002	Safeguard Building 2	Division 2	N/A	Temp/ Temp	N/A
Battery Room Temperature	30SAC13CT002	Safeguard Building 3	Division 3	N/A	Temp/ Temp	N/A
Battery Room Temperature	30SAC14CT002	Safeguard Building 4	Division 4	N/A	Temp/ Temp	N/A

Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design
Sheet 6 of 11

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Battery Room Temperature	30SAC14CT005	Safeguard Building 4	Division 4	N/A	Temp/ Temp	N/A
I&C Cabinet Room Temperature	30SAC11CT003	Safeguard Building 1	Division 1	N/A	Temp/ Temp	N/A
I&C Cabinet Room Temperature	30SAC12CT003	Safeguard Building 2	Division 2	N/A	Temp/ Temp	N/A
I&C Cabinet Room Temperature	30SAC13CT003	Safeguard Building 3	Division 3	N/A	Temp/ Temp	N/A
I&C Cabinet Room Temperature	30SAC14CT003	Safeguard Building 4	Division 4	N/A	Temp/ Temp	N/A
Switchgear Room Temperature	30SAC11CT006	Safeguard Building 1	Division 1	N/A	Temp/ Temp	N/A
Switchgear Room Temperature	30SAC12CT006	Safeguard Building 2	Division 2	N/A	Temp/ Temp	N/A
Switchgear Room Temperature	30SAC12CT007	Safeguard Building 2	Division 2	N/A	Temp/ Temp	N/A
Switchgear Room Temperature	30SAC13CT006	Safeguard Building 3	Division 3	N/A	Temp/ Temp	N/A
Switchgear Room Temperature	30SAC13CT007	Safeguard Building 3	Division 3	N/A	Temp/ Temp	N/A
Switchgear Room Temperature	30SAC14CT006	Safeguard Building 4	Division 4	N/A	Temp/ Temp	N/A
Switchgear Room Return Air Temperature	30SAC21CT001	Safeguard Building 1	Division 1	N/A	Temp/ Temp	N/A

Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design
Sheet 7 of 11

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Switchgear Room Return Air Temperature	30SAC21CT002	Safeguard Building 1	Division 1	N/A	Temp/ Temp	N/A
Switchgear Room Return Air Temperature	30SAC22CT001	Safeguard Building 2	Division 2	N/A	Temp/ Temp	N/A
Switchgear Room Return Air Temperature	30SAC22CT002	Safeguard Building 2	Division 2	N/A	Temp/ Temp	N/A
Switchgear Room Return Air Temperature	30SAC23CT001	Safeguard Building 3	Division 3	N/A	Temp/ Temp	N/A
Switchgear Room Return Air Temperature	30SAC23CT002	Safeguard Building 3	Division 3	N/A	Temp/ Temp	N/A
Switchgear Room Return Air Temperature	30SAC24CT001	Safeguard Building 4	Division 4	N/A	Temp/ Temp	N/A
Switchgear Room Return Air Temperature	30SAC24CT002	Safeguard Building 4	Division 4	N/A	Temp/ Temp	N/A
Emergency Feedwater Pump Room Temperature	30SAC61CT001	Safeguard Building 1	Division 1	N/A	Temp/ Temp	N/A
Emergency Feedwater Pump Room Temperature	30SAC61CT002	Safeguard Building 1	Division 1	N/A	Temp/ Temp	N/A

Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design
Sheet 8 of 11

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Emergency Feedwater Pump Room Temperature	30SAC62CT001	Safeguard Building 2	Division 2	N/A	Temp/ Temp	N/A
Emergency Feedwater Pump Room Temperature	30SAC62CT002	Safeguard Building 2	Division 2	N/A	Temp/ Temp	N/A
Emergency Feedwater Pump Room Temperature	30SAC63CT001	Safeguard Building 3	Division 3	N/A	Temp/ Temp	N/A
Emergency Feedwater Pump Room Temperature	30SAC63CT002	Safeguard Building 3	Division 3	N/A	Temp/ Temp	N/A
Emergency Feedwater Pump Room Temperature	30SAC64CT001	Safeguard Building 4	Division 4	N/A	Temp/ Temp	N/A
Emergency Feedwater Pump Room Temperature	30SAC64CT002	Safeguard Building 4	Division 4	N/A	Temp/ Temp	N/A
Component Cooling Water System Pump Room Temperature	30SAC61CT003	Safeguard Building 1	Division 1	N/A	Temp/ Temp	N/A
Component Cooling Water System Pump Room Temperature	30SAC61CT004	Safeguard Building 1	Division 1	N/A	Temp/ Temp	N/A
Component Cooling Water System Pump Room Temperature	30SAC62CT003	Safeguard Building 2	Division 2	N/A	Temp/ Temp	N/A

Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design
Sheet 9 of 11

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Component Cooling Water System Pump Room Temperature	30SAC62CT004	Safeguard Building 2	Division 2	N/A	Temp/ Temp	N/A
Component Cooling Water System Pump Room Temperature	30SAC63CT003	Safeguard Building 3	Division 3	N/A	Temp/ Temp	N/A
Component Cooling Water System Pump Room Temperature	30SAC63CT004	Safeguard Building 3	Division 3	N/A	Temp/ Temp	N/A
Component Cooling Water System Pump Room Temperature	30SAC64CT003	Safeguard Building 4	Division 4	N/A	Temp/ Temp	N/A
Component Cooling Water System Pump Room Temperature	30SAC64CT004	Safeguard Building 4	Division 4	N/A	Temp/ Temp	N/A
Battery Room Exhaust Air Flow	30SAC41CF001	Safeguard Building 1	Division 1	N/A	Flow/ Flow	N/A
Battery Room Exhaust Air Flow	30SAC44CF001	Safeguard Building 4	Division 4	N/A	Flow/ Flow	N/A
Outside Air Temperature Sensors	30SAC01CT001/002 30SAC02CT001/002 30SAC03CT001/002 30SAC04CT001/002	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A
Temperature Sensors Upstream of heaters	30SAC01CT501 30SAC02CT501 30SAC03CT501 30SAC04CT501	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A

Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design Sheet 10 of 11

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Protective Switch-off Temperature for heaters	30SAC01CT003 30SAC02CT003 30SAC03CT003 30SAC04CT003	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A
Temperature Sensors Downstream of heaters	30SAC01CT004/005 30SAC02CT004/005 30SAC03CT004/005 30SAC04CT004/005	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A
Temperature Sensors Downstream of Moisture Separators	30SAC01CT502 30SAC02CT502 30SAC03CT502 30SAC04CT502	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A

Table 2.6.7-2—SBVSE Equipment I&C and Electrical Design
Sheet 11 of 11

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Supply Air Temperature Sensors	30SAC01CT006 30SAC02CT006 30SAC03CT006 30SAC04CT006	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A

1. Equipment tag numbers are provided for information only and are not part of the certified design.
2. ^{N} denotes division the equipment is normally powered from, while ^{A} denotes division the equipment is powered from when alternate feed is implemented.

Table 2.6.7-3—Electrical Division of Safeguard Building Ventilation System ITAAC Sheet 1 of 5

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the SBVSE is as described in the Design Description of Section 2.6.7, Tables 2.6.7-1 and 2.6.7-2, and as shown on Figures 2.6.7-1, 2.6.7-2, 2.6.7-3, and 2.6.7-4.	An inspection of the as-built SBVSE functional arrangement will be performed.	The SBVSE conforms to the functional arrangement as described in the Design Description of Section 2.6.7, Tables 2.6.7-1 and 2.6.7-2, and as shown on Figures 2.6.7-1, 2.6.7-2, 2.6.7-3, and 2.6.7-4.
2.2	Deleted.	Deleted.	Deleted.
2.3	Physical separation exists between divisions of the SBVSE located in the Safeguard Buildings as listed in Table 2.6.7-1 and as shown on Figure 2.6.7-1.	An inspection will be performed to verify that the as-built divisions of the SBVSE are located in separate Safeguard Buildings.	The divisions of the SBVSE are located in separate Safeguard Buildings as listed in Table 2.6.7-1 and as shown on Figure 2.6.7-1.
3.1	Deleted.	Deleted.	Deleted.
3.2	Class 1E dampers listed in Table 2.6.7-2 will function to change position as listed in Table 2.6.7-1 under normal operating conditions.	Tests will be performed to verify the ability of Class 1E dampers to change position under normal operating conditions.	Class 1E dampers listed in Table 2.6.7-2 change position as listed in Table 2.6.7-1 under normal operating conditions.

Table 2.6.7-3—Electrical Division of Safeguard Building Ventilation System ITAAC
Sheet 2 of 5

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.3	Equipment identified as Seismic Category I in Table 2.6.7-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.7-1~~.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Table 2.6.7-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.6.7-1 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.6.7-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.7-1 including the time required to perform the listed function~~. b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.6.7-1, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.
3.4	Deleted.~~Equipment listed in Table 2.6.7-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~	Deleted.~~An analysis will be performed of ASME AG-1 Code Design Verification Reports.~~	Deleted.~~ASME AG-1 Code Design Verification Reports (AA-4400) conclude that the design of equipment listed as ASME AG-1 Code in Table 2.6.7-1 complies with ASME AG-1 Code requirements.~~
3.5	Deleted.~~Equipment listed in Table 2.6.7-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~	Deleted.~~An inspection of the as-built fabrication activities and documentation for ASME AG-1 Code equipment will be conducted.~~	Deleted.~~A report concludes that ASME AG-1 Code equipment listed in Table 2.6.7-1 are fabricated in accordance with ASME AG-1 Code requirements.~~

Table 2.6.7-3—Electrical Division of Safeguard Building Ventilation System ITAAC
Sheet 3 of 5

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.6	Equipment listed in Table 2.6.7-1 as ASME AG-1 Code are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.	An inspection of the as-built construction activities and documentation for ASME AG-1 Code equipment will be conducted.	A report concludes that ASME AG-1 Code equipment listed in Table 2.6.7-1 are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.
4.1	Displays listed in Table 2.6.7-2 are indicated on the PICS operator workstations in the MCR and the RSS.	a. Tests will be performed to verify that the displays listed in Table 2.6.7-2 are indicated on the PICS operator workstations in the MCR by using test input signals to PICS. b. Tests will be performed to verify that the displays listed in Table 2.6.7-2 are indicated on the PICS operator workstations in the RSS by using test input signals inputs to PICS.	a. Displays listed in Table 2.6.7-2 are indicated on the PICS operator workstations in the MCR. b. Displays listed in Table 2.6.7-2 are indicated on the PICS operator workstations in the RSS.
4.2	Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.7-2.	a. Tests will be performed using controls on the PICS operator workstations in the MCR. b. Tests will be performed using controls on the PICS operator workstations in the RSS.	a. Controls on the PICS operator workstations in the MCR perform the function listed in Table 2.6.7-2. b. Controls on the PICS operator workstations in the RSS perform the function listed in Table 2.6.7-2.
4.3	Equipment listed as being controlled by a PACS module in Table 2.6.7-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.	A test will be performed using test input signals to verify equipment controlled by a PACS module responds to the state requested and provides drive monitoring signals back to the PACS module.	Equipment listed as being controlled by a PACS module in Table 2.6.7-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

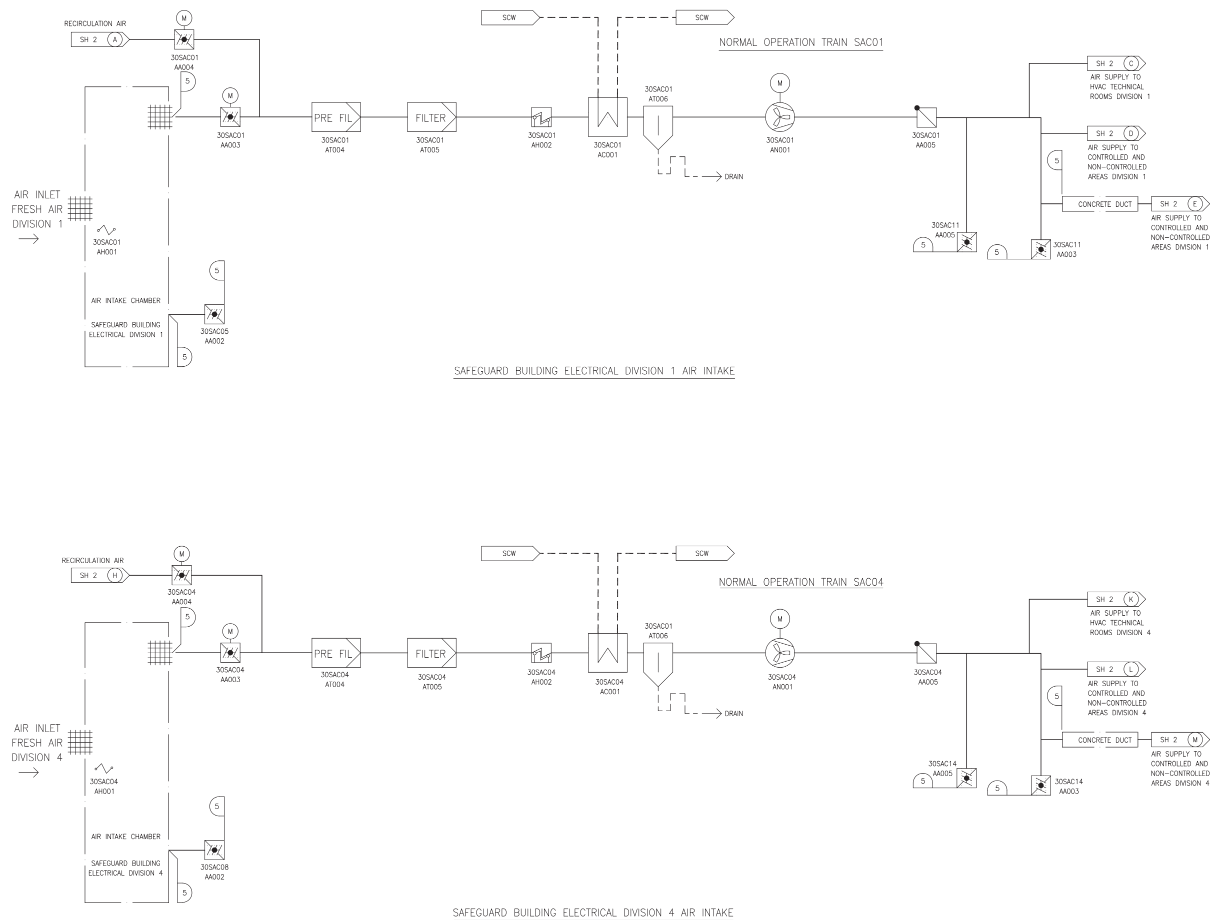
Table 2.6.7-3—Electrical Division of Safeguard Building Ventilation System ITAAC Sheet 4 of 5

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
5.1	Equipment designated as Class 1E in Table 2.6.7-2 are powered from the Class 1E division as listed in Table 2.6.7-2 in a normal or alternate feed condition.	a. Testing will be performed by providing a test input signal in each normally aligned division. b. Testing will be performed by providing a test input signal in each division with the alternate feed aligned to the divisional pair.	a. The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in Table 2.6.7-2. b. The test input signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E equipment identified in Table 2.6.7-2.
5.2	Deleted.	Deleted.	Deleted.
6.1	The SBVSE provides cooling to maintain design temperatures in the Electrical Division of the Safeguard Buildings, while operating in a design basis accident alignment.	a. Tests and analysis will be performed to verify SBVSE provides cooling to maintain design temperatures in the Electrical Division of the Safeguard Buildings, while operating in a design basis accident alignment. b. A test of the SBVSE fans will be performed to verify that the ~~design~~ air flow is greater than the approved design requirement.	a. Each SBVSE cooling coil ~~is capable of providing~~ provides the design cooling requirements, while operating in a design basis accident alignment, and is capable of maintaining temperatures in the Electrical Division of the Safeguard Buildings. b. Each SBVSE fan is capable of meeting the design air flow requirements, while operating in a design basis accident alignment.

Table 2.6.7-3—Electrical Division of Safeguard Building Ventilation System ITAAC Sheet 5 of 5

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.2	The recirculation cooling units start and stop automatically in the EFWS and CCWS pump rooms when the room temperature reaches preset maximum and minimum temperatures in the pump rooms.	a. A test will be performed using test input signals to verify that recirculation cooling units start automatically in the EFWS and CCWS pump rooms when the pump room temperature reaches preset maximum temperatures in the pump rooms. b. A test will be performed using test input signals to verify that recirculation cooling units stop automatically in the EFWS and CCWS pump rooms when the pump room temperature reaches preset minimum temperatures in the pump rooms.	a. The recirculation cooling units start automatically in the EFWS and CCWS pump rooms when the pump room temperature reaches preset maximum temperatures in the pump roomsprior to allowing the pump rooms to exceed the maximum design temperature. b. The recirculation cooling units stop automatically in the EFWS and CCWS pump rooms when the pump room temperature reaches preset maximum temperatures in the pump rooms prior to allowing the pump rooms to fall below the minimum design temperature.
6.3	The SBVSE maintains the hydrogen concentration levels in the battery rooms below one percent by volume.	Tests and analysis will be performed to verify the air flow capability of the SBVSE is adequate to maintain the hydrogen concentration levels in the battery rooms below one percent.	The air flow capability of the SBVSE maintains the hydrogen concentration levels in the battery rooms below one percent by volume.

Figure 2.6.7-1—Electrical Division of Safeguard Building Ventilation System Division 1 and Division 4 Air Intake Functional Arrangement



7	AG-1	N/A
5	AG-1	I
DESIGN AREA	ASME	SSC SEISMIC CLASS

REV 005
SAC01T1

Figure 2.6.7-2—Electrical Division of Safeguard Building Ventilation System Division 1 and Division 4 Air Supply and Exhaust Functional Arrangement

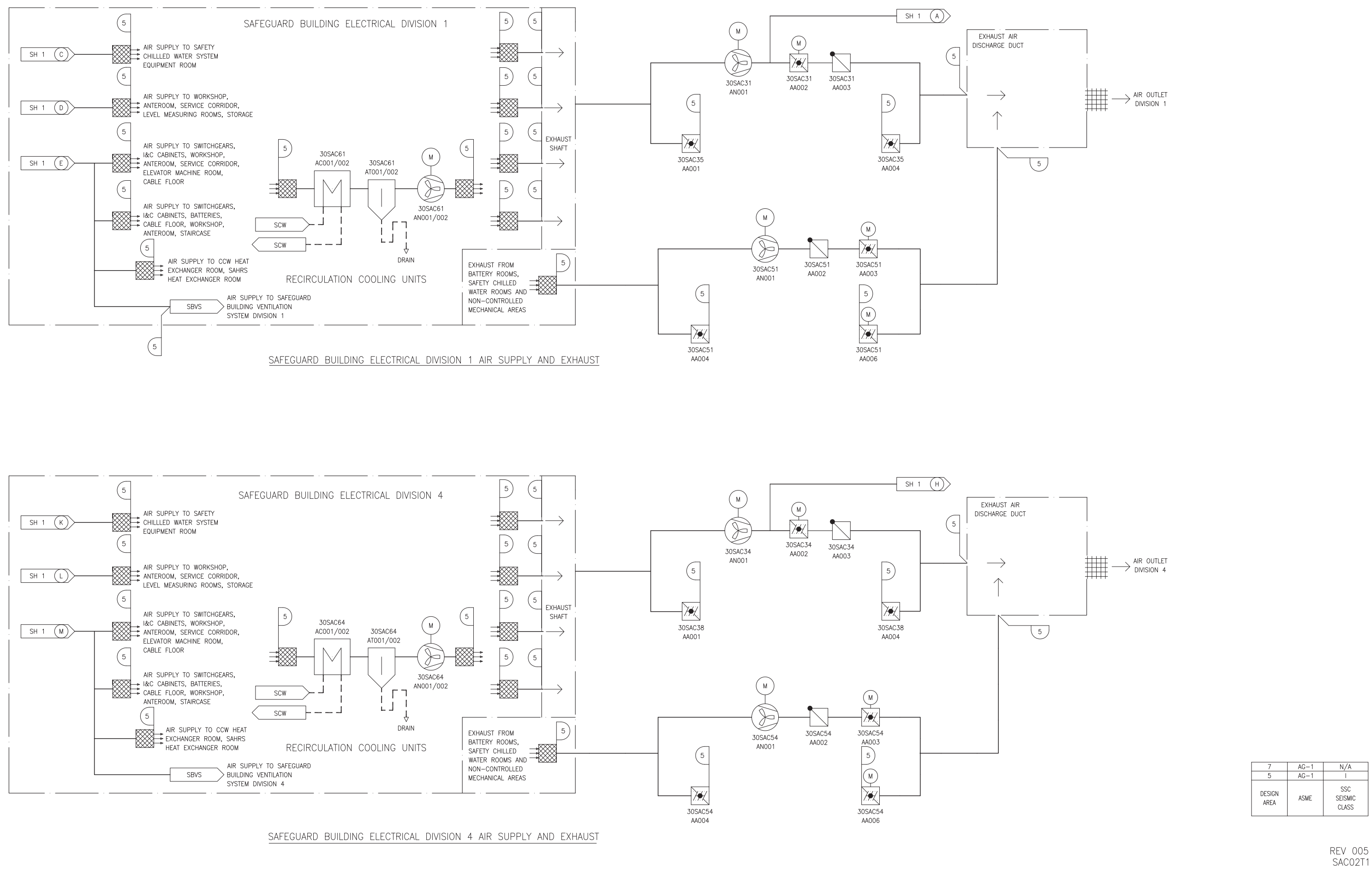
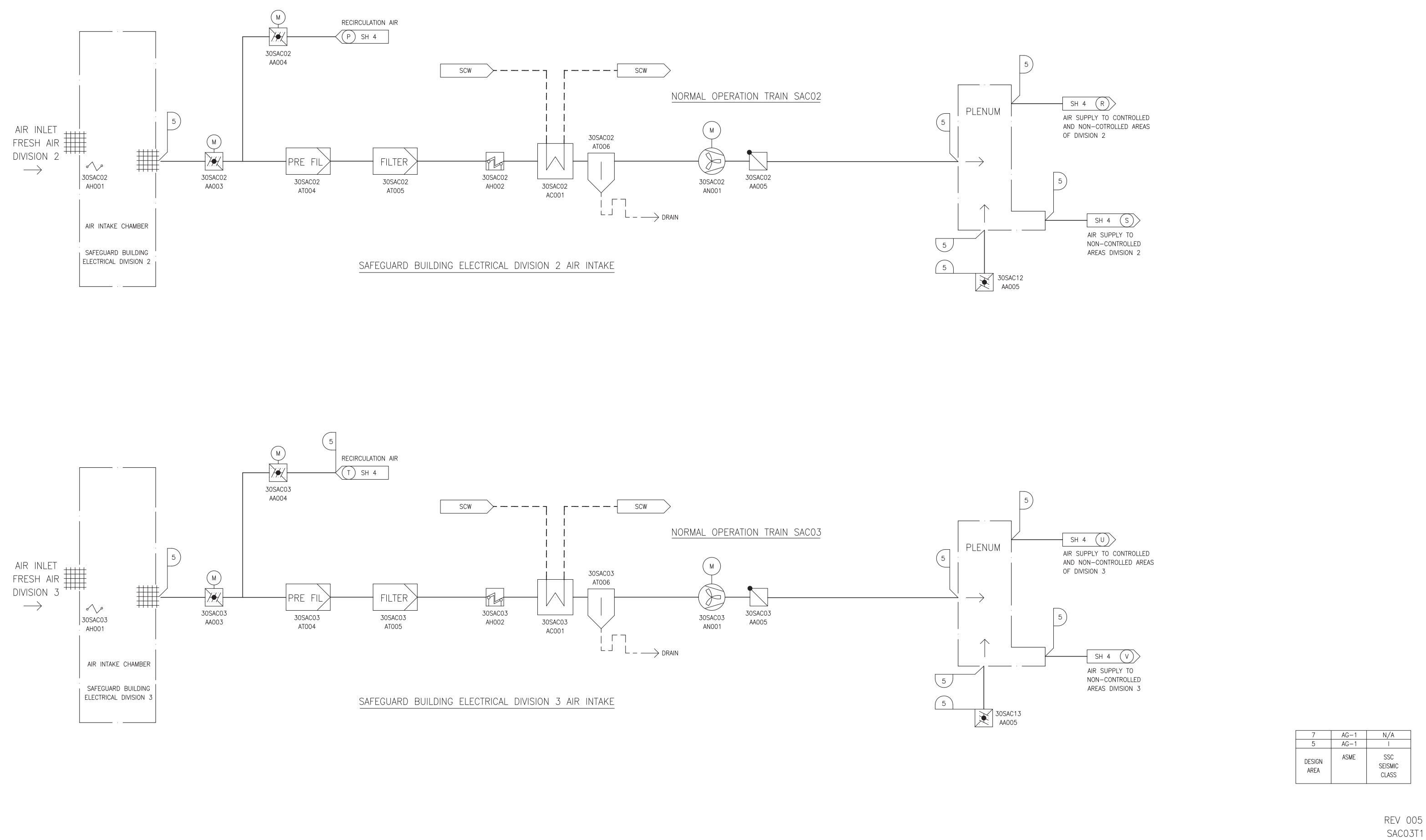
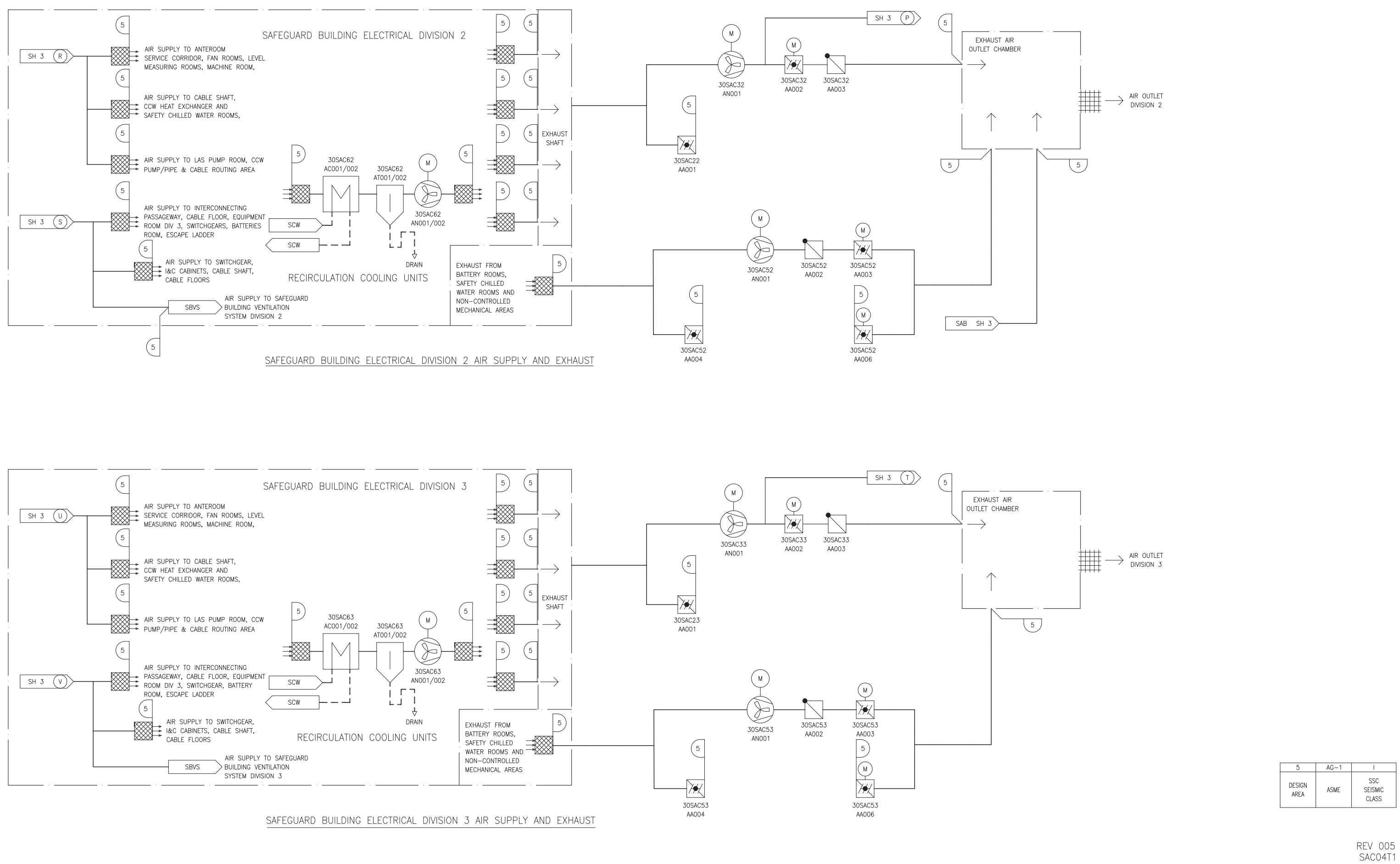


Figure 2.6.7-3—Electrical Division of Safeguard Building Ventilation System Division 2 and Division 3 Air Intake Functional Arrangement



DESIGN AREA	ASME	SSC SEISMIC CLASS
7	AG-1	N/A
5	AG-1	I

Figure 2.6.7-4—Electrical Division of Safeguard Building Ventilation System Division 2 and Division 3 Air Supply and Exhaust Functional Arrangement



2.6.8 Containment Building Ventilation System

Design Description

1.0 System Description

The containment building ventilation system (CBVS) controls the Reactor Containment Building temperature, ~~humidity~~ and air change rate for personnel comfort, personnel safety, and equipment protection during normal plant operation. The CBVS provides cooling, heating, and ventilation for the Reactor Containment Building to remove equipment heat, and heat generated from other sources. The CBVS also provides heat to maintain a minimum temperature in the building. The CBVS provides a minimal air change rate for the building and controls the building pressurization to reduce spreading of contamination.

The CBVS provides the following safety-related functions:

- Upon receipt of a containment isolation signal, the CBVS provides automatic isolation of the containment atmosphere by quick closure of the system containment isolation valves.
- Upon receipt of a containment isolation signal during a low flow purge operation, air exhausted from containment will be filtered by the CBVS low flow iodine filtration units until the containment isolation valves are closed.

The CBVS provides the following non-safety-related functions:

- Isolation of Containment Building Low Flow Purge Subsystem supply air damper to Fuel Building hatch area when the equipment hatch is open on receipt of a high radioactivity signal in the CBVS exhaust.
- Isolation of Fuel Building Ventilation System exhaust air damper to the area in front of emergency airlock on receipt of a high radioactivity signal in the CBVS exhaust.
- Initiate Containment Building Low Flow Purge Subsystem iodine filtration on receipt of a high radioactivity signal in the CBVS exhaust.
- ~~Containment full flow purge supply and exhaust during outages.~~
- ~~Containment low flow purge supply for containment entry during normal plant operation.~~
- ~~Internal filtration to reduce radioactive contamination inside the equipment compartment.~~
- ~~Supply of cool air to the reactor pit area to prevent concrete degradation.~~
- ~~Containment cooling to maintain ambient conditions.~~

2.0 Arrangement

2.1 The functional arrangement of the CBVS is as described in the Design Description of Section 2.6.8, Tables 2.6.8-1—Containment Building Ventilation System Containment Isolation Valves Mechanical Design, 2.6.8-2—Containment Building Ventilation System Equipment Mechanical Design and 2.6.8-3—Containment Ventilation System Equipment I&C and Electrical Design, and as shown on Figure 2.6.8-1—Containment Building Ventilation System Functional Arrangement.

2.2 Deleted.

3.0 Mechanical Design Features

3.1 Valves listed in Table 2.6.8-1 will be functionally designed and qualified such that each valve is capable of performing its intended function ~~for a full range of system differential pressure and flow, ambient temperatures, and available voltage (as applicable)~~ under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions up to and including design basis accident conditions.

3.2 Valves listed in Table 2.6.8-1 will function to change position as listed in Table 2.6.8-1 under normal operating conditions.~~Deleted.~~

3.3 Class 1E dampers listed in Table 2.6.8-3 will function to change position as listed in Table 2.6.8-2 under normal operating conditions.

3.4 Equipment identified as Seismic Category I in Tables 2.6.8-1 and 2.6.8-2 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Tables 2.6.8-1 and 2.6.8-2~~.

3.5 Deleted.~~Equipment listed in Table 2.6.8-2 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~

3.6 Deleted.~~Equipment listed in Table 2.6.8-2 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~

3.7 Equipment listed in Table 2.6.8-2 as ASME AG-1 Code are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

3.8 Deleted.

3.9 As-built ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1 are reconciled with the design requirements.

3.10 Pressure-boundary welds in ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1 meet ASME Code Section III non-destructive examination requirements.

3.11 ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1 retain their pressure-boundary integrity at their design pressure.

3.12 ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1 are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

3.13 ASME Code Class ~~1,~~ 2 ~~and 3~~ piping systems and components listed in Table 2.6.8-1 are designed in accordance with ASME Code Section III requirements.

3.14 Deleted.

3.15 Deleted.

3.16 Deleted.

3.17 Deleted.

4.0 I&C Design Features, Displays, and Controls

4.1 Displays listed in Table 2.6.8-3 are indicated on the PICS operator workstations in the MCR and the RSS.

4.2 Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.8-3.

4.3 Equipment listed as being controlled by a PACS module in Table 2.6.8-3 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

4.4 Deleted.

5.0 Electrical Power Design Features

5.1 Equipment designated as Class 1E in Table 2.6.8-3 are powered from the Class 1E division as listed in Table 2.6.8-3 in a normal or alternate feed condition.

5.2 Deleted.

6.0 Environmental Qualifications

6.1 Equipment designated as harsh environment in Table 2.6.8-3 will perform the function listed in Tables 2.6.8-1 and 2.6.8-2 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.

7.0 Equipment and System Performance

7.1 The CBVS low flow purge exhaust subsystem exhausts through a CBVS iodine filtration train.

7.2 ~~Deleted~~Upon receipt of a high radioactivity signal in the CBVS exhaust, the following actions occur automatically:

- Close Containment Building Low Flow Purge Subsystem supply air damper to Fuel Building hatch area when the equipment hatch is open.

- Close Fuel Building Ventilation System exhaust air damper to the area in front of emergency airlock.

- Opens Containment Building Low Flow Purge Subsystem iodine filtration isolation dampers, starts Containment Building Low Flow Purge Subsystem iodine filtration unit fans.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.8-4 lists the CBVS ITAAC.

Table 2.6.8-1—CBVS Containment Isolation Valves Mechanical Design

Description	Tag Number[1]	Location	ASME Code Section III	Function	Seismic Category
Containment Isolation Valve	30KLA10AA001	Fuel Building	Yes	Close	I
Containment Isolation Valve	30KLA10AA003	Reactor Building	Yes	Close	I
Containment Isolation Valve	30KLA30AA002	Fuel Building	Yes	Close	I
Containment Isolation Valve	30KLA30AA003	Reactor Building	Yes	Close	I
Containment Isolation Valve	30KLA20AA003	Fuel Building	Yes	Close	I
Containment Isolation Valve	30KLA20AA001	Reactor Building	Yes	Close	I
Containment Isolation Valve	30KLA40AA002	Fuel Building	Yes	Close	I
Containment Isolation Valve	30KLA40AA001	Reactor Building	Yes	Close	I

1. Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.6.8-2—CBVS Equipment Mechanical Design
Sheet 1 of 2

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Reactor Pit Cooling Fans					
Reactor Pit Cooling Fan	30KLA65AN001	Reactor Building	Yes	Run	II
Reactor Pit Cooling Fan	30KLA66AN001	Reactor Building	Yes	Run	II
Reactor Pit Cooling Fan	30KLA65AN002	Reactor Building	Yes	Run	II
Reactor Pit Cooling Fan	30KLA66AN002	Reactor Building	Yes	Run	II
Low Flow Purge Exhaust					
Motor operated dampers	30KLA21AA004 30KLA22AA004	Fuel Building	Yes	Open	I
Electric Heaters	30KLA21AH005 30KLA22AH005	Fuel Building	Yes	On / Off	I
Prefilters	30KLA21AT001 30KLA22AT001	Fuel Building	Yes	N/A	I
Upstream HEPA Filters	30KLA21AT002 30KLA22AT002	Fuel Building	Yes	N/A	I
Carbon Absorbers	30KLA21AT003 30KLA22AT003	Fuel Building	Yes	N/A	I
Downstream HEPA Post Filters	30KLA21AT004 30KLA22AT004	Fuel Building	Yes	N/A	I
Motor Operated Dampers	30KLA21AA007 30KLA22AA007	Fuel Building	Yes	Open	I
Exhaust Fans	30KLA21AN001 30KLA22AN001	Fuel Building	Yes	Run	I
Backdraft Dampers	30KLA21AA003 30KLA22AA003	Fuel Building	Yes	Open / Close N/A	I

Table 2.6.8-2—CBVS Equipment Mechanical Design
Sheet 2 of 2

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Moisture Separators	30KLA21AT005 30KLA22AT005	Fuel Building	Yes	N/A	I
Motor Operated Dampers	30KLA21AA001 30KLA22AA001	Fuel Building	Yes	Close	I
Internal Filtration Train					
Motor Operated Damper	30KLA50AA002	Reactor Building	Yes	Open	I
Electric Heater	30KLA50AH001	Reactor Building	Yes	On / Off	I
Prefilter	30KLA50AT001	Reactor Building	Yes	N/A	I
~~Upstream~~ HEPA Filters	30KLA50AT002	Reactor Building	Yes	N/A	I
Carbon Absorber	30KLA50AT003	Reactor Building	Yes	N/A	I
~~Downstream HEPA~~ Post Filters	30KLA50AT004	Reactor Building	Yes	N/A	I
Motor Operated Damper	30KLA50AA004	Reactor Building	Yes	Open	I
~~Manual Dampers~~	~~30KLA51AA006~~ ~~30KLA52AA006~~	~~Reactor Building~~	~~Yes~~	~~Open~~	~~I~~
Recirculation Fans	30KLA51AN001 30KLA52AN001	Reactor Building	Yes	Run	I
Backdraft Dampers	30KLA51AA007 30KLA52AA007	Reactor Building	Yes	Open / Close ~~N/A~~	I

1. Equipment tag numbers are provided for information only and are not part of the certified design.

**Table 2.6.8-3—CBVS Equipment I&C and Electrical Design
Sheet 1 of 5**

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
~~Reactor Pit Cooling Fan~~	~~30KLA65AN001~~	~~Reactor Building~~	~~Division 1~~	~~Yes~~	~~Yes~~	~~On-Off / On-Off~~	~~Run-Stop / Run-Stop~~
~~Reactor Pit Cooling Fan~~	~~30KLA66AN001~~	~~Reactor Building~~	~~Division 4~~	~~Yes~~	~~Yes~~	~~On-Off / On-Off~~	~~Run-Stop / Run-Stop~~
~~Reactor Pit Cooling Fan~~	~~30KLA65AN002~~	~~Reactor Building~~	~~Division 1~~	~~Yes~~	~~Yes~~	~~On-Off / On-Off~~	~~Run-Stop / Run-Stop~~
~~Reactor Pit Cooling Fan~~	~~30KLA66AN002~~	~~Reactor Building~~	~~Division 4~~	~~Yes~~	~~Yes~~	~~On-Off / On-Off~~	~~Run-Stop / Run-Stop~~
Low Flow Purge Exhaust							
Motor Operated Damper	30KLA21AA004	Fuel Building	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Damper	30KLA22AA004	Fuel Building	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Electric Heater	30KLA21AH005	Fuel Building	Division 1^N Division 2^A	Yes	Yes	On-Off / On-Off	On-Off / On-Off ~~Start-Stop / Start-Stop~~
Electric Heater	30KLA22AH005	Fuel Building	Division 4^N Division 3^A	Yes	Yes	On-Off / On-Off	On-Off / On-Off ~~Start-Stop / Start-Stop~~
Motor Operated Damper	30KLA21AA007	Fuel Building	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close

Table 2.6.8-3—CBVS Equipment I&C and Electrical Design
Sheet 2 of 5

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Motor Operated Damper	30KLA22AA007	Fuel Building	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30KLA21AN0001	Fuel Building	Division 1	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Exhaust Fan	30KLA22AN0001	Fuel Building	Division 4	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Dampers	30KLA21AA001	Fuel Building	N/A	N/A	N/A	Position / Position	Open-Close / Open-Close
Motor Operated Dampers	30KLA22AA001	Fuel Building	N/A	N/A	N/A	Position / Position	Open-Close / Open-Close
Internal Filtration Train							
Motor Operated Damper	30KLA50AA002	Reactor Building	Division 2^N Division 1^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Electric Heater	30KLA50AH001	Reactor Building	Division 2^N Division 1^A	Yes	Yes	On-Off / On-Off	On-Off / On-Off ~~Start-Stop / Start-Stop~~
Motor Operated Damper	30KLA50AA004	Reactor Building	Division 2^N Division 1^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Recirculation Fans	30KLA51AN001	Reactor Building	Division 2^N Division 1^A	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fans	30KLA52AN001	Reactor Building	Division 1^N Division 2^A	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop

Table 2.6.8-3—CBVS Equipment I&C and Electrical Design
Sheet 3 of 5

Description	Tag Number(1)	Location	IEEE Class 1E (2)	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Instruments							
Containment Pressure	30KLA70CP801	Fuel Building	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA70CP802	Safeguard Building 2	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA70CP803	Safeguard Building 3	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA70CP804	Fuel Building	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA60CP851	Fuel Building	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA70CP851	Fuel Building	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA60CP852	Safeguard Building 2	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA70CP852	Safeguard Building 2	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA60CP853	Safeguard Building 3	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA70CP853	Safeguard Building 3	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA60CP854	Fuel Building	N/A	Yes	N/A	Pressure/ Pressure	N/A
Containment Pressure	30KLA70CP854	Fuel Building	N/A	Yes	N/A	Pressure/ Pressure	N/A

Table 2.6.8-3—CBVS Equipment I&C and Electrical Design
Sheet 4 of 5

Description	Tag Number[1]	Location	IEEE Class 1E [2]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Temperature Downstream of Electric Heater	30KLA21CT001	Fuel Building	N/A	Yes	N/A	Temperature/ Temperature	N/A
Temperature Upstream of Electric Heater	30KLA21CT002	Fuel Building	N/A	Yes	N/A	Temperature/ Temperature	N/A
Duct Air Flow	30KLA21CF001	Fuel Building	N/A	Yes	N/A	Flow/Flow	N/A
Iodine Filter Differential Pressure	30KLA21CP505	Fuel Building	N/A	Yes	N/A	Pressure/ Pressure~~N/A~~	N/A
Temperature Downstream of Electric Heater	30KLA22CT001	Fuel Building	N/A	Yes	N/A	Temperature/ Temperature	N/A
Temperature Upstream of Electric Heater	30KLA22CT002	Fuel Building	N/A	Yes	N/A	Temperature/ Temperature	N/A
Duct Air Flow	30KLA22CF001	Fuel Building	N/A	Yes	N/A	Flow/Flow	N/A
Iodine Filter Differential Pressure	30KLA22CP505	Fuel Building	N/A	Yes	N/A	Pressure/ Pressure~~N/A~~	N/A
Temperature Downstream of Carbon Adsorbers	30KLA21CT003	Fuel Building	N/A	Yes	N/A	Temperature/ Temperature	N/A
Temperature Downstream of Carbon Adsorbers	30KLA22CT003	Fuel Building	N/A	Yes	N/A	Temperature/ Temperature	N/A

Table 2.6.8-3—CBVS Equipment I&C and Electrical Design
Sheet 5 of 5

Description	Tag Number[1]	Location	IEEE Class 1E [2]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Temperature Upstream of Electric Heater	30KLA50CT002	Reactor Building	N/A	Yes	N/A	Temperature / Temperature	N/A
Temperature Downstream of Electric Heater	30KLA50CT001	Reactor Building	N/A	Yes	N/A	Temperature / Temperature	N/A
Duct Air Flow	30KLA50CF001	Reactor Building	N/A	Yes	N/A	Flow/Flow	N/A
Temperature Downstream of Carbon Adsorber	30KLA50CT003	Reactor Building	N/A	Yes	N/A	Temperature / Temperature	N/A

1. Equipment tag numbers are provided for information only and are not part of the certified design.
2. ^{N} denotes division the equipment is normally powered from, while ^{A} denotes division the equipment is powered from when alternate feed is implemented.

Table 2.6.8-4—Containment Building Ventilation System ITAAC
Sheet 1 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the CBVS is as described in the Design Description of Section 2.6.8, Tables 2.6.8-1, 2.6.8-2 and 2.6.8-3, and as shown on Figure 2.6.8-1.	An inspection of the as-built CBVS functional arrangement will be performed.	The CBVS conforms to the functional arrangement as described in the Design Description of Section 2.6.8, Tables 2.6.8-1, 2.6.8-2 and 2.6.8-3, and as shown on Figure 2.6.8-1.
2.2	Deleted.	Deleted.	Deleted.
3.1	Valves listed in Table 2.6.8-1 will be functionally designed and qualified such that each valve is capable of performing its intended function ~~for a full range of system differential pressure and flow, ambient temperatures, and available voltage (as applicable)~~ under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions up to and including design basis accident conditions.	Tests or type tests of valves will be performed to demonstrate that the valves function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions up to and including design basis accident conditions.	A report concludes that the valves listed in Table 2.6.8-1 are capable of performing their intended function ~~for a full range of system differential pressure and flow, ambient temperatures, and available voltage (as applicable)~~ under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions up to and including design basis accident conditions.
3.2	Valves listed in Table 2.6.8-1 will function to change position as listed in Table 2.6.8-1 under normal operating conditions.~~Deleted.~~	Tests will be performed to demonstrate the ability of valves to change position under normal operating conditions~~Deleted.~~	Valves listed in Table 2.6.8-1 change position as listed in Table 2.6.8-1 under normal operating conditions.~~Deleted.~~
3.3	Class 1E dampers listed in Table 2.6.8-3 will function to change position as listed in Table 2.6.8-2 under normal operating conditions.	Tests will be performed to verify the ability of Class 1E dampers to change position under normal operating conditions.	Class 1E dampers listed in Table 2.6.8-3 change position as listed in Table 2.6.8-2 under normal operating conditions.

Table 2.6.8-4—Containment Building Ventilation System ITAAC
Sheet 2 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.4	Equipment identified as Seismic Category I in Tables 2.6.8-1 and 2.6.8-2 can withstand seismic design basis loads without a loss of safety~~the~~ function(s) ~~listed in Tables 2.6.8-1 and 2.6.8-2~~.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Tables 2.6.8-1 and 2.6.8-2 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Tables 2.6.8-1 and 2.6.8-2 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Tables 2.6.8-1 and 2.6.8-2 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Tables 2.6.8-1 and 2.6.8-2 including the time required to perform the listed function~~. b. Inspection reports conclude that the equipment identified as Seismic Category I in Tables 2.6.8-1 and 2.6.8-2, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.
3.5	Deleted.~~Equipment listed in Table 2.6.8-2 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~	Deleted.~~An analysis will be performed of ASME AG-1 Code Design Verification Reports.~~	Deleted.~~ASME AG-1 Code Design Verification Reports (AA-4400) conclude that the design of equipment listed as ASME AG-1 Code in Table 2.6.8-2 complies with ASME AG-1 Code requirements.~~
3.6	Deleted.~~Equipment listed in Table 2.6.8-2 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~	Deleted.~~An inspection of the as-built fabrication activities and documentation for ASME AG-1 Code equipment will be conducted.~~	Deleted.~~A report concludes that ASME AG-1 Code equipment listed in Table 2.6.8-2 are fabricated in accordance with ASME AG-1 Code requirements.~~

Table 2.6.8-4—Containment Building Ventilation System ITAAC
Sheet 3 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.7	Equipment listed in Table 2.6.8-2 as ASME AG-1 Code are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.	An inspection of the as-built construction activities and documentation for ASME AG-1 Code equipment will be conducted.	A report concludes that ASME AG-1 Code equipment listed in Table 2.6.8-2 are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.
3.8	Deleted.	Deleted.	Deleted.
3.9	As-built ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1 are reconciled with the design requirements.	A reconciliation analysis of ASME Code Class ~~1,~~ 2 ~~and 3~~ components will be performed.	ASME Code Design Report(s) exist that meet the requirements of NCA-3550, conclude that the design reconciliation has been completed for as-built ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1, and document that the results of the reconciliation analysis comply with the requirements of the ASME Code Section III.
3.10	Pressure-boundary welds in ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1 meet ASME Code Section III non-destructive examination requirements.	An inspection of the as-built pressure-boundary welds in ASME Code Class ~~1,~~ 2 ~~and 3~~ components will be performed.	ASME Code reports(s) exist that conclude that ASME Code Section III requirements are met for non-destructive examination of pressure-boundary welds in ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1.
3.11	ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1 retain their pressure-boundary integrity at their design pressure.	A hydrostatic test will be conducted on ASME Code Class ~~1,~~ 2 ~~and 3~~ components that are required to be hydrostatically tested by the ASME Code Section III.	ASME Code Data Report(s) exist and conclude that the results of the hydrostatic test of ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1 comply with the requirements of ASME Code Section III.

Table 2.6.8-4—Containment Building Ventilation System ITAAC
Sheet 4 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.12	ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1 are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.	An inspection of the as-built construction activities and documentation for ASME Code Class ~~1,~~ 2 ~~and 3~~ components will be conducted.	ASME Code Data Report(s) exist that conclude that ASME Code Class ~~1,~~ 2 ~~and 3~~ components listed in Table 2.6.8-1 are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.
3.13	ASME Code Class ~~1,~~ 2 ~~and 3~~ piping systems and components listed in Table 2.6.8-1 are designed in accordance with ASME Code Section III requirements.	An inspection of piping design and analysis documentation required by the ASME Code Section III will be performed. {{DAC}}	ASME Code Section III Design Report(s) exist that meet the requirements of NCA-3550 and conclude that the design of the ASME Code Class ~~1,~~ 2 ~~and 3~~ piping system and components listed in Table 2.6.8-1 complies with the requirements of the ASME Code Section III. {{DAC}}
3.14	Deleted.	Deleted.	Deleted.
3.15	Deleted.	Deleted.	Deleted.
3.16	Deleted.	Deleted.	Deleted.
3.17	Deleted.	Deleted.	Deleted.
4.1	Displays listed in Table 2.6.8-3 are indicated on the PICS operator workstations in the MCR and the RSS.	a. Tests will be performed to verify that the displays listed in Table 2.6.8-3 are indicated on the PICS operator workstations in the MCR ~~by using test input signals to PICS~~. b. Tests will be performed to verify that the displays listed in Table 2.6.8-3 are indicated on the PICS operator workstations in the RSS ~~by using test input signals inputs to PICS~~.	a. Displays listed in Table 2.6.8-3 are indicated on the PICS operator workstations in the MCR. b. Displays listed in Table 2.6.8-3 are indicated on the PICS operator workstations in the RSS.

Table 2.6.8-4—Containment Building Ventilation System ITAAC
Sheet 5 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
4.2	Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.8-3.	a. Tests will be performed using controls on the PICS operator workstations in the MCR. b. Tests will be performed using controls on the PICS operator workstations in the RSS.	a. Controls on the PICS operator workstations in the MCR perform the function listed in Table 2.6.8-3. b. Controls on the PICS operator workstations in the RSS perform the function listed in Table 2.6.8-3.
4.3	Equipment listed as being controlled by a PACS module in Table 2.6.8-3 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.	A test will be performed using test input signals to verify equipment controlled by a PACS module responds to the state requested and provides drive monitoring signals back to the PACS module.	Equipment listed as being controlled by a PACS module in Table 2.6.8-3 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.
4.4	Deleted.	Deleted.	Deleted.
5.1	Equipment designated as Class 1E in Table 2.6.8-3 are powered from the Class 1E division as listed in Table 2.6.8-3 in a normal or alternate feed condition.	a. Testing will be performed by providing a test input signal in each normally aligned division. b. Testing will be performed by providing a test input signal in each division with the alternate feed aligned to the divisional pair.	a. The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in 2.6.8-3. b. The test input signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E equipment identified in 2.6.8-3.
5.2	Deleted.	Deleted.	Deleted.

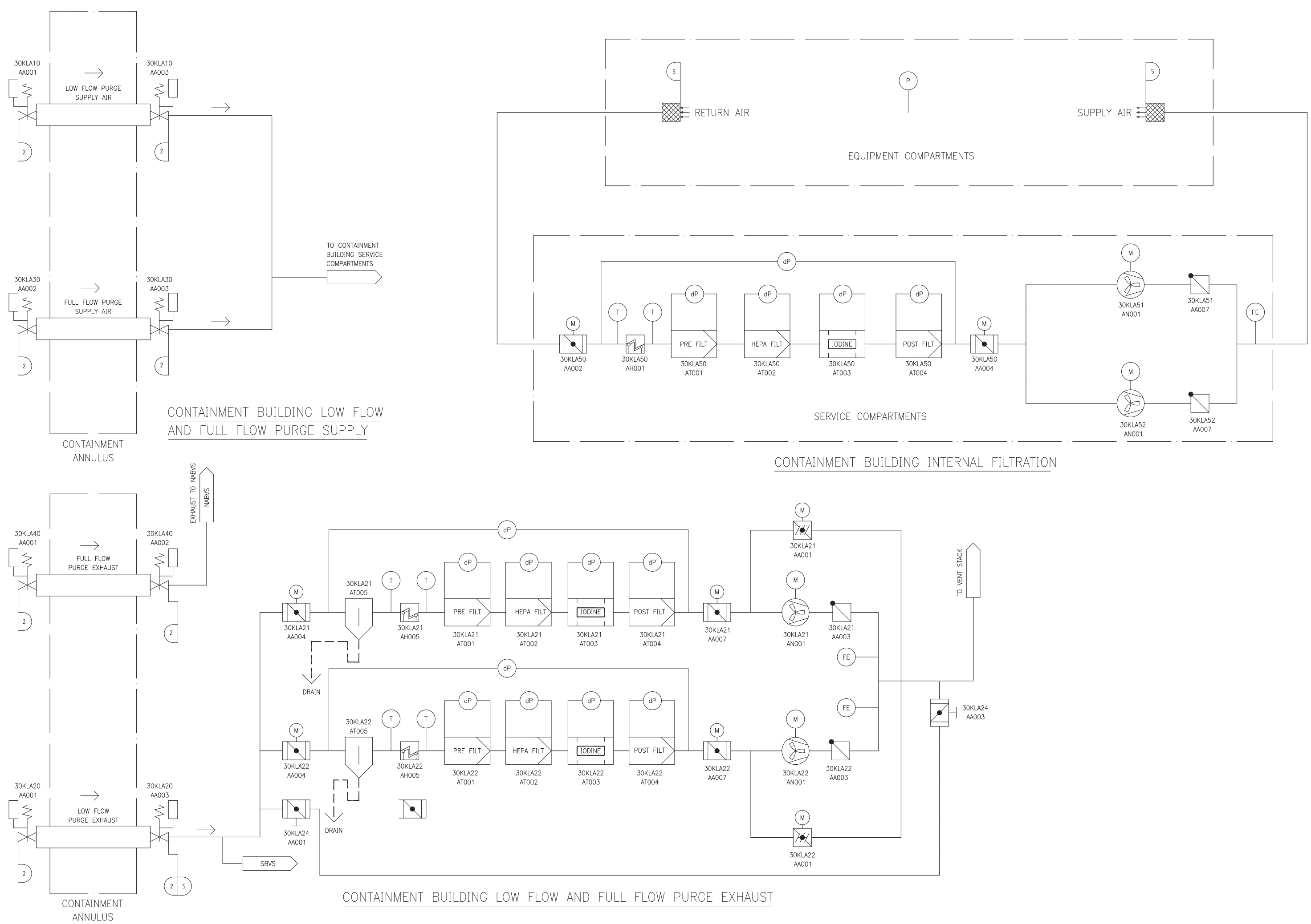
Table 2.6.8-4—Containment Building Ventilation System ITAAC
Sheet 6 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.1	Equipment designated as harsh environment in Table 2.6.8-3 will perform the function listed in Tables 2.6.8-1 and 2.6.8-2 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.	a. Type tests or type tests and analysis will be performed to demonstrate the ability of the equipment designated as harsh environment in Table 2.6.8-3 to perform the function listed in Tables 2.6.8-1 and 2.6.8-2 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions. b. An inspection will be performed of the as-built equipment designated as harsh environment in Table 2.6.8-3 to verify that the equipment, including the associated cables, wiring, and terminations located in a harsh environment, is bounded by the type test or combination of type tests and analyses. ~~anchorage, are installed per the approved design requirements.~~	a. EQDPs conclude that the equipment designated as harsh environment in Table 2.6.8-3 can perform the function listed in Tables 2.6.8-1 and 2.6.8-2 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions, including the time required to perform the listed function. b. ~~Inspection reports~~ A report exists and concludes that the equipment designated as harsh environment in Table 2.6.8-3, including the associated cables, wiring, and terminations located in a harsh environment, is bounded by the type test or combination of type tests and analyses.~~including anchorage, are installed per the approved design requirements.~~
7.1	The CBVS low flow purge exhaust subsystem exhausts through a CBVS iodine filtration train.	Tests will be performed to verify the capability of the low flow purge exhaust subsystem to exhaust through a CBVS iodine filtration train.	The CBVS exhausts through a CBVS iodine filtration train when the CBVS low flow purge exhaust subsystem is operating.

Table 2.6.8-4—Containment Building Ventilation System ITAAC Sheet 7 of 7

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
7.2	Upon receipt of a high radioactivity signal in the CBVS exhaust, the following actions occur automatically: • Close Containment Building Low Flow Purge Subsystem supply air damper to Fuel Building hatch area when the equipment hatch is open. • Close Fuel Building Ventilation System exhaust air damper to the area in front of emergency airlock. • Opens Containment Building Low Flow Purge Subsystem iodine filtration isolation dampers, starts Containment Building Low Flow Purge Subsystem iodine filtration unit fans.~~Deleted.~~	A test will be performed to verify that upon receipt of a high radioactivity test input signal, the following actions occur automatically: • Close Containment Building Low Flow Purge Subsystem supply air damper to Fuel Building hatch area when the equipment hatch is open. • Close Fuel Building Ventilation System exhaust air damper to the area in front of emergency airlock. • Opens Containment Building Low Flow Purge Subsystem iodine filtration isolation dampers, starts Containment Building Low Flow Purge Subsystem iodine filtration unit fans.~~Deleted.~~	The following actions occur automatically within 60 seconds after receipt of an isolation test input signal from the PACS module: • Close Containment Building Low Flow Purge Subsystem supply air damper to Fuel Building hatch area when the equipment hatch is open. • Close Fuel Building Ventilation System exhaust air damper to the area in front of emergency airlock. • Opens Containment Building Low Flow Purge Subsystem iodine filtration isolation dampers, starts Containment Building Low Flow Purge Subsystem iodine filtration unit fans.~~Deleted~~.

Figure 2.6.8-1—Containment Building Ventilation System Functional Arrangement



DESIGN AREA	ASME	SSC SEISMIC CLASS
2	III, CLASS 2	I
5	AG-1	I

REV 005
KLA01T1

Next File

2.6.9 Emergency Power Generating Building Ventilation System

Design Description

1.0 System Description

The emergency power generating building ventilation system (EPGBVS) controls the temperature and air change rate in the Emergency Power Generating Buildings (EPGB) for personnel comfort, personnel safety, and equipment protection. The EPGBVS provides ventilation of the diesel hall, electrical room, and main tank room; and cooling of the electrical room for each of the four divisions of the EPGBs to remove equipment heat, and heat generated from other sources. The EPGBVS also provides heat to maintain a minimum temperature in the buildings.

Each division of the EPGBs has its own independent heating, ventilation and air conditioning system which is not connected to other divisions. Two divisions are located in each of the two EPGBs. EPGBVS Divisions 1 and 2 are located in EPGB 1/2 and Divisions 3 and 4 in EPGB 3/4. During normal plant operation, the emergency diesel generators (EDG) do not operate, however the EPGBVS maintains an acceptable ambient temperature for the startup of EDGs and for personnel comfort.

The EPGBVS provides the following safety-related functions:

- Removes heat generated by the EDGs during operation of the EDGs to maintain acceptable operating conditions in the diesel hall.
- Maintains acceptable ambient conditions in the electrical room and main tank room.
- Maintains environmental conditions for startup of the EDGs.

The EPGBVS provides the following non-safety-related functions:

- Maintains the room ambient conditions to allow personnel access during normal operation.
- Provides ventilation to maintain required air renewal rates.

2.0 Arrangement

2.1 The functional arrangement of the EPGBVS is as described in the Design Description of Section 2.6.9, Tables 2.6.9-12.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design and 2.6.9-2, and as shown on Figures 2.6.9-1—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 1, 2.6.9-2—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 2, 2.6.9-3—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 3, and

2.6.9-4—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 4.

2.2 Deleted.

2.3 Physical separation exists between the divisions of the EPGBVS as listed in Table 2.6.9-1 and as shown on Figure 2.6.9-1.

3.0 Mechanical Design Features

3.1 Deleted.

3.2 Class 1E dampers listed in Table 2.6.9-2 will function to change position as listed in 2.6.9-1 under normal operating conditions.

3.3 Equipment identified as Seismic Category I in Table 2.6.9-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.9-1~~.

3.4 Deleted.~~Equipment listed in Table 2.6.9-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~

3.5 Deleted.~~Equipment listed in Table 2.6.9-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~

3.6 Equipment listed in Table 2.6.9-1 as ASME AG-1 Code are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

4.0 I&C Design Features, Displays, and Controls

4.1 Displays listed in Table 2.6.9-2 are indicated on the PICS operator workstations in the MCR and the RSS.

4.2 Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.9-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.9-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

5.0 Electrical Power Design Features

5.1 Equipment designated as Class 1E in Table 2.6.9-2 are powered from the Class 1E division as listed in Table 2.6.9-2 in a normal feed condition.

5.2 Deleted.

6.0 Equipment and System Performance

6.1 The EPGBVS provides cooling to maintain design temperatures in the EPGB Buildings, while operating in a design basis accident alignment.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.9-3 lists the EPGBVS ITAAC.

Table 2.6.9-1—EPGBVS Equipment Mechanical Design
Sheet 1 of 8

Description	Tag Number[(1)]	Location	ASME AG-1 Code	Function	Seismic Category
Fresh Air Supply					
Backdraft Dampers	30SAD11AA001 30SAD21AA001 30SAD31AA001 30SAD41AA001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Open / Close~~N/A~~	I
Backdraft Dampers	30SAD11AA002 30SAD21AA002 30SAD31AA002 30SAD41AA002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Open / Close~~N/A~~	I
Prefilters	30SAD11AT001 30SAD21AT001 30SAD31AT001 30SAD41AT001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Prefilters	30SAD11AT002 30SAD21AT002 30SAD31AT002 30SAD41AT002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Supply Air Fans	30SAD11AN001 30SAD21AN001 30SAD31AN001 30SAD41AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Run	I
Supply Air Fans	30SAD11AN002 30SAD21AN002 30SAD31AN002 30SAD41AN002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Run	I

Table 2.6.9-1—EPGBVS Equipment Mechanical Design
Sheet 2 of 8

Description	Tag Number[(1)]	Location	ASME AG-1 Code	Function	Seismic Category
~~Backdraft Dampers~~	~~30SAD11AA003~~ ~~30SAD21AA003~~ ~~30SAD31AA003~~ ~~30SAD41AA003~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~II~~
~~Pre-filters~~	~~30SAD11AT003~~ ~~30SAD21AT003~~ ~~30SAD31AT003~~ ~~30SAD41AT003~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~II~~
~~Supply Air Fans~~	~~30SAD11AN003~~ ~~30SAD21AN003~~ ~~30SAD31AN003~~ ~~30SAD41AN003~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~II~~
Motor Operated Dampers	30SAD11AA004 30SAD21AA004 30SAD31AA004 30SAD41AA004	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	Open / Close~~N/A~~	I
Diesel Hall Air Supply and Exhaust					
~~Manual Dampers~~	~~30SAD12AA001~~ ~~30SAD22AA001~~ ~~30SAD32AA001~~ ~~30SAD42AA001~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~I~~
~~Manual Dampers~~	~~30SAD12AA002~~ ~~30SAD22AA002~~ ~~30SAD32AA002~~ ~~30SAD42AA002~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~I~~

Table 2.6.9-1—EPGBVS Equipment Mechanical Design
Sheet 3 of 8

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Manual Dampers	30SAD12AA003 30SAD22AA003 30SAD32AA003 30SAD42AA003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Manual Dampers	30SAD12AA004 30SAD22AA004 30SAD32AA004 30SAD42AA004	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Manual Dampers	30SAD12AA005 30SAD22AA005 30SAD32AA005 30SAD42AA005	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Exhaust Fans	30SAD15AN001 30SAD25AN001 30SAD35AN001 30SAD45AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	RunN/A	I
Exhaust Fans	30SAD15AN002 30SAD25AN002 30SAD35AN002 30SAD45AN002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	RunN/A	I
Backdraft Dampers	30SAD15AA001 30SAD25AA001 30SAD35AA001 30SAD45AA001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Open / CloseN/A	I
Backdraft Dampers	30SAD15AA002 30SAD25AA002 30SAD35AA002 30SAD45AA002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Open / CloseN/A	I

Table 2.6.9-1—EPGBVS Equipment Mechanical Design
Sheet 4 of 8

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Motor Operated Dampers	30SAD15AA004 30SAD25AA004 30SAD35AA004 30SAD45AA004	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	Open / Close N/A	I
Exhaust Fans	30SAD15AN003 30SAD25AN003 30SAD35AN003 30SAD45AN003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Backdraft Dampers	30SAD15AA003 30SAD25AA003 30SAD35AA003 30SAD45AA003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Electrical Room Air Supply and Recirculation					
Manual dampers	30SAD13AA002 30SAD23AA002 30SAD33AA002 30SAD43AA002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Prefilters	30SAD13AT001 30SAD23AT001 30SAD33AT001 30SAD43AT001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
HEPA Filters	30SAD13AT002 30SAD23AT002 30SAD33AT002 30SAD43AT002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I

**Table 2.6.9-1—EPGBVS Equipment Mechanical Design
Sheet 5 of 8**

Description	Tag Number(1)	Location	ASME AG-1 Code	Function	Seismic Category
Cooling Coils	30SAD13AC001 30SAD23AC001 30SAD33AC001 30SAD43AC001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Moisture Separators	30SAD13AT003 30SAD23AT003 30SAD33AT003 30SAD43AT003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Supply Air Fans	30SAD13AN001 30SAD23AN001 30SAD33AN001 30SAD43AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Run	I
Motor Operated Dampers	30SAD13AA007 30SAD23AA007 30SAD33AA007 30SAD43AA007	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	Open / CloseN/A	I
Manual Dampers	30SAD13AA008 30SAD23AA008 30SAD33AA008 30SAD43AA008	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Manual Dampers	30SAD13AA009 30SAD23AA009 30SAD33AA009 30SAD43AA009	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Pre-filters	30SAD13AT003 30SAD23AT003 30SAD33AT003 30SAD43AT003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II

Table 2.6.9-1—EPGBVS Equipment Mechanical Design Sheet 6 of 8

Description	Tag Number[1]	Location	ASME AG-1 Code	Function	Seismic Category
~~Cooling Coils~~	~~30SAD13AC002~~ ~~30SAD23AC002~~ ~~30SAD33AC002~~ ~~30SAD43AC002~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~II~~
~~Cooling Coils~~	~~30SAD13AC102~~ ~~30SAD23AC102~~ ~~30SAD33AC102~~ ~~30SAD43AC102~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~II~~
~~Supply Air Fans~~	~~30SAD13AN002~~ ~~30SAD23AN002~~ ~~30SAD33AN002~~ ~~30SAD43AN002~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~II~~
Backdraft Dampers	30SAD13AA010 30SAD23AA010 30SAD33AA010 30SAD43AA010	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	Open / Close~~N/A~~	I
Main Tank Room Air Supply and Exhaust					
Backdraft Dampers	30SAD16AA001 30SAD26AA001 30SAD36AA001 30SAD46AA001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Open / Close~~N/A~~	I
~~Manual Dampers~~	~~30SAD16AA003~~ ~~30SAD26AA003~~ ~~30SAD36AA003~~ ~~30SAD46AA003~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~I~~

Table 2.6.9-1—EPGBVS Equipment Mechanical Design
Sheet 7 of 8

Description	Tag Number[1]	Location	ASME AG-1 Code	Function	Seismic Category
~~Manual Dampers~~	~~30SAD16AA004~~ ~~30SAD26AA004~~ ~~30SAD36AA004~~ ~~30SAD46AA004~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~I~~
Electric Heaters	30SAD16AH001 30SAD26AH001 30SAD36AH001 30SAD46AH001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	On / Off	I
Exhaust Fans	30SAD16AN001 30SAD26AN001 30SAD36AN001 30SAD46AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Run	I
Backdraft Dampers	30SAD16AA005 30SAD26AA005 30SAD36AA005 30SAD46AA005	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Open / Close~~N/A~~	I
Motor Operated Dampers	30SAD16AA007 30SAD26AA007 30SAD36AA007 30SAD46AA007	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Open	I
Motor Operated Dampers	30SAD16AA008 30SAD26AA008 30SAD36AA008 30SAD46AA008	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Open	I
~~Fan Heaters~~	~~30SAD14AH001~~ ~~30SAD14AH002~~ ~~30SAD14AH003~~ ~~30SAD14AH004~~	~~1/2 EPGB, Division 1~~	~~Yes~~	~~On / Off~~	~~II~~

Table 2.6.9-1—EPGBVS Equipment Mechanical Design
Sheet 8 of 8

Description	Tag Number[1]	Location	ASME AG-1 Code	Function	Seismic Category
~~Fan Heaters~~	~~30SAD24AH001~~ ~~30SAD24AH002~~ ~~30SAD24AH003~~ ~~30SAD24AH004~~	~~1/2 EPGB, Division 2~~	~~Yes~~	~~On / Off~~	~~II~~
~~Fan Heaters~~	~~30SAD34AH001~~ ~~30SAD34AH002~~ ~~30SAD34AH003~~ ~~30SAD34AH004~~	~~3/4 EPGB, Division 3~~	~~Yes~~	~~On / Off~~	~~II~~
~~Fan Heaters~~	~~30SAD44AH001~~ ~~30SAD44AH002~~ ~~30SAD44AH003~~ ~~30SAD44AH004~~	~~3/4 EPGB, Division 4~~	~~Yes~~	~~On / Off~~	~~II~~

1. Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.6.9-2—EPGBVS Equipment I&C and Electrical Design
Sheet 1 of 3

Description	Tag Number(1)	Location	IEEE Class 1E(2)	PACS	MCR / RSS Displays	MCR / RSS Controls
Supply Air Fans	30SAD11AN001 30SAD21AN001 30SAD31AN001 30SAD41AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Supply Air Fans	30SAD11AN002 30SAD21AN002 30SAD31AN002 30SAD41AN002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Exhaust Fans	30SAD15AN001 30SAD25AN001 30SAD35AN001 30SAD45AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Exhaust Fans	30SAD15AN002 30SAD25AN002 30SAD35AN002 30SAD45AN002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Supply Air Fans	30SAD13AN001 30SAD23AN001 30SAD33AN001 30SAD43AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Dampers	30SAD16AA007 30SAD26AA007 30SAD36AA007 30SAD46AA007	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	Position / Position	Open-Close / Open-Close

**Table 2.6.9-2—EPGBVS Equipment I&C and Electrical Design
Sheet 2 of 3**

Description	Tag Number[1]	Location	IEEE Class 1E[2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Motor Operated Dampers	30SAD16AA008 30SAD26AA008 30SAD36AA008 30SAD46AA008	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fans	30SAD16AN001 30SAD26AN001 30SAD36AN001 30SAD46AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Fan Heaters	30SAD16AH001 30SAD26AH001 30SAD36AH001 30SAD46AH001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	On-Off / On-Off
~~Fan Heaters~~	~~30SAD14AH001~~ ~~30SAD14AH002~~ ~~30SAD14AH003~~ ~~30SAD14AH004~~	~~1/2 EPGB, Division 1~~	~~Division 1~~	~~Yes~~	~~On-Off / On-Off~~	~~Start-Stop / Start-Stop~~
~~Fan Heaters~~	~~30SAD24AH001~~ ~~30SAD24AH002~~ ~~30SAD24AH003~~ ~~30SAD24AH004~~	~~1/2 EPGB, Division 2~~	~~Division 2~~	~~Yes~~	~~On-Off / On-Off~~	~~Start-Stop / Start-Stop~~
~~Fan Heaters~~	~~30SAD34AH001~~ ~~30SAD34AH002~~ ~~30SAD34AH003~~ ~~30SAD34AH004~~	~~3/4 EPGB, Division 3~~	~~Division 3~~	~~Yes~~	~~On-Off / On-Off~~	~~Start-Stop / Start-Stop~~
~~Fan Heaters~~	~~30SAD44AH001~~ ~~30SAD44AH002~~ ~~30SAD44AH003~~ ~~30SAD44AH004~~	~~3/4 EPGB, Division 4~~	~~Division 4~~	~~Yes~~	~~On-Off / On-Off~~	~~Start-Stop / Start-Stop~~

Table 2.6.9-2—EPGBVS Equipment I&C and Electrical Design
Sheet 3 of 3

Description	Tag Number(1)	Location	IEEE Class 1E(2)	PACS	MCR / RSS Displays	MCR / RSS Controls
Motor Operated Dampers	30SAD11AA004 30SAD21AA004 30SAD31AA004 30SAD41AA004	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Dampers	30SAD15AA004 30SAD25AA004 30SAD35AA004 30SAD45AA004	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Dampers	30SAD13AA007 30SAD23AA007 30SAD33AA007 30SAD43AA007	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	Yes	Position / Position	Open-Close / Open-Close

1. Equipment tag numbers are provided for information only and are not part of the certified design.

2. ^{N} denotes division the equipment is normally powered from, while ^{A} denotes division the equipment is powered from when alternate feed is implemented.

Table 2.6.9-3—Emergency Power Generating Building Ventilation System ITAAC
Sheet 1 of 4

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the EPGBVS is as described in the Design Description of Section 2.6.9, Tables 2.6.9-1 and 2.6.9-2, and as shown on Figures 2.6.9-1, 2.6.9-2, 2.6.9-3, and 2.6.9-4.	An inspection of the as-built EPGBVS functional arrangement will be performed.	The EPGBVS conforms to the functional arrangement as described in the Design Description of Section 2.6.9, Tables 2.6.9-1 and 2.6.9-2, and as shown on Figures 2.6.9-1, 2.6.9-2, 2.6.9-3, and 2.6.9-4.
2.2	Deleted.	Deleted.	Deleted.
2.3	Physical separation exists between the divisions of the EPGBVS as listed in Table 2.6.9-1 and shown on Figure 2.6.9-1 through Figure 2.6.9-4.	An inspection will be performed to verify that the as-built EPGBVS are located in separate EPGBs.	The divisions of the EPGBVS are located in separate EPGBs as listed in Table 2.6.9-1 and shown on Figure 2.6.9-1 through Figure 2.6.9-4.
3.1	Deleted.	Deleted.	Deleted.
3.2	Class 1E dampers listed in Table 2.6.9-2 will function to change position as listed in 2.6.9-1 under normal operating conditions.	Tests will be performed to verify the ability of Class 1E dampers to change position under normal operating conditions.	Class 1E dampers listed in Table 2.6.9-2 change position as listed in 2.6.9-1 under normal operating conditions.

Table 2.6.9-3—Emergency Power Generating Building Ventilation System ITAAC
Sheet 2 of 4

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.3	Equipment identified as Seismic Category I in Table 2.6.9-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.9-1~~.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Table 2.6.9-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.6.9-1 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.6.9-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.9-1 including the time required to perform the listed function~~. b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.6.9-1, including anchorage, are installed in a condition bounded by the tested or analyzed condition~~per the approved design requirements~~.
3.4	Deleted.~~Equipment listed in Table 2.6.9-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~	Deleted.~~An analysis will be performed of ASME AG-1 Code Design Verification Reports.~~	Deleted.~~ASME AG-1 Code Design Verification Reports (AA-4400) conclude that the design of equipment listed as ASME AG-1 Code in Table 2.6.9-1 complies with ASME AG-1 Code requirements.~~
3.5	Deleted.~~Equipment listed in Table 2.6.9-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~	Deleted.~~An inspection of the as-built fabrication activities and documentation for ASME AG-1 Code equipment will be conducted.~~	Deleted.~~A report concludes that ASME AG-1 Code equipment listed in Table 2.6.9-1 are fabricated in accordance with ASME AG-1 Code requirements.~~

Table 2.6.9-3—Emergency Power Generating Building Ventilation System ITAAC Sheet 3 of 4

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.6	Equipment listed in Table 2.6.9-1 as ASME AG-1 Code are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.	An inspection of the as-built construction activities and documentation for ASME AG-1 Code equipment will be conducted.	A report concludes that ASME AG-1 Code equipment listed in Table 2.6.9-1 are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.
4.1	Displays listed in Table 2.6.9-2 are indicated on the PICS operator workstations in the MCR and the RSS.	a. Tests will be performed to verify that the displays listed in Table 2.6.9-2 are indicated on the PICS operator workstations in the MCR ~~by using test input signals to PICS~~. b. Tests will be performed to verify that the displays listed in Table 2.6.9-2 are indicated on the PICS operator workstations in the RSS ~~by using test input signals inputs to PICS~~.	a. Displays listed in Table 2.6.9-2 are indicated on the PICS operator workstations in the MCR. b. Displays listed in Table 2.6.9-2 are indicated on the PICS operator workstations in the RSS.
4.2	Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.9-2.	a. Tests will be performed using controls on the PICS operator workstations in the MCR. b. Tests will be performed using controls on the PICS operator workstations in the RSS.	a. Controls on the PICS operator workstations in the MCR perform the function listed in Table 2.6.9-2. b. Controls on the PICS operator workstations in the RSS perform the function listed in Table 2.6.9-2.
4.3	Equipment listed as being controlled by a PACS module in Table 2.6.9-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.	A test will be performed using test input signals to verify equipment controlled by a PACS module responds to the state requested and provides drive monitoring signals back to the PACS module.	Equipment listed as being controlled by a PACS module in Table 2.6.9-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

Table 2.6.9-3—Emergency Power Generating Building Ventilation System ITAAC
Sheet 4 of 4

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
5.1	Equipment designated as Class 1E in Table 2.6.9-2 are powered from the Class 1E division as listed in Table 2.6.9-2 in a normal feed condition.	Testing will be performed by providing a test input signal in each normally aligned division.	The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in Table 2.6.9-2.
5.2	Deleted.	Deleted.	Deleted.
6.1	The EPGBVS provides cooling to maintain design temperatures in the EPGB Buildings, while operating in a design basis accident alignment.	a. Tests and analysis will be performed to verify EPGBVS provides cooling to maintain design temperatures in the EPGB Buildings, while operating in a design basis accident alignment. b. A test of the EPGBVS fans will be performed to verify that the ~~design~~ air flow is greater than the approved design requirement.	a. Each EPGBVS cooling coil provides the ~~is capable of providing~~ design cooling requirements, while operating in a design basis accident alignment, and is capable of maintaining temperatures in the EPGB Buildings. b. Each EPGBVS fan is capable of meeting the design air flow requirements, while operating in a design basis accident alignment.

Figure 2.6.9-1—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 1

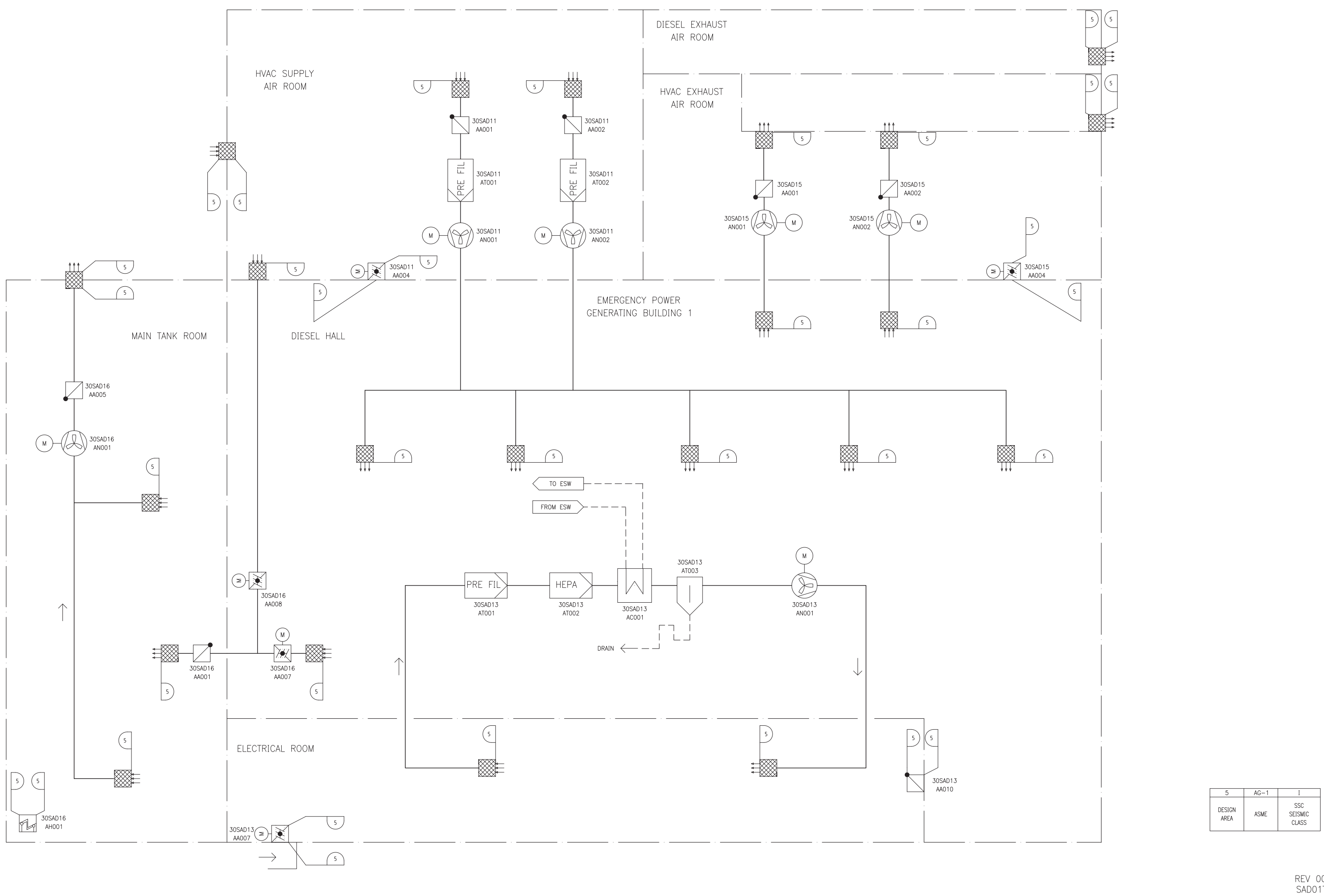


Figure 2.6.9-2—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 2

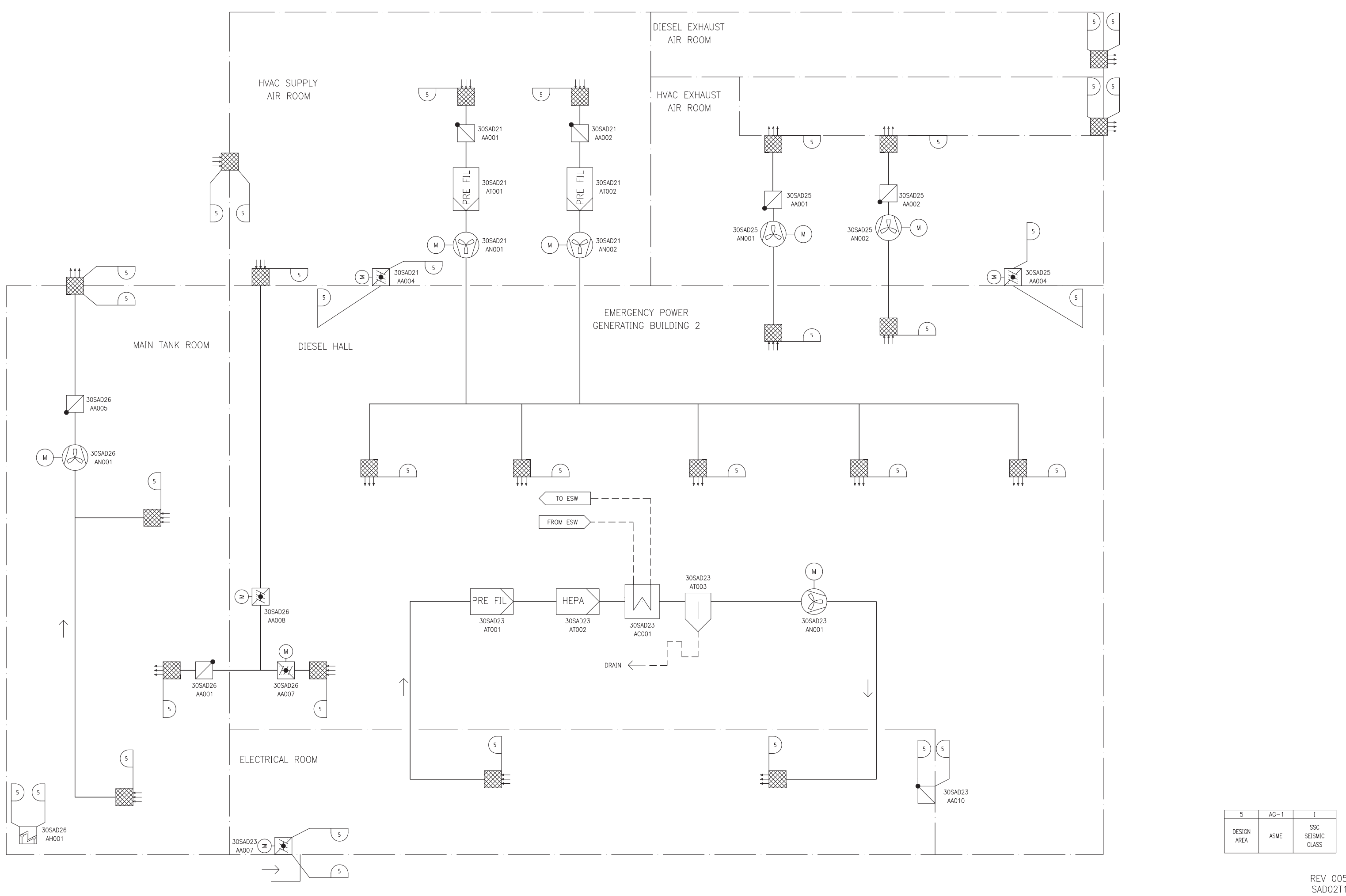


Figure 2.6.9-3—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 3

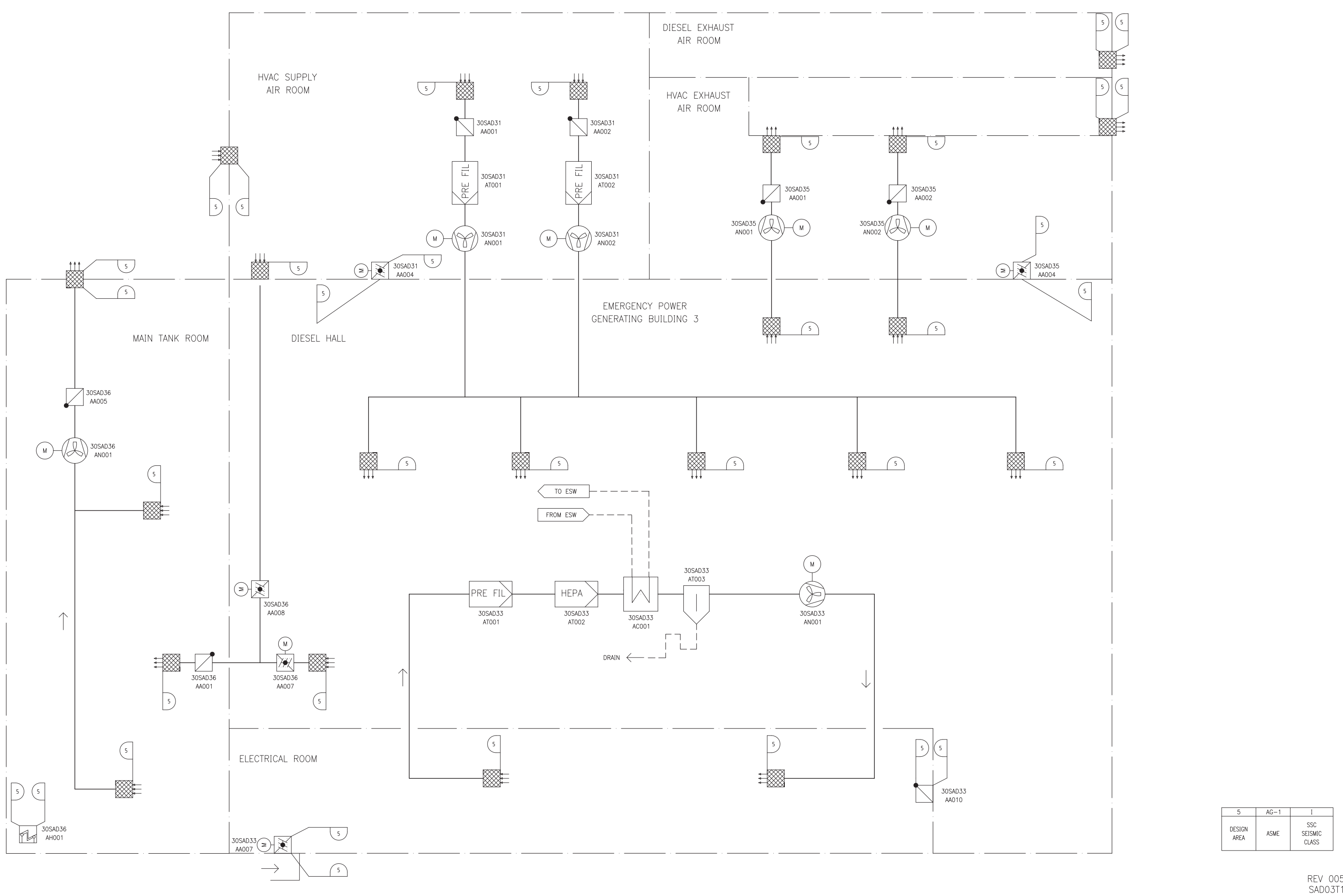
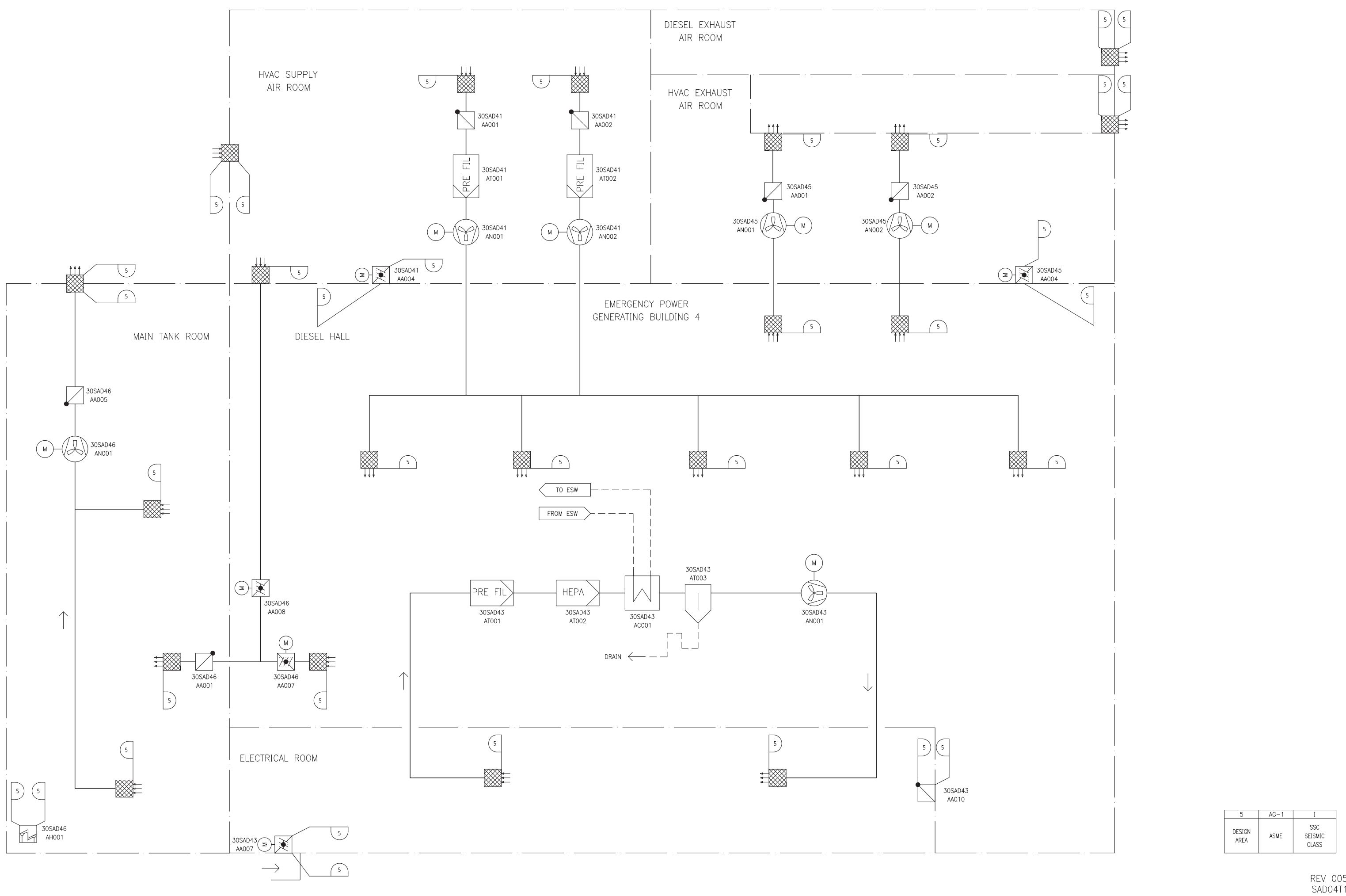


Figure 2.6.9-4—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 4



2.6.10 Radioactive Waste Processing Building Ventilation System

There are no Tier 1 entries for this system.

2.6.11 Smoke Confinement System

There are no Tier 1 entries for this system.

2.6.12 Main Steam and Feedwater Valve Room Ventilation System

There are no Tier 1 entries for this system.

2.6.13 Essential Service Water Pump Building Ventilation System

Design Description

1.0 System Description

The essential service water pump building ventilation system (ESWPBVS) controls the temperature and air change rate in the essential service water system (ESWS) pump areas for personnel comfort, personnel safety, and equipment protection. The ESWPBVS provides cooling and heating for the ESWS pump area and associated electrical equipment in each of the four ESWS Pump Buildings (ESWPB) to remove equipment heat, and heat generated from other sources. Each building has its own independent ventilation system and is not connected to the other buildings.

The ESWPBVS provides the following safety-related functions:

- Removes heat generated by the ESWS pumps and associated electrical equipment.
- Maintains acceptable temperature limits to support operation of ESWS pumps.

The ESWPBVS provides the following non-safety-related functions:

- Maintains the room ambient conditions to allow personnel access during normal operation.
- Provides ventilation and cooling during plant operation when an ESW pump is not operating.

2.0 Arrangement

2.1 The functional arrangement of the ESWPBVS is as described in the Design Description of Section 2.6.13, Tables 2.6.13-1—Essential Service Water Pump Building Ventilation System Equipment Mechanical Design and 2.6.13-2—Essential Service Water Pump Building Ventilation System Equipment I&C and Electrical Design, and as shown on Figure 2.6.13-1—Essential Service Water Pump Building Ventilation System Functional Arrangement.

2.2 Deleted.

2.3 Physical separation exists between the divisions of the ESWPBVS located in separate ESWPBs as listed in Table 2.6.13-1 and as shown on Figure 2.6.13-1.

3.0 Mechanical Design Features

3.1 Deleted.

3.2 Class 1E dampers listed in Table 2.6.13-2 will function to change position as listed in Table 2.6.13-1 under normal operating conditions.

3.3 Equipment identified as Seismic Category I in Table 2.6.13-1 can withstand seismic design basis loads without a loss of ~~the~~safety function(s) ~~listed in Table 2.6.13-1~~.

3.4 Deleted.~~Equipment listed in Table 2.6.13-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.~~

3.5 Deleted.~~Equipment listed in Table 2.6.13-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.~~

3.6 Equipment listed in Table 2.6.13-1 as ASME AG-1 Code are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

4.0 I&C Design Features, Displays, and Controls

4.1 Displays listed in Table 2.6.13-2 are indicated on the PICS operator workstations in the MCR and the RSS.

4.2 Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.13-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.13-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

5.0 Electrical Power Design Features

5.1 Equipment designated as Class 1E in Table 2.6.13-2 are powered from the Class 1E division as listed in Table 2.6.13-2 in a normal feed condition.

6.0 Equipment and System Performance

6.1 The ESWPBVS provides cooling to maintain design temperatures in the ESWPBs, while operating in a design basis accident alignment.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.13-3 lists the ESWPBVS ITAAC.

Table 2.6.13-1—ESWPBVS Equipment Mechanical Design
Sheet 1 of 2

Description	Tag Number[1]	Location	ASME AG-1 Code	Function	Seismic Category
Air Cooling Coils	30SAQ01AC001 30SAQ02AC001 30SAQ03AC001 30SAQ04AC001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I
Moisture Separators	30SAQ01AT001 30SAQ02AT001 30SAQ03AT001 30SAQ04AT001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I
Electrical Heaters	30SAQ01AH001/002 30SAQ02AH001/002 30SAQ03AH001/002 30SAQ04AH001/002	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	On / Off ~~(based on ambient conditions)~~	I
Recirculation Fans	30SAQ01AN001 30SAQ02AN001 30SAQ03AN001 30SAQ04AN001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	Run	I
Motor Operated Outside Air Isolation Dampers	30SAQ01AA007 30SAQ02AA007 30SAQ03AA007 30SAQ04AA007	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I
~~Manual Balancing Dampers~~	~~30SAQ01AA002~~ ~~30SAQ02AA002~~ ~~30SAQ03AA002~~ ~~30SAQ04AA002~~	~~ESW Pump Building 1~~ ~~ESW Pump Building 2~~ ~~ESW Pump Building 3~~ ~~ESW Pump Building 4~~	~~Yes~~	~~N/A~~	~~I~~

Table 2.6.13-1—ESWPBVS Equipment Mechanical Design
Sheet 2 of 2

Description	Tag Number[(1)]	Location	ASME AG-1 Code	Function	Seismic Category
Prefilters	30SAQ01AT002 30SAQ02AT002 30SAQ03AT002 30SAQ04AT002	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I

1. Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.6.13-2—ESWPBVS Equipment I&C and Electrical Design

Description	Tag Number[(1)]	Location	IEEE Class 1E	PACS	MCR / RSS Displays	MCR / RSS Controls
Electrical Heaters	30SAQ01AH001/002 30SAQ02AH001/002 30SAQ03AH001/002 30SAQ04AH001/002	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	On-Off / On-Off ~~Start-Stop /~~ ~~Start-Stop~~
Recirculation Fans	30SAQ01AN001 30SAQ02AN001 30SAQ03AN001 30SAQ04AN001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Outside Air Isolation Dampers	30SAQ01AA005/007 30SAQ02AA005/007 30SAQ03AA005/007 30SAQ04AA005/007	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	Position/Position	Open-Close/ Open-Close
Temperature Sensors—Elec Heaters	30SAQ01CT002/003 30SAQ02CT002/003 30SAQ03CT002/003 30SAQ04CT002/003	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	Temperature/ Temperature	N/A
Temperature Sensors—M.O. Outside Air Isol Dampers	30SAQ01CT004 30SAQ02CT004 30SAQ03CT004 30SAQ04CT004	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	N/A	N/A

1. Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.6.13-3—Essential Service Water Pump Building Ventilation System ITAAC
Sheet 1 of 4

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the ESWPBVS is as described in the Design Description of Section 2.6.13, Tables 2.6.13-1 and 2.6.13-2, and as shown on Figures 2.6.13-1.	An inspection of the as-built ESWPBVS functional arrangement will be performed.	The ESWPBVS conforms to the functional arrangement as described in the Design Description of Section 2.6.13, Tables 2.6.13-1 and 2.6.13-2, and as shown on Figures 2.6.13-1.
2.2	Deleted.	Deleted.	Deleted.
2.3	Physical separation exists between the divisions of the ESWPBVS located in separate ESWPBs as listed in Table 2.6.13-1 and as shown on Figure 2.6.13-1.	An inspection will be performed to verify that the as-built ESWPBVS are located in separate ESWPBs.	The divisions of the ESWPBVS are located in separate ESWPBs as shown on Figure 2.6.13-1.
3.1	Deleted.	Deleted.	Deleted.
3.2	Class 1E dampers listed in Table 2.6.13-2 will function to change position as listed in Table 2.6.13-1 under normal operating conditions.	Tests will be performed to verify the ability of Class 1E dampers to change position under normal operating conditions.	Class 1E dampers listed in Table 2.6.13-2 change position as listed in Table 2.6.13-1 under normal operating conditions.

Table 2.6.13-3—Essential Service Water Pump Building Ventilation System ITAAC
Sheet 2 of 4

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.3	Equipment identified as Seismic Category I in Table 2.6.13-1 can withstand seismic design basis loads without a loss of thesafety function(s) listed in Table 2.6.13-1.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Table 2.6.13-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.6.13-1 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed conditionper the approved design requirements.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.6.13-1 can withstand seismic design basis loads without a loss of thesafety function(s) listed in Table 2.6.13-1 including the time required to perform the listed function. b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.6.13-1, including anchorage, are installed in a condition bounded by the tested or analyzed conditionper the approved design requirements.
3.4	Deleted.Equipment listed in Table 2.6.13-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.	Deleted.An analysis will be performed of ASME AG-1 Code Design Verification Reports.	Deleted.ASME AG-1 Code Design Verification Reports (AA-4400) conclude that the design of equipment listed as ASME AG-1 Code in Table 2.6.13-1 complies with ASME AG-1 Code requirements.
3.5	Deleted.Equipment listed in Table 2.6.13-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.	Deleted.An inspection of the as-built fabrication activities and documentation for ASME AG-1 Code equipment will be conducted.	Deleted.A report concludes that ASME AG-1 Code equipment listed in Table 2.6.13-1 are fabricated in accordance with ASME AG-1 Code requirements.

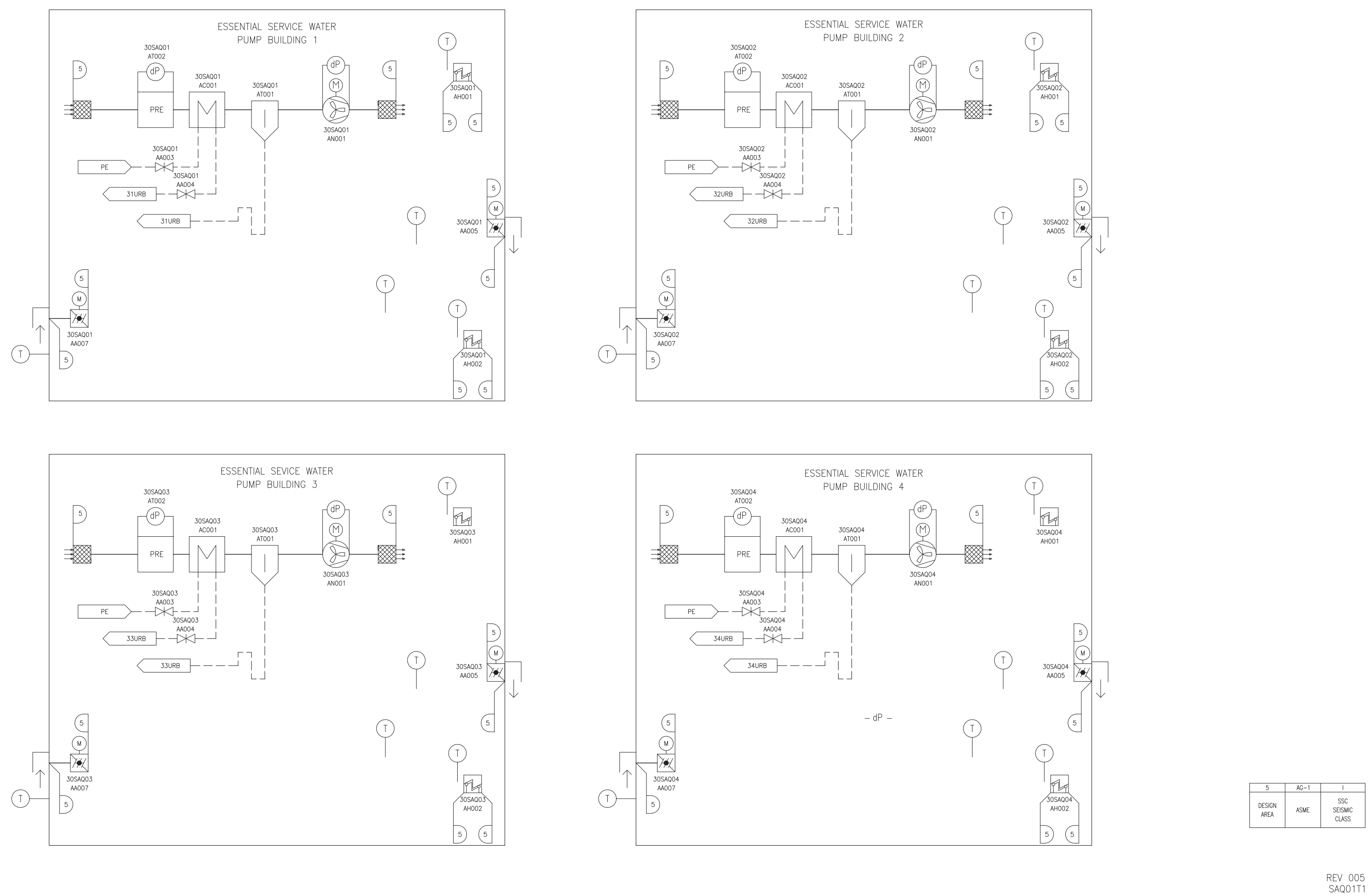
Table 2.6.13-3—Essential Service Water Pump Building Ventilation System ITAAC Sheet 3 of 4

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.6	Equipment listed in Table 2.6.13-1 as ASME AG-1 Code are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.	An inspection of the as-built construction activities and documentation for ASME AG-1 Code equipment will be conducted.	A report concludes that ASME AG-1 Code equipment listed in Table 2.6.13-1 are installed, inspected, and tested in accordance with ASME AG-1 Code requirements.
4.1	Displays listed in Table 2.6.13-2 are indicated on the PICS operator workstations in the MCR and the RSS.	a. Tests will be performed to verify that the displays listed in Table 2.6.13-2 are indicated on the PICS operator workstations in the MCR ~~by using test input signals to PICS~~. b. Tests will be performed to verify that the displays listed in Table 2.6.13-2 are indicated on the PICS operator workstations in the RSS ~~by using test input signals inputs to PICS~~.	a. Displays listed in Table 2.6.13-2 are indicated on the PICS operator workstations in the MCR. b. Displays listed in Table 2.6.13-2 are indicated on the PICS operator workstations in the RSS.
4.2	Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.6.13-2.	a. Tests will be performed using controls on the PICS operator workstations in the MCR. b. Tests will be performed using controls on the PICS operator workstations in the RSS.	a. Controls on the PICS operator workstations in the MCR perform the function listed in Table 2.6.13-2. b. Controls on the PICS operator workstations in the RSS perform the function listed in Table 2.6.13-2.
4.3	Equipment listed as being controlled by a PACS module in Table 2.6.13-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.	A test will be performed using test input signals to verify equipment controlled by a PACS module responds to the state requested and provides drive monitoring signals back to the PACS module.	Equipment listed as being controlled by a PACS module in Table 2.6.13-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

Table 2.6.13-3—Essential Service Water Pump Building Ventilation System ITAAC
Sheet 4 of 4

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
5.1	Equipment designated as Class 1E in Table 2.6.13-2 are powered from the Class 1E division as listed in Table 2.6.13-2 in a normal feed condition.	Testing will be performed by providing a test input signal in each normally aligned division.	The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in Table 2.6.13-2.
6.1	The ESWPBVS provides cooling to maintain design temperatures in the ESWPBs, while operating in a design basis accident alignment.	a. Tests and analysis will be performed to verify ESWPBVS provides cooling to maintain design temperatures in the ESWPBs, while operating in a design basis accident alignment.	a. Each ESWPBVS safety-related cooling coil provides theis capable of providing design cooling requirements, while operating in a design basis accident alignment, and is capable of maintaining temperatures in the ESWPBs.
		b. A test of the ESWPBVS fans will be performed to verify that the design air flow is greater than the approved design requirement.	b. Each ESWPBVS safety-related fan is capable of meeting the design air flow requirements, while operating in a design basis accident alignment.

Figure 2.6.13-1—Essential Service Water Pump Building Ventilation System Functional Arrangement



Next File

2.6.14 Station Blackout Room Ventilation System

No Tier 1 entries for this system.

2.6.15 Turbine Island Ventilation Systems

No Tier 1 entries for these systems.

Table 1.1-1—U.S. EPR FSAR Acronyms and Descriptions
Sheet 1 of 20

Acronym	Description
12UPS	12-Hour Uninterruptible Power Supply
AAC	Alternate AC (Source)
ABVS	Access Building Ventilation System
AC	Alternating Current
ACB	Access Building
ACT	Average Coolant Temperature
ACWS	Auxiliary Cooling Water System
A/D	Analog-to-Digital
ADL	Additional Dynamic Loads
AFWS	Auxiliary Feedwater System
AHU	Air Handling Unit
~~AHS~~	~~Air Humidification System~~
AIC	Ag-In-Cd (Alloy)
AICC	Adiabatic Isochoric Complete Combustion
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALARA	As Low As Reasonably Achievable
ALL	Allowable Load Limit
ALU	Actuation Logic Unit
ALWR	Advanced Light-Water Reactors
AMI	Accident Monitoring Instrumentation
AMS	Aeroball Measurement System
AO	Axial Offset
AOO	Anticipated Operational Occurrence
AOP	Abnormal Operating Procedure
APU	Acquisition and Processing Units
ARS	Amplified Response Spectra
ART	Adjusted Reference Temperature
ASEP	Accident Sequence Evaluation Program
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATWS	Anticipated Transient Without Scram

Table 1.1-1—U.S. EPR FSAR Acronyms and Descriptions
Sheet 3 of 20

Acronym	Description
CE	Combustion Engineering
CET	Containment Event Tree
CEUS	Central Eastern United States
CFS	Condensate and Feedwater System
CGC	Combustible Gas Control
CGCS	Combustible Gas Control System
CH	Common Header
CHE	Closure Head Equipment
CHF	Critical Heat Flux
CHLA	Candidate High-Level Actions
CI	Conventional Island
CILRT	Containment Integrated Leakage Rate Test
CIS	Containment Isolation Signal
CIV	Containment Isolation Valve
CLCWS	Closed Cooling Water System
CLFPS	Containment Low-Flow Purge Subsystem
CMAA	Crane Manufacturers Association of America
CMF	Common Mode Failure
CMRS	Core Melt Retention System
CMSS	Core Melt Stabilization System
CMTR	Certified Material Test Report
CNI	Constrained Non-Informative Distribution
COL	Combined License
COLR	Core Operating Limits Report
COMS	Communication System
COTC	Core Outlet Thermocouple
CPD	Condensate Pump Discharge
CPR	Critical Power Ratio
CPS	Coolant Purification System
CRACS	Main Control Room Air Conditioning System
CRAVS	Control Room Area Ventilation System
CRC	Cyclic Redundancy Checks
CRDCS	Control Rod Drive Control System

Table 1.1-1—U.S. EPR FSAR Acronyms and Descriptions
Sheet 8 of 20

Acronym	Description
GSI	Generic Safety Issue
GTAW	Gas Tungsten Arc Welding
GW	Gateway
GWMS	Gaseous Waste Management System
GWPS	Gaseous Waste Processing System
HA	Human Action
HAZ	Heat Affected Zone
HCF	Hot Channel Factors
HCLPF	High Confidence, Low Probability of Failure
HCPL	High Core Power Level
HCR	Human Cognitive Reliability
HED	Human Engineering Discrepancy
HELB	High Energy Line Break
HEM	Homogeneous Equilibrium Model
HEP	Human Error Probability
HEPA	High Efficiency Particulate Air
HF	High Frequency
HFE	Human Factors Engineering
HFP	Hot Full Power
HFT	Hot Functional Test
HGDS	Hydrogen Gas Distribution System
HI	Hydraulics Institute
HL	High Load Line
HLHE	Heavy Load Handling Equipment
~~HLMS~~	~~Humidity Leakage Monitoring System~~
HLPD	High Linear Power Density
HMD	Hydrogen Mixing Damper
HMI	Human Machine Interface
HMP	High Mechanical Performance
HMS	Hydrogen Monitoring System
HP	High Pressure
HPME	High-Pressure Melt Ejection
HRA	Human Reliability Analysis

Table 1.1-1—U.S. EPR FSAR Acronyms and Descriptions
Sheet 16 of 20

Acronym	Description
RPVDT	Reactor Pressure Vessel Dome Temperature
RPVL	Reactor Pressure Vessel Level
RR	Rod Return
RRS	Required Response Spectra
RS	Radwaste Seismic
RSB	Reactor Shield Building
RSS	Remote Shutdown Station
RT	Reactor Trip
RT_{NDT}	Reference Temperature
RTNSS	Regulatory Treatment of Non-Safety Systems
RTP	Rated Thermal Power
RV	Reactor Vessel
RWB	Radioactive Waste (Processing) Building
RWBVS	Radioactive Waste Processing Building Ventilation System
RWSS	Raw Water Supply System
SA	Severe Accident
SADV	Severe Accident Depressurization Valves
SAFDL	Specified Acceptable Fuel Design Limits
SAHRS	Severe Accident Heat Removal System
SAM	Severe Accident Management
SAMDA	Severe Accident Mitigation Design Alternatives
SAMG	Severe Accident Mitigation Guideline
SAMS	Sampling Activity Monitoring System
SAS	Safety Automation System
SASS	Severe Accident Sampling System
SAT	Systematic Approach to Training
SB	Safeguard Building
SBA	Small Pipe Break Accident
SBLOCA	Small Break Loss of Coolant Accident
SBO	Station Blackout
SBODG	Station Blackout Diesel Generator
SBORVS	Station Blackout Room Ventilation System
SBVS	Safeguard Building (Controlled Area) Ventilation System

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 94 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Mechanical Draft Cooling Tower Train 2 (excluding fans)	30PED20AC001	32URB	M	M	SI	S	Y (5)
Mechanical Draft Cooling Tower Train 3 (excluding fans)	30PED30AC001	33URB	M	M	SI	S	Y (5)
Mechanical Draft Cooling Tower Train 4 (excluding fans)	30PED40AC001	34URB	M	M	SI	S	Y (5)
UHS Cooling Tower Fan	30 PED10AN001	31URB~~03001~~	M	M	ES SI	S SI C/NM	Y (5)
UHS Cooling Tower Fan	30 PED10AN002	31URB~~03002~~	M	M	ES SI	S SI C/NM	Y (5)
UHS Cooling Tower Fan	30 PED20AN001	32URB~~03001~~	M	M	ES SI	S SI C/NM	Y (5)
UHS Cooling Tower Fan	30 PED20AN002	32URB~~03002~~	M	M	ES SI	S SI C/NM	Y (5)
UHS Cooling Tower Fan	30 PED30AN001	33URB~~03001~~	M	M	ES SI	S SI C/NM	Y (5)
UHS Cooling Tower Fan	30 PED30AN002	33URB~~03002~~	M	M	ES SI	S SI C/NM	Y (5)
UHS Cooling Tower Fan	30 PED40AN001	34URB~~03001~~	M	M	ES SI	S SI C/NM	Y (5)
UHS Cooling Tower Fan	30 PED40AN002	34URB~~03002~~	M	M	ES SI	S SI C/NM	Y (5)
Safety Chilled Water System (SCWS)							
QKA Cross-Tie Valve, Div 1	30QKA10AA102	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA Cross-Tie Valve, Div 1	30QKA10AA103	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Tank Isol Valve, Div 1	30QKA10AA001	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QK Pmp #1 Suct Isol Valve, Div 1	30QKA10AA002	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Pmp #1 Disch Check Valve, Div 1	30QKA10AA003	31UJK~~22028~~	M	M	SI	S	Y (5)
QK Pmp #1 Disch Isol Valve, Div 1	30QKA10AA004	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Chiller Dnstrm Flow Reg Valve, Div 1	30QKA10AA005	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Chiller Dnstrm Isol Valve, Div 1	30QKA10AA006	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA10AT001 Upstrm Isol Valve, Div 1	30QKA10AA007	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA10AT001 Dnstrm Flow Reg Valve, Div 1	30QKA10AA008	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA10AT001 Dnstrm Isol Valve, Div 1	30QKA10AA009	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QK QCB Isol Valve, Div 1	30QKA10AA010	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK QCB Check Valve, Div 1	30QKA10AA011	31UJK~~22028~~	M	M	SI	S	Y (5)
QK Bypass Control Valve-MOV, Div 1	30QKA10AA101	31UJK~~26029~~	M	M	ES SI	S C/NM	Y (5)
QK System Press Relief Valve, Div 1	30QKA10AA191	31UJK~~26029~~	M	M	ES SI	S C/NM	Y (5)
QKA CP501 Root Valve, Div 1	30QKA10AA301	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP502 Root Valve, Div 1	30QKA10AA302	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP001 Root Valve, Div 1	30QKA10AA303	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 95 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
QKA CP002 Root Valve, Div 1	30QKA10AA304	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP505 Root Valve, Div 1	30QKA10AA305	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA CP506 Root Valve, Div 1	30QKA10AA306	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA CP507 Root Valve, Div 1	30QKA10AA307	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA CP508 Root Valve, Div 1	30QKA10AA308	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA Chiller Upstrm CP008 Root Vlv, Div 1	30QKA10AA309	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA Chiller Dnstrm CP008 Root Vlv, Div 1	30QKA10AA310	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA CP511 Root Valve, Div 1	30QKA10AA311	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP512 Root Valve, Div 1	30QKA10AA312	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP513 Root Valve, Div 1	30QKA10AA315	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP514 Root Valve, Div 1	30QKA10AA316	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA10BR111 Drain Valve, Div 1	30QKA10AA401	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA10BR108 Drain Valve, Div 1	30QKA10AA402	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA10BR110 Drain Valve, Div 1	30QKA10AA403	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Chiller Upstrm Vent Valve, Div 1	30QKA10AA501	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA10AT001 Upstrm Vent Valve, Div 1	30QKA10AA502	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QK Sample Isol Valve, Div 1	30QKA10AA609	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Safety Chilled Water Evaporator, Div 1	30QKA10AC001	31UJK~~22028~~	M	M	ES SI	S C/NM	Y (5)
Safety Chilled Water Condenser, Div 1	30QKA10AC002	31UJK~~31032~~	M	M	ES SI	S C/NM	Y (5)
Safety Chilled Water Pump #1, Div 1	30QKA10AP107	31UJK~~22028~~	M	M	ES SI	S C/NM	Y (5)
Safety Chilled Screen for Bypass, Div 1	30QKA10AT001	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
Safety Chilled Water Exp Tank, Div 1	30QKA10BB101	31UJK~~26029~~	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #1, Div 1	30QKA10AN021	31UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #2, Div 1	30QKA10AN022	31UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #3, Div 1	30QKA10AN023	31UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #4, Div 1	30QKA10AN024	31UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #5, Div 1	30QKA10AN025	31UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #6, Div 1	30QKA10AN026	31UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #7, Div 1	30QKA10AN027	31UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #8, Div 1	30QKA10AN028	31UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #1, Div 1	30QKA10AA023	31UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #2, Div 1	30QKA10AA024	31UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #3, Div 1	30QKA10AA025	31UJK	M	M	ES SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 96 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Fan Check Damper #4, Div 1	30QKA10AA026	31UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #5, Div 1	30QKA10AA033	31UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #6, Div 1	30QKA10AA034	31UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #7, Div 1	30QKA10AA035	31UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #8 Div 1	30QKA10AA036	31UJK	M	M	ES SI	S C/NM	Y (5)
QKA Cross-Tie Valve, Div 2	30QKA20AA102	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA Cross-Tie Valve, Div 2	30QKA20AA103	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Tank Isol Valve, Div 2	30QKA20AA001	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Pmp #1 Suct Isol Valve, Div 2	30QKA20AA002	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Pmp #1 Disch Check Valve, Div 2	30QKA20AA003	32UJH~~05020~~	M	H	SI	S	Y (5)
QK Pmp #1 Disch Isol Valve, Div 2	30QKA20AA004	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Chiller Dnstrm Flow Reg Valve, Div 2	30QKA20AA005	32UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Chiller Dnstrm Isol Valve, Div 2	30QKA20AA006	32UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA20AT001 Upstrm Isol Valve, Div 2	30QKA20AA007	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA20AT001 Dnstrm Flow Reg Valve, Div 2	30QKA20AA008	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA20AT001 Dnstrm Isol Valve, Div 2	30QKA20AA009	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK QCB Isol Valve, Div 2	30QKA20AA010	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK QCB Check Valve, Div 2	30QKA20AA011	32UJH~~05020~~	M	H	SI	S	Y (5)
QK Bypass Control Valve-MOV, Div 2	30QKA20AA101	32UJH~~05020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
QK System Press Relief Valve, Div 2	30QKA20AA191	32UJH~~05020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
QKA CP501 Root Valve, Div 2	30QKA20AA301	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP502 Root Valve, Div 2	30QKA20AA302	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP001 Root Valve, Div 2	30QKA20AA303	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP002 Root Valve, Div 2	30QKA20AA304	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP505 Root Valve, Div 2	30QKA20AA305	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP506 Root Valve, Div 2	30QKA20AA306	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP507 Root Valve, Div 2	30QKA20AA307	32UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP508 Root Valve, Div 2	30QKA20AA308	32UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP008 Upstrm Root Valve, Div 2	30QKA20AA309	32UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP0008 Dnstrm Root Valve, Div 2	30QKA20AA310	32UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP511 Root Valve, Div 2	30QKA20AA311	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP512 Root Valve, Dov 2	30QKA20AA312	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP513 Root Valve, Div 2	30QKA20AA315	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
QKA CP514 Root Valve, Div 2	30QKA20AA316	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA20BR003 Drain Valve, Div 2	30QKA20AA401	32UJH~~01020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA20BR110 Drain Valve, Div 2	30QKA20AA402	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA20BR002 Drain Valve, Div 2	30QKA20AA403	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA20BR114 Drain Valve, Div 2	30QKA20AA404	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA20BR108 DrainValve, Div 2	30QKA20AA501	32UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Sample Isol Valve, Div 2	30QKA20AA609	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
Safety Chilled Water Evaporator, Div 2	30QKA20AC001	32UJH~~10020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Safety Chilled Water Condenser, Div 2	30QKA20AC002	32UJH~~10020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Safety Chilled Water Pump #1, Div 2	30QKA20AP107	32UJH~~05020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Safety Chilled Screen for Bypass, Div 2	30QKA20AT001	32UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
Safety Chilled Water Exp Tank, Div 2	30QKA20BB101	32UJH~~05020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
QKA Cross-Tie Valve, Div 3	30QKA30AA102	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA Cross-Tie Valve, Div 3	30QKA30AA103	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Tank Isol Valve, Div 3	30QKA30AA001	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Pmp #1 Suct Isol Valv, Div 3	30QKA30AA002	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Pmp #1 Disch Check Valve, Div 3	30QKA30AA003	33UJH~~05020~~	M	H	SI	S	Y (5)
QK Pmp #1 Disch Isol Valve, Div 3	30QKA30AA004	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Chiller Dnstrm Flow Reg Valve, Div 3	30QKA30AA005	33UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Chiller Dnstrm Isol Valve, Div 3	30QKA30AA006	33UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA30AT001 Upstrm Isol Valve, Div 3	30QKA30AA007	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA30AT001 Dnstrm Flow Reg Valve, Div 3	30QKA30AA008	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA30AT001 Dnstrm Isol Valve, Div 3	30QKA30AA009	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK QCB Isol Valve, Div 3	30QKA30AA010	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK QCB Check Valve, Div 3	30QKA30AA011	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QK Bypass Control Valve-MOV, Div 3	30QKA30AA101	33UJH~~05020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
QK System Press Relief Valve, Div 3	30QKA30AA191	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP501 Root Valve, Div 3	30QKA30AA301	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP502 Root Valve, Div 3	30QKA30AA302	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP001 Root Valve, Div 3	30QKA30AA303	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP002 Root Valve, Div 2	30QKA30AA304	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP505 Root Valve, Div 3	30QKA30AA305	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP506 Root Valve, Div 3	30QKA30AA306	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
QKA CP507 Root Valve, Div 3	30QKA30AA307	33UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP508 Root Valve, Div 3	30QKA30AA308	33UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP008 Upstrm Root Valve, Div 3	30QKA30AA309	33UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP008 Dnstrm Root Valve, Div 3	30QKA30AA310	33UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP511 Root Valve, Div 3	30QKA30AA311	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP512 Root Valve, Div 3	30QKA30AA312	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP5513 Root Valve, Div 3	30QKA30AA315	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA CP514 Root Valve, Div 3	30QKA30AA316	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA30BR003 Drain Valve, Div 3	30QKA30AA401	33UJH~~01020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA30BR002 Drain Valve, Div 3	30QKA30AA402	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA30BR108 Drain Valve, Div 3	30QKA30AA403	33UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA30BR110 Drain Valve, Div 3	30QKA30AA404	33UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA30BR114 Drain Valve, Div 3	30QKA30AA405	30UFA~~01001~~	M	H	SI	S C/NM	Y (3) Y (5)
QKA30BR108 Vent Valve, Div 3	30QKA30AA501	33UJH~~10020~~	M	H	SI	S C/NM	Y (3) Y (5)
QKB30BR112 Vent Valve, Div 3	30QKA30AA503	33UJK~~31035~~	M	M	SI	S C/NM	Y (5)
QK Sample Isol Valve, Div 2	30QKA30AA609	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
Safety Chilled Water Evaporator, Div 3	30QKA30AC001	33UJH~~10020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Safety Chilled Water Condenser, Div 3	30QKA30AC002	33UJH~~10020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Safety Chilled Water Pump #1, Div 3	30QKA30AP107	33UJH~~05020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Safety Chilled Screen for Bypass, Div 3	30QKA30AT001	33UJH~~05020~~	M	H	SI	S C/NM	Y (3) Y (5)
Safety Chilled Water Exp Tank, Div 3	30QKA30BB101	33UJH~~05020~~	M	H	ES SI	S C/NM	Y (3) Y (5)
QKA Cross-Tie Valve, Div 4	30QKA40AA102	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA Cross-Tie Valve, Div 4	30QKA40AA103	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Tank Isol Valve, Div 4	30QKA40AA001	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QK Pmp #1 Suct Isol Valve, Div 4	30QKA40AA002	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Pmp #1 Disch Check Valve, Div 4	30QKA40AA003	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Pmp #1 Disch Isol Valve, Div 4	30QKA40AA004	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Chiller Dnstrm Flow Reg Valve, Div 4	30QKA40AA005	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Chiller Dnstrm Isol Valve, Div 4	30QKA40AA006	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA40AT001 Upstrm Isol Valve, Div 4	30QKA40AA007	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA40AT001 Dnstrm Flow Reg Valve, Div 4	30QKA40AA008	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA40AT001 Dnstrm Isol Valve, Div 4	30QKA40AA009	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QK QCB Isol Valve, Div 4	30QKA40AA010	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
QK QCB Check Valve, Div 4	30QKA40AA011	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Bypass Control Valve-MOV, Div 4	30QKA40AA101	34UJK~~26029~~	M	M	ES SI	S C/NM	Y (5)
QK System Press Relief Valve, Div 4	30QKA40AA191	34UJK~~26029~~	M	M	ES SI	S C/NM	Y (5)
QKA CP501 Root Valve, Div 4	30QKA40AA301	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP502 Root Valve, Div 4	30QKA40AA302	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP001 Root Valve, Div 4	30QKA40AA303	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP002 Root Valve, Div 4	30QKA40AA304	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP505 Root Valve, Div 4	30QKA40AA305	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA CP506 Root Valve, Div 4	30QKA40AA306	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA CP507 Root Valve, Div 4	30QKA40AA307	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA CP508 Root Valve, Div 4	30QKA40AA308	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA CP008 Upstrm Root Valve, Div 4	30QKA40AA309	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA CP008 Dnstrm Root Valve, Div 4	30QKA40AA310	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA CP511 Root Valve, Div 4	30QKA40AA311	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP512 Root Valve, Div 4	30QKA40AA312	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP513 Root Valve, Div 4	30QKA40AA315	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA CP514 Root Valve, Div 4	30QKA40AA316	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
QKA40BR111 Drain Valve, Div 4	30QKA40AA401	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QKA40BR108 Drain Valve, Div 4	30QKA40AA407	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
QK Sample Isol Valve, Div 4	30QKA40AA609	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Safety Chilled Water Evaporator, Div 4	30QKA40AC001	34UJK~~22028~~	M	M	ES SI	S C/NM	Y (5)
Safety Chilled Water Condenser, Div 4	30QKA40AC002	34UJK~~31032~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Safety Chilled Water Pump #1, Div 4	30QKA40AP107	34UJK~~22028~~	M	M	ES SI	S C/NM	Y (5)
Safety Chilled Screen for Bypass, Div 4	30QKA40AT001	34UJK~~26029~~	M	M	SI	S C/NM	Y (5)
Safety Chilled Water Exp Tank, Div 4	30QKA40BB101	34UJK~~26029~~	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #1, Div 1	30QKA40AN021	34UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #2, Div 1	30QKA40AN022	34UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #3, Div 1	30QKA40AN023	34UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #4, Div 1	30QKA40AN024	34UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #5, Div 1	30QKA40AN025	34UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #6, Div 1	30QKA40AN026	34UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #7, Div 1	30QKA40AN027	34UJK	M	M	ES SI	S C/NM	Y (5)
Air Cooled Condenser Fan #8, Div 1	30QKA40AN028	34UJK	M	M	ES SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 100 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Fan Check Damper #1, Div 1	30QKA40AA023	34UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #2, Div 1	30QKA40AA024	34UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #3, Div 1	30QKA40AA025	34UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #4, Div 1	30QKA40AA026	34UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #5, Div 1	30QKA40AA033	34UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #6, Div 1	30QKA40AA034	34UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #7, Div 1	30QKA40AA035	34UJK	M	M	ES SI	S C/NM	Y (5)
Fan Check Damper #8 Div 1	30QKA40AA036	34UJK	M	M	ES SI	S C/NM	Y (5)
SAB01AC001 Upstrm Isol Valve, Div 1	30QKB10AA001	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
SAB01AC001 Dnstrm Flow Reg Vlv, Div 1	30QKB10AA002	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
SAB01AC001 Dnstrm Isol Valve, Div 1	30QKB10AA004	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
SAB01AC001 Control Valve-MOV, Div 1	30QKB10AA101	32UJK~~31034~~	M	M	ES SI	S C/NM	Y (5)
QKB CP501 Root Valve, Div 1	30QKB10AA301	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
QKB CP502 Root Valve, Div 1	30QKB10AA302	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
QKB CP503 Root Valve, Div 1	30QKB10AA303	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
QKB CP504 Root Valve, Div 1	30QKB10AA304	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
QKB CP505 Root Valve, Div 1	30QKB10AA305	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
QKB10BR113 Drain Valve, Div 1	30QKB10AA401	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
SAB01AC001 Upstrm Vent Valve, Div 1	30QKB10AA501	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
QKB10AA001 Upstrm Vent Valve, Div 1	30QKB10AA502	31UJK~~22024~~	M	M	SI	S C/NM	Y (5)
QKB10AT001 Dnstrm Vent Valve, Div 1	30QKB10AA503	31UJK~~22024~~	M	M	SI	S C/NM	Y (5)
Safety Chilled Screen for SAB01, Div 1	30QKB10AT001	31UJK~~26029~~	M	M	SI	S C/NM	Y (5)
SAB02AC001 Upstrm Isol Valve, Div 2	30QKB20AA001	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
SAB02AC001 Flow Reg Valve, Div 2	30QKB20AA002	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
SAB02AC001 Dnstrm Isol Valve, Div 2	30QKB20AA004	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
SAB02AC001 Control Valve-MOV, Div 2	30QKB20AA101	32UJK~~31035~~	M	M	ES SI	S C/NM	Y (5)
QKB CP501 Root Valve, Div 2	30QKB20AA301	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
QKB CP502 Root Valve, Div 2	30QKB20AA302	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
QKB CP503 Root Valve, Div 2	30QKB20AA303	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
QKB CP504 Root Valve, Div 2	30QKB20AA304	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
QKB CP505 Root Valve, Div 2	30QKB20AA305	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
QKB20BR113 Drain Valve, Div 2	30QKB20AA401	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
QKB20BR112 Drain Valve, Div 2	30QKB20AA402	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 160 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Heater Cont Pen	30JMU51AH007	30UJA~~29014~~	H	H	SII	NS-AQ	Y (5)
Fan	30JMU51AN001	31UJH~~10010~~	M	H	SII	NS-AQ	Y (5)
Vacuum PP	30JMU51AP001	31UJH~~10010~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Vacuum PP	30JMU51AP002	31UJH~~10010~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Vacuum Tank	30JMU51BB001	31UJH~~10010~~	M	H	SII	NS-AQ	Y (5)
Vacuum Tank	30JMU51BB002	31UJH~~10010~~	M	H	SII	NS-AQ	Y (5)
Test Vessel	30JMU51BB003	31UJH~~10010~~	M	H	SII	NS-AQ	Y (5)
Gas Cyl N2 Supp	30JMU51BB011	31UJH~~10011~~	M	H	SII	NS-AQ	Y (5)
Gas Cyl N2 Supp	30JMU51BB012	31UJH~~10011~~	M	H	SII	NS-AQ	Y (5)
ATM Sampler	30JMU51BZ001	30UJA~~40001~~	H	H	SII	NS-AQ	Y (5)
ATM Sampler	30JMU51BZ002	30UJA~~29003~~	H	H	SII	NS-AQ	Y (5)
ATM Sampler	30JMU51BZ003	30UJA~~18013~~	H	H	SII	NS-AQ	Y (5)
ATM Sampler	30JMU51BZ004	30UJA~~29008~~	H	H	SII	NS-AQ	Y (5)
Processing Unit	30JMU51BZ010	31UJH~~10010~~	M	H	SII	NS-AQ	Y (5)
P Redu Station	30JMU51BZ020	31UJH~~10010~~	M	H	SII	NS-AQ	Y (5)
Radiation Monitoring System (RMS)							
As a result of the EQ program screening, no components in this system were identifed for seismic qualification.							
HVAC SYSTEMS							
Containment Building Ventilation System (CBVS)							
KLA1 Containment Iso Valve 42 ft FB	30KLA10AA001	30UFA~~21095~~	M	H	ES PAM SI	S C/NM	Y (3) Y (5)
KLA 1 Cont Iso Solen Glob Valv 1	30KLA10AA001A	30UFA~~21095~~	M	H	ES SI	S C/NM	Y (3) Y (5)
KLA1 1 Cont Iso Solen Glob Valv 2	30KLA10AA001B	30UFA~~21095~~	M	H	ES SI	S C/NM	Y (3) Y (5)
KLA 1 Containment Iso Valve 42 ft RB	30KLA10AA003	30UJA~~18016~~	H	H	ES PAM SI	S C/NM	Y (4) Y (5)
KLA1 1 Cont Iso Solen Glob Valv 3	30KLA10AA003A	30UJA~~18016~~	H	H	ES SI	S C/NM	Y (4) Y (5)
KLA 5 Tech Rm Fire Damper Sup	30KLA10AA004	30UJA~~29015~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA1 Staircase Sup Fire Damp	30KLA10AA006	30UJA~~11020~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 1 Staircase Sup Branch Fire Damper	30KLA10AA007	30UJA~~07013~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 1 Staircase South Sup Fire Damper	30KLA10AA008	30UJA~~15010~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 1 Plen Sup Fire Damp	30KLA10AA012	30UFA~~21065~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Flame Arrestor KLA 1	30KLA10AT007	30UJA~~18016~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 2 Cont Iso Valve 48 ft FB	30KLA20AA001	30UJA~~23015~~	H	H	ES PAM SI	S C/NM	Y (4) Y (5)
KLA 2 Cont Iso Solen Glob Val 48 ft FB	30KLA20AA001A	30UJA~~23015~~	H	H	ES SI	S C/NM	Y (4) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 161 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
KLA 2 Cont Iso Valve 48 ft RB	30KLA20AA003	30UFA~~24045~~	M	H	ES PAM SI	S C/NM	Y (3) Y (5)
KLA 2 Cont Iso Solen Glob Val 1 48 ft RB	30KLA20AA003A	30UFA~~24045~~	M	H	ES SI	S C/NM	Y (3) Y (5)
KLA 2 Cont Iso Solen Glob Val 2 48 ft RB	30KLA20AA003B	30UFA~~24045~~	M	H	ES SI	S C/NM	Y (3) Y (5)
KLA 2 SCB Isolation Valve	30KLA20AA0003D	30UFA~~24045~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 SCB Isolation Valve	30KLA20AA0003E	30UFA~~24045~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 SCB Isolation Valve	30KLA20AA0003C	30UFA~~24045~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 5 Tech Rm Fire Damper Exh	30KLA20AA007	30UJA~~29015~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
North Staircase Exh Fire Damper	30KLA20AA009	30UJA~~34011~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
South Staircase Exh Fire Damper	30KLA20AA010	30UJA~~29023~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 2 Fire Damp UFA24045	30KLA20AA011	30UFA~~24045~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Fire Damp UFA24081	30KLA20AA012	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Fire Damp UFA24053	30KLA20AA014	30UFA~~24053~~	M	H	SI	S C/NM	Y (3) Y (5)
Flame Arrestor KLA 2	30KLA20AT002	30UJA~~23016~~	H	H	SI	S C/NM	Y (4) Y (5)
KLA Purge Filtr Tr 1 Control Damper	30KLA21AA001	30UFA~~24080~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA Purge Filtr Tr 1 Man Ch Damper	30KLA21AA003	30UFA~~24085~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA Purge Filter Tr 1 Isolation Damper 1	30KLA21AA004	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA Purge Filter Tr 1 Isolation Damper 2	30KLA21AA007	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
Elec Air Heater KLA 2 Tr 1 Filt	30KLA21AH005	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 1 Fan	30KLA21AN001	30UFA~~24085~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 1 Prefilter	30KLA21AT001	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 1 HEPA Filter	30KLA21AT002	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 1 Iodine Filter	30KLA21AT003	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 1 ~~HEPA~~ Post Filter	30KLA21AT004	30UFA~~24080~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 1 Moisture Separator	30KLA21AT005	30UFA	M	H	SI	S C/NM	Y (3) Y (5)
KLA Purge Filtr Tr 2 Control Damper	30KLA22AA001	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA Purge Filtr Tr 2 Man Ch Damper	30KLA22AA003	30UFA~~24085~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 2 Damper	30KLA22AA004	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 2 Damper	30KLA22AA007	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
Elec Air Heater KLA 2 Tr 2 Filt	30KLA22AH005	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 2 Fan	30KLA22AN001	30UFA~~24085~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 2 Prefilter	30KLA22AT001	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 2 HEPA Filter	30KLA22AT002	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 2 Iodine Filter	30KLA22AT003	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 162 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
KLA 2 ESF Filter Bypass Isolation Damper	30KLA24AA0001	30UFA~~24045~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 ESF Filter Bypass Fire Damper	30KLA24AA0002	30UFA~~24045~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 ESF Filter Bypass Isolation Damper	30KLA24AA0003	30UFA~~24095~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 2 ~~HEPA~~ Post Filter	30KLA22AT004	30UFA~~24081~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA 2 Tr 2 Moisture Separator	30KLA22AT0005	30UFA	M	H	SI	S C/NM	Y (3) Y (5)
KLA Plen Sup Motor Bal Damper	30KLA30AA001	30UFA~~21065~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
KLA 3 Cont Iso Valv 32 ft FB	30KLA30AA002	30UFA~~17095~~	M	H	ES PAM SI	S C/NM	Y (3) Y (5)
KLA 3 Cont Iso Solen Glob Valv 1	30KLA30AA002A	30UFA~~17095~~	M	H	ES SI	S C/NM	Y (3) Y (5)
KLA 3 Cont Iso Valv 32 ft RB	30KLA30AA003	30UJA~~18016~~	H	H	ES PAM SI	S C/NM	Y (4) Y (5)
KLA 3 Cont Iso Son Glob Valv 2	30KLA30AA003A	30UJA~~18016~~	H	H	ES SI	S C/NM	Y (4) Y (5)
Motor Control Damper 1 to FB KLL	30KLA30AA004	30UFA~~21065~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Op Fl Control Damper Sup	30KLA30AA006	30UJA~~29013~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
Op Fl Motorized Control Damper Sup	30KLA30AA007	30UJA~~29013~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
Motor Control Damper 2 to FB KLL	30KLA30AA008	30UFA~~21065~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
KLA 3 Plen Sup Fire Damper	30KLA30AA013	30UFA~~17065~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Fire Damper Plen Sup to FB KLL	30KLA30AA014	30UFA~~17065~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
KLA 4 Cont Iso Damp 32 ft RB	30KLA40AA001	30UJA~~18016~~	H	H	ES PAM SI	S C/NM	Y (4) Y (5)
KLA 4 Cont Iso Solen Glob Val 32 ft RB	30KLA40AA001A	30UJA~~18016~~	H	H	ES SI	S C/NM	Y (4) Y (5)
KLA 4 Cont Iso Damp 32 ft FB	30KLA40AA002	30UFA~~17095~~	M	H	ES PAM SI	S C/NM	Y (3) Y (5)
KLA 4 Cont Iso Solen Glob Val 32 ft FB	30KLA40AA002A	30UFA~~17095~~	M	H	ES SI	S C/NM	Y (3) Y (5)
KLA 4 Sup Louver Damper 1	30KLA40AA003	30UJA~~34015~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 4 Eq Comp Control Damper	30KLA40AA004	30UJA~~18016~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 4 Eq Comp Iso Damper	30KLA40AA005	30UJA~~18016~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 4 Fire Damper UFA24095	30KLA40AA006	30UFA~~24095~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
KLA 4 Sup Motor Louver Damper	30KLA40AA007	30UJA~~34015~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 4 Sup Louver Damper 2	30KLA40AA008	30UJA~~34015~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 5 FireDamper Service Compart Supply	30KLA50AA001	30UJA~~29015~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 Filter Train Upstream Isolation Damper	30KLA50AA002	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 FireDamper Service Compart Exhaust	30KLA50AA003	30UJA~~29015~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 Filter Train Downstream Isolation Damper	30KLA50AA004	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 Electric Heater	30KLA50AH001	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 Train 1 Fan	30KLA50AN001	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 Train 2 Fan	30KLA50AN002	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 163 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
KLA 5 Prefilter	30KLA50AT001	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 HEPA Filter ~~Prefilter~~	30KLA50AT002	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 Iodine Filter	30KLA50AT003	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 ~~HEPA~~ Post Filter	30KLA50AT004	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 Balancing Damper 1	30KLA51AA006	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 ~~Check~~Backdraft Damper 1	30KLA51AA007	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 Balancing Damper 2	30KLA52AA006	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA 5 ~~Check~~Backdraft Damper 2	30KLA52AA007	30UJA~~29022~~	H	H	SI	NS-AQ C/NM	Y (4) Y (5)
KLA DP Sens Valve 1 SG3	30KLA60AA701	33UJH~~10002~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
KLA DP Sens Valve 1 FB	30KLA60AA702	30UFA~~10052~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
KLA DP Sens Valve 1 SG2	30KLA60AA703	32UJH~~10002~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
KLA DP Sens Valv 2 FB	30KLA60AA704	30UFA~~13004~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
KLA 6 Plenum Sup Chk Damper 1	30KLA65AA002	30UJA~~18026~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 6 Plenum Sup Chk Damper 3	30KLA65AA004	30UJA~~18027~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 6 Rx Pit Suppy Fan 1	30KLA65AN001	30UJA~~15026~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 6 Rx Pit Suppy Fan 3	30KLA65AN002	30UJA~~15027~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 6 Plenum Sup Chk Damper 2	30KLA66AA002	30UJA~~15026~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 6 Plenum Sup Chk Damper 4	30KLA66AA004	30UJA~~15027~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 6 Rx Pit Supply Fan 2	30KLA66AN001	30UJA~~15026~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA 6 Rx Pit Supply Fan 4	30KLA66AN002	30UJA~~15027~~	H	H	SII	NS-AQ C/NM	Y (4) Y (5)
KLA DP Sens Valv 2 SG3	30KLA70AA701	33UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA DP Sens Valv 3 SG3	30KLA70AA702	33UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA DP Sens Valv 2 FB	30KLA70AA703	30UFA~~10052~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA DP Sens Valv 3 FB	30KLA70AA704	30UFA~~10052~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA DP Sens Valv 2 SG2	30KLA70AA706	32UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA DP Sens Valv 3 SG2	30KLA70AA707	32UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA DP Sens Valv 5 FB	30KLA70AA708	30UFA~~13004~~	M	H	SI	S C/NM	Y (3) Y (5)
KLA DP Sens Valv 4 FB	30KLA70AA709	30UFA~~13004~~	M	H	SI	S C/NM	Y (3) Y (5)
Annulus Ventilation System (AVS)							
Motor Operated Supply Damper (Train 21)	30KLB21AA003	30UFA~~17084~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Motor Operated Exhaust Damper	30KLB21AA004	30UFA~~17084~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Backdraft Damper (Train 21)	30KLB21AA006	30UFA~~17083~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Electric Heater (Train 21)	30KLB21AH001	30UFA~~17084~~	M	H	ES SI	S C/NM	Y (3) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 164 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Exhaust Fan (Train 21)	30KLB21AN001	30UFA~~17083~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Prefilter (Train 21)	30KLB21AT001	30UFA~~17084~~	M	H	ES SI	S C/NM	Y (3) Y (5)
~~Upstream~~ HEPA Filter (Train 21)	30KLB21AT002	30UFA~~17084~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Iodine Adsorber (Train 21)	30KLB21AT003	30UFA~~17084~~	M	H	ES SI	S C/NM	Y (3) Y (5)
~~Downstream Hepa~~ Post Filter (Train 21)	30KLB21AT004	30UFA~~17084~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Motor Operated Supply Damper (Train 24)	30KLB24AA003	30UFA~~17082~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Motor Operated Exhaust Damper (Train 24)	30KLB24AA004	30UFA~~17082~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Backdraft Damper (Train 24)	30KLB24AA006	30UFA~~17081~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Electric Heater (Train 24)	30KLB24AH001	30UFA~~17082~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Exhaust Fan (Train 24)	30KLB24AN001	30UFA~~17081~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Prefilter (Train 24)	30KLB24AT001	30UFA~~17082~~	M	H	ES SI	S C/NM	Y (3) Y (5)
~~Upstream~~ HEPA Filter (Train 24)	30KLB24AT002	30UFA~~17082~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Iodine Adsorber (Train 24)	30KLB24AT003	30UFA~~17082~~	M	H	ES SI	S C/NM	Y (3) Y (5)
~~Downstream Hepa~~ Post Filter	30KLB24AT004	30UFA~~17082~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Supply Motor Operated Isolation Damper	30KLB34AA002	30UFA~~21095~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Supply Motor Operated Isolation Damper	30KLB34AA003	30UFA~~21095~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Exhaust Motor Operated Isolation Damper	30KLB44AA002	30UFA~~29054~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Exhaust Motor Operated Isolation Damper	30KLB44AA003	30UFA~~29054~~	M	H	ES SI	S C/NM	Y (3) Y (5)
Safeguard Building Controlled Area Ventilation System (SBVS)							
Fire Damper Sup ICP, SG1	30KLC11AA002	31UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Vol Cont Damper Sup, Div 1	30KLC11AA003	31UJH~~05025~~	M	H	SI	S C/NM	Y (3) Y (5)
Iso Damper 1 Sup, Div 1	30KLC11AA004	31UJH~~05025~~	M	H	SI	S C/NM	Y (3) Y (5)
Iso Damper 2 Sup, Div 1	30KLC11AA005	31UJH~~05025~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Is Damper, Div 1, SG1	30KLC11AA007	31UJH~~05006~~	M	H	SI	S C/NM	Y (3) Y (5)
~~Sup Dmpr KAA Vlv Rm, Anteroom, SG1~~	~~30KLC11AA008~~		~~M~~	~~H~~	~~SI~~	~~S C/NM~~	~~Y (3) Y (5)~~
Fire Damper ICP 1, SG2	30KLC12AA002	32UJH~~10003~~	M	H	SI	S C/NM	Y (3) Y (5)
Vol Cont Damper Sup, Div 2	30KLC12AA003	32UJH~~01020~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper 1, Div 2	30KLC12AA004	32UJH~~01020~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper 2, Div 2	30KLC12AA005	32UJH~~01020~~	M	H	SI	S C/NM	Y (3) Y (5)
Fire Damper 2 Sup, Div 2	30KLC12AA008	32UJH~~01001~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper 1, Air Lock, SG2	30KLC12AA009	32UJH~~10006~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper 2, Air Lock, SG2	30KLC12AA010	32UJH~~10006~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Fire Damper, ICP, SG3	30KLC13AA002	33UJH~~10003~~	M	H	SI	S C/NM	Y (3) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Vol Cont Damper Sup, Div 3	30KLC13AA003	33UJH~~01020~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper 1, Div 3	30KLC13AA004	33UJH~~01020~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper 2, Div 3	30KLC13AA005	33UJH~~01020~~	M	H	SI	S C/NM	Y (3) Y (5)
~~Sup Fire Damper, Staircase, Div 3~~	~~30KLC13AA008~~		~~M~~	~~H~~	~~SI~~	~~S C/NM~~	~~Y (3) Y (5)~~
~~Sup Fire Damper 1, ICP, SG4~~	~~30KLC14AA002~~		~~M~~	~~H~~	~~SI~~	~~S C/NM~~	~~Y (3) Y (5)~~
Vol Cont Damper Sup, Div 4	30KLC14AA003	34UJH~~05025~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper 1, Div 4	30KLC14AA004	34UJH~~05025~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper 2, Div 4	30KLC14AA005	34UJH~~05025~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper, Div 4	30KLC14AA007	34UJH~~05006~~	M	H	SI	S C/NM	Y (3) Y (5)
Fire Damper Exh ICP, SG1	30KLC21AA001	31UJH~~10011~~	M	H	SI	S C/NM	Y (3) Y (5)
~~Ext Dmpr, KAA Vlv Rm, Anteroom, SG1~~	~~30KLC21AA002~~		~~M~~	~~H~~	~~SI~~	~~S C/NM~~	~~Y (3) Y (5)~~
Exh Iso Damper, SG1	30KLC21AA005	31UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Vol Cntrl Damper, Div 1	30KLC21AA006	31UJH~~10010~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Iso Damper 1, Div 1	30KLC21AA007	31UJH~~10010~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Iso Damper 2, Div 1	30KLC21AA008	31UJH~~10010~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Fire Damper, Div 1	30KLC21AA009	31UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper, SG1	30KLC21AA010	31UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Fire Damper ICP 2, SG2	30KLC22AA001	32UJH~~10003~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Vol Cntrl Damper, Div 2	30KLC22AA006	32UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Iso Damper 1, Div 2	30KLC22AA007	32UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Iso Damper 2, Div 2	30KLC22AA008	32UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
~~Oper Ex Iso Damper 2, Div 2~~	~~30KLC22AA009~~		~~M~~	~~H~~	~~SI~~	~~S C/NM~~	~~Y (3) Y (5)~~
Exh Iso Damper, Air Lock, SG2	30KLC22AA010	32UJH~~10006~~	M	H	SI	S C/NM	Y (3) Y (5)
Stairwell Fire Damper 1, SG2	30KLC22AA011	32UJH~~05001~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Fire Damper, ICP, SG3	30KLC23AA001	33UJH~~10003~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Vol Cntrl Damper, Div 3	30KLC23AA006	33UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Iso Damper 1, Div 3	30KLC23AA007	33UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Iso Damper 2, Div 3	30KLC23AA008	33UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Oper Ex Fire Damper, Div 3	30KLC23AA009	33UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Stairwell Fire Damper 1, SG3	30KLC23AA011	33UJH~~05001~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Fire Damper 2, ICP, SG4	30KLC24AA001	34UJH~~10011~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper, KUL~~JMU~~ Rm, SG4	30KLC24AA002	34UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper, Anteroom, Div 4	30KLC24AA003	34UJH~~05006~~	M	H	SI	S C/NM	Y (3) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 166 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)	
Sup Iso Damper, Anteroom, Div 4	30KLC24AA004	34UJH01011	M	H	SI	S	C/NM	Y (3)	Y (5)
Exh Iso Damper, Div 4	30KLC24AA005	34UJH10004	M	H	SI	S	C/NM	Y (3)	Y (5)
Oper Ex Vol Cntrl Damper, Div 4	30KLC24AA006	34UJH10010	M	H	SI	S	C/NM	Y (3)	Y (5)
Oper Ex Iso Damper 1, Div 4	30KLC24AA007	34UJH10010	M	H	SI	S	C/NM	Y (3)	Y (5)
Oper Ex Iso Damper 2, Div 4	30KLC24AA008	34UJH10010	M	H	SI	S	C/NM	Y (3)	Y (5)
Oper Ex Fire Damper, Div 4	30KLC24AA009	34UJH10004	M	H	SI	S	C/NM	Y (3)	Y (5)
Oper Ex Iso Damper 2, Div 4	30KLC24AA010	34UJH10004	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Iso Damper Vlv Rm, Div 1	30KLC31AA001	31UJH10004	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Fire Damper Vlv Rm, Div 1	30KLC31AA002	31UJH10004	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Iso Damper Vlv Rm, Div 1	30KLC31AA003	31UJH10004	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Iso Damper Vlv Rm, Div 2	30KLC32AA001	32UJH10002	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Fire Damper Vlv Rm, Div 2	30KLC32AA002	32UJH10002	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Iso Damper Vlv Rm, Div 2	30KLC32AA003	32UJH10002	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Iso Damper Vlv Rm, Div 3	30KLC33AA001	33UJH10002	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Fire Damper Vlv Rm, Div 3	30KLC33AA002	33UJH10002	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Iso Damper Vlv Rm, Div 3	30KLC33AA003	33UJH10002	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Iso Damper Vlv Rm, Div 4	30KLC34AA001	34UJH10004	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Fire Damper Vlv Rm, Div 4	30KLC34AA002	34UJH10004	M	H	SI	S	C/NM	Y (3)	Y (5)
Acc Ex Iso Damper Vlv Rm, Div 4	30KLC34AA003	34UJH10004	M	H	SI	S	C/NM	Y (3)	Y (5)
Iso Damper 1, Acc Ex Tr 1	30KLC41AA001	30UFA21082	M	H	SI	S	C/NM	Y (3)	Y (5)
Iso Damper 2, Acc Ex Tr 1	30KLC41AA002	30UFA21082	M	H	SI	S	C/NM	Y (3)	Y (5)
CheckBackdraft Damper, Acc Ex Tr 1	30KLC41AA003	30UFA21083	M	H	SI	S	C/NM	Y (3)	Y (5)
Elec Air Preheater, Accident Filt Tr 1	30KLC41AH001	30UFA21082	M	H	SI	S	C/NM	Y (3)	Y (5)
Exhaust Fan, Accident Filtr Tr 1	30KLC41AN001	30UFA21083	M	H	SI	S	C/NM	Y (3)	Y (5)
Prefilter/moisture Separator, Accident Filtr Tr 1	30KLC41AT001	30UFA21082	M	H	SI	S	C/NM	Y (3)	Y (5)
HEPA Prefilter, Accident Filtr Tr 1	30KLC41AT002	30UFA21082	M	H	SI	S	C/NM	Y (3)	Y (5)
Iodine Filter, Accident Filtr Tr 1	30KLC41AT003	30UFA21082	M	H	SI	S	C/NM	Y (3)	Y (5)
HEPA Post Filter, Accident Filtr Tr 1	30KLC41AT004	30UFA21082	M	H	SI	S	C/NM	Y (3)	Y (5)
Moisture Separator	30KLC41AT005	30UFA21082	M	H	SI	S			Y (5)
Iso Damper 1, Acc Ex Tr 2	30KLC42AA001	30UFA21084	M	H	SI	S	C/NM	Y (3)	Y (5)
Iso Damper 2, Acc Ex Tr 2	30KLC42AA002	30UFA21084	M	H	SI	S	C/NM	Y (3)	Y (5)
CheckBackdraft Damper, Acc Ex Tr 2	30KLC42AA003	30UFA21083	M	H	SI	S	C/NM	Y (3)	Y (5)
Elec Air Preheater, Accident Filt Tr 2	30KLC42AH001	30UFA21084	M	H	SI	S	C/NM	Y (3)	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Exhaust Fan, Accident Filtr Tr 2	30KLC42AN001	30UFA~~21081~~	M	H	SI	S C/NM	Y (3) Y (5)
Prefilter~~/moisture Separator~~, Accident Filtr Tr 2	30KLC42AT001	30UFA~~21084~~	M	H	SI	S C/NM	Y (3) Y (5)
HEPA ~~Prefilter~~, Accident Filtr Tr 2	30KLC42AT002	30UFA~~21084~~	M	H	SI	S C/NM	Y (3) Y (5)
Iodine Filter, Accident Filtr Tr 2	30KLC42AT003	30UFA~~21084~~	M	H	SI	S C/NM	Y (3) Y (5)
~~HEPA~~ Post Filter, Accident Filtr Tr 2	30KLC42AT004	30UFA~~21084~~	M	H	SI	S C/NM	Y (3) Y (5)
Moisture Separator	30KLC42AT005	30UFA~~21084~~	M	H	SI	S	Y (5)
Acc Ex Sw Iso Damper 1	30KLC45AA001	30UFA~~21095~~	M	H	SI	S C/NM	Y (3) Y (5)
Acc Ex Sw Iso Damper 2	30KLC45AA002	30UFA~~21095~~	M	H	SI	S C/NM	Y (3) Y (5)
Acc Ex Sw Iso Damper 3	30KLC45AA003	30UFA~~29045~~	M	H	SI	S C/NM	Y (3) Y (5)
Acc Ex Sw Iso Damper 4	30KLC45AA004	30UFA~~29045~~	M	H	SI	S C/NM	Y (3) Y (5)
Acc Ex Sw Iso Damper 5	30KLC45AA005	30UFA~~24045~~	M	H	SI	S C/NM	Y (3) Y (5)
Acc Ex Sw Iso Damper 6	30KLC45AA006	30UFA~~24045~~	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, KLC SG1	30KLC51AC001	31UJH~~05004~~	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, KAA Vlv Rm, SG1	30KLC51AC002	31UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, JMU Rm, SG1	30KLC51AC003	31UJH~~10010~~	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, KLC SG1	30KLC51AN001	31UJH~~05004~~	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, KAA Vlv Rm, SG1	30KLC51AN002	31UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, JMU Rm, SG1	30KLC51AN003	31UJH~~10010~~	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, KLC SG1	30KLC51AT001	31UJH~~05004~~	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, KAA Vlv Rm, SG1	30KLC51AT002	31UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, JMU Rm, SG1	30KLC51AT003	31UJH~~10010~~	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, KLC SG2	30KLC52AC001	32UJH~~05002~~	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, Vlv Rm, KLC SG2	30KLC52AC002	32UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, KLC SG2	30KLC52AN001	32UJH~~05002~~	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, Vlv Rm, KLC SG2	30KLC52AN002	32UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, Vlv Rm, KLC SG2	30KLC52AT001	32UJH~~05002~~	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, Vlv Rm, KLC SG2	30KLC52AT002	32UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, KLC SG3	30KLC53AC001	33UJH~~05002~~	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, Vlv Rm, KLC SG3	30KLC53AC002	33UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, KLC SG3	30KLC53AN001	33UJH~~05002~~	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, Vlv Rm, KLC SG3	30KLC53AN002	33UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, Vlv Rm, KLC SG3	30KLC53AT001	33UJH~~05002~~	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, Vlv Rm, KLC SG3	30KLC53AT002	33UJH~~10002~~	M	H	SI	S C/NM	Y (3) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Chiller Recirc Unit, KLC SG4	30KLC54AC001	34UJH~~05004~~	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, KAA vlv rm, SG4	30KLC54AC002	34UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, JMU Rm, SG4	30KLC54AC003	34UJH~~10010~~	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, KLC SG4	30KLC54AN001	34UJH~~05004~~	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, KAA Vlv Rm, SG4	30KLC54AN002	34UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, JMU Rm, SG4	30KLC54AN003	34UJH~~10010~~	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, KLC SG4	30KLC54AT001	34UJH~~05004~~	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, KAA Vlv Rm, SG4	30KLC54AT002	34UJH~~10004~~	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, JMU Rm, SG4	30KLC54AT002	34UJH~~10010~~	M	H	SI	S C/NM	Y (3) Y (5)
Nuclear Auxiliary Building Ventilation System (NABVS)							
Exhaust Air Backdraft Damper	30KLE50AA001	30UFA~~34075~~	M	M	~~SI~~ ~~S~~ SI	S ~~C/NM~~	Y (5)
Electrical Division of Safeguard Building Ventilation System (SBVSE)							
Outside Air Isolation Damper	30SAC01AA002	31UJK~~22026~~	M	M	SI	S C/NM	Y (5)
Outside Air Control Damper	30SAC01AA003	31UJK~~22026~~	M	M	SI	S C/NM	Y (5)
Recirc Air Control Damper	30SAC01AA004	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Supply Air Backdraft Damper	30SAC01AA005	31UJK~~22026~~	M	M	SI	S C/NM	Y (5)
Supply Air Cooler	30SAC01AC001	31UJK~~22026~~	M	M	SI	S	Y (5)
Supply Air Heater	30SAC01AH002	31UJK~~22026~~	M	M	SI	S C/NM	Y (5)
Fan Motor Heater	30SAC01AH501	31UJK~~22026~~	M	M	SI	S C/NM	Y (5)
Supply Air Fan	30SAC01AN001	31UJK~~22026~~	M	M	SI	S C/NM	Y (5)
~~Air Inlet Outside Air~~	~~30SAC01AT001~~		~~M~~	~~M~~	~~SI~~	~~S~~	~~Y (5)~~
Insect Screen Supply Air	30SAC01AT003	31UJK~~22026~~	M	M	SI	S	Y (5)
Supply Air Pre Filter	30SAC01AT004	31UJK~~22026~~	M	M	SI	S C/NM	Y (5)
Supply Air Roughing Filter	30SAC01AT005	31UJK~~22026~~	M	M	SI	S C/NM	Y (5)
Moisture Separator Supply Air Cooler	30SAC01AT006	31UJK~~22026~~	M	M	SI	S	Y (5)
Supply Air Silencer	30SAC01BS001	31UJK~~22026~~	M	M	SI	S	Y (5)
Supply Air Silencer	30SAC01BS002	31UJK~~22026~~	M	M	SI	S	Y (5)
Recirc Air Silencer	30SAC01BS003	31UJK~~22039~~	M	M	SI	S	Y (5)
Outside Air Isolation Damper	30SAC02AA002	32UJK~~34005~~	M	M	SI	S C/NM	Y (5)
Outside Air Control Damper	30SAC02AA003	32UJK~~34005~~	M	M	SI	S C/NM	Y (5)
Recirc Air Control Damper	30SAC02AA004	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Supply Air Backdraft Damper	30SAC02AA005	32UJK~~31007~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 169 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Supply Air Cooler	30SAC02AC001	32UJK~~34009~~	M	M	SI	S	Y (5)
Supply Air Heater	30SAC02AH002	32UJK~~34008~~	M	M	SI	S C/NM	Y (5)
~~Humidifier Heater~~	~~30SAC02AH003~~		~~M~~	~~M~~	~~SII~~	~~NS-AQ C/NM~~	~~Y (5)~~
~~Humidifier Heater~~	~~30SAC02AH004~~		~~M~~	~~M~~	~~SII~~	~~NS-AQ C/NM~~	~~Y (5)~~
Fan Motor Heater	30SAC02AH501	32UJK~~31007~~	M	M	SI	S C/NM	Y (5)
Supply Air Fan	30SAC02AN001	32UJK~~31007~~	M	M	SI	S C/NM	Y (5)
Air Inlet Outside Air	30SAC02AT001	32UJK~~38006~~	M	M	SI	S	Y (5)
Insect Screen Supply Air	30SAC02AT003	32UJK~~38006~~	M	M	SI	S	Y (5)
Supply Air Pre Filter	30SAC02AT004	32UJK~~34006~~	M	M	SI	S C/NM	Y (5)
Supply Air Roughing Filter	30SAC02AT005	32UJK~~34007~~	M	M	SI	S C/NM	Y (5)
Moisture Separator Supply Air Cooler	30SAC02AT006	32UJK~~34009~~	M	M	SI	S	Y (5)
~~Air Inlet Outside Air~~	~~30SAC02AT010~~		~~M~~	~~M~~	~~SI~~	~~S~~	~~Y (5)~~
Supply Air Silencer	30SAC02BS001	32UJK~~31007~~	M	M	SI	S	Y (5)
Supply Air Silencer	30SAC02BS002	32UJK~~31007~~	M	M	SI	S	Y (5)
Recirc Air Silencer	30SAC02BS003	32UJK~~31032~~	M	M	SI	S	Y (5)
Outside Air Isolation Damper	30SAC03AA002	33UJK~~34005~~	M	M	SI	S C/NM	Y (5)
Outside Air Control Damper	30SAC03AA003	33UJK~~34005~~	M	M	SI	S C/NM	Y (5)
Recirc Air Control Damper	30SAC03AA004	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Supply Air Backdraft Damper	30SAC03AA005	33UJK~~31007~~	M	M	SI	S C/NM	Y (5)
Supply Air Cooler	30SAC03AC001	33UJK~~34009~~	M	M	SI	S	Y (5)
Supply Air Heater	30SAC03AH002	33UJK~~34008~~	M	M	SI	S C/NM	Y (5)
Fan Motor Heater	30SAC03AH501	33UJK~~31007~~	M	M	SI	S C/NM	Y (5)
Supply Air Fan	30SAC03AN001	33UJK~~31007~~	M	M	SI	S C/NM	Y (5)
~~Air Inlet Outside Air~~	~~30SAC03AT001~~		~~M~~	~~M~~	~~SI~~	~~S~~	~~Y (5)~~
Insect Screen Supply Air	30SAC03AT003	33UJK~~38006~~	M	M	SI	S	Y (5)
Supply Air Pre Filter	30SAC03AT004	33UJK~~34006~~	M	M	SI	S C/NM	Y (5)
Supply Air Roughing Filter	30SAC03AT005	33UJK~~34007~~	M	M	SI	S C/NM	Y (5)
Moisture Separator Supply Air Cooler	30SAC03AT006	33UJK~~34009~~	M	M	SI	S	Y (5)
Supply Air Silencer	30SAC03BS001	33UJK~~31007~~	M	M	SI	S	Y (5)
Supply Air Silencer	30SAC03BS002	33UJK~~31007~~	M	M	SI	S	Y (5)
Recirc Air Silencer	30SAC03BS003	33UJK~~31032~~	M	M	SI	S	Y (5)
Outside Air Isolation Damper	30SAC04AA002	34UJK~~22026~~	M	M	SI	S C/NM	Y (5)
Outside Air Control Damper	30SAC04AA003	34UJK~~22026~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 170 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
Recirc Air Control Damper	30SAC04AA004	34UJK~~22028~~	M	M	SI	S	C/NM	Y (5)
Supply Air Backdraft Damper	30SAC04AA005	34UJK~~22026~~	M	M	SI	S	C/NM	Y (5)
Supply Air Cooler	30SAC04AC001	34UJK~~22026~~	M	M	SI	S		Y (5)
Supply Air Heater	30SAC04AH002	34UJK~~22026~~	M	M	SI	S	C/NM	Y (5)
Fan Motor Heater	30SAC04AH501	34UJK~~22026~~	M	M	SI	S	C/NM	Y (5)
Supply Air Fan	30SAC04AN001	34UJK~~22026~~	M	M	SI	S	C/NM	Y (5)
~~Air Inlet Outside Air~~	~~30SAC04AT001~~		~~M~~	~~M~~	~~SI~~	~~S~~		~~Y (5)~~
Insect Screen Supply Air	30SAC04AT003	34UJK~~22026~~	M	M	SI	S		Y (5)
Supply Air Pre Filter	30SAC04AT004	34UJK~~22026~~	M	M	SI	S	C/NM	Y (5)
Supply Air Roughing Filter	30SAC04AT005	34UJK~~22026~~	M	M	SI	S	C/NM	Y (5)
Moisture Separator Supply Air Cooler	30SAC04AT006	34UJK~~22026~~	M	M	SI	S		Y (5)
Supply Air Silencer	30SAC04BS001	34UJK~~22026~~	M	M	SI	S		Y (5)
Supply Air Silencer	30SAC04BS002	34UJK~~22026~~	M	M	SI	S		Y (5)
Recirc Air Silencer	30SAC04BS003	34UJK~~22039~~	M	M	SI	S		Y (5)
Isolation Damper	30SAC05AA002	31UJK~~22026~~	M	M	SI	S	C/NM	Y (5)
Isolation Damper	30SAC08AA002	31UKJ~~22026~~	M	M	SI	S	C/NM	Y (5)
Supply Air Isolation Damper	30SAC11AA001	31UJK~~22024~~	M	M	SI	S	C/NM	Y (5)
Supply Air Isolation Damper	30SAC11AA003	31UJK~~22024~~	M	M	SI	S	C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA004	31UJK~~22026~~	M	M	SI	S	C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA005	31UJK~~22026~~	M	M	SI	S	C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA006	31UJK~~22024~~	M	M	SI	S	C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA007	31UJK~~22024~~	M	M	SI	S	C/NM	Y (5)
Fire Damper	30SAC11AA008	31UJK~~22024~~	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA009	31UJK~~31027~~	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA010	31UJK~~34024~~	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA011	31UJK~~18033~~	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA012	31UJK~~18033~~	M	M	SI	S		Y (5)
Supply Air Adjustable Damper	30SAC11AA013	31UJK~~18026~~	M	M	SI	S	C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA014	31UJK~~18026~~	M	M	SI	S	C/NM	Y (5)
Fire Damper	30SAC11AA015	31UJK~~18033~~	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA016	31UJK~~18022~~	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA017	31UJK~~18022~~	M	M	SI	S		Y (5)
Supply Air Adjustable Damper	30SAC11AA018	31UJK~~18027~~	M	M	SI	S	C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 171 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Fire Damper	30SAC11AA019	31UJK~~18024~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC11AA020	31UJK~~18027~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC11AA021	31UJK~~18027~~	M	M	SI	S	Y (5)
Fire Damper	30SAC11AA022	31UJK~~14033~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC11AA023	31UJK~~14025~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC11AA024	31UJK~~14022~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC11AA025	31UJK~~14026~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC11AA027	31UJK~~14026~~	M	M	SI	S	Y (5)
Fire Damper	30SAC11AA028	31UJK~~14021~~	M	M	SI	S	Y (5)
Fire Damper	30SAC11AA029	31UJK~~14026~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC11AA030	31UJK~~18027~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA031	31UJK~~18027~~	M	M	SI	S C/NM	Y (5)
Battery Room Supply Air Heater	30SAC11AH001	31UJK~~18027~~	M	M	SI	S C/NM	Y (5)
Battery Room Supply Air Heater	30SAC11AH002	31UJK~~14026~~	M	M	SI	S C/NM	Y (5)
Toilet Supply Air Heater	30SAC11AH003	31UJK~~26021~~	M	M	SI	S C/NM	Y (5)
Supply Air Isolation Damper	30SAC12AA001	32UJK~~31005~~	M	M	SI	S C/NM	Y (5)
Maintenance Supply Air Isol Damper	30SAC12AA005	32UJK~~31018~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC12AA006	32UJK~~31018~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC12AA008	32UJK~~31020~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC12AA009	32UJK~~31020~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC12AA010	32UJK~~31020~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA011	32UJK~~31020~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA012	32UJK~~31021~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA013	32UJK~~22002~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC12AA014	32UJK~~22002~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC12AA015	32UJK~~22004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA016	32UJK~~22004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA017	32UJK~~22029~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA018	32UJK~~22028~~	M	M	SI	S	Y (5)
Supply Air Div 3 Control Damper	30SAC12AA020	32UJK~~22004~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC12AA021	33UJK~~22030~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA022	32UJK~~18004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA023	32UJK~~18004~~	M	M	SI	S	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Fire Damper	30SAC12AA024	32UJK~~18002~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC12AA025	32UJK~~18004~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC12AA026	32UJK~~18004~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC12AA027	32UJK~~18004~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC12AA028	32UJK~~18004~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC12AA029	32UJK~~18002~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC12AA030	32UJK~~14002~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC12AA031	32UJK~~14002~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC12AA032	32UJK~~14040~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA033	32UJK~~14040~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA034	32UJK~~14001~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA035	32UJK~~18005~~	M	M	SI	S	Y (5)
Fire Damper	30SAC12AA036	32UJK~~22004~~	M	M	SI	S	Y (5)
Battery Room Supply Air Heater	30SAC12AH001	32UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Supply Air Isolation Damper	30SAC13AA001	33UJK~~31018~~	M	M	SI	S C/NM	Y (5)
Maintenance Supply Air Isol Damper	30SAC13AA005	33UJK~~31041~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC13AA006	33UJK~~31018~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC13AA008	33UJK~~31020~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC13AA009	33UJK~~31020~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC13AA010	33UJK~~31020~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA011	33UJK~~31020~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA012	33UJK~~31021~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA013	33UJK~~22002~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC13AA014	33UJK~~22002~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC13AA015	33UJK~~22004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA016	33UJK~~22004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA017	33UJK~~22029~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA018	33UJK~~22028~~	M	M	SI	S	Y (5)
Supply Air Equip Room Control Damper	30SAC13AA020	33UJK~~22030~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC13AA021	33UJK~~22004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA022	33UJK~~18004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA023	33UJK~~18004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA024	33UJK~~18002~~	M	M	SI	S	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Supply Air Adjustable Damper	30SAC13AA025	33UJK~~18004~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC13AA026	33UJK~~18004~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC13AA027	33UJK~~18004~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC13AA028	33UJK~~18004~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC13AA029	33UJK~~18002~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC13AA030	33UJK~~14002~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC13AA031	33UJK~~14002~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC13AA032	33UJK~~14040~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA033	33UJK~~14040~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA034	33UJK~~14001~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA035	33UJK~~18004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC13AA036	33UJK~~22004~~	M	M	SI	S	Y (5)
Battery Room Supply Air Heater	30SAC13AH001	33UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Supply Air Isolation Damper	30SAC14AA001	34UJK~~22024~~	M	M	SI	S C/NM	Y (5)
Supply Air Isolation Damper	30SAC14AA003	34UJK~~22024~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC14AA004	34UJK~~22026~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC14AA005	34UJK~~22026~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC14AA006	34UJK~~22024~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC14AA007	34UJK~~22024~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC14AA008	34UJK~~22024~~	M	M	SI	S	Y (5)
Supply Air Fire Dampner	30SAC14AA009	34UJK~~31027~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC14AA010	34UJK~~34024~~	M	M	SI	S	Y (5)
Fire Damper	30SAC14AA011	34UJK~~18023~~	M	M	SI	S	Y (5)
Fire Damper	30SAC14AA012	34UJK~~18033~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC14AA013	34UJK~~18026~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC14AA014	34UJK~~18026~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC14AA015	34UJK~~18033~~	M	M	SI	S	Y (5)
Fire Damper	30SAC14AA016	34UJK~~18022~~	M	M	SI	S	Y (5)
Fire Damper	30SAC14AA017	34UJK~~18022~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC14AA018	34UJK~~18027~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC14AA019	34UJK~~18024~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC14AA020	34UJK~~18027~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC14AA021	34UJK~~18027~~	M	M	SI	S	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Fire Damper	30SAC14AA022	34UJK~~14033~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC14AA023	34UJK~~14025~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC14AA024	34UJK~~14022~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC14AA025	34UJK~~14026~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC14AA027	34UJK~~14026~~	M	M	SI	S	Y (5)
Fire Damper	30SAC14AA028	34UJK~~14021~~	M	M	SI	S	Y (5)
Fire Damper	30SAC14AA029	34UJK~~14026~~	M	M	SI	S	Y (5)
Supply Air Adjustable Damper	30SAC14AA030	34UJK~~18027~~	M	M	SI	S C/NM	Y (5)
Supply Air Adjustable Damper	30SAC14AA031	34UJK~~18027~~	M	M	SI	S C/NM	Y (5)
Battery Room Supply Air Heater	30SAC14AH001	34UJK~~18027~~	M	M	SI	S C/NM	Y (5)
Battery Room Supply Air Heater	30SAC14AH002	34UJK~~14026~~	M	M	SI	S C/NM	Y (5)
Toilet Supply Air Heater	30SAC14AH003	34UJK~~26021~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC15AA001	31UJH~~10022~~	M	H	SI	S	Y (5)
Fire Damper	30SAC15AA002	31UJH~~05021~~	M	H	SI	S	Y (5)
Fire Damper	30SAC15AA003	31UJH~~05022~~	M	H	SI	S	Y (5)
Fire Damper	30SAC15AA004	31UJH~~05021~~	M	H	SI	S	Y (5)
Fire Damper	30SAC15AA005	31UJH~~01022~~	M	H	SI	S	Y (5)
Fire Damper	30SAC15AA006	31UJH~~01021~~	M	H	SI	S	Y (5)
Fire Damper	30SAC15AA007	31UJH~~01021~~	M	H	SI	S	Y (5)
Toilet Supply Air Heater	30SAC15AH001	31UJH~~10024~~	M	H	SI	S C/NM	Y (3) Y (5)
Fire Damper	30SAC16AA001	32UJH~~05020~~	M	H	SI	S	Y (5)
Fire Damper	30SAC16AA002	32UJH~~05020~~	M	H	SI	S	Y (5)
Fire Damper	30SAC16AA003	32UJH~~01020~~	M	H	SI	S	Y (5)
Fire Damper	30SAC16AA004	32UJH~~01040~~	M	H	SI	S	Y (5)
Fire Damper	30SAC16AA005	32UJH~~01040~~	M	H	SI	S	Y (5)
Fire Damper	30SAC17AA001	33UJH~~05020~~	M	H	SI	S	Y (5)
Fire Damper	30SAC17AA002	33UJH~~05020~~	M	H	SI	S	Y (5)
Fire Damper	30SAC17AA003	33UJH~~01020~~	M	H	SI	S	Y (5)
Fire Damper	30SAC17AA004	33UJH~~01040~~	M	H	SI	S	Y (5)
Fire Damper	30SAC17AA005	33UJH~~01040~~	M	H	SI	S	Y (5)
Fire Damper	30SAC18AA001	34UJH~~10022~~	M	H	SI	S	Y (5)
Fire Damper	30SAC18AA002	34UJH~~05021~~	M	H	SI	S	Y (5)
Fire Damper	30SAC18AA003	34UJH~~05022~~	M	H	SI	S	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Fire Damper	30SAC18AA004	34UJH~~05021~~	M	H	SI	S	Y (5)
Fire Damper	30SAC18AA005	34UJH~~01022~~	M	H	SI	S	Y (5)
Fire Damper	30SAC18AA006	34UJH~~05021~~	M	H	SI	S	Y (5)
Fire Damper	30SAC18AA007	34UJH~~01022~~	M	H	SI	S	Y (5)
Toilet Supply Air Heater	30SAC18AH001	34UJH~~10024~~	M	H	SI	S C/NM	Y (3) Y (5)
Fire Damper	30SAC21AA001	31UJK~~34022~~	M	M	SI	S	Y (5)
Fire Damper	30SAC21AA003	31UJK~~34024~~	M	M	SI	S	Y (5)
Fire Damper	30SAC21AA004	31UJK~~31027~~	M	M	SI	S	Y (5)
Fire Damper	30SAC21AA005	31UJK~~14026~~	M	M	SI	S	Y (5)
Fire Damper	30SAC21AA006	31UJK~~14031~~	M	M	SI	S	Y (5)
Fire Damper	30SAC21AA007	31UJK~~18025~~	M	M	SI	S	Y (5)
Fire Damper	30SAC21AA008	31UJK~~18027~~	M	M	SI	S	Y (5)
Return Air Adjustable Damper	30SAC21AA009	31UJK~~18031~~	M	M	SI	S C/NM	Y (5)
Return Air Adjustable Damper	30SAC21AA010	31UJK~~18025~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC21AA011	31UJK~~18031~~	M	M	SI	S	Y (5)
Fire Damper	30SAC21AA012	31UJK~~18031~~	M	M	SI	S	Y (5)
Fire Damper	30SAC21AA013	31UJK~~18031~~	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC21AA014	31UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Adjustable Damper	30SAC21AA016	31UJK~~18031~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Pressure Prot Damper	30SAC21AA020	31UJK~~22038~~	M	M	SI	S C/NM	Y (5)
Exhaust Screen	30SAC21AT001	31UJK~~22038~~	M	M	SI	S	Y (5)
Exhaust Screen	30SAC21AT002	31UJK~~22038~~	M	M	SI	S	Y (5)
Exhaust Air Silencer	30SAC21BS001	31UJK~~22039~~	M	M	SI	S	Y (5)
Exhaust Air Silencer	30SAC21BS002	31UJK~~22039~~	M	M	SI	S	Y (5)
Maint Exhaust Air Isolation Damper	30SAC22AA001	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC22AA006	32UJK~~14020~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA007	32UJK~~18002~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA008	32UJK~~18005~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA010	32UJK~~18020~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA011	32UJK~~18020~~	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC22AA012	32UJK~~18020~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC22AA013	32UJK~~18020~~	M	M	SI	S	Y (5)
Exhaust Air Div 3 Control Damper	30SAC22AA015	32UJK~~22020~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 176 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Fire Damper	30SAC22AA016	32UJK~~22004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA017	32UJK~~22004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA018	32UJK~~22028~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA019	32UJK~~22028~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA021	32UJK~~22028~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA023	32UJK~~31040~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA024	32UJK~~31040~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA025	32UJK~~31040~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA026	32UJK~~31036~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA027	32UJK~~31036~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA028	32UJK~~31020~~	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC22AA029	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC22AA031	32UJK~~18005~~	M	M	SI	S	Y (5)
Fire Damper	30SAC22AA032	32UJK~~22028~~	M	M	SI	S	Y (5)
Exhaust Screen	30SAC22AT001	32UJK~~31045~~	M	M	SI	S	Y (5)
Exhaust Screen	30SAC22AT002	32UJK~~31045~~	M	M	SI	S	Y (5)
Exhaust Air Silencer	30SAC22BS001	32UJK~~31032~~	M	M	SI	S	Y (5)
Maint Exhaust Air Isolation Damper	30SAC23AA001	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC23AA006	33UJK~~14020~~	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA007	33UJK~~18002~~	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA008	33UJK~~18004~~	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC23AA009	33UJK~~18020~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC23AA010	33UJK~~18020~~	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA011	33UJK~~18020~~	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC23AA012	33UJK~~18020~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC23AA013	33UJK~~18020~~	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA014	33UJK~~22030~~	M	M	SI	S	Y (5)
Exhaust Air Div 3 Control Damper	30SAC23AA015	33UJK~~22030~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC23AA016	33UJK~~22004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA017	33UJK~~22004~~	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA018	33UJK~~22028~~	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA019	33UJK~~22028~~	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA021	33UJK~~22028~~	M	M	SI	S	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Fire Damper	30SAC23AA022	33UJK22030	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA023	33UJK31040	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA024	33UJK31040	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA025	33UJK31040	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA026	33UJK31036	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA027	33UJK31036	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA028	33UJK31020	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC23AA029	33UJK31032	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC23AA031	33UJK18004	M	M	SI	S	Y (5)
Fire Damper	30SAC23AA032	33UJK22028	M	M	SI	S	Y (5)
Exhaust Screen	30SAC23AT001	33UJK31045	M	M	SI	S	Y (5)
Exhaust Screen	30SAC23AT002	33UJK31045	M	M	SI	S	Y (5)
Exhaust Air Silencer	30SAC23BS001	33UJK31032	M	M	SI	S	Y (5)
Fire Damper	30SAC24AA001	34UJK34022	M	M	SI	S	Y (5)
Fire Damper	30SAC24AA003	34UJK34024	M	M	SI	S	Y (5)
Exhaust Air Fire Damper	30SAC24AA004	34UJK31027	M	M	SI	S	Y (5)
Fire Damper	30SAC24AA005	34UJK14026	M	M	SI	S	Y (5)
Fire Damper	30SAC24AA006	34UJK14031	M	M	SI	S	Y (5)
Fire Damper	30SAC24AA007	34UJK18025	M	M	SI	S	Y (5)
Fire Damper	30SAC24AA008	34UJK18024	M	M	SI	S	Y (5)
Return Air Adjustable Damper	30SAC24AA009	34UJK18031	M	M	SI	S C/NM	Y (5)
Return Air Adjustable Damper	30SAC24AA010	34UJK18025	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC24AA011	34UJK18031	M	M	SI	S	Y (5)
Fire Damper	30SAC24AA012	34UJK18031	M	M	SI	S	Y (5)
Fire Damper	30SAC24AA013	34UJK18031	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC24AA014	34UJK22039	M	M	SI	S C/NM	Y (5)
Exhaust Air Adjustable Damper	30SAC24AA016	34UJK18031	M	M	SI	S C/NM	Y (5)
Exhaust Screen	30SAC24AT001	34UJK22038	M	M	SI	S	Y (5)
Exhaust Screen	30SAC24AT002	34UJK22038	M	M	SI	S	Y (5)
Exhaust Air Silencer	30SAC24BS001	34UJK22039	M	M	SI	S	Y (5)
Exhaust Air Silencer	30SAC24BS002	34UJK22039	M	M	SI	S	Y (5)
Exhaust Fan Isolation Damper	30SAC31AA001	31UJK22039	M	M	SI	S C/NM	Y (5)
Exhaust Air Control Damper	30SAC31AA002	31UJK22039	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Exhaust Air Isolation Damper	30SAC31AA003	31UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan Isolation Damper	30SAC31AA004	31UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan Motor Heater	30SAC31AH501	31UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan	30SAC31AN001	31UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan Isolation Damper	30SAC32AA001	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Control Damper	30SAC32AA002	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Backdraft Damper	30SAC32AA003	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan Isolation Damper	30SAC32AA004	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan Motor Heater	30SAC32AH501	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan	30SAC32AN001	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Silencer	30SAC32BS002	32UJK~~31032~~	M	M	SI	S	Y (5)
Exhaust Fan Isolation Damper	30SAC33AA001	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Control Damper	30SAC33AA002	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Backdraft Damper	30SAC33AA003	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan Isolation Damper	30SAC33AA004	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan Motor Heater	30SAC33AH501	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan	30SAC33AN001	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Silencer	30SAC33BS002	33UJK~~31032~~	M	M	SI	S	Y (5)
Exhaust Fan Isolation Damper	30SAC34AA001	34UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Control Damper	30SAC34AA002	34UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Isolation Damper	30SAC34AA003	34UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan Isolation Damper	30SAC34AA004	34UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan Motor Heater	30SAC34AH501	34UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan	30SAC34AN001	34UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Maint Exhaust Fan Isolation Damper	30SAC35AA001	31UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Isolation Damper-maint	30SAC35AA004	31UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Maint Exhaust Fan Isolation Damper	30SAC38AA001	34UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Isolation Damper-maint	30SAC38AA004	34UJK~~22039~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Control Damper	30SAC41AA001	31UJK~~18028~~	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC41AA002	31UJK~~18024~~	M	M	SI	S	Y (5)
Fire Damper	30SAC41AA003	31UJK~~22028~~	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC41AA004	31UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Silencer	30SAC41BS001	31UJK~~22030~~	M	M	SI	S	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Battery Room Exhaust Silencer	30SAC41BS002	31UJK22030	M	M	SI	S	Y (5)
Exhaust Air Control Damper	30SAC42AA001	32UJK22028	M	M	SI	S C/NM	Y (5)
Exhaust Air Adjustable Damper	30SAC42AA002	32UJK22028	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC42AA003	32UJK22028	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC42AA004	32UJK31032	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Silencer	30SAC42BS001	32UJK31032	M	M	SI	S	Y (5)
Battery Room Exhaust Silencer	30SAC42BS002	32UJK31032	M	M	SI	S	Y (5)
Exhaust Air Control Damper	30SAC43AA001	33UJK22028	M	M	SI	S C/NM	Y (5)
Exhaust Air Adjustable Damper	30SAC43AA002	33UJK22028	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC43AA003	33UJK22028	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC43AA004	33UJK31032	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Silencer	30SAC43BS001	33UJK31032	M	M	SI	S	Y (5)
Battery Room Exhaust Silencer	30SAC43BS002	33UJK31032	M	M	SI	S	Y (5)
Exhaust Air Control Damper	30SAC44AA001	34UJK18028	M	M	SI	S C/NM	Y (5)
Fire Damper	30SAC44AA002	34UJK18024	M	M	SI	S	Y (5)
Fire Damper	30SAC44AA003	34UJK22028	M	M	SI	S	Y (5)
Exhaust Air Adjustable Damper	30SAC44AA004	34UJK22028	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Silencer	30SAC44BS001	34UJK22028	M	M	SI	S	Y (5)
Battery Room Exhaust Silencer	30SAC44BS002	34UJK22028	M	M	SI	S	Y (5)
Fire Damper	30SAC45AA001	31UJH10021	M	H	SI	S	Y (5)
Fire Damper	30SAC45AA002	31UJH10021	M	H	SI	S	Y (5)
Fire Damper	30SAC45AA003	31UJK22028	M	M	SI	S	Y (5)
Fire Damper	30SAC46AA001	32UJH10040	M	H	SI	S	Y (5)
Fire Damper	30SAC46AA002	32UJH10040	M	H	SI	S	Y (5)
Fire Damper	30SAC46AA003	32UJH10020	M	H	SI	S	Y (5)
Fire Damper	30SAC47AA001	33UJH10040	M	H	SI	S	Y (5)
Fire Damper	30SAC47AA002	33UJH10040	M	H	SI	S	Y (5)
Fire Damper	30SAC47AA003	33UJH10020	M	H	SI	S	Y (5)
Fire Damper	30SAC48AA001	34UJH10021	M	H	SI	S	Y (5)
Fire Damper	30SAC48AA002	34UJH05021	M	H	SI	S	Y (5)
Fire Damper	30SAC48AA003	34UJK22028	M	M	SI	S	Y (5)
Battery Room Exhaust Isolation Damper	30SAC51AA001	31UJK22030	M	M	SI	S C/NM	Y (5)
Battery Exhaust Backdraft Damper	30SAC51AA002	31UJK22030	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 180 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Battery Exhaust Air Control Damper-Maint	30SAC51AA003	31UJK~~22030~~	M	M	SI	S C/NM	Y (5)
Battery Rm Exhaust Isol Damper-Maint	30SAC51AA004	31UJK~~22030~~	M	M	SI	S C/NM	Y (5)
Battery Exhaust Control Damper-Maint	30SAC51AA006	31UJK~~22030~~	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Fan	30SAC51AN001	31UJK~~22030~~	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Isolation Damper	30SAC52AA001	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Exhaust Backdraft Damper	30SAC52AA002	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Exhaust Air Control Damper	30SAC52AA003	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Rm Exhaust Isol Damper-Maint	30SAC52AA004	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Exhaust Control Damper-Maint	30SAC52AA006	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Fan	30SAC52AN001	32UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Isolation Damper	30SAC53AA001	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Exhaust Backdraft Damper	30SAC53AA002	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Exhaust Air Control Damper	30SAC53AA003	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Rm Exhaust Isol Damper-Maint	30SAC53AA004	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Exhaust Control Damper-Maint	30SAC53AA006	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Fan	30SAC53AN001	33UJK~~31032~~	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Isolation Damper	30SAC54AA001	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Battery Exhaust Backdraft Damper	30SAC54AA002	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Battery Exhaust Air Control Damper-maint	30SAC54AA003	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Battery Rm Exhaust Isol Damper-Maint	30SAC54AA004	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Battery Exhaust Control Damper-Maint	30SAC54AA006	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
Battery Room Exhaust Fan	30SAC54AN001	34UJK~~22028~~	M	M	SI	S C/NM	Y (5)
LAS Pump Room Recirc Cooler	30SAC61AC001	31UJH~~01024~~	M	H	SI	S	Y (5)
KAA Pump Room Recirc Cooler	30SAC61AC002	31UJH~~01026~~	M	H	SI	S	Y (5)
LAS Pump Room Recirc Fan	30SAC61AN001	31UJH~~01024~~	M	H	SI	S C/NM	Y (3) Y (5)
KAA Pump Room Recirc Fan	30SAC61AN002	31UJH~~01026~~	M	H	SI	S C/NM	Y (3) Y (5)
Moisture Separator Recirc Cooler	30SAC61AT001	31UJH~~01024~~	M	H	SI	S	Y (5)
Moisture Separator Recirc Cooler	30SAC61AT002	31UJH~~01026~~	M	H	SI	S	Y (5)
LAS Pump Room Recirc Cooler	30SAC62AC001	32UJH~~01024~~	M	H	SI	S	Y (5)
KAA Pump Room Recirc Cooler	30SAC62AC002	32UJH~~01020~~	M	H	SI	S	Y (5)
LAS Pump Room Recirc Fan	30SAC62AN001	32UJH~~01024~~	M	H	SI	S C/NM	Y (3) Y (5)
KAA Pump Room Recirc Fan	30SAC62AN002	32UJH~~01020~~	M	H	SI	S C/NM	Y (3) Y (5)
Moisture Separator Recirc Cooler	30SAC62AT001	32UJH~~01024~~	M	H	SI	S	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 181 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Moisture Separator Recirc Cooler	30SAC62AT002	32UJH~~01020~~	M	H	SI	S	Y (5)
LAS Pump Room Recirc Cooler	30SAC63AC001	33UJH~~01024~~	M	H	SI	S	Y (5)
KAA Pump Room Recirc Cooler	30SAC63AC002	33UJH~~01020~~	M	H	SI	S	Y (5)
LAS Pump Room Recirc Fan	30SAC63AN001	33UJH~~01024~~	M	H	SI	S C/NM	Y (3) Y (5)
KAA Pump Room Recirc Fan	30SAC63AN002	33UJH~~01020~~	M	H	SI	S C/NM	Y (3) Y (5)
Moisture Separator Recirc Cooler	30SAC63AT001	33UJH~~01024~~	M	H	SI	S	Y (5)
Moisture Separator Recirc Cooler	30SAC63AT002	33UJH~~01020~~	M	H	SI	S	Y (5)
LAS Pump Room Recirc Cooler	30SAC64AC001	34UJH~~01024~~	M	H	SI	S	Y (5)
KAA Pump Room Recirc Cooler	30SAC64AC002	34UJH~~01026~~	M	H	SI	S	Y (5)
LAS Pump Room Recirc Fan	30SAC64AN001	34UJH~~01024~~	M	H	SI	S C/NM	Y (3) Y (5)
KAA Pump Room Recirc Fan	30SAC64AN002	34UJH~~01026~~	M	H	SI	S C/NM	Y (3) Y (5)
Moisture Separator Recirc Cooler	30SAC64AT001	34UJH~~01024~~	M	H	SI	S	Y (5)
Moisture Separator Recirc Cooler	30SAC64AT002	34UJH~~01026~~	M	H	SI	S	Y (5)
Toilet Exhaust Fan Isol Damper	30SAC65AA002	31UJK~~34024~~	M	M	SI	S C/NM	Y (5)
Fuel Building Ventilation System (FBVS)							
Supp Iso Damper Equip Hatch	30KLL11AA001	30UFA~~29090~~	M	H	SI	S	Y (5)
Sup Iso Damper, Fuel Hdlg Hall Div 1	30KLL11AA002	30UFA~~29045~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper, Emer Airlock Div 1	30KLL11AA003	30UFA~~29005~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso/Cntr Damper, Fuel Pool Flr	30KLL11AA010	30UFA~~29015~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Sup Iso Damper, Equip Hatch Div 4	30KLL14AA001	30UFA~~29090~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper, Fuel Hdlg Hall Div 4	30KLL14AA002	30UFA~~29015~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper, Emer Airlock Div 4	30KLL14AA003	30UFA~~29004~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper Equip Hatch	30KLL21AA001	30UFA~~29090~~	M	H	SI	S	Y (5)
Exh Iso Damper, Fuel Pool Flr to KLC	30KLL21AA002	30UFA~~29015~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper, Emer Airlock Div 1	30KLL21AA003	30UFA~~29005~~	M	H	SI	S	Y (5)
Exh Iso Damper (KLL - Cell 4 to KLE)	30KLL21AA004	30UFA~~29015~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper, Equip Hatch Div 4	30KLL24AA001	30UFA~~29090~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper, Fuel Hdlg Hall Div 4	30KLL24AA002	30UFA~~29045~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper, Emer Airlock	30KLL24AA003	30UFA~~29005~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper (KLL - Cell 4 to KLE)	30KLL24AA004	30UFA~~29015~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso/Cntr Damper (KLE to KLL - Cell 5)	30KLL31AA049	30UFA~~24045~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso Damper (KLE to KLL - Cell 4)	30KLL31AA090	30UFA~~24095~~	M	H	SI	S C/NM	Y (3) Y (5)
Sup Iso/Cntr Damper (KLE to KLL - Cell 4)	30KLL34AA065	30UFA~~24095~~	M	H	SI	S C/NM	Y (3) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 182 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Sup Iso Damper (KLE to KLL - Cell 5)	30KLL34AA090	30UFA~~24045~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper (KLL - Cell 4 to KLE)	30KLL41AA100	30UFA~~29054~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper (KLL - Cell 5 to KLE)	30KLL41AA101	30UFA~~24056~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper (KLL - Cell 4 to KLE)	30KLL44AA100	30UFA~~29054~~	M	H	SI	S C/NM	Y (3) Y (5)
Exh Iso Damper (KLL - Cell 5 to KLE)	30KLL44AA101	30UFA~~24056~~	M	H	SI	S C/NM	Y (3) Y (5)
Recirc Cooling Coils, Ex Borating Pump	30KLL61AC001	30UFA~~01038~~	M	H	SI	S C/NM	Y (3) Y (5)
Recirc Cooling Coils, FP Cooling Pump	30KLL61AC002	30UFA~~01026~~	M	H	SI	S C/NM	Y (3) Y (5)
Recirc Cooling Coils, FP Cooling Pump	30KLL61AC003	30UFA~~05082~~	M	H	SI	S C/NM	Y (3) Y (5)
Air Heater, EBS Pump Room	30KLL61AH001	30UFA~~01038~~	M	H	SI	S C/NM	Y (3) Y (5)
Air Heater, EBS Pump Room	30KLL61AH002	30UFA~~01038~~	M	H	SI	S C/NM	Y (3) Y (5)
Air Heater, EBS Pipe Chase	30KLL61AH003	30UFA~~06039~~	M	H	SI	S C/NM	Y (3) Y (5)
Air Heater, EBS Pipe Chase	30KLL61AH004	30UFA~~06039~~	M	H	SI	S C/NM	Y (3) Y (5)
Air Heater, Loading Hall Duct	30KLL61AH010	30UFA~~10015~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Air Heater, Pipe Pene. Duct	30KLL61AH011	30UFA~~15045~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Recirc Fan, Ex Borating Pump RM	30KLL61AN001	30UFA~~01038~~	M	H	SI	S C/NM	Y (3) Y (5)
Recirc Fan, FP Cooling Pump RM	30KLL61AN002	30UFA~~01026~~	M	H	SI	S C/NM	Y (3) Y (5)
Recirc Fan, FP Cooling Pump RM	30KLL61AN003	30UFA~~05082~~	M	H	SI	S C/NM	Y (3) Y (5)
Moist Sep, Ex Borating Pump RM	30KLL61AT001	30UFA~~01038~~	M	H	SI	S C/NM	Y (3) Y (5)
Moist Sep, FP Cooling Pump RM	30KLL61AT002	30UFA~~01026~~	M	H	SI	S C/NM	Y (3) Y (5)
Moist Sep, FP Cooling Pump RM	30KLL61AT003	30UFA~~05082~~	M	H	SI	S C/NM	Y (3) Y (5)
Recirc Cooling Coils, Ex Borating Pump	30KLL64AC001	30UFA~~01088~~	M	H	SI	S C/NM	Y (3) Y (5)
Recirc Cooling Coils, FP Cooling Pump	30KLL64AC002	30UFA~~01076~~	M	H	SI	S C/NM	Y (3) Y (5)
Recirc Cooling Coils FP Cooling Pump R	30KLL64AC003	30UFA~~01077~~	M	H	SI	S C/NM	Y (3) Y (5)
Air Heater, EBS Pump Room	30KLL64AH001	30UFA~~01088~~	M	H	SI	S C/NM	Y (3) Y (5)
Air Heater, EBS Pump Room	30KLL64AH002	30UFA~~01088~~	M	H	SI	S C/NM	Y (3) Y (5)
Air Heater, EPS Pipe Chase	30KLL64AH003	30UFA~~06087~~	M	H	SI	S C/NM	Y (3) Y (5)
Air Heater, EPS Pipe Chase	30KLL64AH004	30UFA~~06087~~	M	H	SI	S C/NM	Y (3) Y (5)
Air Heater, Corridor Duct	30KLL64AH012	30UFA~~06057~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Air Heater, Corridor Duct	30KLL64AH013	30UFA~~06056~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Air Heater, Corridor Duct	30KLL64AH014	30UFA~~24056~~	M	H	SII	NS-AQ C/NM	Y (3) Y (5)
Recirc Fan, Ex Borating Pump RM	30KLL64AN001	30UFA~~01088~~	M	H	SI	S C/NM	Y (3) Y (5)
Recirc Fan, FP Cooling Pump RM	30KLL64AN002	30UFA~~01076~~	M	H	SI	S C/NM	Y (3) Y (5)
Recirc Fan, FP Cooling Pump RM	30KLL64AN003	30UFA~~01077~~	M	H	SI	S C/NM	Y (3) Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 183 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Moist Sep, Ex Borating Pump RM	30KLL64AT001	30UFA~~01088~~	M	H	SI	S C/NM	Y (3) Y (5)
Moist Sep, FP Cooling Pump RM	30KLL64AT002	30UFA~~01076~~	M	H	SI	S C/NM	Y (3) Y (5)
Moist Sep, FP Cooling Pump RM	30KLL64AT003	30UFA~~01077~~	M	H	SI	S C/NM	Y (3) Y (5)
Main Control Room Air Conditioning System (CRACS)							
Inlet Fire Damper - Div 1	30SAB01AA001	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Inlet Isolation Damper - Div 1	30SAB01AA002	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Makeup Air Isolation Damper - Div 1	30SAB01AA003	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Makeup Air Isolation Damper - Div 1	30SAB01AA004	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
MCRAirCond. Rm Return Balancing - Div1	30SAB01AA005	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Makeup Air Balancing Damper - Div 1	30SAB01AA006	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Air Fire Damper - Div 1~~-A~~	30SAB01AA007	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
~~Recirc. Return Air Fire Damper - Div 1 B~~	~~30SAB01AA008~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc. Return Air Isolation Damper - Div1	30SAB01AA009	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Air Balancing Damper - Div 1	30SAB01AA010	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Air Backdraft ~~flow~~ Damper - Div 1	30SAB01AA011	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Pressure Control Damper - Div 1	30SAB01AA012	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Supply Air Fire Damper - Div 1~~-A~~	30SAB01AA014	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
~~Recirc. Supply Air Fire Damper - Div 1 B~~	~~30SAB01AA015~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc. Cooling Coil - Div 1	30SAB01AC001	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Makeup Air Heater - Div 1	30SAB01AH001	32UJK~~31034~~	M	M	SI	S	Y (5)
Recirc. Fan Motor Heater - Div 1	30SAB01AH501	32UJK~~31034~~	M	M	SI	S	Y (5)
Recirc. Fan - Div 1	30SAB01AN001	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Makeup Air Prefilter - Div 1	30SAB01AT001	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Moisture ~~/ Condensate~~ Separator - Div 1	30SAB01AT004	32UJK~~31034~~	M	M	SI	S	Y (5)
Recirc. ~~HEPA~~Final Filter - Div 1	30SAB01AT005	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Silencer - Div 1	30SAB01BS001	32UJK~~31034~~	M	M	SI	S	Y (5)
Recirc. Fan Inlet Silencer - Div 1	30SAB01BS002	32UJK~~31034~~	M	M	SI	S	Y (5)
Recirc. Fan Outlet Silencer - Div 1	30SAB01BS003	32UJK~~31034~~	M	M	SI	S	Y (5)
~~Inlet Fire Damper - Div 2~~	~~30SAB02AA001~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
MCRAirCond. Rm Return Balanc Damp - Div 2	30SAB02AA005	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Air Fire Damper - Div 2~~-A~~	30SAB02AA007	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
~~Recirc. Return Air Fire Damper - Div 2 B~~	~~30SAB02AA008~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc. Return Air Isolation Damper - Div 2	30SAB02AA009	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Recirc. Return Air Balancing Damp - Div 2	30SAB02AA010	32UJK~~31035~~	M	M	SI~~I~~	S~~NS-AQ~~ C/NM	Y (5)
Recirc. Air Backdraft ~~flow~~ Damper - Div 2	30SAB02AA011	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
Recirc. Supply Air Fire Damper - Div 2 ~~A~~	30SAB02AA014	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
~~Recirc. Supply Air Fire Damper - Div 2 B~~	~~30SAB02AA015~~		~~M~~	~~M~~	~~SI~~	~~S~~ ~~C/NM~~	~~Y (5)~~
Recirc. Cooling Coil - Div 2	30SAB02AC001	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
Recirc. Fan Motor Heater - Div 2	30SAB02AH501	32UJK~~31035~~	M	M	SI	S	Y (5)
Recirc. Fan - Div 2	30SAB02AN001	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
Moisture ~~/ Condensate~~ Separator - Div 2	30SAB02AT004	32UJK~~31035~~	M	M	SI	S	Y (5)
Recirc. ~~HEPA~~Final Filter - Div 2	30SAB02AT005	32UJK~~31035~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Silencer - Div 2	30SAB02BS001	32UJK~~31035~~	M	M	SI	S	Y (5)
Recirc. Fan Inlet Silencer - Div 2	30SAB02BS002	32UJK~~31035~~	M	M	SI	S	Y (5)
Recirc. Fan Outlet Silencer - Div 2	30SAB02BS003	32UJK~~31035~~	M	M	SI	S	Y (5)
~~Inlet Fire Damper - Div 3~~	~~30SAB03AA001~~		~~M~~	~~M~~	~~SI~~	~~S~~ ~~C/NM~~	~~Y (5)~~
MCRAirCond Rm Return Balanc Damp - Div 3	30SAB03AA005	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Air Fire Damper - Div 3 ~~A~~	30SAB03AA007	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
~~Recirc. Return Air Fire Damper - Div 3 B~~	~~30SAB03AA008~~		~~M~~	~~M~~	~~SI~~	~~S~~ ~~C/NM~~	~~Y (5)~~
Recirc. Return Air Iso Damper - Div 3	30SAB03AA009	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Air Balancing Damp - Div 3	30SAB03AA010	33UJK~~31034~~	M	M	SI~~I~~	S~~NS-AQ~~ C/NM	Y (5)
Recirc. Air Backdraft ~~flow~~ Damper - Div 3	30SAB03AA011	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Supply Air Fire Damper - Div 3 ~~A~~	30SAB03AA014	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
~~Recirc. Supply Air Fire Damper - Div 3 B~~	~~30SAB03AA015~~		~~M~~	~~M~~	~~SI~~	~~S~~ ~~C/NM~~	~~Y (5)~~
Recirc. Cooling Coil - Div 3	30SAB03AC001	33UJK~~31035~~	M	M	SI	S C/NM	Y (5)
Recirc. Fan Motor Heater- Div 3	30SAB03AH501	33UJK~~31035~~	M	M	SI	S	Y (5)
Recirc. Fan - Div 3	30SAB03AN001	33UJK~~31035~~	M	M	SI	S C/NM	Y (5)
Moisture ~~/ Condensate~~ Separator - Div 3	30SAB03AT004	33UJK~~31035~~	M	M	SI	S	Y (5)
Recirc. ~~HEPA~~ Final Filter - Div 3	30SAB03AT005	33UJK~~31035~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Silencer - Div 3	30SAB03BS001	33UJK~~31035~~	M	M	SI	S	Y (5)
Recirc. Fan Inlet Silencer - Div 3	30SAB03BS002	33UJK~~31035~~	M	M	SI	S	Y (5)
Recirc. Fan Outlet Silencer - Div 3	30SAB03BS003	33UJK~~31035~~	M	M	SI	S	Y (5)
Inlet Fire Damper - Div 4	30SAB04AA001	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Inlet Isol. Damper - Div 4	30SAB04AA002	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Makeup Air Isol. Damper - Div 4	30SAB04AA003	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Makeup Air Isol. Damper - Div 4	30SAB04AA004	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 185 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Makeup Air Balancing Damper - Div 4	30SAB04AA006	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
MCRAirCond Rm Return Balanc Damp - Div 4	30SAB04AA005	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Air Fire Damper - Div 4~~-A~~	30SAB04AA007	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
~~Recirc. Return Air Fire Damper - Div 4 B~~	~~30SAB04AA008~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc. Return Air Isolation Damper - Div 4	30SAB04AA009	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Air Balancing Damper - Div 4	30SAB04AA010	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Air Backdraft~~-flow~~ Damper - Div 4	30SAB04AA011	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Pressure Control Damper - Div 4	30SAB04AA012	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Supply Air Fire Damper - Div 4~~-A~~	30SAB04AA014	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
~~Recirc. Supply Air Fire Damper - Div 4 B~~	~~30SAB04AA015~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc. Cooling Coil - Div 4	30SAB04AC001	33UJK~~31034~~	M	M	SI	S	Y (5)
Makeup Air Heaters - Div 4	30SAB04AH001	33UJK~~31034~~	M	M	SI	S	Y (5)
Recirc. Fan Motor Heater - Div 4	30SAB04AH501	33UJK~~31034~~	M	M	SI	S	Y (5)
Recirc. Fans - Div 4	30SAB04AN001	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Makeup Air Prefilters - Div 4	30SAB04AT001	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Moisture~~/ Condensate~~ Separator - Div 4	30SAB04AT004	33UJK~~31034~~	M	M	SI	S	Y (5)
Recirc. ~~HEPA~~Final Filter - Div 4	30SAB04AT005	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc. Return Silencer - Div 4	30SAB04BS001	33UJK~~31034~~	M	M	SI	S	Y (5)
Recirc. Fan Inlet Silencer - Div 4	30SAB04BS002	33UJK~~31034~~	M	M	SI	S	Y (5)
Recirc. Fan Outlet Silencer - Div 4	30SAB04BS003	33UJK~~31034~~	M	M	SI	S	Y (5)
Iodine Filtr. Inlet Isol. Damper - Div 1	30SAB11AA001	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Filtr. Outlet Air Back Flow Damper - Div 1	30SAB11AA002	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
~~SAB11 Recirc Back-draft Damper~~	~~30SAB11AA002~~		~~M~~	~~M~~	~~SII~~	~~NS-AQ~~	~~Y (5)~~
SAB11 Filtr Train Iso Damper Dwnstrm	30SAB11AA003	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc Gastight Iso Damper Div 2	30SAB11AA004	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Recirc. Air Back Flow Damper - Div 1	30SAB11AA005	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
SAB11 Filtration Trn Elec Preheater	30SAB11AH001	32UJK~~31034~~	M	M	SI	S	Y (5)
Iodine Filtr. Booster Fan - Div 1	30SAB11AN001	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Filtr. Prefilter - Div 1	30SAB11AT001	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Filtr. ~~Inlet~~ HEPA Filter - Div 1	30SAB11AT002	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Filtr. Charcoal Filter - Div 1	30SAB11AT003	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Filtr. ~~Outlet HEPA~~ Post Filter - Div 1	30SAB11AT004	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Moisture Separator - Div 1	30SAB11AT005	32UJK~~31034~~	M	M	SI	S	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Iodine Filtr. Inlet Iso. Damper - Div 4	30SAB14AA001	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
SAB14 Iodine Filtration Train ~~Check~~Backdraft Damper	30SAB14AA002	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
SAB14 Filtr Train Iso Damper Dwnstrm	30SAB14AA003	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Recirc Damper Div 3	30SAB14AA004	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
SAB14 Recirc Backdraft Damper	30SAB14AA005	33UJK~~31034~~	M	M	SI~~I~~	S~~NS-AQ~~	Y (5)
SAB14 Iodine Filtration Train Preheater	30SAB14AH001	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Filtration Booster Fan - Div 4	30SAB14AN001	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Filtration Prefilter - Div 4	30SAB14AT001	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Filtr. ~~Inlet~~ HEPA Filter - Div 4	30SAB14AT002	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Filtr. Charcoal Filter - Div 4	30SAB14AT003	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Iodine Filtr. ~~Outlet HEPA~~ Post Filter - Div 4	30SAB14AT004	33UJK~~31034~~	M	M	SI	S C/NM	Y (5)
Moisture Separator - Div 4	30SAB14AT005	33UJK~~31034~~	M	M	SI	S	Y (5)
MCRAirCond. Rm Supply Fire Damp - Div 1	30SAB31AA030	32UJK~~31034~~	M	M	SI	S C/NM	Y (5)
WC & Kitchen Supply Balancing Damper	30SAB32AA001	32UJK~~26029~~	M	M	SI	S C/NM	Y (5)
MCR Balancing Damper	30SAB32AA002	33UJK~~26029~~	M	M	SI	S C/NM	Y (5)
TechSupp/SpecUse Supply Balanc Damp	30SAB32AA003	32UJK~~26029~~	M	M	SI	S C/NM	Y (5)
~~TechSupport Supply Fire Damper A~~	~~30SAB32AA004~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~TechSupport Supply Fire Damper B~~	~~30SAB32AA005~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Tag/Shift Office Supply Balancing Damp	30SAB32AA006	32UJK~~26029~~	M	M	SI	S C/NM	Y (5)
MCR Kitchen, I&C, and Office Supply Air Fire Damper	30SAB32AA007	32UJK~~26033~~	M	M	SI	S C/NM	Y (5)
MCR Kitchen Supply Air Fire Damper	30SAB32AA008	32UJK~~31019~~	M	M	SI	S C/NM	Y (5)
Interconnec Passage Supply Fire Damper	30SAB32AA010	32UJK~~26020~~	M	M	SI	S C/NM	Y (5)
Interconnect Passage Supply Balanc Damp	30SAB32AA013	32UJK~~26020~~	M	M	SI	S C/NM	Y (5)
SICS1/Computer Rm1 Supply Balancing Damp	30SAB32AA015	32UJK~~26002~~	M	M	SI	S C/NM	Y (5)
SICS2/Computer Rm2 Supply Balancing Damp	30SAB32AA017	33UJK~~26002~~	M	M	SI	S C/NM	Y (5)
~~MCR, WC, & Kitchen Supply Fire Damp A~~	~~30SAB32AA020~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~MCR, WC, & Kitchen Supply Fire Damp B~~	~~30SAB32AA021~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~MCR, WC & Kitchen Supply Fire Damp C~~	~~30SAB32AA022~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~MCRAirCond. Rm Supply Fire Damp - Div 2~~	~~30SAB32AA030~~		~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Electric Duct Heater Division 2	30SAB32AH001	32UJK~~26030~~	M	M	SI	S C/NM	Y (5)
Electric Duct Heater Division 3	30SAB32AH002	33UJK~~26030~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 187 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
Electric Duct Heater Division 2	30SAB32AH003	32UJK26015	M	M	SI	S	C/NM	Y (5)
Electric Duct Heater Division 3	30SAB32AH004	33UJK26044	M	M	SI	S	C/NM	Y (5)
Electric Duct Heater Division 3	30SAB32AH005	33UJK26034	M	M	SI	S	C/NM	Y (5)
Electric Duct Heater Division 3	30SAB32AH006	33UJK26032	M	M	SI	S	C/NM	Y (5)
Electric Duct Heater Division 3	30SAB32AH007	33UJK26030	M	M	SI	S	C/NM	Y (5)
Supply Air Duct Silencer 1	30SAB32BS001	32UJK31019	M	M	SI	S		Y (5)
Supply Air Duct Silencer 2	30SAB32BS002	32UJK31019	M	M	SI	S		Y (5)
MCRAirCond Rm Supply Fire Damper - Div 3	30SAB33AA030		M	M	SI	S	C/NM	Y (5)
MCRAirCond Rm Supply Fire Damper- Div 4	30SAB34AA030		M	M	SI	S	C/NM	Y (5)
Exhaust Air Recirc. Vol Contr Damper A	30SAB42AA001	32UJK26031	M	M	SI	S	C/NM	Y (5)
Exhaust Air Recirc. Vol. Contr Damper B	30SAB42AA002	32UJK26031	M	M	SI	S	C/NM	Y (5)
Exhaust Air Recirc. Fire Damper	30SAB42AA003	32UJK26031	M	M	SI	S	C/NM	Y (5)
Interconnect Passage Exhaust Fire Damp A	30SAB42AA004		M	M	SI	S	C/NM	Y (5)
SICS2/Computer Rm2 Exhaust Fire Damp	30SAB42AA005	33UJK26002	M	M	SI	S	C/NM	Y (5)
SICS2/Computer Rm2 Exhaust Balanc Damp	30SAB42AA006	33UJK26002	M	M	SI	S	C/NM	Y (5)
Interconnect Passage Exhaust Fire Damp B	30SAB42AA007		M	M	SI	S	C/NM	Y (5)
SICS1/Computer Rm1 Exhaust Air Fire Damp	30SAB42AA008	32UJK26002	M	M	SI	S	C/NM	Y (5)
SICS1/Computer Rm1 Exhaust Balanc Damp	30SAB42AA009	32UJK26002	M	M	SI	S	C/NM	Y (5)
MCR Exhaust Fire Damper	30SAB42AA010	32UJK26031	M	M	SI	S	C/NM	Y (5)
MCR Exhaust Balancing Damper	30SAB42AA011	32UJK26031	M	M	SI	S	C/NM	Y (5)
TechSupport Exhaust Balancing Damp	30SAB42AA012	33UJK26006	M	M	SI	S	C/NM	Y (5)
TechSupport Exhaust Fire Damper	30SAB42AA013	33UJK26006	M	M	SI	S	C/NM	Y (5)
I&CServ/SpecialUse Exhaust Balanc Damp	30SAB42AA014	33UJK26044	M	M	SI	S	C/NM	Y (5)
I&CServ/SpecialUse Exhaust Fire Damp	30SAB42AA015	33UJK26044	M	M	SI	S	C/NM	Y (5)
Tag/ShiftOffice Exhaust Balancing Damp	30SAB42AA016	32UJK26029	M	M	SI	S	C/NM	Y (5)
Tag/ShiftOffice Exhaust Fire Damper	30SAB42AA017	32UJK26029	M	M	SI	S	C/NM	Y (5)
MCR Exhaust Air Fire Damper	30SAB42AA021	32UJK26030	M	M	SI	S	C/NM	Y (5)
Exhaust Air Fire Damper	30SAB45AA001		M	M	SI	S	C/NM	Y (5)
Exhaust Air Isolation Damper - A	30SAB45AA003	32UJK31020	M	M	SI	S	C/NM	Y (5)
Exhaust Air Isolation Damper - B	30SAB45AA004	32UJK31020	M	M	SI	S	C/NM	Y (5)
Exhaust Air Balancing Damper	30SAB45AA005	32UJK31020	M	M	SII	NS-AQ	C/NM	Y (5)
Exhaust Air Backdraft flow Damper	30SAB45AA006	32UJK31020	M	M	SII	SNS-AQ	C/NM	Y (5)
Restrooms Exhaust Air Fire Damper	30SAB45AA008		M	M	SI	S	C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
~~Kitchen Exhaust Fire Damper~~	~~30SAB45AA009~~		~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~
Exhaust Fan	30SAB45AN001	32UJK~~31020~~	M	M	SII	NS-AQ	C/NM	Y (5)
Exhaust Fan Silencer	30SAB45BS001	32UJK~~31020~~	M	M	SII	NS-AQ		Y (5)
Essential Service Water Pump Building Ventilation System (ESWPBVS)								
Recirc Chiller Balancing Damper Bldg 1	30SAQ01AA002	31UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Plug Valve Chiller Cold Leg Bldg 1	30SAQ01AA003	31UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Plug Valve Chiller Hot Leg Bldg 1	30SAQ01AA004	31UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Recirc Chiller Prefilter Bldg 1	30SAQ01AT002	31UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Recirc Chiller Bldg 1	30SAQ01AC001	31UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Elec Room Air Heater Bldg 1	30SAQ01AH001	31UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Elec Room Air Heater Bldg 1	30SAQ01AH002	31UBQ~~02001~~	M	M	SI	S	C/NM	Y (5)
Recirc Fan Bldg 1	30SAQ01AN001	31UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Impact Sep Bldg 1	30SAQ01AT001	31UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Inlet Air Isol Damper Bldg 1	30SAQ01AH007	31UBQ~~02001~~	M	M	SI	S	C/NM	Y (5)
Exhaust Air Isol Damper Bldg 1	30SAQ01AH005	31UBQ~~02001~~	M	M	SI	S	C/NM	Y (5)
Split Clr Inlet Balancing Damper Bldg 1	30SAQ01AA008	31UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Split Clr Recirc Balancing Damper Bldg 1	30SAQ01AA006	31UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Split Clr Prefilter Bldg 1	30SAQ01AT003	31UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Split Refrig Air Chiller Unit Bldg 1	30SAQ01AC002	31UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Split Refrig Air Cooler Unit Bldg 1	30SAQ01AC102	31UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Split Cooler Fan Bldg 1	30SAQ01AN002	31UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Recirc Chiller Balancing Damper Bldg 2	30SAQ02AA002	32UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Plug Valve Chiller Cold Leg Bldg 2	30SAQ02AA003	32UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Plug Valve Chiller Hot Leg Bldg 2	30SAQ02AA004	32UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Recirc Chiller Prefilter Bldg 2	30SAQ02AT002	32UBQ~~02001~~	M	M	SI	S	C/NM	Y (5)
Recirc Chiller Bldg 2	30SAQ02AC001	32UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Elec Room Air Heater Bldg 2	30SAQ02AH001	32UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Elec Room Air Heater Bldg 2	30SAQ02AH002	32UBQ~~02001~~	M	M	SI	S	C/NM	Y (5)
Recirc Fan Bldg 2	30SAQ02AN001	32UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Impact Sep Bldg 2	30SAQ02AT001	32UQB~~02001~~	M	M	SI	S	C/NM	Y (5)
Inlet Air Isol Damper Bldg 2	30SAQ02AH007	32UBQ~~02001~~	M	M	SI	S	C/NM	Y (5)
Exhaust Air Isol Damper Bldg 2	30SAQ02AH005	32UBQ~~02001~~	M	M	SI	S	C/NM	Y (5)
Split Clr Inlet Balancing Damper Bldg 2	30SAQ02AA008	32UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Split Clr Recirc Balancing Damper Bldg 2	30SAQ02AA006	32UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Split Clr Prefilter Bldg 2	30SAQ02AT003	32UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Split Refrig Air Chiller Unit Bldg 2	30SAQ02AC002	32UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Split Refrig Air Cooler Unit Bldg 2	30SAQ02AC102	32UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Split Cooler Fan Bldg 2	30SAQ02AN002	32UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Recirc Chiller Balancing Damper Bldg 3	30SAQ03AA002	33UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Plug Valve Chiller Cold Leg Bldg 3	30SAQ03AA003	33UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Plug Valve Chiller Hot Leg Bldg 3	30SAQ03AA004	33UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Recirc Chiller Prefilter Bldg 3	30SAQ03AT002	33UBQ~~02001~~	M	M	SI	S C/NM	Y (5)
Recirc Chiller Bldg 3	30SAQ03AC001	33UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Elec Room Air Heater Bldg 3	30SAQ03AH001	33UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Elec Room Air Heater Bldg 3	30SAQ03AH002	33UBQ~~02001~~	M	M	SI	S C/NM	Y (5)
Recirc Fan Bldg 3	30SAQ03AN001	33UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Impact Sep Bldg 3	30SAQ03AT001	33UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Inlet Air Isol Damper Bldg 3	30SAQ03AH007	33UBQ~~02001~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Isol Damper Bldg 3	30SAQ03AH005	33UBQ~~02001~~	M	M	SI	S C/NM	Y (5)
Split Clr Inlet Balancing Damper Bldg 3	30SAQ03AA008	33UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Split Clr Recirc Balancing Damper Bldg 3	30SAQ03AA006	33UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Split Clr Prefilter Bldg 3	30SAQ03AT003	33UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Split Refrig Air Chiller Unit Bldg 3	30SAQ03AC002	33UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Split Refrig Air Cooler Unit Bldg 3	30SAQ03AC102	33UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Split Cooler Fan Bldg 3	30SAQ03AN002	33UBQ~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Recirc Chiller Balancing Damper Bldg 4	30SAQ04AA002	34UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Plug Valve Chiller Cold Leg Bldg 4	30SAQ04AA003	34UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Plug Valve Chiller Hot Leg Bldg 4	30SAQ04AA004	34UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Recirc Chiller Prefilter Bldg 4	30SAQ04AT002	34UBQ~~02001~~	M	M	SI	S C/NM	Y (5)
Recirc Chiller Bldg 4	30SAQ04AC001	34UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Elec Room Air Heater Bldg 4	30SAQ04AH001	34UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Elec Room Air Heater Bldg 4	30SAQ04AH002	34UBQ~~02001~~	M	M	SI	S C/NM	Y (5)
Recirc Fan Bldg 4	30SAQ04AN001	34UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Impact Sep Bldg 4	30SAQ04AT001	34UQB~~02001~~	M	M	SI	S C/NM	Y (5)
Inlet Air Isol Damper Bldg 4	30SAQ04AH007	34UBQ~~02001~~	M	M	SI	S C/NM	Y (5)
Exhaust Air Isol Damper Bldg 4	30SAQ04AH005	34UBQ~~02001~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 190 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
Split Clr Inlet Balancing Damper Bldg 4	30SAQ04AA008	34UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Split Clr Recirc Balancing Damper Bldg 4	30SAQ04AA006	34UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Split Clr Prefilter Bldg 4	30SAQ04AT003	34UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Split Refrig Air Chiller Unit Bldg 4	30SAQ04AC002	34UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Split Refrig Air Cooler Unit Bldg 4	30SAQ04AC102	34UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Split Cooler Fan Bldg 4	30SAQ04AN002	34UBQ~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Emergency Power Generating Building Ventilation System (EPGBVS)								
Building Supply Backdraft Damper - Div 1	30SAD11AA003	31UBP~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Building Inlet Prefilter - Div 1	30SAD11AT003	31UBP~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Supply Fan - Div 1	30SAD11AN003	31UBP~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Supply Air Motor Damper - Div 1	30SAD11AA004	31UBP~~02001~~	M	M	SI	S	C/NM	Y (5)
Supply Air Manual Damper - Div 1	30SAD11AA005	31UBP~~01001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Building Exhaust Motor Damper - Div 1	30SAD15AA004	31UBP~~02002~~	M	M	SI	S	C/NM	Y (5)
Exhaust Fan - Div 1	30SAD15AN003	31UBP~~02002~~	M	M	SII	NS-AQ	C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 1	30SAD15AA003	31UBP~~02002~~	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Motor Damper - Div 1	30SAD13AA007	31UBP~~01002~~	M	M	SI	S	C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 1	30SAD13AA008	31UBP~~01002~~	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 1	30SAD13AA009	31UBP~~01002~~	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Prefilter - Div 1	30SAD13AT003	31UBP~~01002~~	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 1	30SAD13AC002	31UBP~~01002~~	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 1	30SAD13AC102	31UBP~~01002~~	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Fan - Div 1	30SAD13AN002	31UBP~~01002~~	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Exhaust Backdraft Damper - Div 1	30SAD13AA010	31UBP~~01002~~	M	M	SI	S	C/NM	Y (5)
Building Supply Backdraft Damper - Div 2	30SAD21AA003	32UBP~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Building Inlet Prefilter - Div 2	30SAD21AT003	32UBP~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Supply Fan - Div 2	30SAD21AN003	32UBP~~02001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Supply Air Motor Damper - Div 2	30SAD21AA004	32UBP~~02001~~	M	M	SI	S	C/NM	Y (5)
Supply Air Manual Damper - Div 2	30SAD21AA005	32UBP~~01001~~	M	M	SII	NS-AQ	C/NM	Y (5)
Building Exhaust Motor Damper - Div 2	30SAD25AA004	32UBP~~02002~~	M	M	SI	S	C/NM	Y (5)
Exhaust Fan - Div 2	30SAD25AN003	32UBP~~02002~~	M	M	SII	NS-AQ	C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 2	30SAD25AA003	32UBP~~02002~~	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Motor Damper - Div 2	30SAD23AA007	32UBP~~01002~~	M	M	SI	S	C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 2	30SAD23AA008	32UBP~~01002~~	M	M	SII	NS-AQ	C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Electrical Room Supply Air Manual Damper - Div 2	30SAD23AA009	32UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Prefilter - Div 2	30SAD23AT003	32UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 2	30SAD23AC002	32UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 2	30SAD23AC102	32UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Fan - Div 2	30SAD23AN002	32UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Exhaust Backdraft Damper - Div 2	30SAD23AA010	32UBP~~01002~~	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 3	30SAD31AA003	33UBP~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Building Inlet Prefilter - Div 3	30SAD31AT003	33UBP~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Supply Fan - Div 3	30SAD31AN003	33UBP~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Supply Air Motor Damper - Div 3	30SAD31AA004	33UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Supply Air Manual Damper - Div 3	30SAD31AA005	33UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Motor Damper - Div 3	30SAD35AA004	33UBP~~02002~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 3	30SAD35AN003	33UBP~~02002~~	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 3	30SAD35AA003	33UBP~~02002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Damper - Div 3	30SAD33AA007	33UBP~~01002~~	M	M	SI	S C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 3	30SAD33AA008	33UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 3	30SAD33AA009	33UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Prefilter - Div 3	30SAD33AT003	33UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 3	30SAD33AC002	33UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 3	30SAD33AC102	33UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Fan - Div 3	30SAD33AN002	33UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Exhaust Backdraft Damper - Div 3	30SAD33AA010	33UBP~~01002~~	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 4	30SAD41AA003	34UBP~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Building Inlet Prefilter - Div 4	30SAD41AT003	34UBP~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Supply Fan - Div 4	30SAD41AN003	34UBP~~02001~~	M	M	SII	NS-AQ C/NM	Y (5)
Supply Air Motor Damper - Div 4	30SAD41AA004	34UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Supply Air Manual Damper - Div 4	30SAD41AA005	34UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Motor Damper - Div 4	30SAD45AA004	34UBP~~02002~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 4	30SAD45AN003	34UBP~~02002~~	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 4	30SAD45AA003	34UBP~~02002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Damper - Div 4	30SAD43AA007	34UBP~~01002~~	M	M	SI	S C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 4	30SAD43AA008	34UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 4	30SAD43AA009	34UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 192 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Electrical Room Supply Air Prefilter - Div 4	30SAD43AT003	34UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 4	30SAD43AC002	34UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 4	30SAD43AC102	34UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Fan - Div 4	30SAD43AN002	34UBP~~01002~~	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Exhaust Backdraft Damper - Div 4	30SAD43AA010	34UBP~~01002~~	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 1	30SAD11AA001	31UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 1	30SAD11AA002	31UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Supply Fan - Div 1	30SAD11AN001	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Supply Fan - Div 1	30SAD11AN002	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Building Inlet Prefilter - Div 1	30SAD11AT001	31UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Building Inlet Prefilter - Div 1	30SAD11AT002	31UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper A - Div 1	30SAD12AA001	31UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper B - Div 1	30SAD12AA002	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper C - Div 1	30SAD12AA003	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper D - Div 1	30SAD12AA004	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper E - Div 1	30SAD12AA005	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc. Balancing Damper - Div 1	30SAD13AA002	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Fire Damper - Div 1	30SAD13AA004	31UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Fire Damper - Div 1	30SAD13AA005	31UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Recirc Unit Cooling Coil - Div 1	30SAD13AC001	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Supply Fan - Div 1	30SAD13AN001	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Prefilter - Div 1	30SAD13AT001	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit HEPA Filter - Div 1	30SAD13AT002	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Moisture Separator - Div 1	30SAD13AT003	31UBP~~01001~~	M	M	SI	S	Y (5)
Diesel Hall Space Heater/Fan 1 - Div 1	30SAD14AH001	31UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 2 - Div 1	30SAD14AH002	31UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 3 - Div 1	30SAD14AH003	31UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 4 - Div 1	30SAD14AH004	31UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 1	30SAD15AA001	31UBP~~02002~~	M	M	SI	S C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 1	30SAD15AA002	31UBP~~02002~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 1	30SAD15AN001	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 1	30SAD15AN002	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Main Tank Supply Backdraft Damp - Div 1	30SAD16AA001	31UBP~~01003~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 193 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Main Tank Supply Fire Damper - Div 1	30SAD16AA002	31UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Balancing Damp A - Div 1	30SAD16AA003	31UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Balancing Damp B - Div 1	30SAD16AA004	31UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Backflow Damp - Div 1	30SAD16AA005	31UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Supp Damper A - Div 1	30SAD16AA007	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Main Tank Supp Damper B - Div 1	30SAD16AA008	31UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Fuel Tank Room Space Heater - Div 1	30SAD16AH001	31UBP~~01003~~	M	M	SI	S	Y (5)
Fuel Tank Room Ventilation Fan - Div 1	30SAD16AN001	31UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 2	30SAD21AA001	32UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 2	30SAD21AA002	32UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Supply Fan - Div 2	30SAD21AN001	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Supply Fan - Div 2	30SAD21AN002	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Building Inlet Prefilter - Div 2	30SAD21AT001	32UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Building Inlet Prefilter - Div 2	30SAD21AT002	32UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper A - Div 2	30SAD22AA001	32UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper B - Div 2	30SAD22AA002	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper C - Div 2	30SAD22AA003	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper D - Div 2	30SAD22AA004	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper E - Div 2	30SAD22AA005	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc. Balancing Damper - Div 2	30SAD23AA002	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Fire Damper - Div 2	30SAD23AA004	32UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Fire Damper - Div 2	30SAD23AA005	32UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Recirc Unit Cooling Coil - Div 2	30SAD23AC001	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Supply Fan - Div 2	30SAD23AN001	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Prefilter - Div 2	30SAD23AT001	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit HEPA Filter - Div 2	30SAD23AT002	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Moisture Separator - Div 2	30SAD23AT003	32UBP~~01001~~	M	M	SI	S	Y (5)
Diesel Hall Space Heater/Fan 1 - Div 2	30SAD24AH001	32UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 2 - Div 2	30SAD24AH002	32UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 3 - Div 2	30SAD24AH003	32UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 4 - Div 2	30SAD24AH004	32UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 2	30SAD25AA001	32UBP~~02002~~	M	M	SI	S C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 2	30SAD25AA002	32UBP~~02002~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 194 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Exhaust Fan - Div 2	30SAD25AN001	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 2	30SAD25AN002	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Main Tank Supply Backdraft Damp - Div 2	30SAD26AA001	32UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Supply Fire Damper - Div 2	30SAD26AA002	32UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Balancing Damp A - Div 2	30SAD26AA003	32UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Balancing Damp B - Div 2	30SAD26AA004	32UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Backflow Damp - Div 2	30SAD26AA005	32UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Supp Damper A - Div 2	30SAD26AA007	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Main Tank Supp Damper B - Div 2	30SAD26AA008	32UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Fuel Tank Room Space Heater - Div 2	30SAD26AH001	32UBP~~01003~~	M	M	SI	S	Y (5)
Fuel Tank Room Ventilation Fan - Div 2	30SAD26AN001	32UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 3	30SAD31AA001	33UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 3	30SAD31AA002	33UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Supply Fan - Div 3	30SAD31AN001	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Supply Fan - Div 3	30SAD31AN002	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Building Inlet Prefilter - Div 3	30SAD31AT001	33UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Building Inlet Prefilter - Div 3	30SAD31AT002	33UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Recirc. Balancing Damper - Div 3	30SAD33AA002	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Fire Damper - Div 3	30SAD33AA004	33UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Fire Damper - Div 3	30SAD33AA005	33UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Recirc Unit Cooling Coil - Div 3	30SAD33AC001	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Supply Fan - Div 3	30SAD33AN001	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Prefilter - Div 3	30SAD33AT001	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit HEPA Filter - Div 3	30SAD33AT002	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Moisture Separator - Div 3	30SAD33AT003	33UBP~~01001~~	M	M	SI	S	Y (5)
Diesel Hall Space Heater/Fan 1 - Div 3	30SAD34AH001	33UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 2 - Div 3	30SAD34AH002	33UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 3 - Div 3	30SAD34AH003	33UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 4 - Div 3	30SAD34AH004	33UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 3	30SAD35AA001	33UBP~~02002~~	M	M	SI	S C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 3	30SAD35AA002	33UBP~~02002~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 3	30SAD35AN001	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 3	30SAD35AN002	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 195 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Main Tank Supply Backdraft Damp - Div 3	30SAD36AA001	33UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Supply Fire Damper - Div 3	30SAD36AA002	33UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Balancing Damp A - Div 3	30SAD36AA003	33UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Balancing Damp B - Div 3	30SAD36AA004	33UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Backflow Damp - Div 3	30SAD36AA005	33UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Supp Damper A - Div 3	30SAD36AA007	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Main Tank Supp Damper B - Div 3	30SAD36AA008	33UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Fuel Tank Room Space Heater - Div 3	30SAD36AH001	33UBP~~01003~~	M	M	SI	S	Y (5)
Fuel Tank Room Ventilation Fan - Div 3	30SAD36AN001	33UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 4	30SAD41AA001	34UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 4	30SAD41AA002	34UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Supply Fan - Div 4	30SAD41AN001	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Supply Fan - Div 4	30SAD41AN002	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Building Inlet Prefilter - Div 4	30SAD41AT001	34UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Building Inlet Prefilter - Div 4	30SAD41AT002	34UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper A - Div 1	30SAD42AA001	34UBP~~02001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper B - Div 1	30SAD42AA002	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper C - Div 1	30SAD42AA003	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper D - Div 1	30SAD42AA004	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper E - Div 1	30SAD42AA005	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc. Balancing Damper - Div 4	30SAD43AA002	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Fire Damper - Div 4	30SAD43AA004	34UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Fire Damper - Div 4	30SAD43AA005	34UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Recirc Unit Cooling Coil - Div 4	30SAD43AC001	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Supply Fan - Div 4	30SAD43AN001	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Prefilter - Div 4	30SAD43AT001	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit HEPA Filter - Div 4	30SAD43AT002	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Recirc Unit Moisture Separator - Div 4	30SAD43AT003	34UBP~~01001~~	M	M	SI	S	Y (5)
Diesel Hall Space Heater/Fan 1 - Div 4	30SAD44AH001	34UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 2 - Div 4	30SAD44AH002	34UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 3 - Div 4	30SAD44AH003	34UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 4 - Div 4	30SAD44AH004	34UBP~~01001~~	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 4	30SAD45AA001	34UBP~~02002~~	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 196 of 206

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Building Exhaust Backdraft Damper - Div 4	30SAD45AA002	34UBP~~02002~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 4	30SAD45AN001	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 4	30SAD45AN002	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Main Tank Supply Backdraft Damp - Div 4	30SAD46AA001	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Main Tank Supply Fire Damper - Div 4	30SAD46AA002	34UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Balancing Damp A - Div 4	30SAD46AA003	34UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Balancing Damp B - Div 4	30SAD46AA004	34UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Backflow Damp - Div 4	30SAD46AA005	34UBP~~01003~~	M	M	SI	S C/NM	Y (5)
Main Tank Supp Damper A - Div 4	30SAD46AA007	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Main Tank Supp Damper B - Div 4	30SAD46AA008	34UBP~~01001~~	M	M	SI	S C/NM	Y (5)
Fuel Tank Room Space Heater - Div 4	30SAD46AH001	34UBP~~01003~~	M	M	SI	S	Y (5)
Fuel Tank Room Ventilation Fan - Div 4	30SAD46AN001	34UBP~~01003~~	M	M	SI	S C/NM	Y (5)
CONTAINMENT ISOLATION SYSTEMS							
Fuel Pool Cooling and Purification System (FPCPS)							
Cooling Pumps Inlet Pres Sensor	30FAK10CP001	30UFA	M	H	SII	NS-AQ SII	Y(5)
Cooling Pumps Inlet Pres Sensor Isol	30FAK10AA304	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pumps Inlet Pres Sensor Isol	30FAK10AA303	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pumps Inlet Pres Sensor	30FAK10CP501	30UFA	M	H	SII	NS-AQ SII	Y(5)
Heat Exchanger Outlet Isol	30FAK10AA002	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Supply Header Bypass Isol	30FAK10AA004	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pump #1 Inlet Isol	30FAK11AA001	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pump #1 Disch Check	30FAK11AA002	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pump #1 Outlet Isol	30FAK11AA003	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pump #1 Disch Pres Sensor	30FAK11CP003	30UFA	M	H	SII	NS-AQ SII	Y(5)
Cooling Pump #1 Disch Pres Sensor Isol	30FAK11AA302	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pump #1 Disch Pres Sensor Isol	30FAK11AA301	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pump #1 Disch Pres Sensor	30FAK11CP503	30UFA	M	H	SII	NS-AQ SII	Y(5)
Cooling Pump #2 Inlet Isol	30FAK12AA001	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pump #2 Disch Check	30FAK12AA002	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pump #2 Outlet Isol	30FAK12AA003	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)
Cooling Pump #2 Disch Pres Sensor	30FAK12CP003	30UFA	M	H	SII	NS-AQ SII	Y(5)
Cooling Pump #2 Disch Pres Sensor Isol	30FAK12AA302	30UFA	M	H	SI	S SI C/NM	Y(3) Y(5)

Table 3.10-2—List of U.S. EPR Important-to-Safety Systems Screened for the Seismic Qualification Program Sheet 4 of 5

Category	Systems
HVAC Systems	Containment Building Ventilation KLA
	Annulus Ventilation KLB
	Safeguard Building Controlled Area Ventilation KLC
	Electrical Division Safeguards Building Ventilation SAC
	Fuel Building Ventilation KLL
	Main Control Room Air Conditioning SAB
	Essential Service Water Pump Building Ventilation SAQ
	Emergency Power Generating Building Ventilation SAD
	Nuclear Auxiliary Building Ventilation System KLE
Containment Isolation Systems[2]	Fuel Pool Cooling & Purification FAK, FAL
	Demineralized Water Distribution GHC
	Leak-off JMM
	Severe Accident Heat Removal JMQ
	Gaseous Waste Processing KPL
	Condensate (Inside Containment) LC, LD, MAG
	Central Gas Distribution (Nitrogen) QJ
	Operational Chilled Water – Nuclear Island QNA, QNB, QNJ

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
30PED20 AA019 Valve Motor Actuator	30PED20AA019	32UQB~~02001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED20 AA021 Valve Motor Actuator	30PED20AA021	32UQB~~02001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED20 AN001 Fan Motor	30PED20AN001	32URB~~03001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED20 AN002 Fan Motor	30PED20AN002	32URB~~03002~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED30 AA010 Valve Motor Actuator	30PED30AA010	33UQB~~02001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PEB10AA004 Valve Motor Actuator	30PEB10AA004	31UQB~~2001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PEB20AA004 Valve Motor Actuator	30PEB20AA004	32UQB~~2001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PEB30AA004 Valve Motor Actuator	30PEB30AA004	33UQB~~2001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PEB40AA004 Valve Motor Actuator	30PEB40AA004	34UQB~~2001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED30 AA011 Valve Motor Actuator	30PED30AA011	33UQB~~02001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED30 AA019 Valve Motor Actuator	30PED30AA019	33UQB~~02001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED30 AA021 Valve Motor Actuator	30PED30AA021	33UQB~~02001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED30 AN001 Fan Motor	30PED30AN001	33URB~~03001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED30 AN002 Fan Motor	30PED30AN002	33URB~~03002~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED40 AA010 Valve Motor Actuator	30PED40AA010	34UQB~~02001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED40 AA011 Valve Motor Actuator	30PED40AA011	34UQB~~02001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PED40 AA019 Valve Motor Actuator	30PED40AA019	34UQB~~02001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30PEDF40 AA021 Valve Motor Actuator	30PED40AA021	34UQB~~02001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
34PED40 AN001 Fan Motor	30PED40AN001	34URB~~03001~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
34PED40 AN002 Fan Motor	30PED40AN002	34URB~~03002~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Safety Chilled Water System (SCWS)							
Motor for Valve 30QKA10AA101	30QKA10AA101	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Motor for Valve 30QKA10AA102	30QKA10AA102	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Motor for Valve 30QKA10AA103	30QKA10AA103	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Motor for Pump #1 30QKA10AP107	30QKA10AP107	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Motor for Pump #2 30QKA10AP108	30QKA10AP108	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Motor for Valve30QKA20AA101	30QKA20AA101	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Motor for Valve 30QKA20AA102	30QKA20AA102	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Motor for Valve 30QKA20AA103	30QKA20AA103	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Motor for Pump #1 30QKA20AP107	30QKA20AP107	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Motor for Pump #2 30QKA20AP108	30QKA20AP108	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Motor for Valve 30QKA30AA101	30QKA30AA101	33UJH~~05020~~	M	H	ESY (SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)		Safety Class (Note 4)			EQ Program Designation (Note 5)		
Motor for Valve 30QKA30AA102	30QKA30AA102	33UJH~~05020~~	M	H	ES	SI	S	1E	EMC	Y (2)	Y (5)	Y (6)
Motor for Valve 30QKA30AA103	30QKA30AA103	33UJH~~05020~~	M	H	ES	SI	S	1E	EMC	Y (2)	Y (5)	Y (6)
Motor for Pump #1 30QKA30AP107	30QKA30AP107	33UJH~~05020~~	M	H	ES	SI	S	1E	EMC	Y (2)	Y (5)	Y (6)
Motor for Pump #2 30QKA30AP108	30QKA30AP108	33UJH~~05020~~	M	H	ES	SI	S	1E	EMC	Y (2)	Y (5)	Y (6)
Motor for Valve 30QKA40AA101	30QKA40AA101	34UJK~~26029~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor For Valve 30QKA40AA102	30QKA40AA102	34UJK~~22028~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor For Valve 30QKA40AA103	30QKA40AA103	34UJK~~22028~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor for Pump #1 30QKA40AP107	30QKA40AP107	34UJK~~22028~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor for Pump #2 30QKA40AP108	30QKA40AP108	34UJK~~22028~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor for Valve 30QKB10AA101	30QKB10AA101	32UJK~~31033~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor for Valve 30QKB20AA101	30QKB20AA101	32UJK~~31035~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor for Valve 30QKB30AA101	30QKB30AA101	33UJK~~31035~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor for Valve 30QKB40AA101	30QKB40AA101	32UJK~~31033~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor for Valve 30QKC10AA025	30QKC10AA025	31UJH~~01001~~	M	H	ES	SI	S	1E	EMC	Y (2)	Y (5)	Y (6)
Motor for Valve 30QKC10AA101	30QKC10AA101	31UJK~~26029~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor for Valve 30QKC20AA101	30QKC20AA101	32UJK~~31018~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor for Valve 30QKC30AA101	30QKC30AA101	33UJK~~31018~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Motor for Valve 30QKC40AA025	30QKC40AA025	34UJH~~01001~~	M	H	ES	SI	S	1E	EMC	Y (2)	Y (5)	Y (6)
Motor for Valve 30QKC40AA101	30QKC40AA101	34UJK~~26028~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
QK10AA101 Position Meas, Div 1	30QKA10CG101	31UJK~~26029~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
QK Pump #1 Level Meas, Div 1	30QKA10CL501	31UJK~~22028~~	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
~~QK Tank Humidity Meas, Div 1~~	~~30QKA10CM001~~		~~M~~	~~M~~	~~ES~~	~~SI~~	~~S~~	~~1E~~	~~EMC~~		~~Y (5)~~	~~Y (6)~~
30QKA10AN021 Fan Motor	30QKA10AN021	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
30QKA10AN022 Fan Motor	30QKA10AN022	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
30QKA10AN023 Fan Motor	30QKA10AN023	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
30QKA10AN024 Fan Motor	30QKA10AN024	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
30QKA10AN025 Fan Motor	30QKA10AN025	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
30QKA10AN026 Fan Motor	30QKA10AN026	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
30QKA10AN027Fan Motor	30QKA10AN027	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
30QKA10AN028Fan Motor	30QKA10AN028	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Supply Air Heater, Div 1	30QKA10AH021	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
Fan Room Temp Meas, Div 1	30QKA10CT022	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)
30QKA10AN021 Fan Motor Heater	30QKA10AH022	31UJK	M	M	ES	SI	S	1E	EMC		Y (5)	Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
30QKA10AN022 Fan Motor Heater	30QKA10AH023	31UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN023 Fan Motor Heater	30QKA10AH024	31UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN024 Fan Motor Heater	30QKA10AH025	31UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN025 Fan Motor Heater	30QKA10AH026	31UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN026 Fan Motor Heater	30QKA10AH027	31UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN027 Fan Motor Heater	30QKA10AH028	31UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN028 Fan Motor Heater	30QKA10AH001	31UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Evaporator/Compressor Unit Motor, Div 1	30QKA10AC001	31UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Evaporator/Compressor Unit Motor, Div 2	30QKA20AC001	32UJH	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Evaporator/Compressor Unit Motor, Div 3	30QKA30AC001	33UJH	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Evaporator/Compressor Unit Motor, Div 4	30QKA40AC001	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK System Press Meas #1, Div 1	30QKA10CP001	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK System Press Meas #2, Div 1	30QKA10CP002	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Chiller DP Press Meas, Div 1	30QKA10CP008	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK System Press Meas #3, Div 1	30QKA10CP501	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Tank Nitrogen Press Meas, Div 1	30QKA10CP502	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pump #1 Suct Press Meas, Div 1	30QKA10CP505	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pump #1 Disch Press Meas, Div 1	30QKA10CP506	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA10AA005 Upstrm Press Meas, Div 1	30QKA10CP507	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA10AA005 Dnstrm Press Meas, Div 1	30QKA10CP508	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA10AA008 Upstrm Press Meas, Div 1	30QKA10CP511	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA10AA008 Dnstrm Press Meas, Div 1	30QKA10CP512	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA10AT001 Upstrm Press Meas, Div 1	30QKA10CP513	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pump Temp Meas #1, Div 1	30QKA10CT001	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pump Temp Meas #2, Div 1	30QKA10CT002	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pump #1 Temp Meas #3, Div 1	30QKA10CT003	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #1, Div 1	30QKA10CT051	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #2, Div 1	30QKA10CT052	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp Motor Temp Meas #3, Div 1	30QKA10CT061	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp Motor Temp Meas #4, Div 1	30QKA10CT062	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp Motor Temp Meas #5, Div 1	30QKA10CT063	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA20AA101 Position Meas, Div 2	30QKA20CG101	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Level Meas, Div 2	30QKA20CL501	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
~~QK Tank Humidity Meas, Div 2~~	~~30QKA20CM001~~		~~M~~	~~H~~	~~ES SI~~	~~S 1E EMC~~	~~Y (2) Y (5) Y (6)~~
QK Tank Press Meas #1, Div 2	30QKA20CP001	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Tank Press Meas #2, Div 2	30QKA20CP002	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Chiller DP Press Meas, Div 2	30QKA20CP008	32UJH~~10020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Tank Press Meas #3, Div 2	30QKA20CP501	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Tank Nitrogen Press Meas, Div 2	30QKA20CP502	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Suct Press Meas, Div 2	30QKA20CP505	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Disch Press Meas, Div 2	30QKA20CP506	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA20AA005 Upstrm Press Meas, Div 2	30QKA20CP507	32UJH~~10020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA20AA005 Dnstrm Press Meas, Div 2	30QKA20CP508	32UJH~~10020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA20AA008 Upstrm Press Meas, Div 2	30QKA20CP511	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA20AA008 Dnstrm Press Meas, Div 2	30QKA20CP512	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA20AT001 Upstrm Press Meas, Div 2	30QKA20CP513	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA20AT001 Dnstrm Press Meas, Div 2	30QKA20CP514	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Temp Meas #1, Div 2	30QKA20CT001	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Temp Meas #2, Div 2	30QKA20CT002	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Temp Meas #3, Div 2	30QKA20CT003	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #1, Div 2	30QKA20CT051	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #2, Div 2	30QKA20CT052	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #3, Div 2	30QKA20CT061	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #4, Div 2	30QKA20CT062	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #5, Div 2	30QKA20CT063	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA30AA101 Position Meas, Div 3	30QKA30CG101	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pump #1 Level Meas, Div 3	30QKA30CL501	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
~~QK Tank Humidity Meas, Div 3~~	~~30QKA30CM001~~		~~M~~	~~H~~	~~ES SI~~	~~S 1E EMC~~	~~Y (2) Y (5) Y (6)~~
QK Tank Press Meas #1, Div 3	30QKA30CP001	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Tank Press Meas #2, Div 3	30QKA30CP002	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Chiller DP Press Meas, Div 3	30QKA30CP008	33UJH~~10020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Tank Press Meas #3, Div 3	30QKA30CP501	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Tank Nitrogen Press Meas, Div 3	30QKA30CP502	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pump #1 Suct Press Meas, Div 3	30QKA30CP505	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pump #1 Disch Press Meas, Div 3	30QKA30CP506	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA30AA005 Upstrm Press Meas, Div 3	30QKA30CP507	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
QKA30AA005 Dnstrm Press Meas, Div 3	30QKA30CP508	33UJH~~10020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA30AA008 Upstrm Press Meas, Div 3	30QKA30CP511	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA30AA008 Dnstrm Press Meas, Div 3	30QKA30CP512	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA30AT001 Upstrm Press Meas, Div 3	30QKA30CP513	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA30AT001 Dnstrm Press Meas, Div 3	30QKA30CP514	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pump #1 Temp Meas #1, Div 3	30QKA30CT001	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pump #1 Temp Meas #2, Div 3	30QKA30CT002	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pump #1 Temp Meas #3, Div 3	30QKA30CT003	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #1, Div 3	30QKA30CT051	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #2, Div 3	30QKA30CT052	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #3, Div 3	30QKA30CT061	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #4, Div 3	30QKA30CT062	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QK Pmp #1 Motor Temp Meas, Div 3	30QKA30CT063	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
30QKA10AN021 Fan Motor	30QKA40AN021	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN022 Fan Motor	30QKA40AN022	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN023 Fan Motor	30QKA40AN023	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN024 Fan Motor	30QKA40AN024	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN025 Fan Motor	30QKA40AN025	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN026 Fan Motor	30QKA40AN026	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN027Fan Motor	30QKA40AN027	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN028Fan Motor	30QKA40AN028	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Supply Air Heater, Div 1	30QKA40AH021	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
Fan Room Temp Meas, Div 4	30QKA40CT022	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN021 Fan Motor Heater	30QKA40AH022	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN022 Fan Motor Heater	30QKA40AH023	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN023 Fan Motor Heater	30QKA40AH024	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN024 Fan Motor Heater	30QKA40AH025	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN025 Fan Motor Heater	30QKA40AH026	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN026 Fan Motor Heater	30QKA40AH027	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN027 Fan Motor Heater	30QKA40AH028	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
30QKA10AN028 Fan Motor Heater	30QKA40AH029	34UJK	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA40AA101 Position Meas, Div 4	30QKA40CG101	34UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pump #1 Level Meas, Div 4	30QKA40CL501	34UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
QK Tank Humidity Meas, Div 4	30QKA40CM001		M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Tank Pressure Meas #1, Div 4	30QKA40CP001	34UJK26029	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Tank Press Meas #2, Div 4	30QKA40CP002	34UJK26029	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Chiller DP Press Meas, Div 4	30QKA40CP008	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Tank Press Meas #3, Div 4	30QKA40CP501	34UJK26029	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Tank Nitrogen Press Meas, Div 4	30QKA40CP502	34UJK26029	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp #1 Suct Press Meas, Div 4	30QKA40CP505	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp #1 Disch Press Meas, Div 4	30QKA40CP506	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA40AA005 Upstrm Press Meas, Div 4	30QKA40CP507	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA40AA005 Dnstrm Press Meas, Div 4	30QKA40CP508	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA40AA008 Upstrm Press Meas, Div 4	30QKA40CP511	34UJK26029	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA40AA008 Dnstrm Press Meas, Div 4	30QKA40CP512	34UJK26029	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA40AT001 Upstrm Press Meas, Div 4	30QKA40CP513	34UJK26029	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKA40AT001 Dnstrm Press Meas, Div 4	30QKA40CP514	34UJK26029	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pump #1 Temp Meas #1, Div 4	30QKA40CT001	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pump #1 Temp Meas #2, Div 4	30QKA40CT002	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pump #1 Temp Meas #3, Div 4	30QKA40CT003	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #1, Div 4	30QKA40CT051	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #2, Div 4	30QKA40CT052	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #3, Div 4	30QKA40CT061	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #4, Div 4	30QKA40CT062	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QK Pmp #1 Motor Temp Meas #5, Div 4	30QKA40CT063	34UJK22028	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB10AA101 Pos Meas, Div 1	30QKB10CG101	32UJK31034	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB01AC001 Upstrm Press Meas, Div 1	30QKB10CP501	32UJK31034	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB10AA002 Upstrm Press Meas, Div 1	30QKB10CP502	32UJK31034	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB10AA002 Dnstrm Press Meas, Div 1	30QKB10CP503	32UJK31034	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB10AT001 Upstrm Press Meas, Div 1	30QKB10CP504	32UJK31034	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB10AT001 Dnstrm Press Meas, Div 1	30QKB10CP505	32UJK31034	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB01AC001 Upstrm Temp Meas, Div 1	30QKB10CT501	32UJK31034	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB01AC001 Dnstrm Temp Meas, Div 1	30QKB10CT502	32UJK31034	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB20AA101 Position Meas, Div 2	30QKB20CG101	32UJK31035	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB02AC001 Upstrm Press Meas, Div 2	30QKB20CP501	32UJK31035	M	M	ES SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
QKB20AA002 Upstrm Press Meas, Div 2	30QKB20CP502	32UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB20AA002 Dnstrm Press Meas, Div 2	30QKB20CP503	32UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB20AT001 Upstrm Press Meas, Div 2	30QKB20CP504	32UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB20AT001 Dnstrm Press Meas, Div 2	30QKB20CP505	32UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB02AC001 Upstrm Temp Meas, Div 2	30QKB20CT501	32UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB02AC001 Dnstrm Temp Meas, Div 2	30QKB20CT502	32UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB30AA101 Position Meas, Div 3	30QKB30CG101	33UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB03AC001 Upstrm Press Meas, Div 3	30QKB30CP501	33UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB30AA002 Upstrm Press Meas, Div 3	30QKB30CP502	33UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB30AA002 Dnstrm Press Meas, Div 3	30QKB30CP503	33UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB30AT001 Upstrm Press Meas, Div 3	30QKB30CP504	33UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB30AT001 Dnstrm Press Meas, Div 3	30QKB30CP505	33UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB03AC001 Upstrm Temp Meas, Div 3	30QKB30CT501	33UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB03AC001 Dnstrm Temp Meas, Div 3	30QKB30CT502	33UJK~~31035~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB40AA101 Position Meas, Div 4	30QKB40CG101	33UJK~~31034~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB04AC001 Upstrm Press Meas, Div 4	30QKB40CP501	33UJK~~31034~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB40AA002 Upstrm Press Meas, Div 4	30QKB40CP502	33UJK~~31034~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB40AA002 Dnstrm Press Meas, Div 4	30QKB40CP503	33UJK~~31034~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB40AT001 Upstrm Press Meas, Div 4	30QKB40CP504	33UJK~~31034~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKB40AT001 Dnstrm Press Meas, Div 4	30QKB40CP505	33UJK~~31034~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB04AC001 Upstrm Temp Meas, Div 4	30QKB40CT501	33UJK~~31034~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAB04AC001 Dnstrm Temp Meas, Div 4	30QKB40CT502	33UJK~~31034~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC10AA101 Pos Meas, Div 1	30QKC10CG101	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC01AC001 Upstrm Press Meas, Div 1	30QKC10CP501	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC10AA002 Upstrm Press Meas, Div 1	30QKC10CP502	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC10AA002 Dnstrm Press Meas, Div 1	30QKC10CP503	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC61AC001 Upstrm Press Meas, Div 1	30QKC10CP504	31UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA005 Upstrm Press Meas, Div 1	30QKC10CP505	31UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA005 Dnstrm Press Meas, Div 1	30QKC10CP506	31UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC61AC002 Upstrm Press Meas, Div 1	30QKC10CP508	31UJH~~01026~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA009 Upstrm Press Meas, Div 1	30QKC10CP509	31UJH~~01026~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA009 Dnstrm Press Meas, Div 1	30QKC10CP510	31UJH~~01026~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC51AC001 Upstrm Press Meas, Div 1	30QKC10CP511	31UJH~~10001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
QKC10AA012 Upstrm Press Meas, Div 1	30QKC10CP512	31UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA012 Dnstrm Press Meas, Div 1	30QKC10CP513	31UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKA10AT001 Dnstrm Press Meas, Div 1	30QKC10CP514	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC10AT001 Upstrm Press Meas, Div 1	30QKC10CP519	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC10AT001 Dnstrm Press Meas, Div 1	30QKC10CP520	31UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
KLC51AC003 Upstrm Press Meas, Div 1	30QKC10CP521	31UJH~~10010~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA015 Upstrm Press Meas, Div 1	30QKC10CP522	31UJH~~10010~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA015 Dnstrm Press Meas, Div 1	30QKC10CP523	31UJH~~10010~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC51AC002 Upstrm Press Meas, Div 1	30QKC10CP524	31UJH~~10001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA018 Upstrm Press Meas, Div 1	30QKC10CP525	31UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA018 Dnstrm Press Meas, Div 1	30QKC10CP526	31UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA022 Dnstrm Press Meas, Div 1	30QKC10CP527	31UJH~~01001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC10AA022 Upstrm Press Meas, Div 1	30QKC10CP528	31UJH~~01001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
JNG10AP001 Upstrm Press Meas, Div 1	30QKC10CP529	31UJH~~01001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC01AC001 Upstrm Temp Meas, Div 1	30QKC10CT501	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC10AT001 Dnstrm Temp Meas, Div 1	30QKC10CT502	31UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC61AC001 Upstrm Temp Meas, Div 1	30QKC10CT503	31UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC61AC001 Dnstrm Temp Meas, Div 1	30QKC10CT504	31UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC61AC002 Upstrm Temp Meas, Div 1	30QKC10CT506	31UJH~~01026~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC61AC002 Dnstrm Temp Meas, Div 1	30QKC10CT507	31UJH~~01026~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC51AC001 Upstrm Temp Meas, Div 1	30QKC10CT508	31UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC51AC001 Dnstrm Temp Meas, Div 1	30QKC10CT509	31UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC51AC003 Dnstrm Temp Meas, Div 1	30QKC10CT510	31UJH~~10010~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC51AC002 Dnstrm Temp Meas, Div 1	30QKC10CT511	31UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC51AC003 Upstrm Temp Meas, Div 1	30QKC10CT512	31UJH~~10010~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
JNG10AP001 Dnstrm Temp Meas, Div 1	30QKC10CT513	31UJH~~01001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
JNG10AP001 Upstrm Temp Meas, Div 1	30QKC10CT514	31UJH~~01001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC51AC002 Upstrm Temp Meas, Div 1	30QKC10CT524	31UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC20AA101 Position Meas, Div 2	30QKC20CG101	32UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC02AC001 Upstrm Press Meas, Div 2	30QKC20CP501	32UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC20AA002 Upstrm Press Meas, Div 2	30QKC20CP502	32UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC20AA002 Dnstrm Press Meas, Div 2	30QKC20CP503	32UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC62AC001 Upstrm Press Meas, Div 2	30QKC20CP504	32UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
QKC20AA005 Upstrm Press Meas, Div 2	30QKC20CP505	32UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC20AA05 Dnstrm Press Meas, Div 2	30QKC20CP506	32UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC62AC002 Upstrm Press Meas, Div 2	30QKC20CP508	32UJH~~05002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC20AA009 Upstrm Press Meas, Div 2	30QKC20CP509	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC20AA009 Dnstrm Press Meas, Div 2	30QKC20CP510	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC52AC001 Upstrm Press Meas, Div 2	30QKC20CP511	32UJH~~05005~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC20AA012 Upstrm Press Meas, Div 2	30QKC20CP512	32UJH~~05005~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC20AA012 Dnstrm Press Meas, Div 2	30QKC20CP513	32UJH~~05005~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC20AT001 Upstrm Press Meas, Div 2	30QKC20CP519	32UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC20AT001 Dnstrm Press Meas, Div 2	30QKC20CP520	32UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
KLC52AC002 Upstrm Press Meas, Div 2	30QKC20CP521	32UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC20AA015 Upstrm Press Meas, Div 2	30QKC20CP522	32UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC20AA015 Dnstrm Press Meas, Div 2	30QKC20CP523	32UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC02AC001 Upstrm Temp Meas, Div 2	30QKC20CT501	32UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC02AC001 Dnstrm Temp Meas, Div 2	30QKC20CT502	32UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC62AC001 Upstrm Temp Meas, Div 2	30QKC20CT503	32UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC62AC001 Dnstrm Temp Meas, Div 2	30QKC20CT504	32UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC62AC002 Upstrm Temp Meas, Div 2	30QKC20CT506	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC62AC002 Dnstrm Temp Meas, Div 2	30QKC20CT507	32UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC52AC001 Upstrm Temp Meas, Div 2	30QKC20CT508	32UJH~~05005~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC52AC001 Dnstrm Temp Meas, Div 2	30QKC20CT509	32UJH~~05005~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC52AC002 Upstrm Temp Meas, Div 2	30QKC20CT510	32UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC52AC002 Dnstrm Temp Meas, Div 2	30QKC20CT511	32UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC30AA101 Position Meas, Div 3	30QKC30CG101	33UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC03AC001 Upstrm Press Meas, Div 3	30QKC30CP501	33UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC30AA002 Upstrm Press Meas, Div 3	30QKC30CP502	33UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC30AA002 Dnstrm Press Meas, Div 3	30QKC30CP503	33UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC63AC001 Upstrm Press Meas, Div 3	30QKC30CP504	33UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC30AA005 Upstrm Press Meas, Div 3	30QKC30CP505	33UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC30AA005 Dnstrm Press Meas, Div 3	30QKC30CP506	33UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC63AC002 Upstrm Press Meas, Div 3	30QKC30CP508	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC30AA009 Upstrm Press Meas, Div 3	30QKC30CP509	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC30AA009 Dnstrm Press Meas, Div 3	30QKC30CP510	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
KLC53AC001 Upstrm Press Meas, Div 3	30QKC30CP511	33UJH~~05005~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC30AA012 Upstrm Press Meas, Div 3	30QKC30CP512	33UJH~~05005~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC30AA012 Dnstrm Press Meas, Div 3	30QKC30CP513	33UJH~~05005~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC30AT001 Upstrm Press Meas, Div 3	30QKC30CP519	33UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC30AT001 Dnstrm Press Meas, Div 3	30QKC30CP520	33UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
KLC53AC002 Upstrm Press Meas, Div 3	30QKC30CP521	33UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC30AA015 Upstrm Press Meas, Div 3	30QKC30CP522	33UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC30AA015 Dnstrm Press Meas, Div 3	30QKC30CP523	33UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC03AC001 Upstrm Temp Meas, Div 3	30QKC30CT501	33UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC03AC001 Temp Meas, Div 3	30QKC30CT502	33UJK~~31018~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC63AC001 Upstrm Temp Meas, Div 3	30QKC30CT503	33UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC63AC001 Dnstrm Temp Meas, Div 3	30QKC30CT504	33UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC63AC002 Upstrm Temp Meas, Div 3	30QKC30CT506	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC63AC002 Dnstrm Temp Meas, Div 3	30QKC30CT507	33UJH~~05020~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC53AC001 Upstrm Temp Meas, Div 3	30QKC30CT508	33UJH~~05005~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC53AC001 Dnstrm Temp Meas, Div 3	30QKC30CT509	33UJH~~05005~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC53AC002 Upstrm Temp Meas, Div 3	30QKC30CT510	33UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC53AC002 Dnstrm Temp Meas, Div 3	30QKC30CT511	33UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA101 Position Meas, Div 4	30QKC40CG101	34UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC04AC001 Upstrm Press Meas, Div 4	30QKC40CP501	34UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC40AA002 Upstrm Press Meas, Div 4	30QKC40CP502	34UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC40AA002 Dnstrm Press Meas, Div 4	30QKC40CP503	34UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC64AC001 Upstrm Press Meas, Div 4	30QKC40CP504	34UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA005 Upstrm Press Meas, Div 4	30QKC40CP505	34UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA005 Dnstrm Press Meas, Div 4	30QKC40CP506	34UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC64AC002 Upstrm Press Meas, Div 4	30QKC40CP508	34UJH~~01026~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA009 Upstrm Press Meas, Div 4	30QKC40CP509	34UJH~~01026~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA009 Dnstrm Press Meas, Div 4	30QKC40CP510	34UJH~~01026~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC54AC001 Upstrm Press Meas, Div 4	30QKC40CP511	34UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA012 Upstrm Press Meas, Div 4	30QKC40CP512	34UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA012 Dnstrm Press Meas, Div 4	30QKC40CP513	34UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AT001 Upstrm Press Meas, Div 4	30QKC40CP519	34UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
QKC40AT001 Dnstrm Press Meas, Div 4	30QKC40CP520	34UJK~~26029~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
KLC54AC003 Upstrm Press Meas, Div 4	30QKC40CP521	34UJH~~10011~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA015 Upstrm Press Meas, Div 4	30QKC40CP522	34UJH~~10011~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA015 Dnstrm Press Meas, Div 4	30QKC40CP523	34UJH~~10011~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC54AC002 Upstrm Press Meas, Div 4	30QKC40CP524	34UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA018 Upstrm Press Meas, Div 4	30QKC40CP525	34UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA018 Dnstrm Press Meas, Div 4	30QKC40CP526	34UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA022 Dnstrm Press Meas, Div 4	30QKC40CP527	34UJH~~01001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKC40AA022 Upstrm Press Meas, Div 4	30QKC40CP528	34UJH~~01001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
JNG40AP001 Upstrm Press Meas, Div 4	30QKC40CP529	34UJH~~01001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC04AC001 Upstrm Temp Meas, Div 4	30QKC40CT501	34UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC04AC001 Dnstrm Temp Meas, Div 4	30QKC40CT502	34UJK~~22028~~	M	M	ES SI	S 1E EMC	Y (5) Y (6)
SAC64AC001 Upstrm Temp Meas, Div 4	30QKC40CT503	34UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC64AC001 Dnstrm Temp Meas, Div 4	30QKC40CT504	34UJH~~01024~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC64AC002 Upstrm Temp Meas, Div 4	30QKC40CT506	34UJH~~01026~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SAC64AC002 Dnstrm Temp Meas, Div 4	30QKC40CT507	34UJH~~01026~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC54AC001 Upstrm Temp Meas, Div 4	30QKC40CT508	34UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC54AC001 Dnstrm Temp Meas, Div 4	30QKC40CT509	34UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC54AC003 Dnstrm Temp Meas, Div 4	30QKC40CT510	34UJH~~10011~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC54AC002 Dnstrm Temp Meas, Div 4	30QKC40CT511	34UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC54AC003 Upstrm Temp Meas, Div 4	30QKC40CT512	34UJH~~10011~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
JNG40AP001 Dnstrm Temp Meas, Div 4	30QKC40CT513	34UJH~~01001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
JNG40AP001 Upstrm Temp Meas, Div 4	30QKC40CT514	34UJH~~01001~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLC54AC002 Upstrm Temp Meas, Div 4	30QKC40CT524	34UJH~~10002~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLL61AC001 Upstrm Press Meas, Div 1	30QKF10CP501	30UFA~~01038~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKF10AA002 Upstrm Press Meas, Div 1	30QKF10CP502	30UFA~~01038~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKF10AA002 Dnstrm Press Meas, Div 1	30QKF10CP503	30UFA~~01038~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLL61AC001 Upstrm Temp Meas, Div 1	30QKF10CT501	30UFA~~01038~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLL61AC001 Dnstrm Temp Meas,Div 1	30QKF10CT502	30UFA~~01038~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLL64AC001 Upstrm Press Meas, Div 4	30QKF40CP501	30UFA~~01088~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKF40AA002 Upstrm Press Meas, Div 4	30QKF40CP502	30UFA~~01088~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
QKF40AA002 Dnstrm Press Meas, Div 4	30QKF40CP503	30UFA~~01088~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLL64AC001 Upstrm Temp Meas, Div 4	30QKF40CT501	30UFA~~01088~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
KLL64AC001 Dnstrm Temp Meas, Div 4	30QKF40CT502	30UFA~~01088~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 105 of 141

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
BBX N16 Gamma Activity Monitor	30JYK00GH082	31UJE	H	H	SI	S 1E EMC	Y(1) Y(5)
BBX N16 Gamma Activity Monitor	30JYK00GH083	31UJE	H	H	SI	S 1E EMC	Y(1) Y(5)
BBX N16 Gamma Activity Monitor	30JYK00GH084	31UJE	H	H	SI	S 1E EMC	Y(1) Y(5)
BBX N16 Gamma Activity Monitor	30JYK00GH085	31UJE	H	H	SI	S 1E EMC	Y(1) Y(5)
BBX KLA5 Ventilation Monitor	30JYK00GH108	30UJA	H	H	SI	S 1E EMC	Y(1) Y(5)
Containment High Range Dose Rate Monitor	30JYK15CR101	30UJA~~29016~~	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
Containment High Range Dose Rate Monitor	30JYK15CR102	30UJA~~29016~~	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
Containment High Range Dose Rate Monitor	30JYK15CR103	30UJA~~29016~~	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
Containment High Range Dose Rate Monitor	30JYK28CR101	30UJA~~29016~~	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
HVAC SYSTEMS							
Containment Building Ventilation System (CBVS)							
KLA1 Containment Iso Valve 42 ft FB	30KLA10AA001	30UFA~~21095~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA1 Containment Iso Valve 42 ft RB	30KLA10AA003	30UJA~~18016~~	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
~~KLA 5 tech rm Fire Damper Sup~~	~~30KLA10AA004~~		~~H~~	~~H~~	~~SII~~	~~NS-AQ~~ ~~EMC~~	~~Y (1)~~ ~~Y (5)~~
~~KLA1 Staircase Sup Fire Damp~~	~~30KLA10AA006~~		~~H~~	~~H~~	~~SII~~	~~NS-AQ~~ ~~EMC~~	~~Y (1)~~ ~~Y (5)~~
~~KLA 1 Staircase Sup Branch Fire Dmpr~~	~~30KLA10AA007~~		~~H~~	~~H~~	~~SII~~	~~NS-AQ~~ ~~EMC~~	~~Y (1)~~ ~~Y (5)~~
~~KLA 1 Staircase south Sup Fire Dmpr~~	~~30KLA10AA008~~		~~H~~	~~H~~	~~SII~~	~~NS-AQ~~ ~~EMC~~	~~Y (1)~~ ~~Y (5)~~
KLA2 Cont Iso Valve 48 ft FB	30KLA20AA001	30UJA~~23015~~	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
KLA2 Cont Iso Valve 48 ft RB	30KLA20AA003	30UFA~~24045~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA 2 Eq Comp Iso Valve	30KLA20AA004	30UJA~~23013~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
~~KLA 5 Tech rm Fire Damper Exh~~	~~30KLA20AA007~~		~~H~~	~~H~~	~~SII~~	~~NS-AQ~~ ~~EMC~~	~~Y (1)~~ ~~Y (5)~~
~~North Staircase Exh Fire Dmpr~~	~~30KLA20AA009~~		~~H~~	~~H~~	~~SII~~	~~NS-AQ~~ ~~EMC~~	~~Y (1)~~ ~~Y (5)~~
~~South Staircase Exh Fire Dmpr~~	~~30KLA20AA010~~		~~H~~	~~H~~	~~SII~~	~~NS-AQ~~ ~~EMC~~	~~Y (1)~~ ~~Y (5)~~
~~KLA 2 Fire Damp UFA24045~~	~~30KLA20AA011~~		~~M~~	~~H~~	~~SII~~	~~NS-AQ~~ ~~EMC~~	~~Y (2)~~ ~~Y (5)~~ ~~Y (6)~~
~~KLA 2 Fire Damp UFA24081~~	~~30KLA20AA012~~		~~M~~	~~H~~	~~SII~~	~~NS-AQ~~ ~~EMC~~	~~Y (2)~~ ~~Y (5)~~ ~~Y (6)~~
KLA Purge Filtr Tr 1 Control Dmpr	30KLA21AA001	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA Purge Filter Tr 1 Isolation Damper 1	30KLA21AA004	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA Purge Filter Tr 1 Isolation Damper 2	30KLA21AA007	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Elec Air Heater KLA 2 Tr 1 Filt	30KLA21AH005	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA 2 Tr 1 Fan	30KLA21AN001	30UFA~~24085~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA Purge Filtr Tr 2 Control Dmpr	30KLA22AA001	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA Purge Filter Tr 2 Isolation Damper 1	30KLA22AA004	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
KLA Purge Filter Tr 2 Isolation Damper 2	30KLA22AA007	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Elec Air Heater KLA 2 Tr 2 Filt	30KLA22AH005	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA 2 Tr 2 Fan	30KLA22AN001	30UFA~~24085~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA Plen Sup Motor Bal Dmpr	30KLA30AA001	30UFA~~21065~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
KLA3 Cont Iso Damp 32 ft FB	30KLA30AA002	30UFA~~17095~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA3 Cont Iso Damp 32 ft RB	30KLA30AA003	30UJA~~18016~~	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
Motor Control Dmpr 1 to FB KLL	30KLA30AA004	30UFA~~21065~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Op Fl Motorized Control Damper Sup	30KLA30AA007	30UJA~~29013~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
Motor Control Dmpr 2 to FB KLL	30KLA30AA008	30UFA~~21065~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
KLA4 Cont Iso Damp 32 ft RB	30KLA40AA001	30UJA~~18016~~	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
KLA4 Cont Iso Damp 32 ft FB	30KLA40AA002	30UFA~~17095~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA 4 Eq Comp Control Dmpr	30KLA40AA004	30UJA~~18016~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 4 Eq Comp Iso Dmpr	30KLA40AA005	30UJA~~18016~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
~~KLA 4 Fire Damper UFA24095~~	~~30KLA40AA006~~		~~M~~	~~H~~	~~SII~~	~~NS-AQ EMC~~	~~Y (2) Y (5) Y (6)~~
KLA 4 Sup Motor Louver Damper	30KLA40AA007	30UJA~~34015~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 5 Filter Train Upstream Iso Dmpr	30KLA50AA002	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
KLA 5 Filter Train Downstream Iso Dmpr	30KLA50AA004	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
KLA 5 Elec Heater	30KLA50AH001	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
KLA 5 Tr 1 Fan	30KLA51AN001	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
KLA 5 Tr 2 Fan	30KLA52AN001	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
KLA 6 Rx Pit Suppy Fan 1	30KLA65AN001	30UJA~~15026~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Rx Pit Suppy Fan 3	30KLA65AN002	30UJA~~15027~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Rx Pit Supply Fan 2	30KLA66AN001	30UJA~~15026~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Rx Pit Supply Fan 4	30KLA66AN002	30UJA~~15027~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
Pos Meas 1 KLA10AA001	30KLA10CG001A	30UFA~~15045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas 2 KLA10AA001	30KLA10CG001B	30UFA~~15045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas 1 KLA10AA003	30KLA10CG003A	30UJA~~18016~~	H	H	SI	S 1E EMC	Y (1) Y (5)
Pos Meas 2 KLA10AA003	30KLA10CG003B	30UJA~~18016~~	H	H	SI	S 1E EMC	Y (1) Y (5)
Press Meas 1 KLA Supply	30KLA10CP001	30UFA~~24095~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Press Meas 2 KLA Supply	30KLA10CP002	30UFA~~24095~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
KLA Purge Vent DP Sens 1	30KLA20CP001	30UJA~~23013~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA Purge Vent DP Sens 2	30KLA20CP002	30UJA~~23013~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
DP Meas KLA21AT001	30KLA21CP501	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
DP Meas KLA21AT002	30KLA21CP502	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA21AT003	30KLA21CP503	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA21AT004	30KLA21CP504	30UFA~~24080~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas 21 Filter Banks	30KLA21CP505	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA21AH005 Downstream	30KLA21CT001	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA21AH005 Upstream	30KLA21CT002	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA21AT003 Downstream	30KLA21CT003	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA Purge Fitrl Tr 2 Flow Meas	30KLA22CF001	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA22AT001	30KLA22CP501	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA22AT002	30KLA22CP502	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA22AT003	30KLA22CP503	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA22AT004	30KLA22CP504	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas 22 Filter Banks	30KLA22CP505	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA22AH005 Downstream	30KLA22CT001	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA22AH005 Upstream	30KLA22CT002	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA22AT003 Downstream	30KLA22CT003	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas KLA30AA001	30KLA30CG001	30UFA~~21065~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Pos Meas 1 KLA30AA002	30KLA30CG002A	30UFA~~17095~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas 2 KLA30AA002	30KLA30CG002B	30UFA~~17095~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas 1 KLA30AA003	30KLA30CG003A	30UJA~~18016~~	H	H	SI	S 1E EMC	Y (1) Y (5)
Pos Meas 2 KLA30AA003	30KLA30CG003B	30UJA~~18016~~	H	H	SI	S 1E EMC	Y (1) Y (5)
Pos Meas 1 KLA40AA002	30KLA40CG002A	30UFA~~21095~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas 2 KLA40AA002	30KLA40CG002B	30UFA~~21095~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas KLA40AA004	30KLA40CG004	30UJA~~18016~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 5 Flow Measurement	30KLA50CF001	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
DP Meas KLA50AT001	30KLA50CP501	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
DP Meas KLA50AT002	30KLA50CP502	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
DP Meas KLA50AT003	30KLA50CP503	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
DP Meas KLA50AT004	30KLA50CP504	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
Temp Meas KLA50AH001 Downstream	30KLA50CT001	30UJA~~29022~~	H	H	SI	S 1E EMC	Y (1) Y (5)
Temp Meas KLA50AH001 Upstream	30KLA21CT003	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA50AT003 Downstream	30KLA21CT003	30UFA~~24081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA DP Sens 1 SG1	30KLA60CP851	30UFA~~13004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
KLA DP Sens 1 SG2	30KLA60CP852	32UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA DP Sens 1 SG3	30KLA60CP853	33UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA DP Sens 1 SG4	30KLA60CP854	30UFA~~10052~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA 6 Supply Air Temp Meas 1	30KLA61CT001	30UJA~~23017~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Supply Air Temp Meas 2	30KLA61CT002	30UJA~~23017~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 RCP1 Air Temp Meas	30KLA61CT003	30UJA~~23002~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 RCP2 Air Temp Meas	30KLA61CT004	30UJA~~34005~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 SG1 Air Temp Meas	30KLA61CT005	30UJA~~34003~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 SG2 Air Temp Meas	30KLA61CT006	30UJA~~34004~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Eq Comp CRDM Air Temp Meas	30KLA61CT007	30UJA~~15001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 FAL Valves Air Temp Meas	30KLA61CT008	30UJA~~23020~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 KTA Pumps Air Temp Meas	30KLA61CT011	30UJA~~07022~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Supply Air Temp Meas 3	30KLA63CT001	30UJA~~23018~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Supply Air Temp Meas 4	30KLA63CT002	30UJA~~23018~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 RCP3 Air Temp Meas	30KLA63CT003	30UJA~~34006~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 RCP4 Air Temp Meas	30KLA63CT004	30UJA~~23009~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 SG3 Air Temp Meas	30KLA63CT005	30UJA~~34007~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 SG4 Air Temp Meas	30KLA63CT006	30UJA~~34008~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Safety Relief Valve rm Air Temp	30KLA63CT008	30UJA~~34019~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 UJA11024 Air Temp Meas	30KLA63CT009	30UJA~~11024~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 UJA11022 Air Temp Meas	30KLA63CT010	30UJA~~11022~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Temp Sensor Primary Pipe 1	30KLA65CT001	30UJA~~11001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Temp Sensor Primary Pipe 2	30KLA65CT002	30UJA~~11001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Temp Sensor Primary Pipe 3	30KLA65CT003	30UJA~~11001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Temp Sensor Primary Pipe 4	30KLA65CT004	30UJA~~11001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Temp Sensor Primary Pipe 5	30KLA65CT005	30UJA~~11001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Temp Sensor Primary Pipe 6	30KLA65CT006	30UJA~~11001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Temp Sensor Primary Pipe 7	30KLA65CT007	30UJA~~11001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 6 Temp Sensor Primary Pipe 8	30KLA65CT008	30UJA~~11001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA DP Sens 3 SG1	30KLA70CP801	30UFA~~13004~~	M	H	PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA DP Sens 3 SG2	30KLA70CP802	32UJH~~10002~~	M	H	PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA DP Sens 3 SG3	30KLA70CP803	33UJH~~10002~~	M	H	PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA DP Sens 3 SG4	30KLA70CP804	30UFA~~10052~~	M	H	PAM SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
KLA DP Sens 2 SG1	30KLA70CP851	30UFA~~13004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA DP Sens 2 SG2	30KLA70CP852	32UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA DP Sens 2 SG3	30KLA70CP853	33UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA DP Sens 2 SG4	30KLA70CP854	30UFA~~10052~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA 7 UJA40001 Temp Sens 1	30KLA71CT001	30UJA~~40001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 UJA40001 Temp Sens 2	30KLA71CT002	30UJA~~40001~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 UJA34014 Temp Sens 1	30KLA71CT003	30UJA~~34014~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 UJA34015 Temp Sens 1	30KLA71CT004	30UJA~~34015~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 Setdown Area Op Fl Temp Sens	30KLA71CT005	30UJA~~29013~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 Access Area Eq Hatch Temp Sens	30KLA71CT006	30UJA~~29016~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 Inst Meas Table Temp Sens	30KLA71CT007	30UJA~~23041~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 JND JNG Valv Lp 1 Temp Sens	30KLA71CT009	30UJA~~11025~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 JND JNG Valv Lp 2 Temp Sens	30KLA71CT010	30UJA~~11026~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 JND JNG Valv Lp 3 Temp Sens	30KLA71CT011	30UJA~~11027~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 JND JNG Valv Lp 4 Temp Sens	30KLA71CT012	30UJA~~11028~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 LCQ Flash Tk Temp Sens	30KLA71CT013	30UJA~~11018~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 LCQ Heat Exchgr Temp Sensor	30KLA71CT014	30UJA~~07018~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA 7 Hot Pip Pen Temp Sens	30KLA71CT015	30UJA~~07016~~	H	H	SII	NS-AQ EMC	Y (1) Y (5)
Annulus Ventilation System (AVS)							
Actuator Supply Damper (Train 21)	30KLB21AA003	30UFA~~17084~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Exhaust Damper (Train 21)	30KLB21AA004	30UFA~~17084~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Electric Heater (Train 21)	30KLB21AH001	30UFA~~17084~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Exhaust Fan (Train 21)	30KLB21AN001	30UFA~~17083~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Supply Damper (Train 24)	30KLB24AA003	30UFA~~17082~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Exhaust Damper (Train 24)	30KLB24AA004	30UFA~~17082~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Electric Heater (Train 24)	30KLB24AH001	30UFA~~17082~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Exhaust Fan (Train 24)	30KLB24AN001	30UFA~~17081~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Supply Air Isolation Damper	30KLB34AA002	30UFA~~21095~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Supply Air Isolation Damper	30KLB34AA003	30UFA~~21095~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Exhaust Air Isolation Damper	30KLB44AA002	30UFA~~29054~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Exhaust Air Isolation Damper	30KLB44AA003	30UFA~~29054~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Accident Filtration Train Flow Sensor	30KLB21CF001A	30UFA~~21095~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Accident Filtration Train Flow Sensor	30KLB21CF001B	30UFA~~21095~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Exhaust Fan Pressure Limit Switch Sensor	30KLB21CP002	30UFA17083	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Pre- And HEPA Ffilter DP Gauge (Train 21)	30KLB21CP501	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
HEPA Filter DP Gauge (Train 21)	30KLB21CP502	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Iodine Adsorber DP Gauge (Train 21)	30KLB21CP503	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream HEPA Post Filter DP Gauge	30KLB21CP504	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Filter Bank DP Gauge (Train 21)	30KLB21CP505	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Sensor Upstream of Heater	30KLB21CT001	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Regulation Sensor for Heater	30KLB21CT002	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Regulation Sensor for Heater	30KLB21CT003	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Sensor Downstream of Carbon Adsorber	30KLB21CT004	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Exhaust Fan Pressure Limit Switch Sensor	30KLB24CP002	30UFA17081	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Pre- and HEPA Ffilter DP Gauge (Train 24)	30KLB24CP501	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
HEPA Filter DP Gauge (Train 24)	30KLB24CP502	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Iodine Adsorber DP Gauge (Train 24)	30KLB24CP503	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream Post HEPA Filter DP Gauge	30KLB24CP504	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Filter Bank DP Gauge (Train 24)	30KLB24CP505	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Sensor Upstream of Heater	30KLB24CT001	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Regulation Sensor for Heater	30KLB24CT002	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Regulation Sensor for Heater	30KLB24CT003	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Sensor Downstream of Carbon Adsorber	30KLB24CT004	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Safeguard Building Controlled Area Ventilation System (SBVS)							
Vol Cont Dmpr Sup, Div 1	30KLC11AA003	31UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Iso Dmpr 1 Sup, Div 1	30KLC11AA004	31UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Iso Dmpr 2 Sup, Div 1	30KLC11AA005	31UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Is Dmpr, Div 1, SG1	30KLC11AA007	31UJH05006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Vol Cont Dmpr Sup, Div 2	30KLC12AA003	32UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 1, Div 2	30KLC12AA004	32UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 2, Div 2	30KLC12AA005	32UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 1, Air Lock, SG2	30KLC12AA009	32UJH10006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 2, Air Lock, SG2	30KLC12AA010	32UJH10006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Vol Cont Dmpr Sup, Div 3	30KLC13AA003	33UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Sup Iso Dmpr 1, Div 3	30KLC13AA004	33UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 2, Div 3	30KLC13AA005	33UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Vol Cont Dmpr Sup, Div 4	30KLC14AA003	34UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 1, Div 4	30KLC14AA004	34UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 2, Div 4	30KLC14AA005	34UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr, Div 4	30KLC14AA007	34UJH05006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Dmpr KAA Vlv Rm, Anteroom, SG1	30KLC21AA002		M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr, SG1	30KLC21AA005	31UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Vol Cntrl Dmpr, Div 1	30KLC21AA006	31UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 1, Div 1	30KLC21AA007	31UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 2, Div 1	30KLC21AA008	31UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 2, Div 1	30KLC21AA010	31UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Vol Cntrl Dmpr, Div 2	30KLC22AA006	32UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 1, Div 2	30KLC22AA007	32UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 2, Div 2	30KLC22AA008	32UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr, Air Lock, SG2	30KLC22AA010	32UJH10006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Vol Cntrl Dmpr, Div 3	30KLC23AA006	33UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 1, Div 3	30KLC23AA007	33UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 2, Div 3	30KLC23AA008	33UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr, KULJMU Rm, SG4	30KLC24AA002	34UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr, Anteroom, Div 4	30KLC24AA003	34UJH05006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr, Anteroom, Div 4	30KLC24AA004	34UJH01011	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr, Div 4	30KLC24AA005	34UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Vol Cntrl Dmpr, Div 4	30KLC24AA006	34UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 1, Div 4	30KLC24AA007	34UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 2, Div 4	30KLC24AA008	34UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 2, Div 1	30KLC24AA010	34UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Iso Dmpr Vlv Rm, Div 1	30KLC31AA001	31UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Iso Dmpr Vlv Rm, Div 1	30KLC31AA003	31UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Iso Dmpr Vlv Rm, Div 2	30KLC32AA003	32UJH10002	M	H	Si	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Iso Dmpr Vlv Rm, Div 3	30KLC33AA001	33UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Iso Dmpr Vlv Rm, Div 3	30KLC33AA003	33UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Iso Dmpr Vlv Rm, Div 4	30KLC34AA001	34UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Acc Ex Iso Dmpr Vlv Rm, Div 4	30KLC34AA003	34UJH~~10004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Iso Dmpr 1, Acc Ex Tr 1	30KLC41AA001	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Iso Dmpr 2, Acc Ex Tr 1	30KLC41AA002	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Elec Air Preheater, Accident Filt Tr 1	30KLC41AH001	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exhaust Fan, Accident Filtr Tr 1	30KLC41AN001	30UFA~~21083~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Iso Dmpr 1, Acc Ex Tr 2	30KLC42AA001	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Elec Air Preheater, Accident Filt Tr 2	30KLC42AH001	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exhaust Fan, Accident Filtr Tr 2	30KLC42AN001	30UFA~~21081~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Sw Iso Dmpr 1	30KLC45AA001	30UFA~~21095~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Sw Iso Dmpr 2	30KLC45AA002	30UFA~~21095~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Sw Iso Dmpr 3	30KLC45AA003	30UFA~~29045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Sw Iso Dmpr 4	30KLC45AA004	30UFA~~29045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Sw Iso Dmpr 5	30KLC45AA005	30UFA~~24045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Acc Ex Sw Iso Dmpr 6	30KLC45AA006	30UFA~~24045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fan Recirc Unit, KLC SG1	30KLC51AN001	31UJH~~05004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fan Recirc Unit, KAA vlv rm, SG1	30KLC51AN002	31UJH~~10004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fan Recirc Unit, JMU rm, SG1	30KLC51AN003	31UJH~~10010~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fan Recirc Unit, KLC SG2	30KLC52AN001	32UJH~~05002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fan Recirc Unit, Vlv Rm, KLC SG2	30KLC52AN002	32UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fan Recirc Unit, KLC SG3	30KLC53AN001	33UJH~~05002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fan Recirc Unit, Vlv Rm, KLC SG3	30KLC53AN002	33UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fan Recirc Unit, KLC SG4	30KLC54AN001	34UJH~~05004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fan Recirc Unit, KAA Vlv Rm, SG4	30KLC54AN002	34UJH~~10004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fan Recirc Unit, JMU Rm, SG4	30KLC54AN003	34UJH~~10010~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Annulus Pressure Sensor (Train 21)	30KLB21CP001	30UFA~~24045~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Annulus Pressure Sensor (Train 24)	30KLB24CP001	30UFA~~17095~~	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas, KLC11AA003	30KLC11CG003	31UJH~~05025~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1 Passageway SG1	30KLC11CP001	31UJH~~05006~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2 Passageway SG1	30KLC11CP002	31UJH~~05006~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Passageway, Anteroom, SG1	30KLC11CP501	31UJH~~01001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas KLC12AA003	30KLC12CG003	32UJH~~01020~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1 Serv Corr, SG2	30KLC12CP001	32UJH~~05005~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2 Serv Corr, SG2	30KLC12CP002	32UJH~~05005~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
DP Serv Corr, Vlv Rm, SG2	30KLC12CP501	32UJH~~01005~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas KLC13AA003	30KLC13CG003	33UJH~~01020~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1 Serv Corr, SG3	30KLC13CP001	32UJH~~05005~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2 Serv Corr, SG3	30KLC13CP002	32UJH~~05005~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Serv Corr, Vlv Rm, SG3	30KLC13CP501	33UJH~~01003~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas KLC14AA003	30KLC14CG003	34UJH~~05025~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1 Serv Corr, Div 4	30KLC14CP001	34UJH~~05006~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2 Serv Corr, Div 4	30KLC14CP002	34UJH~~05006~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Dp Sens, Serv Corr, Anteroom, Div 4	30KLC14CP501	34UJH~~01001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas Dmpr KLC21AA006	30KLC21CG006	31UJH~~10010~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas Dmpr KLC22AA006	30KLC22CG006	32UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas Dmpr KLC24AA006	30KLC24CG006	34UJH~~10010~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1, SG1	30KLC31CP851	32UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2, SG1	30KLC31CP852	32UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 3, SG1	30KLC31CP853	32UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 4, SG1	30KLC31CP854	32UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1, SG2	30KLC32CP851	32UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2, SG2	30KLC32CP852	32UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 3, SG2	30KLC32CP853	32UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 4, SG2	30KLC32CP854	32UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1, SG3	30KLC33CP851	33UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2, SG3	30KLC33CP852	33UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 3, SG3	30KLC33CP853	33UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 4, SG3	30KLC33CP854	33UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1, SG4	30KLC34CP851	33UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2, SG4	30KLC34CP852	33UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 3, SG4	30KLC34CP853	33UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 4, SG4	30KLC34CP854	33UJH~~10001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP, Acc Ex Tr 1	30KLC41CP001	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC41AT001	30KLC41CP501	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC41AT002	30KLC41CP502	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC41AT003	30KLC41CP503	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC41AT004	30KLC41CP504	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 114 of 141

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Upstream Temp Sensor Acc Ex Tr 1 Heater	30KLC41CT004	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream Temp Sensors Acc Ex Tr 1 Heater	30KLC41CT001/ 002	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream Temp Sensor Acc Ex Tr 1 Carbon Adsorber	30KLC41CT003	30UFA~~21082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP, Acc Ex Tr 2	30KLC42CP001	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC42AT001	30KLC42CP501	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC42AT002	30KLC42CP502	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC42AT003	30KLC42CP503	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC42AT004	30KLC42CP504	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Upstream Temp, Acc Ex Tr 2	30KLC42CT001	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Upstream Temp Sensor Acc Ex Tr 2 Heater	30KLC42CT004	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream Temp Sensors Acc Ex Tr 2 Heater	30KLC42CT001/ 002	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream Temp Sensor Acc Ex Tr 2 Carbon Adsorber	30KLC42CT003	30UFA~~21084~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Flow Meas 2 Tot Acc Ex	30KLC45CF002	30UFA~~21095~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1 JND Pump Rm, SG1	30KLC51CT001	31UJH~~01002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2 JND Pump Rm, SG1	30KLC51CT002	31UJH~~01002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1 JNG Pump Rm, SG1	30KLC51CT003	31UJH~~01006~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2 JNG Pump Rm, SG1	30KLC51CT004	31UJH~~01006~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1 KAA Vlv Rm, SG1	30KLC51CT005	31UJH~~10004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2 KAA Vlv Rm, SG1	30KLC51CT006	31UJH~~10004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1 JMU Rm, SG1	30KLC51CT007	31UJH~~10010~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2 JMU Rm, SG1	30KLC51CT008	31UJH~~10010~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, JND Pump Rm, SG2	30KLC52CT001	32UJH~~01007~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, JND Pump Rm, SG2	30KLC52CT002	32UJH~~01007~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, JNG Pump Rm, SG2	30KLC52CT003	32UJH~~01009~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, JNG Pump Rm, SG2	30KLC52CT004	32UJH~~01009~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1 Vlv Rm, SG2	30KLC52CT005	32UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2 Vlv Rm, SG2	30KLC52CT006	32UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, JND Pump Rm, SG3	30KLC53CT001	33UJH~~01007~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, JND Pump Rm, SG3	30KLC53CT002	33UJH~~01007~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, JNG Pump Rm, SG3	30KLC53CT003	33UJH~~01009~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Temp Sens 2, JNG Pump Rm, SG3	30KLC53CT004	33UJH~~01009~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, Vlv Rm SG3	30KLC53CT005	33UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, Vlv Rm, SG3	30KLC53CT006	33UJH~~10002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas 1, JND Pump Rm, Div 4	30KLC54CT001	34UJH~~01002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas 2, JND Pump Rm, Div 4	30KLC54CT002	34UJH~~01002~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas 1, JNG Pump Rm, Div 4	30KLC54CT003	34UJH~~01006~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas 2, JNG Pump Rm, Div 4	30KLC54CT004	34UJH~~01006~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, KAA Vlv Rm, SG4	30KLC54CT005	34UJH~~10004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, KAA Vlv Rm, SG4	30KLC54CT006	34UJH~~10004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, JMU Rm, SG4	30KLC54CT007	34UJH~~10010~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, JMU Rm, SG4	30KLC54CT008	34UJH~~10010~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Electrical Division of Safeguard Building Ventilation System (SBVSE)							
Actuator Supply Air Damper	30SAC01AA003	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Recirc Air Damper	30SAC01AA004	31UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Heater	30SAC01AH002	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fan Motor Heater	30SAC01AH501	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Fan	30SAC01AN001	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Supply Air Damper	30SAC02AA003	32UJK~~34005~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Recirc Air Damper	30SAC02AA004	32UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Heater	30SAC02AH002	32UJK~~34008~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fan Motor Heater	30SAC02AH501	32UJK~~31007~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Fan	30SAC02AN001	32UJK~~31007~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Supply Air Damper	30SAC03AA003	33UJK~~34005~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Recirc Air Damper	30SAC03AA004	33UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Heater	30SAC03AH002	33UJK~~31007~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fan Motor Heater	30SAC03AH501	33UJK~~31007~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Fan	30SAC03AN001	33UJK~~31007~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Supply Air Damper	30SAC04AA003	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Recirc Air Damper	30SAC04AA004	34UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Heater	30SAC04AH002	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fan Motor Heater	30SAC04AH501	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Fan	30SAC04AN001	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Heater	30SAC11AH001	31UJK~~18027~~	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Battery Room Supply Air Heater	30SAC11AH002	31UJK~~14026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Heater	30SAC11AH003	31UJK~~26021~~	M	M	SII	NS-AQ 1E EMC	
Actuator Control Damper	30SAC12AA020	32UJK~~22004~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Heater	30SAC12AH001	32UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Control Damper	30SAC13AA020	33UJK~~22030~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Heater	30SAC13AH001	33UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Heater	30SAC14AH001	34UJK~~18027~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Heater	30SAC14AH002	34UJK~~14026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Heater	30SAC14AH003	30UFA~~01001~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Supply Air Heater	30SAC15AH001	31UJH~~10024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Exhaust Air Div 3 Control Damper	30SAC22AA015	32UJK~~22020~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Exhaust Air Equip Room Control	30SAC23AA015	33UJK~~22030~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Exhaust Air Damper	30SAC31AA002	31UJK~~22024~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan Motor Heater	30SAC31AH501	31UJK~~22039~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan Motor	30SAC31AN001	31UJK~~22039~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Exhaust Air Damper	30SAC32AA002	32UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan Motor Heater	30SAC32AH501	32UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan	30SAC32AN001	32UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Exhaust Air Damper	30SAC33AA002	33UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan Motor Heater	30SAC33AH501	33UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan	30SAC33AN001	33UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Exhaust Air Damper	30SAC34AA002	34UJK~~22024~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan Motor Heater	30SAC34AH501	34UJK~~22039~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan Motor	30SAC34AN001	34UJK~~22039~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Exhaust Air Control Damper	30SAC42AA001	32UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Exhaust Air Control Damper	30SAC43AA001	33UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Battery Room Exhaust	30SAC51AA003	31UJK~~22030~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Battery Room Exhaust-Maint	30SAC51AA006	31UJK~~22030~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Exhaust Fan Motor	30SAC51AN001	31UJK~~22030~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Battery Room Exhaust	30SAC52AA003	32UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Battery Room Exhaust-Maint	30SAC52AA006	32UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Exhaust Fan	30SAC52AN001	32UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Battery Room Exhaust	30SAC53AA003	33UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Actuator Battery Room Exhaust-Maint	30SAC53AA006	33UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Exhaust Fan	30SAC53AN001	33UJK~~31032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Battery Room Exhaust	30SAC54AA003	34UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Actuator Battery Room Exhaust-Maint	30SAC54AA006	34UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Exhaust Fan Motor	30SAC54AN001	34UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
LAS Pump Room Recirc Fan Motor	30SAC61AN001	31UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Recirc Fan Motor	30SAC61AN002	31UJH~~01026~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LAS Pump Room Recirc Fan	30SAC62AN001	32UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Recirc Fan	30SAC62AN002	32UJH~~01020~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LAS Pump Room Recirc Fan	30SAC63AN001	33UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Recirc Fan	30SAC63AN002	33UJH~~01020~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LAS Pump Room Recirc Fan Motor	30SAC64AN001	34UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Recirc Fan Motor	30SAC64AN002	34UJH~~01026~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Supply Air Flow Div 1	30SAC01CF001	31UJK~~22024~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Inlet Control Damper	30SAC01CG003	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Recirc Control Damper	30SAC01CG004	31UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Bank Diff Pressure Sensor	30SAC01CP001	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Pre Filter Diff Pressure Sensor	30SAC01CP501	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Differential Pressure Sensor	30SAC01CP502	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC01CT001	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC01CT002	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT003	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT004	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT005	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT006	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT501	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT502	31UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Flow Div 2	30SAC02CF002	32UJK~~31005~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Inlet Control Damper	30SAC02CG003	32UJK~~31005~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Recirc Control Damper	30SAC02CG003	32UJK~~31005~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Bank Diff Pressure Sensor	30SAC02CP001	32UJK~~31018~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Pre Filter Bank Diff Pressure Sensor	30SAC02CP501	32UJK~~31018~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Differential Pressure Sensor	30SAC02CP502	32UJK~~31018~~	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Outside Air Temperature Sensor	30SAC02CT001	32UJK~~38006~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC02CT002	32UJK~~38006~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT003	32UJK~~34008~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT004	32UJK~~34008~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT005	32UJK~~34008~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT006	32UJK~~31005~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT501	32UJK~~34008~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT502	32UJK~~34009~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Flow Div 3	30SAC03CF001	33UJK~~31005~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Inlet Control Damper	30SAC03CG003	33UJK~~34005~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Recirc Control Damper	30SAC03CG004	33UJK~~31018~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Bank Diff Pressure Sensor	30SAC03CP001	32UJK~~31018~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Pre Filter Diff Pressure Sensor	30SAC03CP501	33UJK~~31018~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Differential Pressure Sensor	30SAC03CP502	33UJK~~31018~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC03CT001	33UJK~~38006~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC03CT002	33UJK~~38006~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT003	33UJK~~34008~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT004	33UJK~~34008~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT005	33UJK~~34008~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT006	33UJK~~31005~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT501	33UJK~~34008~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT502	33UJK~~34009~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Flow Div 4	30SAC03CF001	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Inlet Control Damper	30SAC04CG003	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Recirc Control Damper	30SAC04CG004	34UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Bank Diff Pressure Sensor	30SAC04CP001	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Pre Filter Diff Pressure Sensor	30SAC04CP501	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Differential Pressure Sensor	30SAC04CP502	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC04CT001	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC04CT002	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT003	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT004	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT005	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Supply Air Temperature Sensor	30SAC04CT006	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT501	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT502	34UJK~~22026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Flow Sensor	30SAC11CF001	31UJK~~18027~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Rm Supply Air Flow Sensor	30SAC11CF002	31UJK~~14026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Flow Sensor	30SAC11CF003	31UJK~~26026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Supply Air	30SAC11CG003A	31UJK~~22024~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Supply Air	30SAC11CG003B	31UJK~~22024~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Temp Sensor	30SAC11CT001	31UJK~~18027~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Rm Air Temperature Sensor	30SAC11CT002	31UJK~~18028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
I&C Area Temperature Sensor	30SAC11CT003	31UJK~~18024~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Rm Supply Air Temperature Sensor	30SAC11CT004	31UJH~~01026~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Battery Room Air Temperature Sensor	30SAC11CT005	31UJK~~14028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Rm Air Temp Sensor	30SAC11CT006	31UJK~~18026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Heater Temperature Sen	30SAC11CT008	31UJK~~26024~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Rm Air Temperature Sensor	30SAC11CT009	31UJK~~26026~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Rm Air Temp Sensor	30SAC13CT006	33UJK~~18020~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Flow Sensor	30SAC12CF001	32UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Supply Air	30SAC12CG005A	32UJK~~31041~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Supply Air	30SAC12CG005B	32UJK~~31041~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Temp Sensor	30SAC12CT001	32UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Rm Air Temperature Sensor	30SAC12CT002	32UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
I&C Area Temperature Sensor	30SAC12CT003	32UJK~~18004~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Rm Air Temp Sensor	30SAC12CT006	32UJK~~18020~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Rm Air Temp Sensor	30SAC12CT007	32UJK~~22029~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Flow Sensor	30SAC13CF001	33UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Supply Air	30SAC13CG005A	33UJK~~31041~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Supply Air	30SAC13CG005B	33UJK~~31041~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Temp Sensor	30SAC13CT001	33UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Rm Air Temperature Sensor	30SAC13CT002	33UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
I&C Area Temperature Sensor	30SAC13CT003	33UJK~~18004~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Rm Air Temp Sensor	30SAC13CT007	33UJK~~22029~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Flow Sensor	30SAC14CF001	34UJK~~18027~~	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 120 of 141

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Battery Rm Supply Air Flow Sensor	30SAC14CF002	34UJK14026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Flow Sensor	30SAC14CF003	34UJK26026	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Supply Air	30SAC14CG003A	34UJK22024	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Supply Air	30SAC14CG003B	34UJK22024	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Temp Sensor	30SAC14CT001	34UJK18027	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Rm Air Temperature Sensor	30SAC14CT002	34UJK18028	M	M	SI	S 1E EMC	Y (5) Y (6)
I&C Area Temperature Sensor	30SAC14CT003	34UJK18024	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Rm Supply Air Temperature Sensor	30SAC14CT004	34UJH01026	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Battery Room Air Temperature Sensor	30SAC14CT005	34UJK14028	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Rm Air Temp Sensor	30SAC14CT006	34UJK18026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Heater Temperature Sen	30SAC14CT008	34UJK26024	M	M	SI	S 1E EMC	Y (5) Y (6)
Rm Air Temperature Sensor	30SAC14CT009	34UJK26026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Flow Sensor	30SAC15CF001	31UJH10024	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Supply Air Heater Temperature Sen	30SAC15CT001	31UJH10024	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Rm Air Temperature Sensor	30SAC15CT002	31UJH10024	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Supply Air Flow Sensor	30SAC18CF001	34UJH10024	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Supply Air Heater Temperature Sen	30SAC18CT001	34UJH10024	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Rm Air Temperature Sensor	30SAC18CT002	34UJH10024	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Switchgear Exhaust Air Temp Sensor	30SAC21CT001	31UJK18025	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Exhaust Air Temp Sensor	30SAC21CT002	31UJK18028	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Exhaust Air	30SAC22CG001A	32UJK31032	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Exhaust Air	30SAC22CG001B	32UJK31032	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Exhaust Air Temp Sensor	30SAC22CT001	32UJK18020	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Exhaust Air Temp Sensor	30SAC22CT002	32UJK18002	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Exhaust Air	30SAC23CG001A	33UJK31032	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Exhaust Air	30SAC23CG001B	33UJK31032	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Exhaust Air Temp Sensor	30SAC23CT001	33UJK18020	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Exhaust Air Temp Sensor	30SAC23CT002	33UJK18002	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Exhaust Air Temp Sensor	30SAC24CT001	34UJK18025	M	M	SI	S 1E EMC	Y (5) Y (6)
Switchgear Exhaust Air Temp Sensor	30SAC24CT002	34UJK18028	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Exh Control Damper	30SAC31CG002	31UJK22039	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Exh Control Damper	30SAC32CG002	32UJK31032	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Exh Control Damper	30SAC33CG002	33UJK31032	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 121 of 141

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Position Indicator Exh Control Damper	30SAC34CG002	34UJK~~22039~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Exhaust Flow Sensor	30SAC41CF001	31UJK~~18024~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Exhaust Flow Sensor	30SAC42CF001	32UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Exhaust Flow Sensor	30SAC43CF001	33UJK~~22028~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Exhaust Flow Sensor	30SAC44CF001	34UJK~~18024~~	M	M	SI	S 1E EMC	Y (5) Y (6)
LAS Pump Room Temperature Sensor	30SAC61CT001	31UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LAS Pump Room Temperature Sensor	30SAC61CT002	31UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Temperature Sensor	30SAC61CT003	31UJH~~01026~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Temperature Sensor	30SAC61CT004	31UJH~~01026~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LAS Pump Room Temperature Sensor	30SAC62CT001	32UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LAS Pump Room Temperature Sensor	30SAC62CT002	32UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Temperature Sensor	30SAC62CT003	32UJH~~01020~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Temperature Sensor	30SAC62CT004	32UJH~~01020~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LAS Pump Room Temperature Sensor	30SAC63CT001	33UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LAS Pump Room Temperature Sensor	30SAC63CT002	33UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Temperature Sensor	30SAC63CT003	33UJH~~01020~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Temperature Sensor	30SAC63CT004	33UJH~~01020~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LAS Pump Room Temperature Sensor	30SAC64CT001	34UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LAS Pump Room Temperature Sensor	30SAC64CT002	34UJH~~01024~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Temperature Sensor	30SAC64CT003	34UJH~~01026~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KAA Pump Room Temperature Sensor	30SAC64CT004	34UJH~~01026~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Fuel Building Ventilation System (FBVS)							
Supp Iso Dmpr Equip Hatch	30KLL11AA001	30UFA~~29090~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr, Fuel Hdlg Hall Div 1	30KLL11AA002	30UFA~~29045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr, Emer Airlock Div 1	30KLL11AA003	30UFA~~29005~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso/Cntr Dmpr, Fuel Pool Flr	30KLL11AA010	30UFA~~29015~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr, Equip Hatch Div 4	30KLL14AA001	30UFA~~29090~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr, Fuel Hdlg Hall Div 4	30KLL14AA002	30UFA~~29015~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr, Emer Airlock Div 4	30KLL14AA003	30UFA~~29004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr, Equip Hatch	30KLL21AA001	30UFA~~29090~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr, Fuel Pool Flr to KLC	30KLL21AA002	30UFA~~29015~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr, Emer Airlock	30KLL21AA003	30UFA~~29005~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr (KLL - Cell 4 to KLE)	30KLL21AA004	30UFA~~29015~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 122 of 141

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Exh Iso Dmpr, Equip Hatch Div 4	30KLL24AA001	30UFA~~29090~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr, Fuel Hdlg Hall Div 4	30KLL24AA002	30UFA~~29045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr, Emer Airlock	30KLL24AA003	30UFA~~29004~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr (KLL - Cell 4 to KLE)	30KLL24AA004	30UFA~~29015~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso/Cntr Dmpr (KLE to KLL - Cell 5)	30KLL31AA049	30UFA~~24045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr (KLE to KLL - Cell 4)	30KLL31AA090	30UFA~~24095~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso/Cntr Dmpr (KLE to KLL - Cell 4)	30KLL34AA065	30UFA~~24095~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr (KLE to KLL - Cell 5)	30KLL34AA090	30UFA~~24045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr (KLL - Cell 4 to KLE)	30KLL41AA100	30UFA~~29054~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr (KLL - Cell 5 to KLE)	30KLL41AA101	30UFA~~24056~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr (KLL - Cell 4 to KLE)	30KLL44AA100	30UFA~~29054~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr (KLL - Cell 5 to KLE)	30KLL44AA101	30UFA~~24056~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Air Heater, EBS Pump Room	30KLL61AH001	30UFA~~01038~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Air Heater, EBS Pump Room	30KLL61AH002	30UFA~~01038~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Air Heater, EBS Pipe Chase	30KLL61AH003	30UFA~~06039~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Air Heater, EBS Pipe Chase	30KLL61AH004	30UFA~~06039~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Air Heater, Loading Hall Duct	30KLL61AH010	30UFA~~10015~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Air Heater, Pipe Pene Duct	30KLL61AH011	30UFA~~15045~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Recirc Fan, Ex Borating Pump RM	30KLL61AN001	30UFA~~01038~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Recirc Fan, FP Cooling Pump RM	30KLL61AN002	30UFA~~01026~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Recirc Fan, FP Cooling Pump RM	30KLL61AN003	30UFA~~05082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Nuclear Auxiliary Building Ventilation System (KLE)							
Vent Stack Humidity Measurement	30KLE50CM001	30UFA	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Vent Stack Temperature Sensor	30KLE50CT001	30UFA	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Vent Stack Flow Sensor	30KLE50CF001	30UKH	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Vent Stack Flow Sensor	30KLE50CF002	30UKH	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Air Heater, EBS Pump Room	30KLL64AH001	30UFA~~01088~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Air Heater, EBS Pump Room	30KLL64AH002	30UFA~~01088~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Air Heater, EBS Pipe Chase	30KLL64AH003	30UFA~~06087~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Air Heater, EBS Pipe Chase	30KLL64AH004	30UFA~~06087~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Air Heater, Corridor Duct	30KLL64AH012	30UFA~~06057~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Air Heater, Corridor Duct	30KLL64AH013	30UFA~~06056~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Air Heater, Corridor Duct	30KLL64AH014	30UFA~~24056~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Recirc Fan, Ex Borating Pump RM	30KLL64AN001	30UFA~~01088~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Recirc Fan, FP Cooling Pump RM	30KLL64AN002	30UFA~~01076~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Recirc Fan, FP Cooling Pump RM	30KLL64AN003	30UFA~~01077~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Emer Pushbutton FP	30KLL10EY001	30UFA~~29015~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Emer Pushbutton FP	30KLL10EY002	30UFA~~29015~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA01038	30KLL61CT001	30UFA~~01038~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA01038	30KLL61CT002	30UFA~~01038~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA06039	30KLL61CT003	30UFA~~06039~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA06039	30KLL61CT004	30UFA~~06039~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA10015	30KLL61CT010	30UFA~~10015~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Temp Room UFA21045	30KLL61CT011	30UFA~~21045~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA29015	30KLL61CT020	30UFA~~29015~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA01026	30KLL61CT102	30UFA~~01026~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA05082	30KLL61CT103	30UFA~~05082~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA10015	30KLL61CT110	30UFA~~10015~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Temp Room UFA15045	30KLL61CT11	30UFA~~15045~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Temp Room UFA29015	30KLL61CT140	30UFA~~29015~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
TEmp Room UFA01088	30KLL64CT001	30UFA~~01088~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA01088	30KLL64CT002	30UFA~~01088~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA06087	30KLL64CT003	30UFA~~06087~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA06087	30KLL64CT004	30UFA~~06087~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA24072	30KLL64CT010	30UFA~~24072~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA05076	30KLL64CT011	30UFA~~05076~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA06056	30KLL64CT012	30UFA~~06056~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Temp Room UFA06056	30KLL64CT013	30UFA~~06056~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Temp Room UFA10071	30KLL64CT014	30UFA~~10071~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA13070	30KLL64CT015	30UFA~~13070~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA24070	30KLL64CT016	30UFA~~24070~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA24056	30KLL64CT017	30UFA~~24056~~	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Temp Room UFA13025	30KLL64CT024	30UFA~~13025~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA01088	30KLL64CT101	30UFA~~01088~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA01076	30KLL64CT102	30UFA~~01076~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA01077	30KLL64CT103	30UFA~~01077~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 124 of 141

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Temp Room UFA06087	30KLL64CT104	30UFA~~06087~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
1 Temp Room UFA10070	30KLL64CT106	30UFA~~10070~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA17025	30KLL64CT130	30UFA~~17025~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Room UFA17057	30KLL64CT132	30UFA~~17057~~	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Main Control Room Air Conditioning System (CRACS)							
Inlet Isolation Damper - Div 1	30SAB01AA002	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Isolation Damper - Div 1	30SAB01AA003	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Isolation Damper - Div 1	30SAB01AA004	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Air Vol Control Damper - Div 1	30SAB01AA012	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater - Div 1	30SAB01AH001	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Inlet Iso. Damper - Div 4	30SAB01AH003	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Isolation Damper - Div 4	30SAB04AA003	33UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Isol. Damper - Div 4	30SAB04AA004	33UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Air Volume Control Damper - Div 4	30SAB04AA012	33UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater - Div 4	30SAB04AH001	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtr. Inlet Isol. Damper - Div 1	30SAB11AA001	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
~~SAB11 Recirc Back-draft Damper~~	~~30SAB11AA002~~		~~M~~	~~M~~	~~SII~~	~~NS-AQ~~	~~Y (5) Y (6)~~
SAB11 Filtr Train Iso Dmpr Dwnstrm	30SAB11AA003	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB11 Filtr Train Recirc Iso Dmpr	30SAB11AA004	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB11 Filtr~~ation~~ Train Electric Preheater	30SAB11AH001	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB11 Filtr Train Supply Air Fan	30SAB11AN001	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtr. Inlet Iso. Damper - Div 4	30SAB14AA001	33UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB14 Filtr Train Iso Dmpr Dwnstrm	30SAB14AA003	33UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB14 Filtr Train Recirc Iso Dmpr	30SAB14AA004	33UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
~~SAB14 Recirc Backdraft Damper~~	~~30SAB14AA005~~		~~M~~	~~M~~	~~SII~~	~~NS-AQ~~	~~Y (5) Y (6)~~
SAB14 Filtr~~ation~~ Train Electric Preheater	30SAB14AH001	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB14 Filtr Train Supply Air Fan	30SAB14AN001	32UJK~~31020~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Recirc. Vol Contr Damper A	30SAB42AA001	32UJK~~26031~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Recirc. Vol. Contr. Damper B	30SAB42AA002	32UJK~~26031~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isolation Damper - A	30SAB45AA003	32UJK~~31020~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isolation Damper - B	30SAB45AA004	32UJK~~31020~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan	30SAB45AN001	32UJK~~31020~~	M	M	SII	NS-AQ	Y (5) Y (6)
Recirc. Vol. Cont. Posit. Indic. - Div 1	30SAB01CG012	32UJK~~31034~~	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Conditioning Train 01 Flow Measurement	30SAB01CF001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Final Filter.HEPA DP - Div 1	30SAB01CP002	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Prefilter DP - Div 1	30SAB01CP501	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Final Filter.HEPA DP (Local) - Div 1	30SAB01CP504	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Inlet Temp - Div 1	30SAB01CT001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 1 A	30SAB01CT002	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 1 B	30SAB01CT003	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 1 C	30SAB01CT004	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. CoolCoil Inlet Temp (Local) - Div 1	30SAB01CT501	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. CoolCoil Exit Temp (Local) - Div 1	30SAB01CT502	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Smoke Detector	30SAB01SD001	32UJK31034	M	M	SII	NS-AQ	Y (5) Y (6)
Conditioning Train 02 Flow Measurement	30SAB02CF001	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Final Filter.HEPA DP - Div 2	30SAB02CP002	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Final Filter.HEPA DP (Local) - Div 2	30SAB02CP504	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. CoolCoil Inlet Temp (Local) - Div 2	30SAB02CT501	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. CCoil Outlet Temp (Local) - Div 2	30SAB02CT502	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Conditioning Train 03 Flow Measurement	30SAB03CF001	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Final Filter.HEPA DP - Div 3	30SAB03CP002	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Final Filter.HEPA DP (Local) - Div 3	30SAB03CP504	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc CoolCoil Inlet Temp (Local) - Div 3	30SAB03CT501	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Cool Coil Exit Temp (Local) - Div 3	30SAB03CT502	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Vol Cont Damp Position Indic - Div 4	30SAB04CG012	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Conditioning Train 04 Flow Measurement	30SAB04CF001	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Final Filter. DP - Div 4	30SAB04CP002	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Prefilter DP - Div 4	30SAB04CP501	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Final Filter.HEPA DP (Local) - Div 4	30SAB04CP504	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Inlet Temp - Div 4	30SAB04CT001	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 4 A	30SAB04CT002	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 4 B	30SAB04CT003	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 4 C	30SAB04CT004	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc CoolCoil Inlet Temp (Local) - Div 4	30SAB04CT501	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. CoolCoil Exit Temp (Local) - Div 4	30SAB04CT502	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Smoke Detector	30SAB04SD001	32UJK31034	M	M	SII	NS-AQ	Y (5)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 126 of 141

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Iodine Filtration Train 01 Flow Measurement	30SAB11CF001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtr. Filter DP - Div 1	30SAB11CP001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Prefilter DP - Div 1	30SAB11CP501	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtr. Inlet HEPA DP - Div1	30SAB11CP502	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Charcoal DP - Div 1	30SAB11CP503	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Outlet HEPA Post DP - Div 1	30SAB11CP504	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB11 Filtr Train Temp Sens 1	30SAB11CT001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB11 Filtr Train Temp Sens 2	30SAB11CT002	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Train 01 Carbon Adsorber Outlet Temp Sens	30SAB11CT003	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Train 04 Flow Measurement	30SAB14CF001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Filter DP - Div 4	30SAB14CP001	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Prefilter DP - Div 4	30SAB14CP501	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Inlet HEPA DP - Div 4	30SAB14CP502	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Charcoal DP - Div 4	30SAB14CP503	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Outlet HEPA Post DP - Div 4	30SAB14CP504	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB14 Filtr Train Temp Sens 1	30SAB14CT001	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB14 Filtr Train Temp Sens 2	30SAB14CT002	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Train 04 Carbon Adsorber Outlet Temp Sens	30SAB14CT003	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
MCR Supply Duct Heater Oultet Air Flow	30SAB32CF001	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
Tag/Shift Off Supply Duct Heat Exit Flow	30SAB32CF002	33UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
WC & Kitchen Supply Duct Heat Exit Flow	30SAB32CF003	32UJK26015	M	M	SI	S 1E EMC	Y (5) Y (6)
Kitchen Supply Duct Heater Exit Flow	30SAB32CF004	33UJK26044	M	M	SI	S 1E EMC	Y (5) Y (6)
I&CService Supply Duct Heat Exit Flow	30SAB32CF005	33UJK26034	M	M	SI	S 1E EMC	Y (5) Y (6)
Special Use Supply Duct Heater Exit Flow	30SAB32CF006	33UJK26032	M	M	SI	S 1E EMC	Y (5) Y (6)
TechSupport Supply Duct Heater Exit Flow	30SAB32CF007	33UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
DP between MCR and Anteroom A	30SAB32CP001	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
DP between MCR and Anteroom B	30SAB32CP002	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
DP between MCR and Anteroom C	30SAB32CP003	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
DP between MCR and Anteroom (Local)	30SAB32CP501	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
MCR Supply Duct Heater Oultet Air Temp	30SAB32CT001	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
MCR Temp A	30SAB32CT002	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
MCR Temp B	30SAB32CT003	32UJK~~26030~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Tagging/ShiftOffice Heater Exit Temp	30SAB32CT004	33UJK~~26030~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Tagging Rm Temp	30SAB32CT005	33UJK~~26030~~	M	M	SI	S 1E EMC	Y (5) Y (6)
I&C Service Center Rm Temp A	30SAB32CT006	33UJK~~26034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
SICS1 / Computer Rm 1 Temp	30SAB32CT007	32UJK~~26002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
SICS2 / Computer Rm 2 Temp	30SAB32CT008	33UJK~~26002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
WC & Kitchen Supply Duct Heat Exit Temp	30SAB32CT009	32UJK~~26015~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Kitchen (MCR Staff) Temp	30SAB32CT010	32UJK~~26031~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Kitchen Supply Duct Heater Outlet Temp	30SAB32CT011	33UJK~~26044~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Kitchen Temp	30SAB32CT012	33UJK~~26044~~	M	M	SI	S 1E EMC	Y (5) Y (6)
I&CService Supply Duct Heater Exit Temp	30SAB32CT013	33UJK~~26034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
I&C Service Center Rm Temp B	30SAB32CT014	33UJK~~26034~~	M	M	SI	S 1E EMC	Y (5) Y (6)
SpecialUse Supply Duct Heat Exit Temp	30SAB32CT015	33UJK~~26032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Special Use Temp	30SAB32CT016	33UJK~~26032~~	M	M	SI	S 1E EMC	Y (5) Y (6)
TechSupp Supply Duct Heat Exit Temp	30SAB32CT017	33UJK~~26030~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Tech Support Center Temp	30SAB32CT018	33UJK~~26006~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Essential Service Water Pump Building Ventilation System (ESWPBVS)							
Elec Room Air,Heater Bldg 1	30SAQ01AH001	31UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Elec Room Air,Heater Bldg 1	30SAQ01AH002	31UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Fan Bldg 1	30SAQ01AN001	31UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Inlet Air Isol Dmpr Bldg 1	30SAQ01AA007	31UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isol Dmpr Bldg 1	30SAQ01AA005	31UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Split Cooler Fan Bldg 1	30SAQ01AN002	31UQB~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Split Cooler Condenser Bldg 1	30SAQ01AC102	31UQB~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 2	30SAQ02AH001	32UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 2	30SAQ02AH002	32UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Fan Bldg 2	30SAQ02AN001	32UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Inlet Air Isol Dmpr Bldg 2	30SAQ02AA007	32UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isol Dmpr Bldg 2	30SAQ02AA005	32UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Split Cooler Fan Bldg 2	30SAQ02AN002	32UQB~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Split Cooler Condenser Bldg 2	30SAQ02AC102	32UQB~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 3	30SAQ03AH001	33UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 3	30SAQ03AH002	33UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 128 of 141

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Recirc Fan Bldg 3	30SAQ03AN001	33UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Inlet Air Isol Dmpr Bldg 3	30SAQ03AA007	33UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isol Dmpr Bldg 3	30SAQ03AA005	33UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Split Cooler Fan Bldg 3	30SAQ03AN002	33UQB~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Split Cooler Condenser Bldg 3	30SAQ03AC102	33UQB~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 4	30SAQ04AH001	34UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 4	30SAQ04AH002	34UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Fan Bldg 4	30SAQ04AN001	34UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Inlet Air Isol Dmpr Bldg 4	30SAQ04AH002	34UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isol Dmpr Bldg 4	30SAQ04AA005	34UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Split Cooler Fan Bldg 4	30SAQ04AN002	34UQB~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Split Cooler Condenser Bldg 4	30SAQ04AC102	34UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temp Sensor Bldg 1	30SAQ01CT001	31UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temp Sensor Bldg 2	30SAQ02CT001	32UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temp Sensor Bldg 3	30SAQ03CT001	33UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temp Sensor Bldg 4	30SAQ04CT001	34UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 1	30SAQ01CT002	31UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 1	30SAQ01CT003	31UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 2	30SAQ02CT002	32UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 2	30SAQ02CT003	32UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 3	30SAQ03CT002	33UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 3	30SAQ03CT003	33UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 4	30SAQ04CT002	34UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 4	30SAQ04CT003	34UQB~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Emergency Power Generating Building Ventilation System (EPGBVS)							
Supply Fan - Div 1	30SAD11AN003	31UBP~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Air Motor Damper - Div 1	30SAD11AA004	31UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Exhaust Motor Damper - Div 1	30SAD15AA004	31UBP~~02002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 1	30SAD15AN003	31UBP~~02002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Air Motor Damper - Div 1	30SAD13AA007	31UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Fan - Div 1	30SAD13AN002	31UBP~~01002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Diesel Hall Low/Hi Temperature Alarm Sensor - Div 1	30SAD12CT006	31UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Supply/Exhaust Control Temp Sensor - Div 1	30SAD12CT007	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Intake Air Temperature Sensor - Div 1	30SAD13CT005	31UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Temperature Sensor - Div 1	30SAD13CT006	31UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Supply Filter Pressure - Div 1	30SAD11CP513	31UBP~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Filter Pressure - Div 1	30SAD13CP503	31UBP~~01002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Fan - Div 2	30SAD21AN003	32UBP~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Air Motor Damper - Div 2	30SAD21AA004	32UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Exhaust Motor Damper - Div 2	30SAD25AA004	32UBP~~02002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 2	30SAD25AN003	32UBP~~02002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Air Motor Damper - Div 2	30SAD23AA007	32UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Fan - Div 2	30SAD23AN002	32UBP~~01002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Low/Hi Temperature Alarm Sensor - Div 2	30SAD22CT006	32UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Supply/Exhaust Control Temp Sensor - Div 2	30SAD22CT007	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Intake Air Temperature Sensor - Div 2	30SAD23CT005	32UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Temperature Sensor - Div 2	30SAD23CT006	32UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Supply Filter Pressure - Div 2	30SAD21CP513	32UBP~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Filter Pressure - Div 2	30SAD23CP503	32UBP~~01002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Fan - Div 3	30SAD31AN003	33UBP~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Air Motor Damper - Div 3	30SAD31AA004	33UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Exhaust Motor Damper - Div 3	30SAD35AA004	33UBP~~02002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 3	30SAD35AN003	33UBP~~02002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Air Motor Damper - Div 3	30SAD33AA007	33UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Fan - Div 3	30SAD33AN002	33UBP~~01002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 130 of 141

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Diesel Hall Low/Hi Temperature Alarm Sensor - Div 3	30SAD32CT006	33UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Supply/Exhaust Control Temp Sensor - Div 3	30SAD32CT007	33UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Intake Air Temperature Sensor - Div 3	30SAD33CT005	33UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Temperature Sensor - Div 3	30SAD33CT006	33UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Supply Filter Pressure - Div 3	30SAD31CP513	33UBP~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Filter Pressure - Div 3	30SAD33CP503	33UBP~~01002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Fan - Div 4	30SAD41AN003	34UBP~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Air Motor Damper - Div 4	30SAD41AA004	34UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Exhaust Motor Damper - Div 4	30SAD45AA004	34UBP~~02002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 4	30SAD45AN003	34UBP~~02002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Air Motor Damper - Div 4	30SAD43AA007	34UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Fan - Div 4	30SAD43AN002	34UBP~~01002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Low/Hi Temperature Alarm Sensor - Div 4	30SAD42CT006	34UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Supply/Exhaust Control Temp Sensor - Div 4	30SAD42CT007	34UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Intake Air Temperature Sensor - Div 4	30SAD43CT005	34UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Temperature Sensor - Div 4	30SAD43CT006	34UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Supply Filter Pressure - Div 4	30SAD41CP513	34UBP~~02001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Filter Pressure - Div 4	30SAD43CP503	34UBP~~01002~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Air Fan - Div 1	30SAD11AN001	31UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Fan - Div 1	30SAD11AN002	31UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Unit Supply Fan - Div 1	30SAD13AN001	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 1	30SAD15AN001	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 1	30SAD15AN002	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Main Tank Supp Damper A - Div 1	30SAD16AA007	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Main Tank Supp Damper B - Div 1	30SAD16AA008	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fuel Tank Room Space Heater - Div 1	30SAD16AH001	31UBP~~01003~~	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Fuel Tank Room Ventilation Fan - Div 1	30SAD16AN001	31UBP~~01003~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Fan - Div 2	30SAD21AN001	32UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Fan - Div 2	30SAD21AN002	32UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Unit Supply Fan - Div 2	30SAD23AN001	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 2	30SAD25AN001	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 2	30SAD25AN002	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Main Tank Supp Damper A - Div 2	30SAD26AA007	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Main Tank Supp Damper B - Div 2	30SAD26AA008	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fuel Tank Room Space Heater - Div 2	30SAD26AH001	32UBP~~01003~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fuel Tank Room Ventilation Fan - Div 2	30SAD26AN001	32UBP~~01003~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Fan - Div 3	30SAD31AN001	33UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Fan - Div 3	30SAD31AN002	33UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Unit Supply Fan - Div 3	30SAD33AN001	33UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 3	30SAD35AN001	33UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 3	30SAD35AN002	33UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Main Tank Supp Damper A - Div 3	30SAD36AA007	33UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Main Tank Supp Damper B - Div 3	30SAD36AA008	33UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fuel Tank Room Space Heater - Div 3	30SAD36AH001	33UBP~~01003~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fuel Tank Room Ventilation Fan - Div 3	30SAD36AN001	33UBP~~01003~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Fan - Div 4	30SAD41AN001	34UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Fan - Div 4	30SAD41AN002	34UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Unit Supply Fan - Div 4	30SAD43AN001	34UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 4	30SAD45AN001	34UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 4	30SAD45AN002	34UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Main Tank Supp Damper A - Div 4	30SAD46AA007	34UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Main Tank Supp Damper B - Div 4	30SAD46AA008	34UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fuel Tank Room Space Heater - Div 4	30SAD46AH001	34UBP~~01003~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Fuel Tank Room Ventilation Fan - Div 4	30SAD46AN001	34UBP~~01003~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Components Pressure - Div 1	30SAD11CP501	31UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Components Pressure - Div 1	30SAD11CP502	31UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Filter Pressure - Div 1	30SAD11CP511	31UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Filter Pressure - Div 1	30SAD11CP512	31UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Supply Air Temperature - Div 1	30SAD11CT001	31UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environ-ment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Diesel Hall Area Temperature A - Div 1	30SAD12CT001	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature B - Div 1	30SAD12CT002	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature C - Div 1	30SAD12CT003	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature D - Div 1	30SAD12CT004	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature E - Div 1	30SAD12CT005	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Prefilter Pressure - Div 1	30SAD13CP501	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Final ~~HEPA~~ Filter Pressure - Div 1	30SAD13CP502	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Supply Temperature - Div 1	30SAD13CT001	31UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
EDG Control Rm Temperature A - Div 1	30SAD13CT002	31UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
EDG Control Rm Temperature B - Div 1	30SAD13CT003	31UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp A - Div 1	30SAD14CT001	31UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp B - Div 1	30SAD14CT002	31UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp C - Div 1	30SAD14CT003	31UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp D - Div 1	30SAD14CT004	31UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Main Tank Temperature - Div 1	30SAD16CT001	31UBP~~01003~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Components Pressure - Div 2	30SAD21CP501	32UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Components Pressure - Div 2	30SAD21CP502	32UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Filter Pressure - Div 2	30SAD21CP511	32UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Filter Pressure - Div 2	30SAD21CP512	32UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Supply Air Temperature - Div 2	30SAD21CT001	32UBP~~02001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature A - Div 2	30SAD22CT001	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature B - Div 2	30SAD22CT002	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature C - Div 2	30SAD22CT003	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature D - Div 2	30SAD22CT004	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature E - Div 2	30SAD22CT005	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Prefilter Pressure - Div 2	30SAD23CP501	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Final ~~HEPA~~ Filter Pressure - Div 2	30SAD23CP502	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Supply Temperature - Div 2	30SAD23CT001	32UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
EDG Control Rm Temperature A - Div 2	30SAD23CT002	32UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
EDG Control Rm Temperature B - Div 2	30SAD23CT003	32UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp A - Div 2	30SAD24CT001	32UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp B - Div 2	30SAD24CT002	32UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp C - Div 2	30SAD24CT003	32UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Diesel Hall Heater/Fan Temp D - Div 2	30SAD24CT004	32UBP01001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Main Tank Temperature - Div 2	30SAD26CT001	32UBP01003	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Components Pressure - Div 3	30SAD31CP501	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Components Pressure - Div 3	30SAD31CP502	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Filter Pressure - Div 3	30SAD31CP511	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Filter Pressure - Div 3	30SAD31CP512	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Supply Air Temperature - Div 3	30SAD31CT001	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature A - Div 3	30SAD32CT001	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature B - Div 3	30SAD32CT002	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature C - Div 3	30SAD32CT003	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature D - Div 3	30SAD32CT004	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature E - Div 3	30SAD32CT005	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Prefilter Pressure - Div 3	30SAD33CP501	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Final HEPA Filter Pressure - Div 3	30SAD33CP502	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Supply Temperature - Div 3	30SAD33CT001	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
EDG Control Rm Temperature A - Div 3	30SAD33CT002	33UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
EDG Control Rm Temperature B - Div 3	30SAD33CT003	33UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp A - Div 3	30SAD34CT001	33UBP01001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp B - Div 3	30SAD34CT002	33UBP01001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp C - Div 3	30SAD34CT003	33UBP01001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp D - Div 3	30SAD34CT004	33UBP01001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Main Tank Temperature - Div 3	30SAD36CT001	33UBP01003	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Components Pressure - Div 4	30SAD41CP501	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Components Pressure - Div 4	30SAD41CP502	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Filter Pressure - Div 4	30SAD41CP511	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Filter Pressure - Div 4	30SAD41CP512	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Supply Air Temperature - Div 4	30SAD41CT001	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature A - Div 4	30SAD42CT001	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature B - Div 4	30SAD42CT002	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature C - Div 4	30SAD42CT003	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature D - Div 4	30SAD42CT004	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Area Temperature E - Div 4	30SAD42CT005	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Prefilter Pressure - Div 4	30SAD43CP501	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID ~~(Room Location)~~	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Recirc Final~~HEPA~~ Filter Pressure - Div 4	30SAD43CP502	34UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Supply Temperature - Div 4	30SAD43CT001	34UBP~~01001~~	M	M	SI	S 1E EMC	Y (5) Y (6)
EDG Control Rm Temperature A - Div 4	30SAD43CT002	34UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
EDG Control Rm Temperature B - Div 4	30SAD43CT003	34UBP~~01002~~	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp A - Div 4	30SAD44CT001	34UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp B - Div 4	30SAD44CT002	34UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp C - Div 4	30SAD44CT003	34UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Heater/Fan Temp D - Div 4	30SAD44CT004	34UBP~~01001~~	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Main Tank Temperature - Div 4	30SAD46CT001	34UBP~~01003~~	M	M	SI	S 1E EMC	Y (5) Y (6)
CONTAINMENT ISOLATION SYSTEMS							
Fuel Pool Cooling and Purification System (FPCPS)							
ILCO Isolation Valve	30FAL10AA003	30UJA~~11021~~	H	H	SII	NS-AQ	Y (5)
FPP to RB Pool Inside CI Valve Actuator	30FAL12AA001	30UJA~~07016~~	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
FPP to RB Pool Outside CI Valve Actuator	30FAL12AA002	30UFA~~06045~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
FPP to RB Pool Outside CI Valve Actuator	30FAL15AA002	30UFA~~10045~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
Demineralized Water Distribution System (DWDS)							
Demienalized Water Outer Cotainment Isol	30GHC74AA001	30UFA~~21045~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
Demienalized Water Inner Cotainment Isol	30GHC74AA002	30UJA~~18013~~	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
~~Leak-Off System (LOS)~~							
~~CIDS Inside Ci Valve Actuator~~	~~30JMM10AA006~~	~~23013~~	~~H~~	~~H~~	~~ES PAM SI~~	~~S 1E EMC~~	~~Y (1) Y (5)~~
~~CIDS Outside Ci Valve Actuator~~	~~30JMM10AA007~~	~~24095~~	~~M~~	~~H~~	~~ES PAM SI~~	~~S 1E EMC~~	~~Y (2) Y (5) Y (6)~~
~~CLES CI VAlve Actuator: Located Inside R~~	~~30JMM23AA001~~	~~11016~~	~~H~~	~~H~~	~~ES PAM SI~~	~~S 1E EMC~~	~~Y (1) Y (5)~~
~~CLES CI Valve Actuator: Located Inside A~~	~~30JMM23AA002~~	~~05002~~	~~M~~	~~M~~	~~ES PAM SI~~	~~S 1E EMC~~	~~Y (5) Y (6)~~
Severe Accident Heat Removal System (SAHRS)							
Suction Line From Irwst Outer CI Valve A	30JMQ40AA001	34UJH~~01010~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
Spraying Line Outer CI Valve Actuator	30JMQ41AA001	34UJH~~05007~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
Active Recirculation Line Outer CI Valve	30JMQ42AA001	34UJH~~05007~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
Backflushing Line Outer CI Valve Actuato	30JMQ43AA001	34UJH~~05007~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
SAHRS Pump Motor	30JMQ40AP001	34UJH	M	H	SII	NS-AQ EMC SII	Y (2) Y (5) Y (6)
Gaseous Waste Processing System (GWPS)							
Actuator - Containment Isolation Valve	30KPL84AA002	30UFA~~06095~~	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
SMQ05/06/07/08	Pump Room Cranes	NS-AQ	N/A	II	Yes	UQB	ASME NUM-1 RG 1.29 [25]
SMA01	Manual Hoists	NS	N/A	NSC	No	All	ANSI/ASME B30.11, ANSI/ ASME B30.21
SMZ01	Outdoor Crane	NS-AQ	N/A	II	Yes	UZT	ASME NOG-1 RG 1.29 [25]
SMJ01	Polar Crane	NS-AQ	N/A	II	Yes	UJA	ASME NOG-1 RG 1.29 [25]
SMJ07/08/09/10	Steam Generator Cubicle Cranes	NS-AQ	N/A	II	Yes	UJA	ASME NUM-1 RG 1.29 [25]
[[UBZ	**Buried Conduit Duct Bank**	S	N/A	I	Yes	UBZ]]	
HVAC SYSTEMS							
SAB	**Main Control Room Air Conditioning System**						
30SAB11/14 AT003	Carbon Adsorbers	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/02/03/04 AT004	Moisture Separators ~~Demisters~~	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB45 AA004	Downstream Exhaust Air Isolation Damper	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB32 AH001-007	Electric Air Heaters	S	N/A	I	Yes	UJK	ASME AG-1[14]

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
SAB	Safety-Related Fire Dampers	S	N/A	I	Yes	UJK	NFPA 90A[18] NFPA 80A[20]
30SAB11/14 AH001	Electric Heater for Carbon Filter	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB11/14 AA002	ESF Filter Train Backdraft Damper	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB11/14 AA004	ESF Recirc Isolation Damper	S	N/A	I	Yes	UJK	ASME AG-114
30SAB11/14 AA005	ESF Recirc Backdraft Damper	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB11/14 AN001	ESF Filter Train Fans	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB11/14 AA003/ AA004	ESF Filter Train Isolation Dampers, Electric Operated	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB45 AN001	Exhaust Fan	NS-AQ	N/A	II	Yes	UJK	ASME AG-1[14] RG 1.29[25]
30SAB01/02/03/04 AA011	Backdraft Dampers	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB45 BS001	Exhaust Fan Silencer	NS-AQ	N/A	II	Yes	UJK	ASME AG-1[14] RG 1.29[25]
30SAB45 AA005	Exhaust Air Balancing Damper	NS-AQ	N/A	II	Yes	UJK	ASME AG-1[14] RG 1.29[25]

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAB01/02/03/04 AT005	~~HEPA~~Final Filters	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB11/14 AT002~~/004~~	HEPA Filters	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB11/14 AT004	Post Filters	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB11/14 AT005	Moisture Separators	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB11/14 AA001	Isolation Dampers with Electric Actuators	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/~~02/03/~~04 AA002	Outside Air Inlet Dampers with Electric Operators	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/~~02/03/~~04 AH001	Outside Air Inlet Electric Heaters - 3 Stage	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/~~02/03/~~04 AA003/004	Outside Air Inlet Isolation Dampers with Electric Actuators	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/~~02/03/~~04 AT001	Outside Air Inlet Pre-Filters	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/~~02/03/~~04 AA006	Outside Air Inlet Volume Control Dampers, Manually Adjusted	S	N/A	I	Yes	UJK	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAB11/14 AT001	Pre-Filters	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/02/03/04 AC001	Recirc Air Cooling Coils with Safety Chilled Water	S	C	I	Yes	UJK	ASME Class 3[3]
30SAB01/02/03/04 AA009	Recirculation Unit Isolation Dampers	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/02/03/04 BS003	Silencers on Fan Discharge Side	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/02/03/04 BS002	Silencers on Fan Suctions	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/04 SD001	Smoke Detector	NS-AQ	N/A	II	Yes	UJK	Local Bldg. Code RG 1.29 [25] RG 1.189 [25]
30SAB 01/02/03/04 SD002	Smoke Detector	NS-AQ	N/A	II	Yes	UJK	Local Bldg. Code RG 1.29 [25] RG 1.189 [25]
30SAB01/02/03/04 AN001	Supply Air Fans	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB45 AA003	Upstream Exhaust Air Isolation Damper	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB45 AA006	Exhaust Air Backdraft Damper	S	N/A	I	Yes	UJK	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAB01/02/03/04 AA010	Volume Control Dampers, Manually Adjusted for Recirc Unit	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB01/04 AA012	Pressure Control Damper	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB32 AA001/ 002/003/006/013/ 015/017	Air Supply Balancing Dampers	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB42 AA001/002	Exhaust Air Recirc Control Damper	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAB42 AA006/ 009/011/012/014/016	Exhaust Air Balancing Dampers	S	N/A	I	Yes	UJK	ASME AG-1[14]
SAC	**Electrical Division of Safeguard Building Ventilation System**						
30SAC05/08 AC001	Air Cooling Coils - Maintenance Train Supply Air	NS	E	NSC	No	1UJK, 4UJK	ANSI/ASME B31.1[6]
30SAC61/62/63/64 AC001/002	Air Cooling Coils - Recirculation Cooling Units	S	C	I	Yes	UJK	ASME Class 3[3]
30SAC01/02/03/04 AC001	Air Cooling Coils - Supply Air System	S	C	I	Yes	UJK	ASME Class 3[3]

**Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAC11/14 AH002	Battery Room Air Supply Duct Heaters - Supply and Exhaust Air Shafts	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC11/12/13/14 AH001	Battery Room Air Supply Duct Heaters - Supply and Exhaust Air Shafts	S	N/A	I	Yes	UJK	ASME AG-1[14]
SAC	Electric Air Heating Convectors	NS	N/A	NSC	No	UJK	
30SAC05/08 AH002	Electric Heaters - Maintenance Train Supply Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC01/02/03/04 AH002	Electric Heaters - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC51/52/53/54 AN001	Exhaust Air Fans - Battery/SCWS Room Exhaust	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC51/54 AN002	Exhaust Air Fans - Maintenance Train Battery/SCWS Room Exhaust	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC35/38 AN001	Exhaust Fan - Maintenance Train Exhaust Air	NS	N/A	NSC	No	1UJK, 4UJK	

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAC31/32/33/3~~5~~4 AN001	Exhaust Fans - Exhaust Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
SAC	Maintenance Supply/ Exhaust Ducts	NS	N/A	NSC	No	UJK	
30SAC35/38 AA001/ 004	Manual Isolation Damper - Maintenance Train Exhaust Air	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC51/52/53/54 AA001	Manual Isolation Dampers - Battery/ SCWS Room Exhaust	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC31/32/33/3~~5~~4 AA001/004	Manual Isolation Dampers - Exhaust Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC51/54 AA004	Manual Isolation Dampers - Maintenance Train Battery/SCWS Room Exhaust	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC05/08 AA002	Manual Isolation Dampers - Maintenance Train Supply Air	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC01/02/03/04 AA002	Manual Isolation Dampers - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAC11/15 AA003/ 005	Manual Isolation Dampers between Safety and Maintenance Trains	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC41/44 AA005	Manual Volume Control Dampers - Battery/SCWS Room Exhaust	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC42/43 AA004	Manual Volume Control Dampers - Battery/SCWS Room Exhaust	S	N/A	I	Yes	2UJK, 3UJK	ASME AG-1[14]
30SAC21/24 AA014	Manual Volume Control Dampers - Exhaust Air System	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC22/23 AA029	Manual Volume Control Dampers - Exhaust Air System	S	N/A	I	Yes	2UJK, 3UJK	ASME AG-1[14]
30SAC21/22/23/24 AA009	Manual Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC21/24 AA010	Manual Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAC22/23 AA009/ 011/012/020	Manual Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	2UJK, 3UJK	ASME AG-1[14]
30SAC42/43 AA002	Manual Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	2UJK, 3UJK	ASME AG-1[14]
30SAC11/14 AA013	Manual Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC11/14 AA018/ 020/023	Manual Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC12/13 AA027/ 028/029/031	Manual Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	2UJK, 3UJK	ASME AG-1[14]
30SAC11/12/13/14 AA001/014/025	Manual Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	UJK	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAC05/08 AT006	Moisture Separators - Maintenance Train Supply Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC61/62/63/64 AT001/002	Moisture Separators - Recirculation Cooling Units	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC01/02/03/04 AT006	Moisture Separators - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC51/52/53/54 AA003	Motor Operated Isolation Dampers - Battery/SCWS Room Exhaust	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC51/54 AA006	Motor Operated Isolation Dampers - Maintenance Train Battery/SCWS Room Exhaust	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC35/38 AA002	Motor Operated Volume Control Damper - Maintenance Train Exhaust Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC31/32/33/3~~5~~4 AA002	Motor Operated Volume Control Dampers - Exhaust Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAC05/08 AA003/ 004	Motor Operated Volume Control Dampers - Maintenance Train Supply Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC01/02/03/04 AA003/004	Motor Operated Volume Control Dampers - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC41/42/43/44 AA001	Motor Operated Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC22/23 AA015	Motor Operated Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	2UJK, 3UJK	ASME AG-1[14]
30SAC12/13 AA020	Motor Operated Volume Control Dampers - Supply and Exhaust Air Shafts	S	N/A	I	Yes	2UJK, 3UJK	ASME AG-1[14]
30SAC35/38 AA003	Non-Return Damper - Maintenance Train Exhaust Air	NS	N/A	NSC	No	1UJK, 4UJK	

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAC51/52/53/54 AA002	Non-return Dampers - Battery/SCWS Room Exhaust	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC31/32/33/3~~5~~4 AA003	Non-return Dampers - Exhaust Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC51/54 AA005	Non-Return Dampers - Maintenance Train Battery/SCWS Room Exhaust	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC05/08 AA005	Non-return Dampers - Maintenance Train Supply Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC01/02/03/04 AA005	Non-return Dampers - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
SAC	Non-Safety Related Fire Dampers and Ducts	NS	N/A	NSC	No	UJK	NFPA 90A[18], NFPA 80[20]
30SAC05/08 AT004	Pre-Filters - Maintenance Train Supply Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC01/02/03/04 AT004	Pre-Filters - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAC61/62/63/64 AN001/002	Recirculation Fans - Recirculation Cooling Units	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC05/08 AT005	Roughing Filters - Maintenance Train Supply Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC01/02/03/04 AT005	Roughing Filters - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
SAC	Safety Related Fire Dampers and Ducts	S	N/A	I	Yes	UJK	NFPA 90A[18], NFPA 80[20]
30SAC01/02/03/04 BS001	Silencer on Fan Suctions - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC05/08 BS002	Silencers on Fan Discharges - Maintenance Train Supply Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC01/02/03/04 BS002	Silencers on Fan Discharges - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC05/08 BS001	Silencers on Fan Suctions - Maintenance Train Supply Air	NS	N/A	NSC	No	1UJK, 4UJK	

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAC05/08 AN001	Supply Air Fans - Maintenance Train Supply Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC01/02/03/04 AN001	Supply Air Fans - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
SAC	Supply Duct and Dampers not assigned to Electrical and I&C Rooms	S	N/A	I	Yes	UJK	ASME AG-1[14]
SAC	Supply Duct and Dampers to Electrical and I&C Rooms	S	N/A	I	Yes	UJK	ASME AG-1[14]
SAC	Toilet Exhaust Components - Maintenance Train	NS	N/A	NSC	No	1UJK, 4UJK	
KLC	**Safeguard Building Controlled Area Ventilation System**						
30KLC41/42 AT003	Carbon Adsorbers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLC45 AA005/ 006	Dampers, Containment Building Isolation	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC45 AA003/ 004	Dampers, Fuel Building Isolation	S	N/A	I	Yes	UJH	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLC31/32/33/34 AA001/003	Dampers, Isolation Accident Exhaust	S	N/A	I	Yes	UJH	ASME AG-1[14]
~~30KLC11 AA008~~	~~Dampers, Isolation Div 1 JM room~~	~~S~~	~~N/A~~	~~I~~	~~Yes~~	~~UJH~~	~~ASME AG-1[14]~~
30KLC11/14 AA007	Dampers, Isolation Div 1/4 JN room	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC21/24 AA005	Dampers, Isolation Div 1/4 JN room	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC22 AA010	Dampers, Isolation Div 2 personnel air lock exhaust	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC12 AA009/ 010	Dampers, Isolation Div 2 personnel air lock supply	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC24~~1~~ AA002	Damper, Isolation Div 4 KUL room ~~CCWS/EFWS Valve Room~~	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC24 AA003~~2~~-004	Dampers, Isolation Div 4 JMQ rooms	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC21/22/23/24 AA007/008	Dampers, Isolation Operational Exhaust	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC21/24 AA010	Dampers, Isolation Operational Exhaust	S	N/A	I	Yes	UJH	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLC11/12/13/14 AA004/005	Dampers, Isolation Operational Supply	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC45 AA001/ 002	Dampers, Safeguard Building Isolation	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC21/22/23/24 AA006	Dampers, Volume Control Operational Exhaust	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC11/12/13/14 AA003	Dampers, ~~Volume~~ Control Operational Supply	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC41/42 AN001	Exhaust Fans for KLC filtration Units	S	N/A	I	Yes	UFA	ASME AG-1[14]
KLC	Fire Dampers	S	N/A	I	Yes	UJH	NFPA 90A[18], NFPA 80[20]
30KLC41/42 AH001	Heaters	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLC41/42 AT002	HEPA Filters	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLC41/42 AT004	~~HEPA~~Post Filters	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLC41/42 AT005	Moisture Separators	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLC41/42 AA001	Inlet Tight Isolation Dampers with Electric actuator	S	N/A	I	Yes	UFA~~UJH~~	ASME AG-1[14]
30KLC51/54 AT003	Moisture Separator	S	N/A	I	Yes	UJH	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLC51/52/53/54 AT001	Moisture Separators	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC51/52/53/54 AT002	Moisture Separators	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC41/42 AA003	Non-Return Dampers	S	N/A	I	Yes	UFA~~UJH~~	ASME AG-1[14]
30KLC41/42 AT001	Pre-Filter~~/Moisture Separators~~	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLC51/52/53/54 AC001	Recirculation Cooling Units	S	C	I	Yes	UJH	ASME AG-1[14], ASME Class [3]
30KLC51/52/53/54 AC002	Recirculation Cooling Units	S	C	I	Yes	UJH	ASME AG-1[14], ASME Class [3]
30KLC51/54 AC003	Recirculation Cooling Units	S	C	I	Yes	UJH	ASME AG-1[14], ASME Class [3]
30KLC51/52/53/54 AN001	Recirculation Fans	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC51/52/53/54 AN002	Recirculation Fans	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC51/54 AN003	Recirculation Fans	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC12 AH001	Room Heater	NS	N/A	NSC	No	UJH	
30KLC11/14 AH001/ 002	Room Heaters	NS	N/A	NSC	No	UJH	

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLC12/13 AH002-006	Room Heaters	NS	N/A	NSC	No	UJH	
SAD	**Emergency Power Generating Building Ventilation System**						
30SAD11/21/31/41-AA001/AA002	Backdraft Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD11/21/31/41-AA003	Backdraft Dampers	NS-AQ	N/A	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]
30SAD15/25/35/45-AA001/AA002	Backdraft Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD15/25/35/45-AA003	Backdraft Dampers	NS-AQ	N/A	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]
30SAD13/23/33/43-AA010	Backdraft Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD16/26/36/46-AA001/AA005	Backdraft Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD11/21/31/41-AT001/AT002	Pre-filters	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD11/21/31/41-AT003	Pre-filters	NS-AQ	N/A	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]
30SAD13/23/33/43-AT001	Pre-filters	S	N/A	I	Yes	UBP	ASME AG-1 [14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAD13/23/33/43-AT003	Pre-filters	NS-AQ	N/A	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]
30SAD11/21/31/41-AN001/AN002	Supply Air Fans	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD11/21/31/41-AN003	Supply Air Fans	NS-AQ	N/A	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]
30SAD13/23/33/43-AN001	Supply Air Fans	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD13/23/33/43-AN002	Supply Air Fans	NS-AQ	N/A	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]
30SAD11/21/31/41-AA004	Motor Operated Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD15/25/35/45-AA004	Motor Operated Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD13/23/33/43-AA007	Motor Operated Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD16/26/36/46-AA007/AA008	Motor Operated Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD11/21/31/41-AA005	Manual Dampers	NS-AQ	N/A	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAD12/22/32/42-AA001/AA002/AA003/AA004/AA005	Manual Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD13/23/33/43-AA002	Manual Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD13/23/33/43-AA008/AA009	Manual Dampers	NS-AQ	N/A	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]
30SAD16/26/36/46-AA003/AA004	Manual Dampers	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD15/25/35/45-AN001/AN002	Exhaust Fans	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD15/25/35/45-AN003	Exhaust Fans	NS-AQ	N/A	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]
30SAD16/26/36/46-AN001	Exhaust Fans	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD13/23/33/43-AT002	HEPA filters	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD13/23/33/43-AC001	Cooling Coils	S	C	I	Yes	UBP	ASME AG-1 [14] ASME Class 3
30SAD13/23/33/43-AC002/AC102	Cooling Coils	NS-AQ	D	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAD13/23/33/43-AT003	Moisture Separators	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD16/26/36/46-AH001	Electric Heaters	S	N/A	I	Yes	UBP	ASME AG-1 [14]
30SAD14/24/34/44-AH001/AH002/AH003/AH004	Fan Heaters	NS-AQ	N/A	II	Yes	UBP	ASME AG-1 [14] RG 1.29 [25]
30SAD13/23/33/43-AA004/AA005	Fire Dampers	S	N/A	I	Yes	UBP	NFPA 90A[18], NFPA 80[20] ~~ASME AG-1[14]~~
30SAD16/26/36/46-AA002	Fire Dampers	S	N/A	I	Yes	UBP	NFPA 90A[18], NFPA 80[20] ~~ASME AG-1[14]~~
SAQ	**Essential Service Water Pump Building Ventilation System**						
30SAQ01/02/03/04AA003/004	Cooling Coil Isolation Valves	S	C	I	Yes	URB	ASME Class 3[3]
30SAQ01/02/03/04AC001	Air Cooling Coil	S	C	I	Yes	URB	ASME AG-1[14] ASME Class 3[3]
30SAQ01/02/03/04AA002	Recirc Chiller Balancing Damper	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/04AT002	Recirc Chiller Prefilter	S	N/A	I	Yes	URB	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAQ01/02/03/ 04AN001	Recirc Fan	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AT001	Recirc Chiller Moisture Separator	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AH001/002	Room Electric Air Heaters	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AA007/005	Inlet/Exhaust Air Isolation Dampers	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AA008/006	Split Cooler Balancing Dampers	NS-AQ	N/A	II	Yes	URB	ASME AG-1[14] RG 1.29[25]
30SAQ01/02/03/ 04AT003	Split Cooler Prefilter	NS-AQ	N/A	II	Yes	URB	ASME AG-1[14] RG 1.29[25]
30SAQ01/02/03/ 04AC002	Split Cooler Chiller Unit	NS-AQ	D	II	Yes	URB	ASME AG-1[14] ASME ~~Class 3~~ VIII [8] RG 1.29[25]
30SAQ01/02/03/ 04AC102	Split Cooler Cooling Unit	NS-AQ	D	II	Yes	URB	ASME AG-1[14] ASME ~~Class 3~~ VIII [8] RG 1.29[25]
30SAQ01/02/03/ 04AN002	Split Cooler Fan	NS-AQ	N/A	II	Yes	URB	ASME AG-1[14] RG 1.29[25]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
KLA	**Containment Building Ventilation System**						
30KLA50 AT003	Carbon Adsorber (KLA 5)	NS-AQ	N/A	I	Yes	UJA	ASME AG-1[14], ASME N510 RG 1.45[25]
30KLA21/22 AT003	Carbon Adsorbers	S	N/A	I	Yes	UFA	ASME AG-1[14], ASME N510, RG 1.52
30KLA40 AA001	Containment Isolation Valve - Full Flow Exhaust Inside	S	B	I	Yes	UJA	ASME Class 2[2]
30KLA40 AA002	Containment Isolation Valve - Full Flow Exhaust Outside	S	B	I	Yes	UFA	ASME Class 2[2]
30KLA30 AA003	Containment Isolation Valve - Full Flow Supply Inside	S	B	I	Yes	UJA	ASME Class 2[2]
30KLA30 AA002	Containment Isolation Valve - Full Flow Supply Outside	S	B	I	Yes	UFA	ASME Class 2[2]
30KLA20 AA001	Containment Isolation Valve - Low Flow Exhaust Inside	S	B	I	Yes	UJA	ASME Class 2[2]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLA20 AA003	Containment Isolation Valve - Low Flow Exhaust Outside	S	B	I	Yes	UFA	ASME Class 2[2]
30KLA10 AA003	Containment Isolation Valve - Low Flow Supply Inside	S	B	I	Yes	UJA	ASME Class 2[2]
30KLA10 AA001	Containment Isolation Valve - Low Flow Supply Outside	S	B	I	Yes	UFA	ASME Class 2[2]
30KLA61/63 AC001/ 003	Cooling Coils (4 X 25%) KAB	NS	E	NSC	No	UJA	ASME AG-1[14], ANSI/ASME B31.1[6]
30KLA61/63 AC002/ 004	Cooling Coils (4 X 25%) QNJ	NS	E	NSC	No	UJA	ASME AG-1[14], ANSI/ASME B31.1[6]
30KLA20 AA004	Damper, Controls Negative Pressure	NS	N/A	NSC	No	UJA	ASME AG-1[14]
30KLA10 AA005	Damper, Supply Air	NS	N/A	NSC	No	UJA	ASME AG-1[14]
30KLA61/63 AA004	Dampers (Maintain DP between Service and Equipment Areas)	NS	N/A	NSC	No	UJA	ASME AG-1[14]-

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLA61/63 AA0053/004	Dampers, Cooling Units	NS	N/A	NSC	No	UJA	~~ASME AG-1[14]~~
30KLA21/22 AA004/ 007	Dampers, Isolation	S	N/A	I	Yes	UFA	ASME AG-1[14], ASME N510, RG 1.52
30KLA50 AH001	Electric Heater, (KLA 5)	NS-AQ	N/A	I	Yes	UJA	ASME AG-1[14], ASME N510 RG 1.45[25]
30KLA21/22 AH005	Electric Heaters	S	N/A	I	Yes	UFA	ASME AG-1[14], ASME N510, RG 1.52
30KLA51/52 AN001	Fans, Internal Filtration System	NS-AQ	N/A	I	Yes	UJA	ASME AG-1[14], ASME N510 RG 1.45[25]
30KLA21/22 AN001	Fans, Low Flow Purge Exhaust	S	N/A	I	Yes	UFA	ASME AG-1[14], ASME N510, RG 1.52
30KLA61/62/63/64 AN001	Fans, Main Supply (4 x 50%)	NS	N/A	NSC	No	UJA	~~ASME AG-1[14]~~
30KLA50 AT002	HEPA Filter (KLA 5)	NS-AQ	N/A	I	Yes	UJA	ASME AG-1[14], ASME N510 RG 1.45[25]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLA50 AT004	HEPAPost Filter (KLA 5)	NS-AQ	N/A	I	Yes	UJA	ASME AG-1[14], ASME N510 RG 1.45[25]
30KLA21/22 AT002	HEPA Filters	S	N/A	I	Yes	UFA	ASME AG-1[14], ASME N510, RG 1.52
30KLA21/22 AT0042	HEPAPost Filters	S	N/A	I	Yes	UFA	ASME AG-1[14], ASME N510, RG 1.52
30KLA21/22 AT005	Moisture Separators	S	N/A	I	Yes	UFA	ASME AG-1[14] ASME N510, RG 1.52
30KLA71 AC001-012	Local Air Cooling Units w/ QNJ Cooling Water	NS	E	NSC	No	UJA	ASME AG-1[14], ANSI/ASME B31.1[6]
30KLA50 AT001	Pre-Filter (KLA 5)	NS-AQ	N/A	I	Yes	UJA	ASME AG-1[14], ASME N510 RG 1.45[25]
30KLA21/22 AT001	Pre-Filters	S	N/A	I	Yes	UFA	ASME AG-1[14], ASME N510, RG 1.52

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLA65/66 AN001-AN002	Reactor Pit Fans (4 x 50%)	NS-AQ	N/A	II	Yes	UJA	ASME AG-1[14] RG 1.29 [25] RG 1.155 [25]
30KLA71 AN001-012	Supply Air Fans (Axial, Direct Drive)	NS	N/A	NSC	No	UJA	~~ASME AG-1[14]~~
30KLA20 AA003C/ 003D/003E	KLA 2 SCB Isolation Valves	NS-AQ	D	II	Yes	UFA	ANSI/ASME B31.1[6] RG 1.29 [25]
30KLA24 AA001/ 003	ESF Filter Bypass Isolation Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14], ASME N510
30KLA24 AA002	ESF Filter Bypass Fire Damper	S	N/A	I	Yes	UFA	NFPA 90A[18], NFPA 80[20]
30KLA30 AA004/ 008	Motor Operated Dampers	NS-AQ	N/A	II	Yes	UFA	ASME AG-1[14] RG 1.29 [25]
30KLA30 AA007	Motor Operated Dampers	NS-AQ	N/A	II	Yes	UJA	ASME AG-1[14] RG 1.29 [25]
30KLA30 AA006	Manual Control Damper	NS-AQ	N/A	II	Yes	UJA	ASME AG-1[14] RG 1.29 [25]
30KLA40 AA004/ 005/007	Motor Operated Dampers	NS-AQ	N/A	II	Yes	UJA	ASME AG-1[14] RG 1.29 [25]
30KLA40 AA003/ 008	Manual Isolation Dampers	NS-AQ	N/A	II	Yes	UJA	ASME AG-1[14] RG 1.29 [25]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLA61/62/63/64 AA001	Backdraft Dampers	NS	N/A	NSC	No	UJA	
30KLA65/66 AA002/ 004	Backdraft Dampers	NS-AQ	N/A	II	Yes	UJA	ASME AG-1[14] RG 1.29[25]
30KLA61/63 AA009/ 010	Manual Control Damper	NS	N/A	NSC	No	UJA	
30KLA61/63 AT002/ 004	Moisture Separators	NS	N/A	NSC	No	UJA	
KLB	**Annulus Ventilation System**						
30KLB21/24 AA006	Accident Train Backdraft Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLB21/24 AA004	Accident Train Motor Operated Exhaust Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLB21/24 AA003	Accident Train Motor Operated Supply Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLB21/24 AT003	Adsorbers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLB21/24 AT004	~~Downstream HEPA~~Post Filters	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLB21/24 AT005	Moisture Separators	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLB21/24 AH001	Electric Heaters	S	N/A	I	Yes	UFA	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLB21/24 AN001	Exhaust Fans	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLB34 AA004	Normal Train Control Damper	NS	N/A	NSC	No	UFA	~~ASME AG-1[14]~~
KLB	Normal Train Fire Dampers	NS	N/A	NSC	No	UFA	NFPA 90A[18], NFPA 80[20]
30KLB44 AA002/003	Normal Train Motor Operated Exhaust Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLB34 AA002/003	Normal Train Motor Operated Supply Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLB21/24 AT001	Pre-Filters	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLB21/24 AT002	~~Upstream~~ HEPA Filters	S	N/A	I	Yes	UFA	ASME AG-1[14]
KLL	**Fuel Building Ventilation System**						
KLL	Ductwork between KLL and KLC for Iodine Exhaust from the Fuel Pool Floor ~~Handling Hall~~	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLL21/24 AA001-003	Exhaust Isolation Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLL21/24 AA004	Fuel Building Exhaust/KLC Isolation Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLL41/44 AA100/ 101	Fuel Building Exhaust Air Isolation Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLL31 AA049	Fuel Building Supply Air Isolation Damper	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLL31/34 AA090	Fuel Building Supply Air Isolation Damper	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLL34 AA065	Fuel Building Supply Air Isolation Damper	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLL61AH010/011 30KLL64AH012-014	Non-Safety Related Electric Heating Units in supply air duct	NS-AQ	N/A	II	Yes	UFA	ASME AG-1[14] RG 1.29 [25]
30KLL61/64 AT/ AN002/003	Recirculation Cooling Units in FAK Pump Rooms	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLL61/64 AT/ AN001	Recirculation Cooling Units in JDH Pump Rooms	S	N/A	I	Yes	UFA	ASME AG-1[14]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLL61/64AH001-004	Safety Related Electric Heating Units in JDH Pump Rooms and Pipe Chase	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLL11/14 AA001-003	Supply Isolation Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLL11 AA010	Supply Pressure Control Damper	NS-AQ	N/A	II	Yes	UFA	ASME AG-1[14] RG 1.29 [25]
KLL	Balance of KLL System	NS-AQ	N/A	II	Yes	UFA	ASME AG-1[14] RG 1.29 [25]
KLL	Exhaust Air Duct	S	N/A	I	Yes	UFA	ASME AG-1[14]
KLL	Fire Dampers on exhaust air duct	S	N/A	I	Yes	UFA	NFPA 90A[18], NFPA 80[20]
KLL	All other Fire Dampers	NS-AQ	N/A	II	Yes	UFA	NFPA 90A[18], NFPA 80[20] RG 1.29 [25]
30KLL64AH020/021 30KLL61AH022-028	Non-safety-related Space Electric Heating Units	NS	N/A	NSC	No	UFA	Commercial
30KLL31AA009 30KLL34AA011	Supply Air Manual Isolation Dampers	NS-AQ	N/A	II	Yes	UFA	ASME AG-1[14] RG 1.29 [25]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLL41AA004 30KLL44AA022	Exhaust Air Manual Isolation Dampers	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLL61/64 AC001	Recirculation Cooling Coil in JDH Pump Room	S	C	I	Yes	UFA	ASME AG-1[14], ASME Class 3[3]
30KLL61/64 AC002/ 003	Recirculation Cooling Coil in FAK Pump Room	S	C	I	Yes	UFA	ASME AG-1[14], ASME Class 3[3]
SAM3	**Main Steam & Feedwater Valve Room Ventilation System**						
SAM3	Recirculation Cooling Units	NS	E	NSC	No	UJE	
SAM3	Electric Heaters	NS	N/A	NSC	No	UJE	
KLD	**Access Building Ventilation System**						
KLD	Building Protection Grilles	NS	N/A	NSC	No	UKE	
KLD	Control Area Exhaust Dampers	NS-AQ	N/A	NSC	No	UKE, UKA	ASME AG-1[14] RG 1.140 [25]
30KLD41/42/43 AT002	Controlled Area HEPA Filters	NS-AQ	N/A	NSC	No	UKE	ASME AG-1[14] RG 1.140 [25]
30KLD41/42/43 AT001	Controlled Area Pre-Filters	NS-AQ	N/A	NSC	No	UKE	ASME AG-1[14] RG 1.140 [25]
30KLD01/02 AT005	Droplet Separators	NS	N/A	NSC	No	UKE	

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
KLD	Duct Electric Air Heaters	NS	N/A	NSC	No	UKE	
30KLD45/46 AN001	Exhaust Fans - Controlled Area	NS-AQ	N/A	NSC	No	UKA	ASME AG-1[14] RG 1.140 [25]
30KLD32/33 AN001	Exhaust Fans - Supervised Area	NS	N/A	NSC	No	UKE	
30KLD04/05/32/33 AH501	Fan Motor Anti-Condensate Heaters	NS	N/A	NSC	No	UKE	
30KLD45/46 AH501	Fan Motor Anti-Condensate Heaters	NS-AQ	N/A	NSC	No	UKA	ASME AG-1[14] RG 1.140 [25]
KLD	Fire Dampers	NS-AQ	N/A	NSC	No	UKE	NFPA 90A[18], NFPA 80[20] RG 1.189 [25]
KLD	Intake/Exhaust Screens	NS	N/A	NSC	No	UKE, UJA	
30KLD39 AN001	Prestressing Gallery Exhaust Fan	NS	N/A	NSC	No	UJA	
30KLD01/02 AT006	Roughing Filters	NS	N/A	NSC	No	UKE	
KLD	Silencers	NS	N/A	NSC	No	UKE	
~~30KLD09 AC001~~	~~Steam Humidifier~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKE~~	
30KLD01/02 AC002	Supply Air Coolers	NS	E	NSC	No	UKE	ANSI/ASME B31.1[6]
30KLD04/05 AN001	Supply Air Fans	NS	N/A	NSC	No	UKE	

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLD01/02 AC003	Supply Air Heaters	NS	E	NSC	No	UKE	ANSI/ASME B31.1[6]
30KLD01/02 AT004	Supply Air Pre-Filters	NS	N/A	NSC	No	UKE	
30KLD01/02 AC001	Supply Air Pre-Heaters	NS	E	NSC	No	UKE	ANSI/ASME B31.1[6]
KLD	Supply/Supervised Area Exhaust Dampers	NS	N/A	NSC	No	UKE	
KLE 30KLE50AA001	Backdraft Damper to Vent Stack	S	N/A	I	Yes	UFA	ASME AG-1[14]
KLE	**Nuclear Auxiliary Building Ventilation System**						
30KLE50 AA001	Backdraft Damper to Vent Stack	S	N/A	I	Yes	UFA	ASME AG-1[14]
30KLE01/02/03 AC001	Room Air Heaters	NS	E	NSC	No	UKA	ANSI/ASME B31.1[6]
30KLE01/02/03 AC002	Supply Air Coolers	NS	E	NSC	No	UKA	ANSI/ASME B31.1[6]
30KLE01/02/03 AC003	Room Air Heaters	NS	E	NSC	No	UKA	ANSI/ASME B31.1[6]
KLE	Fire Dampers	NS	N/A	NSC	No	UKA	NFPA 90A[18] NFPA 80[20]
KLE	Balance of KLE	NS	N/A	NSC	No	UKA	

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
SAL	**Station Blackout Room Ventilation System**						
SAL	Supply Air Coolers	NS-AQ	E	NSC	No	UKA	ANSI/ASME B31.1[6] RG 1.155[25]
SAL	Fire Dampers	NS-AQ	N/A	NSC	No	UKA	NFPA 90A[18] NFPA 80[20] RG 1.155[25]
SAL	Balance of SAL	NS-AQ	N/A	NSC	No	UKA	RG 1.155[25]
~~**KLE (All other components)**~~	~~**Nuclear Auxiliary Building Ventilation System**~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKA~~	~~ASME AG-1[14]~~
SAG	**Smoke Confinement System**	NS	N/A	NSC	No	UJK, UJH	NFPA 92A[19]
[[SAM1, SAM2, SAC70	**Turbine Island Ventilation System**	NS	N/A	NSC	No	UMA, UBA	Local Building Codes]]
~~**SAL**~~	~~**Station Blackout Room Ventilation System**~~	~~NS-AQ~~	~~N/A~~	~~NSC~~	~~No~~	~~UBA~~	~~Local Building Codes~~
KLF	**Radioactive Waste Processing Building Ventilation**						
30KLF50/51 AC001	Unit Room Air Coolers	NS	E	NSC	No	UKA	ANSI/ASME B31.1[6]

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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLF50/51 AT001	Unit Room Moisture Separators	NS	N/A	NSC	No	UKA	
30KLF50/51 AN001	Unit Room Fans	NS	N/A	NSC	No	UKA	
~~30KLF50/51 AC001~~	~~Air Coolers~~	~~NS~~	~~E~~	~~NSC~~	~~No~~	~~UKS~~	~~ANSI/ASME B31.1~~[6]
30KLF80 AH001 thru 025	Electric Room Heaters	NS	N/A	NSC	No	UKS	
30KLF06 AH001/ 002/003, 30KLF09 AH001, 30KLF10 AH001/002	Duct Heaters	NS	N/A	NSC	No	UKS	
30KLF08 AC001/ 002/003/004	Unit Room Air Heaters	NS	E	NSC	No	UKS	ANSI/ASME B31.1[6]
30KLF07 AC001	Unit Room Air Heater	NS	E	NSC	No	UKS	ANSI/ASME B31.1[6]
30KLF08 AN001/ 002/003/004	Unit Room Air Heater Fans	NS	N/A	NSC	No	UKS	
30KLF01 AH001	Supply Air Inlet Heater	NS	N/A	NSC	No	UKS	
30KLF02/03AA001, 30KLF04 AA101	Supply Air Motor Dampers	NS	N/A	NSC	No	UKS	
30KLF02/03 AA002	Supply Air Manual Damper	NS	N/A	NSC	No	UKS	
30KLF02/03 AC001/ 003	Supply Air Heaters	NS	E	NSC	No	UKS	ANSI/ASME B31.1[6]

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLF02/03 AC002	Supply Air Coolers	NS	E	NSC	No	UKS	ANSI/ASME B31.1[6]
30KLF02/03 AT001	Supply Air Pre-Filters	NS	N/A	NSC	No	UKS	
30KLF02/03 AT002	Supply Air Filters	NS	N/A	NSC	No	UKS	
30KLF02/03 AT003	Supply Air Demisters	NS	N/A	NSC	No	UKS	
30KLF02/03 AN001	Supply Air Fans	NS	N/A	NSC	No	UKS	
30KLF02/03BS001/ BS002	Supply Air Fan Silencers	NS	N/A	NSC	No	UKS	
30KLF02/03 AA003	Supply Air Backdraft Dampers	NS	N/A	NSC	No	UKS	
KLF	Fire Dampers	NS	N/A	NSC	No	UKS	NFPA 90A[18], NFPA 80[20]
30KLF21 AT001	Exhaust Air Moisture Separator	NS	N/A	NSC	No	UKS	
30KLF04/21/31/35 AA101	Motor Operated Vol Contrl Dampers	NS	N/A	NSC	No	UKS	
30KLF22/23/31/35 AA001/002	Motor Operated Isolation Dampers	NS	N/A	NSC	No	UKS	
30KLF31/35 AA003/ 004	Motor Operated Bypass Dampers	NS	N/A	NSC	No	UKS	
30KLF22/23/31/35 AH001	Exhaust Air Heaters	NS	N/A	NSC	No	UKS	

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLF22/23/31/35 AT001	Exhaust Air Pre-Filters	NS	N/A	NSC	No	UKS	
30KLF22/23/31/35 AT002	Exhaust Air HEPA Filters	NS	N/A	NSC	No	UKS	
30KLF22/23/31/35 AT003	Exhaust Air Carbon Adsorbers	NS	N/A	NSC	No	UKS	
30KLF22/23/31/35 AT004	Exhaust Air Post-Filters	NS	N/A	NSC	No	UKS	
30KLF25/26/39/40 AA001	Exhaust Air Manual Dampers	NS	N/A	NSC	No	UKS	
30KLF25/26/39/40 AN002	Exhaust Fans	NS	N/A	NSC	No	UKS	
30KLF25/26/39/40 AA002	Exhaust Backdraft Dampers	NS	N/A	NSC	No	UKS	
30KLF41 BS001	Silencer	NS	N/A	NSC	No	UKS	
30KLF26/40 AA101	Motor Operated Flow Control Damper	NS	N/A	NSC	No	UKS	
30KLF34AA050	Supply Air Balancing Damper	NS	N/A	NSC	No	UKS	
30KLF08AA010/011	Supply Air Manual Damper	NS	N/A	NSC	No	UKS	
30KLF08AA012	Supply Air Motor Dampers	NS	N/A	NSC	No	UKS	

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLF02/03 AC002	Air Coolers	NS	E	NSC	No	UKS	ANSI/ASME B31.1[6]
30KLF08 AC001-004	Air Heaters	NS	E	NSC	No	UKS	ANSI/ASME B31.1[6]
30KLF25/26/39/40 AA002	Backdraft Dampers	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF02/03 AA003	Backdraft Dampers	NS	N/A	NSC	No	UKS	
30KLF37/38 AN001	Booster Fans	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF22/23 AT003	Carbon Adsorbers	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF36 AT001	Carbon Adsorbers	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF05/50/51 AT001	Demisters	NS	N/A	NSC	No	UKS	
30KLF02/03 AT003	Demisters	NS	N/A	NSC	No	UKS	
30KLF38 AA003	Electric Powered Flow Control Damper	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF31/32/34/35 AA003	Electric Powered Flow Control Dampers	NS	N/A	NSC	No	UKS	
30KLF37/38 AA001	Electric Powered Flow Control Dampers	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF80 AH001/002	Electric Staircase Heaters	NS	N/A	NSC	No	UKS	

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLF25/26/39/40 AN001	Exhaust Fans	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF22/23 AA001/ 002	Filter Unit Bubble-Tight Dampers for Isolation	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF31/32/33/34/ 35 AA001	Filter Unit Bubble-Tight Dampers for Isolation	NS	N/A	NSC	No	UKS	
30KLF31/32/33/34/ 35 AA002	Filter Unit Bubble-Tight Dampers for Isolation	NS	N/A	NSC	No	UKS	
30KLF33 AA003/004	Filter Unit Bubble-Tight Dampers for Isolation	NS	N/A	NSC	No	UKS	
30KLF02/03	Filters	NS	N/A	NSC	No	UKS	ASME AG-1[14]
KLF	Fire Dampers	NS-AQ	N/A	NSC	No	UKS	NFPA 90A[18], NFPA 80[20]
30KLF22/23/36 AH001	Heaters for Filter Units	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF31/32/33/34/ 35 AT002	HEPA Filters	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF22/23/36 AT002	HEPA Filters	NS	N/A	NSC	No	UKS	ASME AG-1[14]
30KLF22/23 AT004	HEPA Filters	NS	N/A	NSC	No	UKS	ASME AG-1[14]

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
~~30KLF25/26/37/38/ 39/40 AA001~~	~~Manual Dampers~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	~~ASME AG-1~~[14]
~~30KLF37/38 AA002~~	~~Manual Dampers~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	~~ASME AG-1~~[14]
~~30KLF02/03 AA002~~	~~Manual Dampers~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	
~~30KLF31/32/33/34/ 35 AT001~~	~~Pre-Filters~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	~~ASME AG-1~~[14]
~~30KLF22/23 AT001~~	~~Pre-Filters~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	~~ASME AG-1~~[14]
~~30KLF02/03~~	~~Pre-Filters~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	~~ASME AG-1~~[14]
~~30KLF07 AC001~~	~~Pre-Heaters~~	~~NS~~	~~E~~	~~NSC~~	~~No~~	~~UKS~~	~~ANSI/ASME B31.1~~[6]
~~30KLF02/03 AC001/ 003~~	~~Pre-Heaters~~	~~NS~~	~~E~~	~~NSC~~	~~No~~	~~UKS~~	~~ANSI/ASME B31.1~~[6]
~~30KLF08 AN002-004~~	~~Recirculating Air Fan~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	
~~30KLF08/50/51 AN001~~	~~Recirculating Air Fans~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	
~~30KLF08 AC001-004~~	~~Recirculating Cooler~~	~~NS~~	~~E~~	~~NSC~~	~~No~~	~~UKS~~	~~ANSI/ASME B31.1~~[6]
~~30KLF10 AH002~~	~~Room Heaters~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	
~~30KLF06/09/10 AH001~~	~~Room Heaters~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	
~~30KLF05 AC001~~	~~Steam Humidifier~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	
~~30KLF04/26/31/35 AA101~~	~~Supply Air Control Dampers~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
~~30KLF02/03 AN001~~	~~Supply Fans~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~UKS~~	

Notes:

1. ASME Class 1 refers to "ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NB - Class 1 Components," 2004 Edition, No Addenda, with 10 CFR 50.55a Exceptions and Clarifications.
2. ASME Class 2 refers to "ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NC - Class 2 Components," 2004 Edition, No Addenda, with 10 CFR 50.55a Exceptions and Clarifications.
3. ASME Class 3 refers to "ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection ND - Class 3 Components," 2004 Edition, No Addenda, with 10 CFR 50.55a Exceptions and Clarifications.
4. ASME Class CS refers to "ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NG - Core Support Structures," 2004 Edition, No Addenda, with 10 CFR 50.55a Exceptions and Clarifications.
5. Those SSCs classified as NS-AQ (for Safety Class) and classified as "Yes" for 10 CFR 50 Appendix B will be subject only to those quality assurance requirements of Appendix B that are pertinent to that SSC based on the potential affect of the SSC on safety-related functions.
6. ANSI/ASME B31.1 refers to "ANSI/ASME B31.1 - 2004: Power Piping."
7. ANSI/ASME B16.34 refers to "ANSI/ASME B16.34 - 2004: Valves Flanged, Threaded and Welding End."
8. ASME VIII refers to "ASME Boiler & Pressure Vessel Code, Section VIII, Rules for Construction of Pressure Vessels, Division 1," 2004 Edition, No Addenda.
9. ANSI/ASME B31.3 refers to "ANSI/ASME B31.3 - 2004: Process Piping."

10. API 620 refers to "American Petroleum Institute - API 620: Design and Construction of Large, Welded, Low-Pressure Storage Tanks," Tenth Edition, 2002 with Addendum 1, June 2004.

11. API 650 refers to "Welded Steel Tanks for Oil Storage," American Petroleum Institute, 1998 with Addenda 1-4.

12. Not Used.

13. ANSI/AISC N690-1994(R2004)s2 refers to "American Institute of Steel Construction - Specification for the Design, Fabrication, and Erection of Steel Safely-Related Structures for Nuclear Facilities," ANSI/AISC N690-1994 (R2004), Supplement 2.

14. ASME AG-1 refers to ASME AG-1, "Code on Nuclear Air and Gas Treatment," 1997 (including the AG-1a-2000, "Housings" Addenda).

15. As defined in Section 3.2.1, the U.S. EPR safety classifications are:
    - S - Safety-related
    - NS - Non-safety-related
    - NS-AQ - Supplemented Grade

16. As defined in Section 3.2.1, the Seismic Classifications are:
    - I - Seismic Category I
    - II - Seismic Category II
    - RS - Radwaste Seismic
    - CS - Conventional Seismic
    - NSC - Non-seismic

17. Locations are defined below:

	KKS Designator	Location
	UAA	Switchyard
	UBA	Switchgear building
1	UBE	Auxiliary power transformer areas
2	UBE	Auxiliary power transformer areas
1	UBF	Generator transformer areas
2	UBF	Generator transformer areas
3	UBF	Generator transformer areas
	UBH	Structure for oil collecting pits
1	UBP	Emergency power generating, building 1
2	UBP	Emergency power generating, building 2
3	UBP	Emergency power generating, building 3
4	UBP	Emergency power generating, building 4
1	UBZ	Buried cable conduit ductbank from UBA (division 1) to 1UJH and 1UJK
2	UBZ	Buried cable conduit ductbank from UBA (division 2) to 2UJH and 2UJK
3	UBZ	Buried cable conduit ductbank from UBA (division 3) to 3UJH and 3UJK
4	UBZ	Buried cable conduit ductbank from UBA (division 4) to 4UJH and 4UJK and UKS
5	UBZ	Buried cable conduit ductbank from switchgear building to transformers
6	UBZ	Buried cable conduit ductbank from turbine building to circulating water structures
	UFA	Fuel building
1	UGC	Demineralized water storage area
2	UGC	Demineralized water storage area
	UGU	Structure for effluent disposal
	UJA	Reactor building
	UJB	Reactor building annulus
1	UJE	Main steam valve room, division 1

	KKS Designator	Location
2	UJE	Main steam valve room, division 2
3	UJE	Main steam valve room, division 3
4	UJE	Main steam valve room, division 4
1	UJH	Safeguard building mechanical, division 1
2	UJH	Safeguard building mechanical, division 2
3	UJH	Safeguard building mechanical, division 3
4	UJH	Safeguard building mechanical, division 4
1	UJK	Safeguard building electrical, division 1
2	UJK	Safeguard building electrical, division 2
3	UJK	Safeguard building electrical, division 3
4	UJK	Safeguard building electrical, division 4
	UJP	Reactor pit
	UK	Structures for reactor auxiliary systems
	UKA	Nuclear auxiliary building
	UKE	Access building
	UKH	Vent stack
	UKS	Radioactive waste processing building
	UM	Structures for main machine sets
	UMA	Turbine building
	UMY	Pipe bridge or support structure
1	UMZ	Buried piping and pipe ducts from UMA to UKA and UKS
2	UMZ	Buried piping and pipe ducts from 1UMZ to building UKE
	UPC	Circulating water intake structure
	UPE	Circulating water makeup intake structure
	UPF	Ultimate heat sink makeup water makeup intake structure
	UPQ	Water treatment building
	UQA	Circulating water pump building

	KKS Designator	Location
1	UQB	Essential service water pump, building 1
2	UQB	Essential service water pump, building 2
3	UQB	Essential service water pump, building 3
4	UQB	Essential service water pump, building 4
	UQM	Service water and circulating water collecting pond
1	UQZ	Buried piping and pipe ducts for service water system and cables from 1UJH
2	UQZ	Buried piping and pipe ducts for service water system and cables from 2UJH
3	UQZ	Buried piping and pipe ducts for service water system and cables from 3UJH
4	UQZ	Buried piping and pipe ducts for service water system and cables from 4UJH
5	UQZ	Buried piping and pipe ducts for service water system
6	UQZ	Buried piping and pipe ducts for service water system
7	UQZ	Buried piping and pipe ducts for service water system
8	UQZ	Buried piping and pipe ducts for service water system
9	UQZ	Buried piping and pipe ducts for essential water pipes
	URA	Cooling tower structure
1	URB	Essential service water cooling tower structure, division 1
2	URB	Essential service water cooling tower structure, division 2
3	URB	Essential service water cooling tower structure, division 3
4	URB	Essential service water cooling tower structure, division 4
	USG	Fire protection storage tanks and building
	UST	Workshop & warehouse building
	UTG	Central gas supply building
	UYA	Office and staff amenities building
	UYF	Security access facility
	UYH	Simulator building (training facilities)
	UZE	Track system (rails if necessary)
	UZJ	Fencing and gates

KKS Designator	Location
UZT	Outdoor area

18. NFPA 90A refers to "Standard for Installation of Air Conditioning and Ventilation Systems," 2002 Edition.

19. NFPA 92A refers to "Standard for Smoke-Control Systems Utilizing Barriers and Pressure Differences," 2006 Edition.

20. NFPA 80 refers to "Standard for Fire Doors and Other Opening Protectives," 2007 Edition.

21. HEI refers to "Standards for Power Plant Heat Exchangers," Fourth Edition, 2004.

22. ESW piping in trains PEB10/20/30/40 located in UZT are situated underground.

23. ASME Class MC refers to "ASME Boiler and Pressure Vessel Code, Section III, Division 2, Rules for Concrete Containments," 2004 Edition, No Addenda, with 10 CFR 50.55a Exceptions and Clarifications.

24. There are no specific construction code rules for this equipment. The RPV refueling cavity ring is constructed using fatigue analysis rules from ASME Section III, Class 2; and materials, design, fabrication and examination rules from Section III Class 3, to the extent that they can be applied. However, as this device is not a pressure retaining component or a support thereof, it is outside the scope of Section III; and, therefore, will not be certified or stamped as an ASME Section III vessel. Refer to Section 3.8.3.1.1 for additional information.

25. The basis for the quality assurance for the respective SSCs is detailed in the following:
    - RG 1.29 Regulatory Position C.1 for Seismic Category I or C for Seismic Category II and NSC
    - RG 1.189 Regulatory Position C.1.7
    - RG 1.155 Regulatory Position C.3.5
    - 10 CFR 50.46a Regulatory Position (b)
    - RG 1.7 Regulatory Position C.2
    - RG 1.143 Regulatory Position C.7

- RG 1.140 Regulatory Position C.1
- RG 1.21 Regulatory Position C.4
- NUREG-0737 Appendix B
- Staff Requirements Manual to SECY-93-087 Section II Q
- RG 1.45, Regulatory Position C 2.4
- RG 1.89 Regulatory Position C.1

Table 3D-4—Normal Operating Environments[1, 2]
Sheet 1 of 5

Location/Parameter	Normal Range	Notes
Containment Building (30UJA)		
Non-accessible areas		
• Temperature	59–122°F	
• Pressure	See Table 3D-5	
• Humidity	Non-Condensing	
• Radiation	See Table 3D-8	
• Chemistry	None	
Accessible Areas (during access)		
• Temperature	59–86°F	
• Pressure	See Table 3D-5	
• Humidity	30–70%	
• Radiation	See Table 3D-8	
• Chemistry	None	
Annulus Building (30UJB)		
• Temperature	45–113°F	
• Pressure	See Table 3D-5	
• Humidity	Non-Condensing	
• Radiation	See Table 3D-8	
• Chemistry	None	
Electrical Areas of Safeguard Building (32UJK)		
Main Control Room		
• Temperature	68–78°F	
• Pressure	See Table 3D-5	
• Humidity	30–60%	
• Radiation	See Table 3D-8	
• Chemistry	None	
Electrical Areas of Safeguard Building (32UJK, 33UJK)		
I&C and computer rooms and Remote Shutdown Station		
• Temperature	65–78°F	
• Pressure	See Table 3D-5	
• Humidity	10~~30~~–60%	
• Radiation	See Table 3D-8	

Table 3D-4—Normal Operating Environments[1, 2]
Sheet 2 of 5

Location/Parameter	Normal Range	Notes
• Chemistry	None	
Electrical Areas of Safeguard Building (31UJK, 32UJK, 33UJK, 34UJK)		
Switchgear Rooms		
• Temperature	59–104°F	
• Pressure	See Table 3D-5	
• Humidity	10-60~~35–70~~%	
• Radiation	See Table 3D-8	
• Chemistry	None	
Cable Floor Rooms		
• Temperature	41–95°F	
• Pressure	See Table 3D-5	
• Humidity	10-60~~20–80~~%	
• Radiation	See Table 3D-8	
• Chemistry	None	
I&C Equipment Rooms		
• Temperature	68–82°F	
• Pressure	See Table 3D-5	
• Humidity	10-60~~30–60~~%	
• Radiation	See Table 3D-8	
• Chemistry	None	
Electrical Areas of Safeguard Building (31UJK, 32UJK, 33UJK, 34UJK)		
Battery Rooms		
• Temperature	65–77°F	
• Pressure	See Table 3D-5	
• Humidity	10-60~~30–60~~%	
• Radiation	See Table 3D-8	
• Chemistry	None	
HVAC Rooms (MCR Envelope)		
• Temperature	50–95°F	
• Pressure	See Table 3D-5	
• Humidity	20–80%	
• Radiation	See Table 3D-8	
• Chemistry	None	

Table 3D-4—Normal Operating Environments[1, 2]
Sheet 3 of 5

Location/Parameter	Normal Range	Notes
All other rooms		
• Temperature	41–104°F	
• Pressure	See Table 3D-5	
• Humidity	10-60~~20–80~~%	
• Radiation	See Table 3D-8	
• Chemistry	None	
Mechanical Area of Safeguard Building: (Part of Building 31UJK, 32UJK, 33UJK, 34UJK)		
Main Steam Valve and Feedwater Valve Rooms		
• Temperature	50–104°F	
• Pressure	See Table 3D-5	
• Humidity	Non-Condensing	
• Radiation	See Table 3D-8	
• Chemistry	None	
Mechanical Area of Safeguard Building: (31UJH, 32UJH, 33UJH, 34UJH)		
All other rooms		
• Temperature	50–104°F	
• Pressure	See Table 3D-5	
• Humidity	10-60~~25–70~~%	
• Radiation	See Table 3D-8	
• Chemistry	None	
Fuel Building (30UFA)		
All other rooms		
• Temperature	50–113°F	
• Pressure	See Table 3D-5	
• Humidity	25–70%	
• Radiation	See Table 3D-8	
• Chemistry	None	
Fuel Pool Rooms		
• Temperature	68–96°F/104°F	
• Pressure	See Table 3D-5	
• Humidity	25–70%	
• Radiation	See Table 3D-8	
• Chemistry	None	

Table 3D-4—Normal Operating Environments[1, 2]
Sheet 4 of 5

Location/Parameter	Normal Range	Notes
Boric Acid Rooms		
• Temperature	68–113°F	
• Pressure	See Table 3D-5	
• Humidity	25–70%	
• Radiation	See Table 3D-8	
• Chemistry	None	
Nuclear Auxiliary Building (30UKA)		
All other rooms (except Laboratory Rooms)		
• Temperature	50–113°F	
• Pressure	See Table 3D-5	
• Humidity	15~~25~~–70%	
• Radiation	See Table 3D-8	
• Chemistry	None	
Laboratory Rooms		
• Temperature	65–79°F	
• Pressure	See Table 3D-5	
• Humidity	30–70%	
• Radiation	See Table 3D-8	
• Chemistry	None	
Emergency Power Generating Buildings (31UBP, 32UBP, 33UBP, 34UBP)		
Diesel Hall		
• Temperature	59–140°F[3]	
• Pressure	See Table 3D-5	
• Humidity	Non-Condensing	
• Radiation	Mild	
• Chemistry	None	
Electrical Room		
• Temperature	40-113~~59–95~~°F	
• Pressure	See Table 3D-5	
• Humidity	10-60~~35–70~~%	
• Radiation	Mild	
• Chemistry	None	

Table 3D-4—Normal Operating Environments[1, 2]
Sheet 5 of 5

Location/Parameter	Normal Range	Notes
Fuel Tank Room		
• Temperature	40-113°F	
• Pressure	See Table 3D-5	
• Humidity	10-60%	
• Radiation	Mild	
• Chemistry	None	

Notes:

1. The U.S. EPR subscribes to the Kraftwerks Kennzeichen System (KKS) for coding and nomenclature of structures, systems, and components.
2. The minimum temperatures are expected during winter design conditions; the maximum temperatures are expected during summer design conditions.
3. The maximum temperature is based on 115°F ambient temperature with an assumed 25°F heat rise.

Table 3D-5—Pressure Requirements of Controlled Buildings

Location	Pressure (Inches of Water)
Reactor Building	
• Equipment compartments	≤ 0.125[2]
Annulus (normal operation)	≤ 0.8 ~~in wg~~
Annulus (accident operation)	≤ 0.25
Fuel Building	
• Normal operation	≤ 0.25
• Fuel during fuel handling accident	≤ 0.25
Nuclear Auxiliary Building	≤ 0.25
Safeguard Building mechanical areas	
• Normal operation	≤ 0.25
• Under accident conditions	≤ 0.25
Safeguard Building electrical areas	Note 4
Main Control Room Envelope (normal operation)	≥ 0.01
Main Control Room Envelope (accident operation)	≥ 0.125[1]
Radioactive Waste Processing Building	≤ 0.01
Access Building controlled area	≤ 0.01
Emergency Power Generating Building	
Diesel Hall	Note 4
Emergency Power Generating Building ~~Ventilation System Building~~ Electrical Room	≥ ~~+~~0.01[3]

Notes:

1. Relative to all adjacent spaces to the Control Room envelope.
2. Relative to service compartment, maintained only when the low flow purge system is operational.
3. Relative to Diesel Hall.
4. There is no pressure requirement for these areas; therefore, these areas are considered to be at atmospheric pressure.

Table 3D-6—Operating Temperature Ranges for Selected Components

Type of Equipment	Minimum Temperature	Maximum Temperature
Raw water system	>32°F	None Specified[1]
Borated water system 2200 ppm	45°F	113°F
Borated water system 7000 ppm	68°F	113°F
I&C equipment	41°F	104°F
Electrical Components (e.g., Transformers, Switchgear)	41°F	104°F
Computers and associated peripherals	50°F	95°F
Battery	65°F	77~~88~~°F

Notes:

1. There is no EQ equipment within this system.

Table 3D-7—Abnormal Room Conditions

Rooms	Maximum Temperature	Humidity	Chemistry
Reactor Building			
Non-accessible area	131˚F	Non-condensing	N/A
Localized hot spots	150~~140~~˚F	Non-condensing	N/A
Electrical Division of Safeguard Building Ventilation System			
All Locations	104˚F	~~2~~10%-~~8~~60%	N/A

6.2.3 Secondary Containment Functional Design

The Reactor Shield Building (RSB) completely encloses the Reactor Containment Building (RCB) and provides a second containment barrier to the release of airborne radioactive material. The space between the RSB and RCB forms an annulus, which is maintained at a subatmospheric pressure and is filtered by the annulus ventilation system (AVS).

6.2.3.1 Design Bases

The RSB functions as a secondary containment to prevent the uncontrolled release of radioactivity to the environment following a postulated accident.

The RSB and AVS provide the secondary containment function under the environmental conditions of normal operation, maintenance, testing, and postulated accidents, including protection against dynamic effects resulting from equipment failures (GDC 4).

The AVS maintains the annulus at a subatmospheric pressure during normal operations and following postulated accidents, establishing a barrier against uncontrolled release of radioactivity to the environment (GDC 16).

The AVS filters leakage from the primary containment electrical penetrations that terminate in the annulus following a postulated accident before releasing it to the environment.

The AVS maintains the ambient air temperature in the annulus to avoid significant boron precipitation in piping that traverses the annulus.

The AVS is designed to permit periodic inspection and functional testing to confirm barrier integrity and the operability of the secondary containment ventilation system (GDC 43). RSB inspection is addressed in Section 3.8.4. Containment leakage testing in accordance with 10 CFR 50, Appendix J is described in Section 6.2.6.

6.2.3.2 System Description

6.2.3.2.1 General Description

The RSB is a reinforced concrete shell structure consisting of an upright cylinder capped with a spherical dome. The RSB is concentric with, and completely encloses the RCB, creating an annular region approximately six feet in width. The RSB is surrounded by the Safeguard Buildings and the Fuel Building. Section 3.8.1 contains plan and elevation views of the Reactor Building.

The primary function of the RSB is to protect the RCB from damage due to external events. The RSB also functions as a secondary containment to prevent the uncontrolled release of radioactivity to the environment. The design description and performance criteria of the RSB are presented in Section 3.8.4.

The annulus ventilation system collects and filters airborne radioactive material that may leak from the primary containment by maintaining a subatmospheric pressure in the annulus.

6.2.3.2.2 Annulus Ventilation System

The AVS is designed to contain leakage from the primary containment by maintaining a subatmospheric pressure in the annulus. The AVS consists of three trains: one train is used during normal plant operation; two trains are used to mitigate potential accidents. AVS design and performance parameters are presented in Table 6.2.3-1.

Table 3.2.2-1 provides the seismic and other design classifications of the components in the AVS.

Refer to Section 12.3.6.5.6 for ventilation system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

6.2.3.2.2.1 AVS Normal Operation Train

The normal operation filtration train is shown in Figure 6.2.3-1. The full capacity normal operation filtration train is designed to maintain a subatmospheric pressure in the annulus, to maintain the annulus temperature above 45°F to prevent boron precipitation in the extra borating system piping, and to provide conditioned air in the annulus for personnel accessibility.

During normal operation, the conditioned air is drawn from the Nuclear Auxiliary Building ventilation supply shaft (See Section 9.4.3) through a fire damper, a motor-operated control damper, and two motor-operated isolation dampers. The supply air is distributed in the bottom of the annulus to four different locations. A subatmospheric pressure of less than or equal to -0.8 inches water gauge is maintained in the annulus during normal operation by regulating the control damper with two redundant pressure sensors located in the annulus.

The exhaust air is drawn from the top of annulus by the Nuclear Auxiliary Building ventilation system exhaust fans through two motor-operated isolation dampers and a fire damper. The exhaust air is filtered by the Nuclear Auxiliary Building filtration trains and discharged through the vent stack.

The normal operation filtration train is in service during normal plant operation and plant shutdown conditions. The two accident trains are available as backup if the normal operation train is not able to maintain the subatmospheric pressure in the annulus.

The motor-operated air-tight dampers—located on the normal operation filtration train supply and exhaust ducts—isolate the secondary containment in case of a postulated accident. The redundant dampers in the supply and exhaust trains are powered by different electrical divisions backed by separate emergency diesel generators. The dampers can be operated automatically or manually from the main control room (MCR). In the event of a station blackout (SBO), these dampers are automatically closed by batteries.

The fire dampers on both supply and exhaust trains are located at the wall penetration between the Fuel Building and the annulus. These dampers are equipped with thermal sensors for automatic closing~~, and can be closed or re-opened remotely if not released by the thermal sensor~~.

6.2.3.2.2.2 AVS Accident Trains

The AVS accident filtration trains are shown on Figure 6.2.3-2. The filtration trains are engineered safety feature (ESF) filters and are used during postulated accidents to contain leakage from the primary containment by maintaining a subatmospheric pressure in the annulus. The exhaust air from the annulus is filtered before release to the environment via the vent stack.

There are two full capacity ESF trains, each consists of an air-tight motor-controlled damper, moisture separator, two stage electrical heater, pre-filter, ~~an upstream~~ HEPA filter, iodine absorber, ~~a downstream HEPA~~post filter, air-tight motor controlled damper, fan, and back~~-~~draft damper. The filter system components are designed in accordance with Regulatory Guide 1.52, and are described in Section 6.5.1.

During a postulated accident, the ESF filtration trains collect the containment leakage from the annulus, remove airborne radioactivity through the filtration train, and release the filtered air to the vent stack. The AVS accident trains reduce the pressure in the annulus to ~~at least~~ less than or equal -0.25 inches water gauge or less and maintain the lower subatmospheric pressure. The system is capable of maintaining a uniform negative pressure throughout the secondary containment structure following the design basis loss of coolant accident (LOCA).

The exhaust air is monitored and sampled for radiation levels before release to the vent stack, as described in Section 11.5.3.1.10 and Table 11.5-1, Monitors R-27 and R-28.

The two ESF trains are physically separated by being installed in separate rooms of the Fuel Building, which are also in separate fire areas. The two ESF trains are powered by different electrical divisions backed by separate emergency diesel generators.

6.2.3.2.2.3 System Operation

The normal operation filtration train is in service during normal plant operation, including cold shutdown and outages. During normal operation, the isolation dampers are in the open position and the annulus is continuously vented. The subatmospheric pressure inside the annulus is maintained by regulating the control damper located on the supply side of the normal operation filtration train. The supply air from the AVS maintains the annulus temperature between 45°F and 113°F.

A failure of the normal operation filtration train leads to the loss of supply and exhaust air to the annulus. In this case, one of the accident filtration trains is started, and the two isolation dampers on the supply and exhaust side of the normal filtration train are closed to isolate the normal operation filtration train and maintain the leak tightness of the annulus.

In case of a postulated accident, a containment isolation signal causes the normal filtration train to automatically stop. The normal filtration train supply air isolation dampers close immediately and the exhaust isolation dampers close with a delay, to maintain the annulus negative pressure during the switchover to the accident filtration trains. Both accident filtration trains start on receipt of a containment isolation signal and an alarm is issued in the MCR.

At the start of an accident, full power of the two stage electric heater is switched on when the fans start and filter bank isolation dampers open. As the negative pressure is drawn down in the annulus, and when the temperature downstream of the heater increases to 158°F, the first step of heater power is switched off automatically. As the temperature downstream of the heater reaches 176°F, the second step of the heater is also switched off automatically.

6.2.3.2.3 Bypass Leakage

Certain containment penetrations introduce the potential for primary containment leakage to bypass the filtered annulus and escape directly to the environment. Potential bypass leakage paths exist through the double resilient seals of the equipment hatch, personnel airlocks, fuel transfer tube, and containment ~~ventilation system~~purge isolation valves. These potential bypass leakage paths terminate in either the fuel building or the anteroom of Safeguards Buildings 2 and 3 in areas equipped with filtered ventilation and monitoring prior to being discharged out the vent stack.

Three basic categories of leakage paths are evaluated:

1. Electrical penetrations and seals that terminate within the secondary containment volume. Potential bypass leakage from electrical penetrations are captured within the annulus. The annulus provides a volume to capture containment leakage that may occur during accident conditions. The AVS provides a sub-atmospheric

pressure in relationship to the containment during normal and accident conditions. Leakage through penetrations and seals that terminate in the secondary containment do not become bypass leakage during normal or accident operation modes.

2. Mechanical penetrations and seals that terminate outside the secondary containment volume in areas that are filtered and exhausted to the vent stack, which is a monitored release path. These mechanical penetrations are a potential source of bypass leakage for which a reasonable and acceptable design leak rate must be established and periodically verified to remain within acceptable operational limits.

   Penetrations that terminate outside the secondary containment (outside the annulus) exit the reactor shield building structure into either the fuel building or one of the four safeguard buildings. The ventilation systems for the fuel building and safeguard buildings are provided with filtering systems to capture radiological contaminants that may occur from a DBA. The ESF filters and ducts that capture potential bypass leakage are located in the fuel building, safeguard buildings and annulus. Therefore, any potential bypass leakage is processed by engineered safety features (ESF) filter systems before release. The ESF filters are described in Section 6.5.1. The fuel building ventilation system and the safeguard building controlled-area ventilation system are described in Section 9.4.2 and Section 9.4.5, respectively.

   A special sub-category of penetrations are those penetrations with elastomer seals. These seals are leakage rate tested in accordance with 10 CFR 50, Appendix J. Test connections are provided on these penetrations to facilitate leakage rate testing.

3. Mechanical penetrations that terminate outside the secondary containment volume in areas that are not filtered or released via the vent stack. These mechanical penetrations consist of closed loop secondary systems:

   A. Main steam (4 penetrations).

   B. Main feedwater (4 penetrations).

   C. Steam generator blowdown flashed steam (1 penetration with two bellows seal isolation valves located outside of the shield building penetration).

   D. Condensate to and from steam generator blowdown coolers (2 penetrations with two bellows seal isolation valves located outside of the shield building penetration on each line).

   These closed systems meet the requirements of SRP 3.6.2, SRP 6.2.4, RG 1.29 and GDC 57.

~~The leak-off system provides a means to capture bypass leakage and route it to the annulus to be processed. The leak-off system is located in the Reactor Containment Building, Reactor Building Annulus, Fuel Building, and Safegurard Buildings 2 and 3, and consists of valves, sensors and piping. It is composed of three main subsystems:~~

~~containment leakage exhaust subsystem (CLES), containment inflating/deflating subsystem (CIDS), and containment leak-tightness test subsystem (CLTS). The CLES collects leaks from various systems and components in the Reactor Containment Building, Fuel Building, and Safegurard Buildings, and transports the leakage to the Reactor Building Annulus. The CIDS is used for the pressurization, depressurization, and evacuation of the Reactor Containment Building in order to test the structural integrity and leak-tightness of the Reactor Containment Building. The CLTS uses sensors in the Reactor Containment Building, Fuel Building, and Reactor Building Annulus and the environment to estimate the leak-tightness of the Reactor Containment Building.~~

~~The CLES contains piping to collect leakage from components located at containment penetrations at the interface boundary between the Reactor Containment Building and Reactor Building Annulus, the Reactor Building Annulus and the environment, and the Fuel Building and Safegurard Building 3. During normal operation, the CLES collects leakage in leak-off lines and routes the leakage to the Reactor Building Annulus. Subatmospheric pressure in the Reactor Building Annulus, provided by the annulus ventilation system (AVS), creates a pressure differential, which drains the CLES leakage. Discharge piping from the CLES is routed to a floor drain in the nuclear island drain and vent system located in the Reactor Building Annulus.~~

~~The leak-off system is functional during normal operation and postulated accidents. During design basis accidents, valves in the CLES are open. Leaks from components (valves, hatch seals) are collected and drained to the Reactor Building Annulus by the pressure differential created by the AVS. Leak-off system component classifications are presented in Section 3.2.~~

~~Containment penetrations that are paths for potential bypass leakage terminate in areas of the surrounding buildings that are filtered during a postulated accident. Section 6.2.6.5 addresses the treatment of bypass leakage for containment leakage rate testing.~~

6.2.3.3 Safety Evaluation

The AVS system components are located inside the Fuel Building, which is a Seismic Category I structure. The two AVS accident filtration trains are designed to withstand the safe shutdown earthquake and are classified as Seismic Category I.

The safety-related components of the AVS system remain functional and perform their intended function following a postulated internal hazard (e.g., fire, flood, internal missiles, pipe breaks). The two accident filtration trains are physically separated from each other to prevent common mode failures. Since the accident filtration trains are completely redundant and are both full capacity, one train alone can collect and process radioactive material that may leak from the primary containment following an accident. The supply and exhaust trains of the normal filtration train can be isolated with two redundant dampers in series.

Guard pipes surround high energy lines passing through the annulus to protect against pipe failures that could compromise the integrity of the secondary containment. Design criteria for guard pipes are presented in Section 3.6.2.2. Containment penetrations are listed in Section 6.2.4. Doors and hatches leading to the annulus are maintained under administrative control.

If a fire is detected in the annulus during normal operation, the continuous ventilation of the annulus is stopped manually from the MCR by closing the isolationfire dampers located at the wall penetration between the Fuel Building and Nuclear Auxiliary Building ventilation supply and exhaust shafts to reduce the possibility for fire propagation.

Analyses have demonstrated the ability of the AVS to depressurize and maintain a subatmospheric pressure in the annulus during normal operation and following a design basis LOCA. The LOCA is assumed to occur concurrent with a loss of off-site power, and a loss of one of the accident trains. The total thermal and pressure expansion of the primary containment structure is assumed to occur prior to the start of the remaining accident train, resulting in a starting pressure of 14.712 psia. The drawdown of the annulus is started 60 seconds after the start of the postulated accident. Analytical results indicate that the pressure in the annulus reaches a subatmospheric pressure sufficient for the AVS to perform its safety function with substantial margin. Analytical specifications and results are presented in Table 6.2.3-2.

6.2.3.4 Inspection and Testing Requirements

The AVS major components, such as dampers, motors, fans, filters, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Initial in-place acceptance testing of the AVS is performed as described in Section 14.2 (test abstracts #077 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The AVS is designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of AVS is performed to demonstrate system and component operability and integrity.

Isolation dampers are periodically inspected and damper seats replaced as required.

Per IEEE 334 (Reference 17), type tests of continuous duty class 1E motors for AVS are conducted to confirm ESF system operation and availability.

Fans are tested by manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 18, 19, and 20). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 21).

Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 22), American Society of Mechanical Engineers, ANSI/ASME N510 (Reference 23), ASME AG-1 (Reference 24), and RG 1.52 (Reference 25).

Heaters are tested in accordance with ASME AG-1, Section CA (Reference 24).

Emergency filtration units are tested by manufacturer for housing leakage, filter bypass leakage and airflow performance. Periodically and subsequent to each filter or adsorber material replacement, the unit is inspected and tested in-place in accordance with the requirements of RG 1.52 (Reference 25), ANSI/ASME N510 (Reference 23) and ASME AG-1 (Reference 24). The charcoal adsorber samples are tested for efficiency in accordance with RG 1.52 (Reference 25) and ASTM D3803 (Reference 26). Air filtration and adsorption unit heaters are tested in accordance with ANSI/ASME N510 (Reference 23).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

In-service test program and test frequency requirements are described in Section 16, "Technical Specification" Subsections 3.6.6, 3.6.7 and per Ventilation Filter Test Program (VFTP) described in Section 16, "Technical Specification" Subsection 5.5.10.

6.2.3.5 Instrumentation Requirements

Indication of the operational status of the AVS equipment, position of dampers, instrument indications and alarms are provided in the MCR. Fans, motor-operated dampers, and heaters are operable from the MCR. Local instruments are provided to measure differential pressure across filters, flow, temperature and pressure. The fire detection and sensors information is delivered to the fire detection system. The radiation instrumentation requirements for controlling airborne radioactivity releases via the vent stack are addressed in Section 11.5.

The minimum instrumentation, indications, and alarms for the AVS ESF filter systems is provided in Table 6.2.3-3 per the requirements of ANSI/ASME N509 (Reference 27).

Table 6.2.3-1—Design and Performance of Annulus Ventilation System

Design Feature	Value
Maximum annulus pressure during normal operation [2]	≤ -0.8 inches water gauge
Maximum annulus pressure during postulated accidents [2]	≤ -0.25~~2.5~~ inches water gauge
Minimum annulus temperature (all modes)	45°F
Maximum relative humidity at iodine filters (postulated accident)	70%
Design pressure	2.77 inches water gauge
Design temperature	212°F
Electrical heater power (each train)	6 kW
Minimum rated efficiency – Pre-filter	55-65%
Minimum rated efficiency – HEPA filters	99.95%
Minimum rated efficiency – Iodine adsorbers [1]	99%
Fan design air flow	60 – 1177 cfm

Note:

1. Laboratory test results for both elemental iodine and organic iodine, based on four (4) inch deep bed of carbon.

2. The subatmospheric pressure in the annulus will be equal to or lower than the value listed.

Table 6.2.3-2—Secondary Containment Response Analysis

Design Feature [3]	Value	
Annulus temperature	Initial After 24 hours	86.6°F < 92°F
Annulus pressure	Start of drawdown At 305 seconds After 565 seconds	0.44 inches water gauge ≤ -0.25 inches water gauge ≤≥ -0.252.5 inches water gauge
Annulus volume	Initial After compression and at start of drawdown analysis	706,299 ft^3 704,737 ft^3
Heat transfer coefficients [1, 2]	N/A [4]	
Conductive heat transfer [1]	N/A [4]	
Radiant heat transfer [1]	N/A [4]	
Compressive effect of primary containment [1]	Volume reduction of 1556 ft^3	
Secondary containment in-leakage assumed [1]	0.25% of containment free volume per day	
Secondary containment out-leakage assumed [1]	Zero leakage out of the secondary containment	
Heat loads generated within annulus [1]	Negligible	

Notes:

1. During postulated accident in primary containment.
2. Heat transfer calculated by methods provided in BTP 6-2.
3. Secondary containment response analysis based on worst single failure.
4. An infinite heat transfer coefficient was assumed such that the surface temperature in contact with primary containment is at the design maximum value from time zero.

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Table 6.2.3-3—Instrumentation, Indication, and Alarm Features for AVS (Accident Filtration Trains)

Sensing Location	Local Indication / Alarm	MCR Indication / Alarm
~~Unit Inlet Moisture Separator~~	~~Pressure Drop Indication~~	
Electric Heater Inlet	Temperature Indication	
Electric Heater	Status Indication	Status Indication
Electric Heater Outlet	Temperature Indication	Temperature Indication / High Temperature Alarm
Prefilter	Pressure Drop Indication / High Alarm	
~~Upstream~~ HEPA	Pressure Drop Indication / High Alarm	
Adsorber	Pressure Drop Indication / High Alarm	
Adsorber Outlet	Temperature Indication	Temperature Indication / High Temperature Alarm
Post filter	Pressure Drop Indication / High Alarm	
System Filters Inlet to Outlet		Summation of pressure drop across entire filtration train (Indication / High Pressure Drop Alarm)
Fan	Pressure Drop Indication	Handswitch / Status Indication
Damper / Operator	Position Indication	Position Indication
Unit Outlet	Flow Rate Indication	Flow Rate (recorded indication, high alarm signal)
Unit Outlet	Radiation Indication	Radiation Indication / High Radiation Alarm

Figure 6.2.3-1—AVS Normal Operation Train

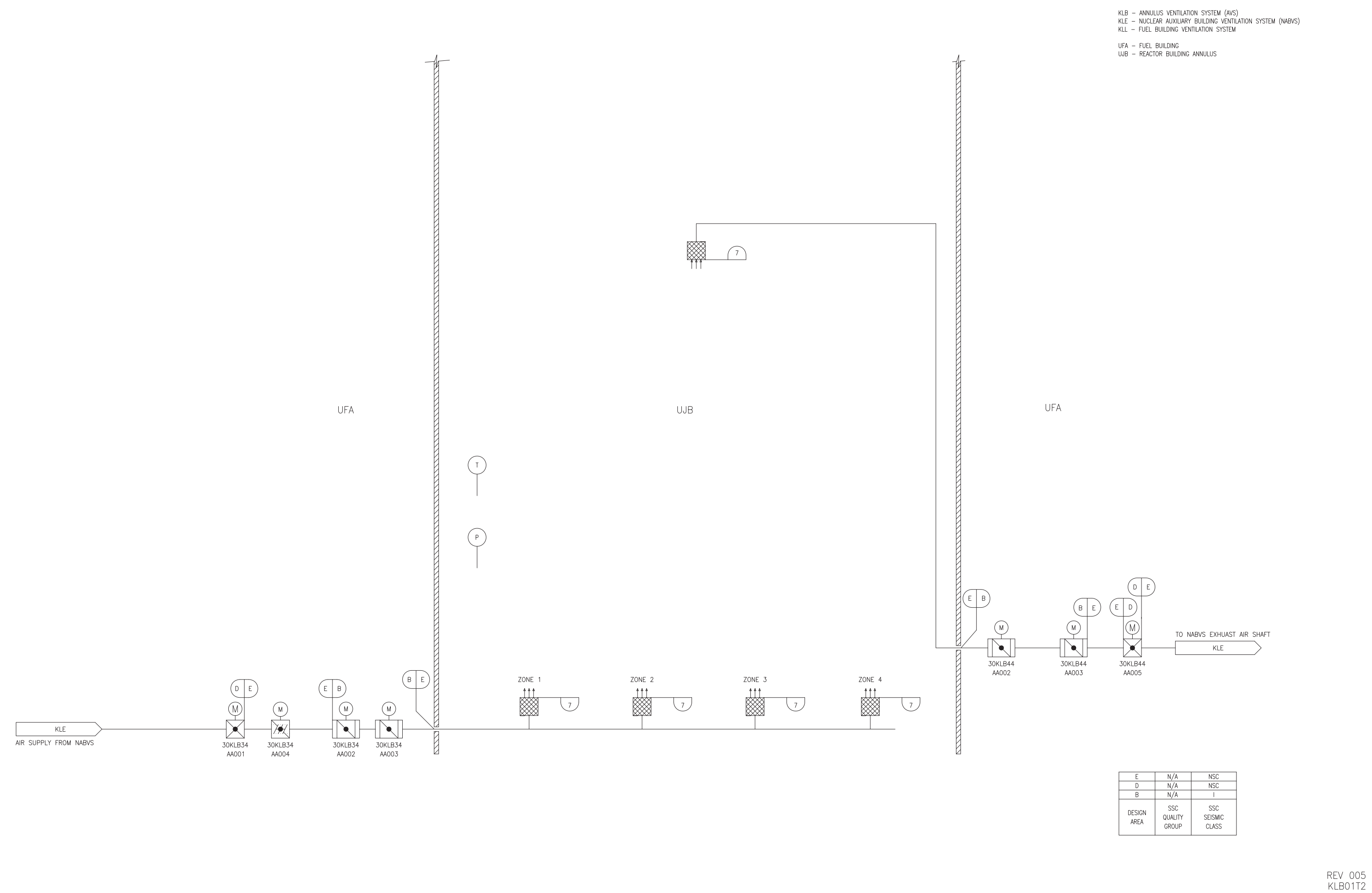
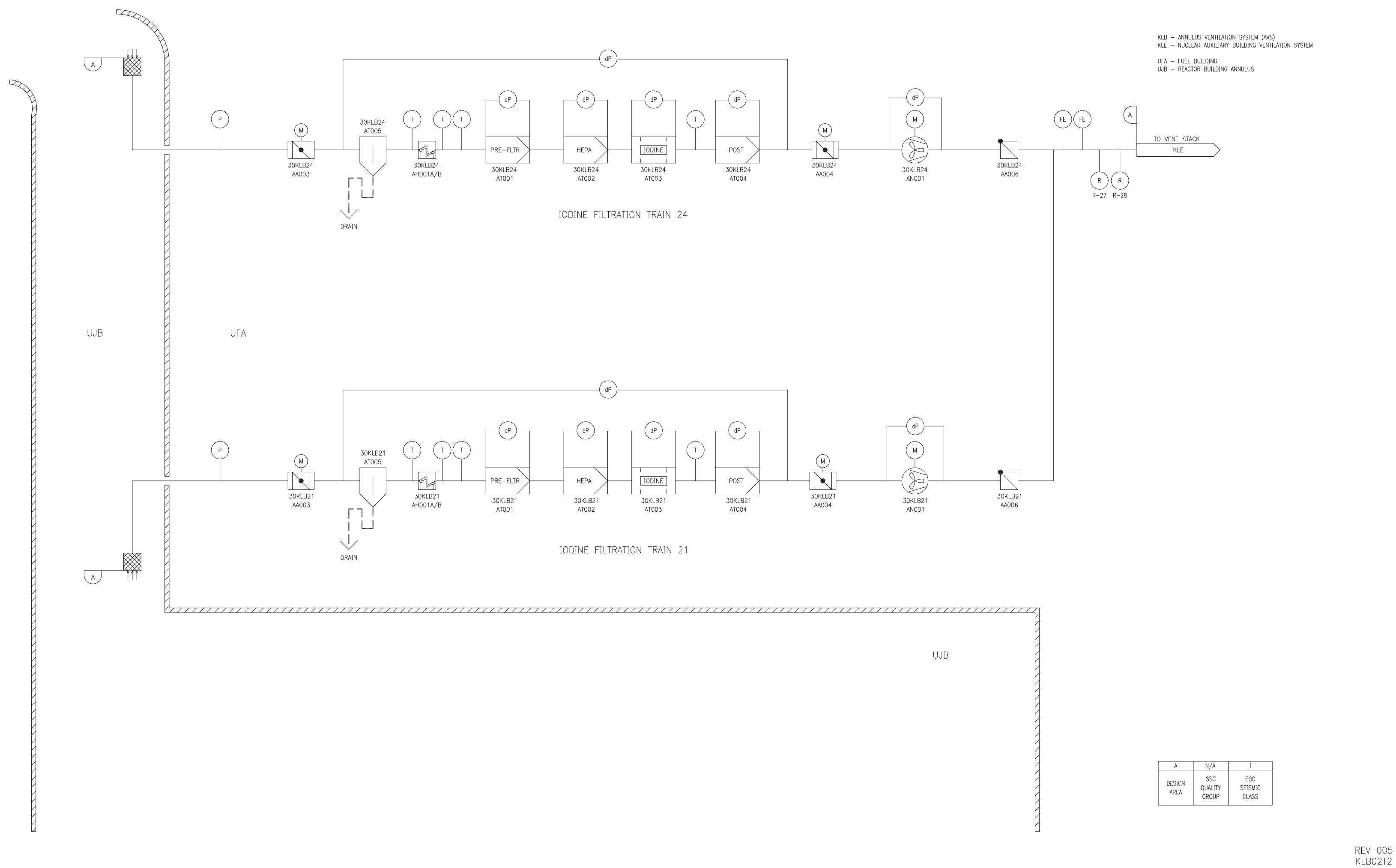


Figure 6.2.3-2—AVS Accident Trains



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6.4 Habitability Systems

The main control room (MCR) habitability systems are designed to allow control room operators to remain in the MCR to operate the plant safely under normal conditions and to maintain the plant in a safe state under accident conditions.

The habitability systems protect the control room operators from the effects of accidental releases of radioactive gases. The systems also provide the necessary support for the Technical Support Center (TSC) personnel in case of an accident or abnormal event. The TSC is contained within the control room envelope (CRE).

The term “habitability systems” refers to equipment, supplies, and procedures. The habitability equipment is defined in Section 6.4.2.1.

Control room habitability system objectives include:

- Missile protection and radiation shielding (Section 3.8).
- Air filtration (Section 6.5.1, Section 9.4.1).
- Pressurization and air conditioning (Section 9.4.1).
- Fire protection (Section 9.5.1).
- Radiation monitoring (Section 12.3.4).
- Detection of smoke (Section 9.4.1).
- Lighting (Section 9.5.3).
- Personnel support.

6.4.1 Design Basis

Control room habitability is provided, so that the plant can be operated safely under normal conditions, and maintained safely under accident conditions or abnormal events. These design bases relate to MCR habitability:

- Habitability systems are designed to accommodate the effects of environmental conditions associated with normal operation, maintenance, testing, and postulated accidents and are protected against dynamic effects that may result from equipment failures and from events and conditions outside the nuclear power unit (GDC 4).
- The MCR habitability systems are not shared among multiple nuclear power units (GDC 5).
- The CRE is protected from radiological releases and outside fire or smoke events to permit access and occupancy of the MCR.

- The MCR air conditioning system (CRACS) provides the capability to isolate the CRE from the surrounding areas, pressurize the CRE to prevent in-leakage, and filter supply air to remove radioactive halogens (10 CFR 50.34(f)(2)(xxviii)).

- The air intake structures are physically located away from potential radiological sources, (10 CFR 50.34(f) (2) (xxviii)).

- The TSC is designed in accordance with NUREG-0696 (Reference 6). A space of at least 1875 ft^2, within the integrated operations area, is allocated to the TSC. Therefore, the TSC is large enough to provide space for 25 personnel at 75 ft^2 per person.

- The CRE design permits periodic testing and in-service inspection to confirm integrity.

- The volume of the CRE is approximately 200,000 ft^3. With the CRE operating in a full recirculation alignment, the air inside the CRE can support five persons in the MCR and twenty-five persons in the TSC (Integrated Support Center) for at least one and one-half days.

The CRACS design bases are presented in Section 9.4.1.

The evaluation of potential toxic chemical accidents is addressed by the COL applicant in Section 2.2.3 and includes the identification of toxic chemicals. A COL applicant that references the U.S. EPR design certification will evaluate the results of the toxic chemical accidents from Section 2.2.3, address their impact on control room habitability in accordance with RG 1.78, and if necessary, identify the types of sensors and automatic control functions required for control room operator protection.

6.4.2 System Design

6.4.2.1 Definition of Control Room Envelope

The MCR contains the equipment necessary to monitor and control the plant during all operating conditions and to bring the plant to a safe shutdown state.

The CRE comprises these areas:

- Main control room.

- Shift supervisor's office.

- Integrated operations area including:

  – Technical support center.

  – NRC office area.

  – Break area.

- Restroom facilities.
- Instrumentation and controls (I&C) service center.
- Service corridors.
- Computer rooms.
- Equipment rooms that contain MCR ventilation supply, filtration, and air conditioning systems.

The CRE is housed within Safeguard Buildings 2 and 3. The CRE is shown in Figure 6.4-1—Control Room Envelope Plan View 1, Figure 6.4-2—Control Room Envelope Plan View 2, and Figure 6.4-3—Control Room Envelope Elevation View. The total free-air volume of the CRE is approximately 200,000 ft^3.

These personnel support items are maintained within the confines of CRE in sufficient quantities for required operational personnel:

- Non-perishable food supply and drinking water.
- Emergency medical supply kits.
- SCBA units, air supply equipment and protective clothing for protection from smoke in accordance with RG 1.189.

Food, water, and medical needs of the control room personnel are met using the site emergency preparedness process for providing these services to emergency centers, following the guidance of NUREG-0654 (Reference 1). Emergency planning is addressed in Section 13.3.

6.4.2.2 Ventilation System Design

The CRACS design is described in Section 9.4.1, which identifies and describes major components, design parameters and classifications, instrumentation and controls, and provides a system schematic. Figure 15.0-4 presents airflows through the system for post-accident filtration. Section 6.5.1 describes the engineered safety features (ESF) filter systems and fission product removal capability for the CRACS.

Section 3.8.4 contains elevation and plan views of the Safeguard Buildings. Figure 2.3-1 provides the relative locations of potential radiological release points and the CRACS air intakes. Figure 6.4-1 through Figure 6.4-3 illustrate the CRE layout, including surrounding corridors, doors, stairwells and shielded walls.

One outside air intake for the CRACS is located in Safeguard Building 2 and the other is located at a separate location on Safeguard Building 3, to prevent intrusion of radiological contamination.

The CRACS intakes are located on the roof of Safeguard Buildings 2 and 3. The two intakes are physically separated and are removed from potential radiological release points, including the main steam relief exhaust, the Safeguard Building depressurization shafts, and the vent stack, in both lateral and vertical directions. Section 15.0.3 identifies the bounding atmospheric release point used in the radiological analyses.

Radiation monitors (R-29 and R-30, Table 11.5-1) in the CRACS supply air duct continuously measure the concentration of radioactive materials in the supply air. The control room airborne radioactivity monitoring system is addressed in Section 12.3.4 and Section 11.5.3.1.11.

The main features related to control room habitability of the CRACS design are:

- Under normal operating conditions:
  - The ventilation system operates in the recycling mode with fresh air makeup.
  - The air makeup rate corresponds to the exhausts from the kitchen and restrooms and leakage out of the area.
  - The ventilation system maintains a positive pressure greater than or equal to 0.01 inches water gauge within the CRE areas with respect to the adjacent environmental zones.
- The ventilation system maintains an ambient condition for comfort and safety of control room occupants and to support operability of the MCR components during normal operation, anticipated operational occurrences (AOO), and design bases accidents (DBA).
- The ventilation system maintains a positive pressure of greater than or equal to 0.01 inches water gauge under normal operation, and greater than or equal to 0.125 inches water gauge under accident conditions ~~as a minimum~~ within the CRE areas with respect to adjacent environmental zones to prevent uncontrolled, unfiltered in-leakage during normal and accident conditions. The filtered outside air supply rate during accident conditions corresponds to 0.3 volume changes per hour.
- During a site radiological contamination event, the air intake is redirected through the ESF filter system trains.
- The ventilation system can be operated in full recirculation mode without outside air makeup during DBAs. The recirculated airflow rate is 3,000 cfm to the CREF unit.
- The ventilation system provides adequate capacity for proper temperature within the CRE.

- Redundancy for air cooling and filtration is provided by having two independent trains for critical functions.
- Redundancy is provided for proper operation of the system when one active component is out of service.
- Power supplies of the active components are backed up with emergency power so that they function in case of a loss of offsite power.
- Each CRACS train has the capability to remove the design heat load. Each CRACS coiling coil (30SAB01AC001, 30SAB02AC001, 30SAB03AC001, and 30SAB04AC001) has a total cooling capacity of 470,000 Btu/hr and is designed in accordance with ASME AG-1 (Reference 2).

6.4.2.3 Leak-tightness

The CRACS is maintained in a manner that minimizes the unfiltered in-leakage across the CRE boundary. Adequate leak-tightness for air sealing components supports control room operator habitability within the CRE boundary during normal operation, AOOs and DBAs.

Leak-tightness provisions for pressure boundary components are:

- Pipe penetrations are sealed and tested for air leakage after initial construction.
- Cable penetrations are sealed and tested for air leakage after initial construction.
- Doors used for personnel or equipment access are sealed and remain substantially air-tight to maintain pressurization of the CRE area. Doors are arranged to allow access by necessary operational personnel and maintain pressurization of the CRE area. Two access doors are arranged in series to form a configuration similar to an air lock, minimizing in-leakage from surrounding areas.
- Open ended drain lines are provided with water seals.
- Building joints within the CRE boundary are sealed.

The CRACS maintains a positive pressure of ~~≥~~ greater than or equal to 0.125 inches ~~of~~ water gauge within the CRE boundary during accident conditions, which limits unfiltered in-leakage through walls, ceiling, doors, pipes and cable penetrations.

The CRE boundary limits leakage from adjacent environmental zones to a maximum of 40 cfm unfiltered in-leakage plus 10 cfm for CRE ingress and egress, in accordance with RG 1.197 (Reference 7). The system design requirements are provided in Section 9.4.1 and testing requirements are specified in the control room envelope habitability program in Technical Specifications Section 5.5.17.

6.4.2.4 Interaction with Other Zones and Pressure-Containing Equipment

The CRACS does not supply air to areas other than the CRE. The air supply filtration and air conditioning systems are within the pressure boundary, thus minimizing the potential in-leakage of contaminated air into the MCR through fan shafts or ductwork connections.

The CRE area is isolated in the event of an outside fire or smoke.

Upon detection of a smoke alarm from the smoke detector located in the outside air inlet ducts for the CRACS, the operator in the MCR will close the outside inlet isolation dampers at the location of the alarm and place both CREF (iodine filtration) trains in the filtered alignment.

Fire barriers with a three hour fire rating enclose the MCR. Openings penetrating the fire barrier are furnished with both fire doors and fire dampers or approved fire rate seals meeting the associated barrier fire duration rating. In case of a fire within the CRE area, the room supply and exhaust are isolated by fire dampers and monitoring and control of the plant can be performed from the remote shutdown station (RSS). The RSS is located in a different fire zone and is on a different elevation than the MCR, and is not contained within the CRE boundary. The RSS is described in Section 7.4.

The CRACS does not interact with air conditioning equipment serving adjacent zones, minimizing the possibility of transferring radioactive gases into the CRE. Piping not connected or related to the equipment within the CRE boundary is routed outside the pressurized boundary of the CRE.

The MCR is not located near pressure-containing tanks, equipment, or piping, such as CO_2 tanks or steam lines, which upon failure could transfer dangerous or hazardous material to the CRE. However, portable self-contained breathing apparatus (SCBA) are available for use by the control room operators.

6.4.2.5 Shielding Design

Massive concrete structures separate the MCR from the reactor containment atmosphere and the external environment, as described in Section 3.8. The thick concrete walls prevent any significant direct radiation shine from outside the Safeguard Buildings. The MCR is protected against direct shine from the MCR charcoal filtration system by a 19 inch concrete floor. Radiation sources and shielding requirements are identified in Section 12.2 and Section 15.0.3. The MCR dose calculations that are presented in these sections identify the contribution from direct radiation shine and demonstrate that the total MCR dose under accident conditions is within regulatory limits.

6.4.3 System Operational Procedures

During normal plant operation, the CRACS maintains acceptable environmental conditions within the CRE boundary. Upon receipt of a high radiation signal in the air intakes or a primary containment isolation signal, the system is automatically switched so that the intake is routed through the CREF (iodine filtration) trains. The operating modes of the CRACS are described in Section 9.4.1.

Upon detection of a smoke alarm from the smoke detector located in the outside air inlet ducts for the CRACS, the operator in the MCR will close the outside inlet isolation dampers at the location of the alarm and place both CREF (iodine filtration) trains in the filtered alignment.

A COL applicant that references the U.S. EPR design certification will provide written emergency planning and procedures in the event of a radiological or a hazardous chemical release within or near the plant, and will provide training of control room personnel.

6.4.4 Design Evaluations

Section 9.4.1 contains the design evaluation of the CRACS. Fire protection inside and outside the CRE boundary is addressed in Section 9.5.1.

The total effective dose equivalent (TEDE) for the MCR occupants throughout the duration of any postulated DBA does not exceed the limits of GDC 19. The evaluation of radiological exposure to control room operators and the dose calculation model for the MCR is described in Section 15.0.3.

The CRE is designed, maintained and tested in accordance with RG 1.196 and RG 1.197. Habitability systems provide the capability to detect and protect personnel within the CRE boundaries from external fires, smoke, and airborne radioactivity.

A COL applicant that references the U.S. EPR design certification will confirm that the radiation exposure of MCR occupants resulting from a DBA at a nearby unit on a multi-unit site is bounded by the radiation exposure from the postulated design basis accidents analyzed for the U.S. EPR; or confirm that the limits of GDC 19 are met.

6.4.5 Testing and Inspection

Testing and inspection of the CRACS are described in Section 9.4.1. Refer to Section 14.2 (test abstract #082) for initial plant testing.

Periodic testing to confirm CRE integrity is performed using testing methods and at testing frequencies consistent with RG 1.197. The air in-leakage test (tracer gas test) of the CRE boundary is performed in accordance with ASTM E741 (Reference 3). Air quality testing is performed in accordance with ANSI/ASHRAE 52.2 (Reference 4) and

ANSI/ASME N510 (Reference 5).

The control room envelope habitability program in Technical Specifications Section 5.5.17 defines testing requirements.

6.4.6 Instrumentation Requirements

The instrumentation and control features of the CRACS are described in Section 9.4.1. Radiation monitoring equipment for the CRE is described in Section 12.3.4, Section 11.5.3.1.11 and Table 11.5-1, Monitors R-29 and R-30.

6.4.7 References

1. NUREG-0654/FEMA-REP-1 Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," U.S. Nuclear Regulatory Commission, November 1980.

2. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, "Housings" Addenda).

3. ASTM E741–2000, "Standard Test Methods for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution," American Society for Testing and Materials, 2000.

4. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," American National Standards Institute/American Society of Heating, Refrigerating and Air-Conditioning Engineers, 1999.

5. ANSI/ASME N510-1989 ~~(R1995)~~, "Testing of Nuclear Air-Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

6. NUREG-0696, "Functional Criteria for Emergency Response Facilities," U.S. Nuclear Regulatory Commission, February 1981.

7. NRC Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," 2003.

6.5 Fission Product Removal and Control Systems

Several U.S. EPR systems are designed to prevent or limit the release of fission products following a postulated design basis accident (DBA) or fuel handling accident. These systems include the engineered safety features (ESF) filter systems, the primary and secondary containment structures and systems, and the containment isolation system. This section describes the systems and how they mitigate fission product release. Section 15.0.3 presents the DBA radiological evaluations that demonstrate the effectiveness of these fission product removal and control systems in maintaining radioactivity releases within regulatory limits. The sequence of events assumed in the dose analyses for DBAs are also presented in Section 15.0.3.

6.5.1 ESF Filter Systems

ESF filter systems consist of filters, moisture separators, heaters, fans, dampers, and ductwork that remove particulate and gaseous radioactive material from the atmosphere. Four ESF filter systems work in conjunction with the five ventilation systems listed below:

- Main control room (MCR) air conditioning system (CRACS), described in Sections 6.4 and 9.4.1.
- Annulus ventilation system (AVS), described in Section 6.2.3.
- Safeguard building (SB) controlled area ventilation system (SBVS), described in Section 9.4.5.
- ~~Fuel building (FB) ventilation system (FBVS), described in Section 9.4.2.~~
- Containment building ventilation system (CBVS) for the containment low-flow purge ~~exhaust~~ subsystem (CLFPS), described in Section 9.4.7.

The sections identified for the ventilation systems provide the descriptions and piping and instrumentation diagrams of these ventilation systems, along with design bases and safety evaluations.

Ventilation systems are aligned to ESF filter systems to support plant operations and accident mitigation. ESF filters in the CBVS low-flow purge exhaust subsystem are aligned during purging operations. The fuel building ventilation system (FBVS) aligns to the SBVS ESF filters in response to a containment isolation signal.

6.5.1.1 Design Bases

The ESF filter systems mitigate the consequences of postulated accidents by removing particulate and gaseous radioactive material from the atmosphere that could be released to the environment (GDC 41). The ESF filter systems are designed to permit periodic inspection and periodic pressure and functional testing (GDC 42, GDC 43).

The ESF filter systems remove radioactive material from the atmosphere to maintain the MCR in a safe condition under accident conditions, including loss of coolant accidents (LOCA), in accordance with GDC 19. These systems, although not credited in the radiological analyses, also provide protection during fuel handling in accordance with GDC 61.

Design bases for radiation monitoring are presented in Section 12.3.4 and Section 11.5.1.

The ESF filter systems are designed to meet the design and performance requirements of RG 1.52, Revision 3, ANSI/ASME N509 (Reference 1), and ANSI/ASME N510 (Reference 2).

6.5.1.2 System Design

6.5.1.2.1 General System Design

The ESF filter systems described in this section are designed to limit the release of fission products to the environment and to limit radiation dose to the personnel in the MCR. Regardless of the application, each ESF filter system consists of two independent trains. Each train has an activated ~~charcoal~~ carbon adsorber with motorized dampers, moisture separator, electric heater, prefilter, ~~and inlet and outlet~~ high efficiency particulate air (HEPA) filter~~s~~, and post filter. A booster fan and isolation dampers are included to provide the flow to the vent stack for the discharge of filtered air.

Table 3.2.2-1 provides the seismic and other design classifications for the components of the ESF filter systems.

6.5.1.2.2 Component Design

Filter Air Heaters

The iodine adsorption efficiency of the filters decreases at high humidity. Therefore, the radiological filter air heaters limit the relative humidity to a maximum of 70 percent so that the carbon adsorber can remove iodine from the exhaust air. The filter air heaters are located upstream of the iodine filtration units to prevent excessive moisture accumulation in the charcoal filter beds. The heaters meet the requirements of ASME AG-1 (Reference 3). The heater sizes are as follows:

- AVS: 6 kW nominal heater rating.
- SBVS: 11 kW nominal heater rating.
- CRACS: 15 kW nominal heater rating.
- CLFPS~~CBVS~~: 14 kW nominal heater rating.

Prefilters

The prefilters are located upstream of the HEPA filters and increase the life of the HEPA filters by collecting the larger particles. The prefilters maintain a minimum rated efficiency of 55–65 percent, which prevents the HEPA filters from becoming overloaded during radiological release events. The prefilters meet the requirements of ANSI/ASHRAE Standard 52.2 (Reference 4). The filters are equipped with local differential pressure measurement, which indicates the degree of particulate loading and the need for filter change.

Moisture Separator

~~The moisture separator is a combination of moisture separator and prefilter.~~ The moisture separator ~~must~~ meets the requirements of RG 1.52 (Reference 10), ANSI/ASME N509 (Reference 1), and ASME AG-1 (Reference 3). The moisture separator is located upstream of the ~~filter air~~ heater and the ~~HEPA~~ prefilter. The moisture separator shall be a design that has been qualified by testing in accordance with the procedures described in Reference 1. Moisture separators are~~must be~~ capable of removing at least 99 percent by weight of entrained moisture in an air stream containing approximately 1.5–2 lb of entrained water per 1000 cubic feet, per ANSI/ASME N509 (Reference 1). ~~Fiberglass knitted media within the moisture separator removes airborne particulates, which prevents the HEPA filters from becoming overloaded during radiological release events. The filters are equipped with local differential pressure measurement, which indicates the degree of particulate loading and the need for filter change.~~

HEPA Filters

HEPA filters are located upstream of the carbon adsorbers to prevent contamination of the carbon adsorbers. A single HEPA filter standard size is rated for 1,500 cfm of air flow and has a dust loading capacity of 1,140 grams. The HEPA filter has an initial pressure drop of 1.3 inches of water gauge and approximately 3 inches of water gauge with a full dust loading. The maximum mass loading of the HEPA filters resulting from a design basis accident is as follows:

- Annulus exhaust filtration system (AVS): 822 mg.
- Safeguard Building exhaust filtration system (SBVS): 631 mg.
- Main Control Room emergency filtration system (CRACS): 0.007 mg.
- Containment low-flow purge subsystem (CLFPS): mg.

The filters are equipped with local differential pressure measurements that indicate the degree of load and the need for a filter change. HEPA filters are designed, constructed, qualified, and factory tested in accordance with ASME AG-1

(Reference 3). Each HEPA filter cell is manufacturer tested to achieve an efficiency of at least 99.97 percent and, once installed, is tested periodically according to ASME N510 (Reference 2) to confirm an efficiency of at least 99.95 percent.

Carbon Adsorbers

The radiological filters use activated charcoal with no more than 5 percent of impregnant to adsorb airborne radioiodine from the air. Carbon filters are designed to meet the requirements of RG 1.52 and the design of the carbon adsorber shall be ≤ 2.5 mg of total iodine per gram of charcoal. The maximum charcoal loading for the carbon adsorbent trains is as follows:

- Annulus exhaust filtration system (AVS): 0.08 mg/g
- Safeguard Building exhaust filtration system (SBVS): 0.94 mg/g
- Main Control Room emergency filtration system (CRACS): 2.0E-06 mg/g.
- Containment low-flow purge subsystem (CLFPS): mg/g.

Each ESF carbon adsorber contains a four-inch-deep carbon bed with an average atmospheric residence time of 0.25 seconds per two inches of adsorber bed thickness and a laboratory decontamination efficiency of ≥ 99 percent, as tested per ASTM D3803 (Reference 5). ~~Downstream of the carbon adsorbers, a HEPA filter removes entrained charcoal.~~ Charcoal trays and screens are fabricated using all-welded construction to preclude potential loss of charcoal. The carbon adsorbers are equipped with differential pressure measurement to indicate the need for filter replacement. Carbon adsorbers are constructed, qualified, and tested in accordance with ASME AG-1 (Reference 3).

The maximum component temperature in the carbon adsorber section with normal air flow through the unit is 122°F. The maximum component temperature in the carbon adsorber section with the fan shut down and the carbon adsorption unit isolated post-LOCA is 148°F. The ignition temperature of the carbon adsorber is 625°F. The recommended limitation of the filter operating temperature is 250°F, per Nuclear Air Cleaning Handbook (Reference 11). A comparison of the recommended limitation of the filter operating temperature with the lower temperature of the isolated post-LOCA carbon adsorption unit, demonstrates that isolation provides an acceptable means of fire protection.

Post Filters

The post filter is located downstream of the carbon adsorber. During operation of the carbon filtration exhaust, the air flow rate will be low through the carbon adsorber to prevent spread of the carbon dust. However, the post filter ensures that the carbon dust or carbon fines are removed prior to the air being distributed further. The post filter meets the requirements of ASME AG-1 (Reference 3), and has an average atmospheric dust efficiency of 95% in accordance with ANSI/ASHRAE Standard 52.2 (Reference 4). The post filter is equipped with differential pressure measurement which indicates the degree of particulate loading and the need for filter change.

Fans

The fans used in the ventilation systems are exhaust fans. The fans are electric motor driven and are radial, axial, or centrifugal type, according to the system flow and pressure requirements. Fan operating characteristics, including flow rate and static head, are measured to confirm the required air delivery flow rates. Fan performance is rated in accordance with the applicable requirements of ANSI/AMCA 210 (Reference 6), or ANSI/AMCA 211 (Reference 7), and ANSI/AMCA 300 (Reference 12).

Dampers

The ESF filter systems use a variety of dampers, and the dampers have the same leakage rate criteria as the ducts on which they are installed. The backdraft dampers close to prevent potentially contaminated exhaust air from blowing back into the non-operating exhaust unit of the filter train.

The performance and testing requirements of the dampers are in accordance with the requirements of ANSI/AMCA 211 (Reference 7)., and ANSI/AMCA 500 (Reference 8).

Fire dampers are installed where ductwork penetrates a fire barrier; these dampers are designed and installed to the requirements of NFPA 80UL 555 (Reference 9) and NFPA 90A (Reference 13). Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

6.5.1.3 Design Evaluation

The ESF filter systems are sized to remove fission products that may be released following postulated accidents so that offsite and control room doses remain within regulatory limits. Radiological analyses, source terms, methods, and assumptions for evaluating the radiological consequences of DBAs are described in Section 15.0.3.

The ESF filter systems have two redundant trains with suitable interconnections, leak detection, isolation, and containment capabilities. The ESF filter train is powered from an emergency bus that is backed up by an emergency diesel generator. Each ESF train is powered from a separate electrical division to maintain its safety function, assuming a single failure. The electrical divisions are addressed in Section 8.3.

The ESF filter systems permit periodic inspections and routine testing to confirm that the equipment is functional and can mitigate the consequences of postulated accidents.

The ESF filter systems permit appropriate periodic inspection of components such as filters and ducts to verify the integrity and capability of the systems. The systems may be periodically operated to demonstrate that their components perform their required functions. The systems are monitored by instrumentation so that system operability and accident mitigation performance can be confirmed.

The ESF filter systems capacities are as follows:

- AVS: ≥ 1060 cfm and ≤ 1295 cfm (nominal 1177 cfm), face velocity 300 fpm, configuration 1 High x 1 Wide.
- SBVS: ≥ 2160 cfm and ≤ 2640 cfm (nominal 2400 cfm), face velocity 375 fpm, configuration 2 High x 1 Wide.
- CRACS: ≥ 3600 cfm and ≤ 4400 cfm (nominal 4000 cfm), face velocity 250 fpm, configuration 2 High x 2 Wide.
- ~~CBVS~~CLFPS: ≥ 2700 cfm and ≤ 3300 cfm (nominal 3000 cfm), face velocity 375 fpm, configuration 2 High x 1 Wide.

The ESF filter systems in the CRACS, AVS, and SBVS are aligned automatically with their associated ventilation systems upon receipt of an ESF actuation signal, including safety injection, or detection of high radiation levels (refer to Table 11.5-1, Monitors R-29 and R-30 (CRACS~~s~~) and R-25 (SBVS)). The ESF filter systems may also be manually aligned. The ESF filter systems can also be aligned to the FB and the containment area during fuel handling of irradiated fuel assemblies. The systems are placed in line with the ~~FBVS and~~ CBVS in case of a fuel handling accident. With this ESF filter system alignment, the offsite release of radioactive material from a fuel handling accident does not exceed regulatory limits. During containment purging, the ESF filters in the low-flow purge exhaust subsystem of the CBVS are aligned to reduce radioactive releases in case of a rod ejection accident occurring during purging operations.

Each ESF filter system is sized to accommodate the required ventilation flow and to remove greater than 99 percent of the fission products that could be entrained in the air. The ESF filter systems conform to the requirements of RG 1.52.

Performance evaluations of the ventilation systems that operate in conjunction with the ESF filter systems to limit fission product release to the environment or the MCR are presented in the sections corresponding to the ventilation systems.

6.5.1.4 Tests and Inspections

Refer to Section 14.2 (test ~~abstracts~~ #076, #077, #082, and #083) for initial plant testing of the ESF filter systems. Routine testing and inspection of ESF filter systems are conducted under the ventilation filter testing program in Technical Specifications

Section 5.5.10. Laboratory testing of samples of activated carbon adsorber material is performed in accordance with ASTM D3803 (Reference 5) and RG 1.52.

6.5.1.5 Instrumentation Requirements

Instrumentation and controls provide automatic operation and remote control of the ESF filter systems and continuous indication of system parameters.

6.5.1.6 Materials

The materials used for ESF filter systems are chosen considering environmental conditions, are consistent with acceptable construction practices, and meet the requirements of RG 1.52 and ASME AG-1 (Reference 3).

6.5.2 Containment Spray Systems

An automatically actuated containment spray system is not required to mitigate the consequences of a DBA, as presented in Section 6.2.1 and Section 15.0.3. However, a manually initiated containment spray system is provided for severe accident mitigation. This system is part of the severe accident heat removal system (SAHRS), which contains a containment dome spray system to reduce pressure and to remove fission products from the containment atmosphere under severe accident conditions. The SAHRS is described in Section 19.2.3.3. This system is not credited in the design basis containment or radiological analyses.

6.5.3 Fission Product Control Systems

The primary mechanism to limit release of fission products that are produced following a DBA is the Containment Building. The primary containment structure is a cylindrical building constructed from reinforced, post-tensioned concrete with a 0.25-inch thick steel liner. The Containment Building is protected from external hazards by the Shield Building. A detailed description of the entire RB is provided in Section 3.8.1.

Additional structures and systems that limit the release of fission products following a DBA are presented in this section.

6.5.3.1 Primary Containment

The primary containment requirements and performance for removal and control of fission products are described in the sections that detail the building structure, accident mitigation capabilities, allowable leakage limits, isolation capability, and the use of other systems that limit the spread of contamination and radiation. Table 6.5-1—Primary Containment Operations Following a Design Basis Accident summarizes primary containment provisions to control fission product releases following a DBA.

The RB structural design basis is specified and layout drawings are provided in Section 3.8.1. The containment design basis for accident mitigation is detailed in Section 6.2.1, which presents the sequence of events that occur within the Containment Building for each of the DBAs. The containment allowable leakage is defined and limits are stated in Section 6.2.6 and Section 5.5.15 of the Technical Specifications. The containment isolation system is described in Section 6.2.4. The control of hydrogen in containment during DBAs and severe accident conditions is described in Section 6.2.5. The ESF filter systems are described in Section 6.5.1. Natural deposition of radioactive particulates and elemental iodine on surfaces within containment is addressed in Section 15.0.3.11.

Periodic containment purging is possible during power operation using the low-flow purge exhaust subsystem of the CBVS. During purging operations, the ventilation system is aligned to ESF filters to filter radioactive releases in case of a rod ejection accident. Upon receipt of a containment isolation signal, the containment purge line is isolated within five seconds after receiving a signal from the PACS module.

Baskets of trisodium phosphate dodecahydrate (TSP-C) are stored in containment above the in-containment refueling water storage tank (IRWST). The TSP-C is positioned so that it is dissolved into the liquid inventory as the water drains back to the IRWST during a LOCA. The TSP-C baskets are further addressed in Section 6.3.2.2 and the description of the postaccident RB water chemistry control is addressed in Section 15.0.3.12.

Following a large-break LOCA, the safety injection system (SIS) draws borated water from IRWST and feeds to the reactor coolant system (RCS). Water from the SIS accumulators is also added during this phase. The combined inventory from the RCS and SIS contain a boric acid solution that lowers the pH. The addition of the TSP-C to the liquid inventory brings the pH of the total water mass to a value above 7.0. The desired pH level limits iodine re-evolution, corrosion, and the associated production of hydrogen.

The non-safety-related SAHRS, described in Section 19.2, provides defense-in-depth by scrubbing fission products from the primary containment atmosphere. This function is not needed to meet offsite and control room dose requirements for DBAs.

6.5.3.2 Secondary Containment

The Containment Building is surrounded by the reinforced concrete Shield Building; an annulus exists between the two structures. The SB and FB physically cover a portion of the Shield Building, including the areas containing the containment penetrations. The SB is divided into four areas, which each contain a train of safety systems or subsystems. SB 2 and SB 3 are concrete reinforced and contain the MCR. Near the SB, the Nuclear Auxiliary Building provides the location and facilities to process liquids and gases that come from, or are provided to, the RCS and other systems located inside containment. The Shield Building, the SB, and the FB structures are described in Section 3.8.4.

The AVS, described in Section 6.2.3, meets the requirements for a secondary containment system. Ventilation systems in the annulus, the SB, and the FB provide adequate ventilation to their assigned areas. These systems limit offsite and MCR doses from fission product releases to within the criteria of 10 CFR 52.47(a)(2)(iv) and GDC 19, respectively, through the use of the ESF filter systems.

Following a DBA, the AVS controls and removes fission products that leak from the primary containment into the annulus. The AVS maintains the annulus at a slightly negative pressure to prevent leakage from the annulus through the Shield Building. A containment isolation actuation signal automatically aligns the discharge of the AVS through its ESF filter trains.

The SBVS services the SB and FB, including areas containing containment penetration piping. Pipes that penetrate the RB have the potential to create a bypass path for radioactive fission products through the annulus. Leakage from the safety injection pumps may also release radioactive fission products. The SB and FB capture bypass leakage from the RB and process it through SBVS, described in Section 9.4.5. ESF signals automatically align the discharge of SBVS through its ESF filter trains.

6.5.4 References

1. ANSI/ASME N509-1989, "Nuclear Power Plant Air-Cleaning Units and Components," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

2. ANSI/ASME N510-1989, "Testing of Nuclear Air Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

3. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, "Housings" Addenda).

4. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size ~~(ANSI approved)~~," American National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

5. ASTM D3803-89, "Standard Test Method for Nuclear-Grade Activated Carbon," American Society for Testing and Materials, 1989.

6. ANSI/AMCA Standard ~~-~~210-99, "Laboratory Methods for Testing Fans for Rating," American National Standards Institute/American Movement and Control Association, 1999.

7. ~~ANSI/~~AMCA Publication ~~-~~211-87, "Certified Ratings Program Air Performance," ~~American National Standards Institute/~~American Movement and Control Association, 1987.

8. Deleted.~~ANSI/AMCA 500, "Test Methods for Louvers, Dampers, and Shutters," American National Standards Institute/American Movement and Control Association, 1989.~~

9. NFPA 80, "Standard for Fire Doors and Other Opening Protectives," National Fire Protection Association Standards, 2007.~~UL 555, "Fire Dampers and Ceiling Dampers," Underwriters Laboratories Inc., 1999.~~

10. Regulatory Guide 1.52, Revision 3, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," U.S. Nuclear Regulatory Commission, June 2001.

11. ERDA 76-21, "Nuclear Air Cleaning Handbook," Oak Ridge National Laboratory, 1976.

12. ANSI/AMCA Standard 300-85, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, 1985.

13. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilation Systems," National Fire Protection Association Standards, 2002.

Table 6.5-1—Primary Containment Operations Following a Design Basis Accident

Design	Description or Value
Type of structure	Concrete with steel liner
Free volume of primary containment	Approximately 2.8 x 10^6 ft^3
Internal fission product removal and control	Natural deposition, TSP-C for containment water pH buffering
Effectiveness of fission product removal systems	99%
Containment leakage rate	L_a (0.25% per day)
Containment isolation times	See Section 6.2.4
Secondary containment system	AVS (Section 6.2.3), FBVS (Section 9.4.2), SBVS (Section 9.4.5)
Purge and vent operation	Low-flow purge filtered through ESF filters. Containment isolation of purge line within 5 seconds on containment isolation signal.
Mode of hydrogen purge	None
Hydrogen recombination	No recombination assumed in design basis analysis (conservative). 47 PARs in containment.

Next File

reliability. Diesel generator designs not previously used as stand-by power sources for nuclear power generating stations will be qualified and type-tested in accordance with the guidance of Reference 8.

The load acceptance test demonstrates the ability of the load sequencer to properly sequence loads listed in Table 8.3-4, Table 8.3-5, Table 8.3-6 and Table 8.3-7 onto the EDGs within the specified time, while the EDG maintains and restores voltage and frequency within specifications.

Load tests are performed to verify an EDG output of 9500 kW or greater while maintaining steady-state frequency at 60 Hz ± 2 percent and steady-state output voltage between 6555 VAC and 7260 VAC. The EDG continuous rating is sufficient to supply the safety-related and non-safety-related loads assigned to each EDG per Table 8.3-4, Table 8.3-5, Table 8.3-6 and Table 8.3-7 for the respective EDG when derated for ambient air temperatures and essential service water temperatures. Additionally, periodic load tests are performed at a load of 105-110 percent to demonstrate capability to operate at the short term rating of 110 percent for a period of two hours.

Emergency Diesel Generator Reliability Program

EDG minimum reliability targets are described in Section 8.4.2.6.1. A COL applicant that references the U.S. EPR design certification will establish procedures to monitor and maintain EDG reliability during plant operations to verify the selected reliability level target is being achieved as intended by RG 1.155. Surveillance testing of the EDGs is in accordance with the availability testing described in RG 1.9, and is detailed in Chapter 16.

The EDGs are procured from a diesel generator manufacturer which meets the requirements of RG 1.9 and considers the recommendations of NUREG/CR-0660 (Reference 9). Specific included design recommendations of Reference 9 are:

- The starting air system air dryer minimizes moisture, as described in Section 9.5.6.2.2.
- The lube oil preheat system performs a non-safety-related function to continuously maintain the lube oil at a set temperature using a preheating unit when the diesel generator is in standby. A motor-driven pump circulates the lube oil through the engine and the standby heater unit to maintain the engine in a prelubricated condition to reduce wear during engine starts.
- ~~The EPGB ventilation system includes particulate air filters in addition to maintaining the building at a positive pressure which limits dust and other contaminates entering the building.~~

- ~~Combustion air and ventilation system intakes are a minimum of 20 ft above adjacent ground elevation. Diesel engine exhaust gases are released from the exhaust stack on the building roof on the opposite side of the building from the ventilation and combustion air intakes that are located on the building side.~~

- Fuel oil storage tanks and day tanks permit the removal of moisture and provide gravity flow from the day tank to the engine driven fuel oil pump, as described in Section 9.5.4.

- Local instrument panels in the diesel rooms at the engine are isolated from engine vibration.

Additional EDG reliability improvement recommendations related to limiting extended no-load operations, training of personnel responsible for maintenance and availability, post-maintenance test and inspection considerations prior to return to service and the maintenance program considerations associated with repetitive component failures, will be incorporated by the COL applicant.

8.3.1.1.6 Station Blackout Diesel Generators

Two station blackout diesel generators (SBODG) are provided for station blackout (SBO) conditions and are described in Section 8.4.

8.3.1.1.7 Extended Loss of AC Power Diesel Generator (ELAP DG)

The U.S. EPR design includes a 480 Vac diesel generator for use during Phase 2 of an ELAP event as described in Reference 43. Using manual transfer switches, this ELAP DG can power Division 1 and 2 equipment via EPSS 480V Buses 31BMB and 32BMB (refer to Figure 8.3-2). The unit is sized to power only a minimum set of Division 1 and 2 equipment as described in Reference 43.

8.3.1.1.8 Electrical Equipment Layout

The electrical distribution system components distribute power to safety-related and non-safety-related loads in the Reactor Building (RB), Safeguards Buildings (SB), EPGBs, Essential Service Water Pump Buildings (ESWPB), Turbine Island (TI), Fuel Building (FB), Nuclear Auxiliary Building (NAB), Access Building (ACB), Circulating Water Pump Building (CWPB) and Radioactive Waste Processing Building (RWB).

The MSU and the auxiliary transformers are installed outdoors in the transformer yard near the Turbine Building.

EPSS 6.9 kV switchgear, 480 Vac load centers, MCCs and distribution transformers, are located in Seismic Category I Buildings electrical switchgear rooms. The electrical equipment is located in the SB, ESWPB or EPGB associated with its division.

Table 8.3-4—Division 1 Emergency Diesel Generator Nominal Loads
Sheet 1 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 1						
0	Start Signal					
15	EDG reaches rated speed and voltage/output breaker closes					
15	Emergency power generating building electric room supply fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building fuel oil storage tank room fan	480	13.4 Bhp		11.1	11.1
15	EDG starting air compressor	480	61 Bhp		50.6	50.6
15	EDG auxiliary loads	480	9.7 kW		9.7	9.7
15	Vent stack monitoring	480	13 kW		13	13
15	Division 1 EUPS battery charger (4)	480	106 kW		106	106
15	Annulus ventilation heating unit	480	6 kW		4.2 (2)	4.2 (2)
15	Annulus ventilation fan	480	4.3 Bhp		3.6	3.6
15	KAA/LAR valve room cooling fan	480	5 Bhp		4.1	4.1
15	Extra boration room cooling fan	480	14 Bhp		11.6	11.6
15	Fuel pool cooling punp room cooling fan	480	7.75 Bhp		6.4	6.4
15	Fuel pool cooling punp room cooling fan	480	7.75 Bhp		6.4	6.4
15	Fuel building ventilation heating unit (7)	480	15 kW		0	0
15	Safety chilled water pump (6)	480	100 Bhp		82.9	82.9
15	Safety chilled water pump (6)	480	100 Bhp		82.9	82.9

**Table 8.3-4—Division 1 Emergency Diesel Generator Nominal Loads
Sheet 2 of 6**

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Safety chiller condenser fans (22)	480	~~240~~325 kW		325~~240~~	325~~240~~
15	Main control room air conditioning fan	480	27 Bhp		22.4	22.4
15	Main control room air conditioning filtration unit heater (11)	480	10 kW			7 (2)
15	Main control room air conditioning iodine filtration fan (11)	480	10 Bhp			8.3
15	Safeguard building ventilation heaters (7)	480	210 kW		0	0
15	Safeguard building ventilation supply fan	480	78 Bhp		64.7	64.7
15	Safeguard building ventilation return fan	480	43 Bhp		35.6	35.6
15	Main control room air conditioning fan	480	27 Bhp	22.4		
15	Safeguard building battery exhaust fan	480	7 Bhp		5.8	5.8
15	Emergency feed water room ventilation recirculation fan	480	2 Bhp		1.7	1.7
15	Emergency lighting panels (18)	480	165.7 kW		165.7	165.7
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1

**Table 8.3-4—Division 1 Emergency Diesel Generator Nominal Loads
Sheet 3 of 6**

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Division 2 EUPS battery charger	480	106 kW	106		
15	Reactor building ventilation filtration fan	480	10 Bhp	8.3		
15	KAA/LAR valve room cooling fan	480	5 Bhp	4.1		
15	Safeguard building ventilation heaters (7)	480	180 kW	0		
15	Safeguard building ventilation supply fan	480	72 Bhp	59.7		
15	Safeguard building ventilation return fan	480	43 Bhp	35.6		
15	Safeguard building battery exhaust fan	480	6 Bhp	5		
15	Emergency feed water ventilation recirculation fan	480	2 Bhp	1.7		
15	KAA pump room recirculation fan	480	2 Bhp	1.7		
15	Emergency lighting panels (18)	480	86.7 kW	86.7		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		

Table 8.3-4—Division 1 Emergency Diesel Generator Nominal Loads
Sheet 4 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Additional connected alternate feed loads	480	73.7 kW	73.7		
15	Reactor building ventilation filtration fan	480	11 Bhp		9.1	9.1
15	Reactor building filtration heating	480	25 kW		25	25
15	Reactor building pit fan (18)	480	14 Bhp		11.6	11.6
15	Reactor building pit fan (18)	480	14 Bhp		11.6	11.6
15	MHSI/LHSI room recirculation fan	480	5 Bhp		4.1	4.1
15	JMU/KUL sample room recirculation fan	480	5 Bhp		4.1	4.1
15	Main control room air conditioning heaters (7)	480	21 kW		0	0
15	Safeguard building controlled-area ventilation system heating unit	480	21 kW			14.7 (2)
15	Safeguard building controlled-area fan	480	9 Bhp			7.5
15	Essential service water building ventilation and auxiliaries	480	110 kW		85.6 (2) (12)	85.6 (2) (12)
15	Essential service water building recirculation fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building supply fan 1	480	100 hp		82.9	82.9
15	Emergency power generating building supply fan 2	480	100 hp		82.9	82.9
15	Emergency power generating building exhaust fan 1	480	75 hp		62.2	62.2

Table 8.3-4—Division 1 Emergency Diesel Generator Nominal Loads
Sheet 5 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Emergency power generating building exhaust fan 2	480	75 hp		62.2	62.2
15	Additional connected loads	480	~~90.9~~ 100.9kW		~~90.9~~100.9	~~90.9~~100.9
15	Load contribution from transformer and cable losses		160 kW	40	120	120
Subtotal Load Step Group 1				469.7 (10)	1717.0~~1622.0~~	1754.5~~1659.5~~
Load Step Group 2 (17)						
20	MHSI pump	6.9 kV	700 hp			580
Subtotal Load Step Group 2						580
Load Step Group 3 (17)						
25	LHSI pump	6.9 kV	500 hp			414
Subtotal Load Step Group 3						414
Load Step Group 4 (14)						
30	CCW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 4					1036	1036
Load Step Group 5 (14)						
35	ESW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 5					1036	1036
Load Step Group 6 (14)						
40	EFW pump	6.9 kV	700 hp		(5)	580
Subtotal Load Step Group 6					(5)	580

Table 8.3-4—Division 1 Emergency Diesel Generator Nominal Loads
Sheet 6 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 7 (14)						
45	Division 1 safety chilled water compressor (23)	6.9 kV	~~900~~1105 kW		~~1000~~1105	~~1000~~1105
Subtotal Load Step Group 7					~~1000~~1105	~~1000~~1105
Load Step Group 8 (14)						
50	Essential service water UHS fan 1	480	250 hp		207.2	207.2
50	Essential service water UHS fan 2	480	250 hp		207.2	207.2
Subtotal Load Step Group 8					414.4	414.4
Subtotal Alternate Feed Loads				469.7		
Total Automatically Sequenced Loads without alternate feed installed					~~5108~~5308.7	~~6721~~6921.0
Total Automatically Sequenced Loads with alternate feed installed					~~5578~~5778.4	~~7190~~7390.7
Additional Manually Connected Loads						
	Emergency pressurizer heaters (16)	480	144 kW		144	
	Extra boration pump	480	163 Bhp		0 (20)	0 (20)
	Fuel pool cooling pump (21)	480	137 Bhp		113.6	113.6
Total Manually Connected Loads					257.6	113.6
Total Division 1 EDG Loading					~~5835~~6035.9	~~7304~~7504.3

Notes:

1. The kW rating derived from hp rating multiplied by 0.746 conversion factor. Indicated hp is considered rated. Where brake horsepower (Bhp) is indicated, this is from the system mechanical requirements.

2. A diversity factor of 0.7 is assumed in load contribution due to cyclical nature of load.

3. Motor efficiencies estimated at 90 percent.

4. One EUPS battery charger is in service with the other battery charger in standby. Contribution to EDG loading is calculated considering only one battery charger.

5. During a LOOP-only EDG loading sequence, the EFW start is prevented until load step group six, which occurs at 30 seconds. At load step six, the start inhibit is removed and the EFW pump start sequence is based on steam generator low level initiation. If a steam generator low level initiation exists, EFW pump start is given priority over subsequent load steps.
   During a LOOP/LOCA condition, the EFW pump is started at the sequence step indicated.

6. The divisional safety chilled water pumps and chiller are assumed operating for EDG loading purposes.

7. Worst case EDG loading occurs during summer operation when safety chilled water loading is highest. Area heater loads are shown, but do not contribute to overall EDG loading since operating conditions where heater operation is expected does not reflect bounding EDG loading scenario.

8. Loads represented in load groups are assumed running during the time duration assumed for accident analysis and mechanical system operational requirements, with the exception of motor-operated valves and dampers. Motor-operated valves and dampers are momentary loads, and are powered within EDG short-term ratings. Manually connected intermittent loads are applied following load sequencing, in accordance with approved operating procedures and their load contributions are within EDG long-term rating.

9. Deleted.

10. Alternate feed loads contributing to EDG loading are shown in the automatic sequenced loads with alternate feed installed totals.

11. Load only operated if control room high radiation signal present.

12. Efficiency estimated at 90 percent for motor loads.

13. EDG output breaker closure of T=15 seconds is an estimated time. Subsequent timing steps are based on EDG output breaker and occur in the sequence time interval after the output breaker closure.

14. During a LOOP-only condition, load steps two, three and six (based on steam generator level) are omitted resulting in the loading of this step earlier than LOOP/LOCA condition.

    A. During a LOOP-only sequence the steps are at the indicated time:

        1. Step 4 20 seconds

        2. Step 5 25 seconds

        3. Step 7 30 seconds

        4. Step 8 35 seconds

    B. If an SI actuation occurs before closure of the EDG output breaker, the LOOP/LOCA sequence is followed.

    C. If an SI actuation occurs after closure of the EDG output breaker, the sequence is interrupted and the DBA/LOOP sequence load steps two through six are performed. Following performance of load step six, the sequence is re-started where interrupted and performed to completion.

15. Loads are safety-related loads, unless otherwise indicated.

16. Non-safety-related load that can be manually applied to the EDG. Contribution to EDG loading from non-safety-related loads is shown in total EDG loading column.

17. Load steps 2 and 3 are started by the load sequencer as indicated by an SI signal. Should a LOOP occur subsequent to starting LOCA mitigation loads, the sequence is reset and restarts at the closure of the EDG output breaker.

18. Non-safety-related load that is automatically applied to the EDG. Contribution to EDG loading from non-safety-related loads is shown in total EDG loading column.

19. The inrush current for motor starting studies during EDG load sequencing is represented by locked-rotor impedance, which draws the maximum possible current from the system and has the most severe effect on other loads. Following the acceleration period, the motors represented in the load step are changed to a constant KVA load.

20. Contribution to EDG loading is not credited in total division 1 EDG loading column as this load is not credited to operate concurrently with MHSI and LHSI at rated power.

21. One fuel pool cooling pump in service, the other pump is in standby. Contribution to EDG loading is calculated considering only the inservice pump.

22. The safety chiller condenser fans consist of eight 12.5 percent rated fans. Contribution to EDG loading is calculated considering all eight fans running continuously.

23. The safety chilled water compressor consists of four 25 percent rated compressors. Contribution to EDG loading is calculated considering all four compressors running continuously.

Table 8.3-5—Division 2 Emergency Diesel Generator Nominal Loads Sheet 1 of 6

Time Seq. (s) [13]	Load Description [8] [15] [19]	Volts	Rating (hp/kW) [3]	Alternate Feed Load (kW) [1] [12]	Operating Load LOOP (kW) [1] [12]	Operating Load DBA/ LOOP (kW) [1] [12]
Load Step Group 1						
0	Start Signal					
15	EDG reaches rated speed and voltage/output breaker closes					
15	Emergency power generating building electric room supply fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building fuel oil storage tank room fan	480	13.4 Bhp		11.1	11.1
15	EDG starting air compressor	480	61 Bhp		50.6	50.6
15	EDG auxiliary loads	480	9.7 kW		9.7	9.7
15	Main control room air conditioning fan	480	27 Bhp		22.4	22.4
15	MHSI/LHSI room recirculation fan	480	5 Bhp		4.1	4.1
15	Main control room air conditioning heaters [7]	480	21 kW		0	0
15	Division 2 EUPS battery charger [4]	480	106 kW		106	106
15	Reactor building ventilation filtration fan	480	10 Bhp		8.3	8.3
15	KAA/LAR valve room cooling fan	480	5 Bhp		4.1	4.1
15	Safety chilled water pump [6]	480	100 Bhp		82.9	82.9
15	Safety chilled water pump [6]	480	100 Bhp		82.9	82.9
15	Safeguard building ventilation heaters [7]	480	180 kW		0	0
15	Safeguard building ventilation supply fan	480	72 Bhp		59.7	59.7
15	Safeguard building ventilation return fan	480	43 Bhp		35.6	35.6

**Table 8.3-5—Division 2 Emergency Diesel Generator Nominal Loads
Sheet 2 of 6**

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Safeguard building battery exhaust fan	480	6 Bhp		5	5
15	Emergency feed water ventilation recirculation fan	480	2 Bhp		1.7	1.7
15	KAA pump room recirculation fan	480	2 Bhp		1.7	1.7
15	Emergency lighting panels (18)	480	86.7 kW		86.7	86.7
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Division 1 EUPS battery charger (4)	480	106 kW	106		
15	Annulus ventilation heating unit	480	6 kW	4.2 (2)		
15	Annulus ventilation fan	480	4.3 Bhp	3.6		
15	KAA/LAR valve room cooling fan	480	5 Bhp	4.1		
15	Extra boration room cooling fan	480	14 Bhp	11.6		
15	Fuel pool cooling pump room cooling fan	480	7.75 Bhp	6.4		

Table 8.3-5—Division 2 Emergency Diesel Generator Nominal Loads
Sheet 3 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Fuel pool cooling pump room cooling fan	480	7.75 Bhp	6.4		
15	Fuel building ventilation heating unit (7)	480	15 kW	0		
15	Main control room air conditioning fan	480	27 Bhp	22.4		
15	Main control room air conditioning filtration unit heater (11)	480	10 kW	7 (2)		
15	Main control room air conditioning iodine train fan (11)	480	10 Bhp	8.3		
15	Safeguard building ventilation heaters (7)	480	210 kW	0		
15	Safeguard building ventilation supply fan	480	78 Bhp	64.7		
15	Safeguard building ventilation return fan	480	43 Bhp	35.6		
15	Safeguard building battery exhaust fan	480	7 Bhp	5.8		
15	Emergency feed water room ventilation recirculation fan	480	2 Bhp	1.7		
15	Emergency lighting panels (18)	480	165.7 kW	165.7		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		

Table 8.3-5—Division 2 Emergency Diesel Generator Nominal Loads
Sheet 4 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Reactor building ventilation filtration fan	480	11 Bhp	9.1		
15	Reactor building filtration heating	480	25 kW	25		
15	Additional alternate feed connected loads	480	72.6 kW	72.6		
15	Essential service water building ventilation and auxiliaries	480	110 kW		85.6 (2) (12)	85.6 (2) (12)
15	Safeguard building controlled-area ventilation system heating unit	480	21 kW	14.7 (2)		
15	Safeguard building controlled-area fan	480	9 Bhp	7.5		
15	Essential service water building recirculation fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building supply fan 1	480	100 hp		82.9	82.9
15	Emergency power generating building supply fan 2	480	100 hp		82.9	82.9
15	Emergency power generating building exhaust fan 1	480	75 hp		62.2	62.2
15	Emergency power generating building exhaust fan 2	480	75 hp		62.2	62.2
15	Additional connected loads	480	84.4 kW		84.4	84.4

Table 8.3-5—Division 2 Emergency Diesel Generator Nominal Loads
Sheet 5 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Lighting (18)	480	300 kW		300	300
15	Reserved for special use (18)	480	125 kW		125	125
15	Load contribution from transformer and cable losses		160 kW	40	120	120
Subtotal Load Step Group 1				647.2 (10)	1619.0	1619.0
Load Step Group 2 (17)						
20	MHSI pump	6.9 kV	700 hp			580
Subtotal Load Step Group 2						580
Load Step Group 3 (17)						
25	LHSI pump	6.9 kV	500 hp			414
Subtotal Load Step Group 3						414
Load Step Group 4 (14)						
30	CCW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 4					1036	1036
Load Step Group 5 (14)						
35	ESW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 5					1036	1036
Load Step Group 6 (14)						
40	EFW pump	6.9 kV	700 hp		(5)	580
Subtotal Load Step Group 6					(5)	580
Load Step Group 7 (14)						

Table 8.3-5—Division 2 Emergency Diesel Generator Nominal Loads
Sheet 6 of 6

Time Seq. (s) [13]	Load Description [8] [15] [19]	Volts	Rating (hp/kW) [3]	Alternate Feed Load (kW) [1] [12]	Operating Load LOOP (kW) [1] [12]	Operating Load DBA/ LOOP (kW) [1] [12]
45	Division 2 safety chilled water compressor (22)	6.9 kV	94700 kW		9471000	9471000
Subtotal Load Step Group 7					9471000	9471000
Load Step Group 8 [14]						
50	Essential service water UHS fan 1	480	250 hp		207.2	207.2
50	Essential service water UHS fan 2	480	250 hp		207.2	207.2
Subtotal Load Step Group 8					414.4	414.4
Subtotal Alternate Feed Loads				647.2		
Total Automatically Sequenced Loads without alternate feed installed					51055052.6	66806627.5
Total Automatically Sequenced Loads with alternate feed installed					57525699.9	73277274.8
Additional Manually Connected Loads						
	Extra boration pump	480	163 Bhp	0 [20]		
	Fuel pool cooling pump [21]	480	137 Bhp	113.6		
	Emergency pressurizer heaters [16]	480	144 kW		144	
Total Manually Connected Loads				113.6	144	
Total Division 2 EDG Loading					60105957.4	74417388.3

Notes:

1. The kW rating derived from hp rating multiplied by 0.746 conversion factor. Indicated hp is considered rated. Where brake horsepower (Bhp) is indicated, this is from the system mechanical requirements.

2. A diversity factor of 0.7 is assumed in load contribution due to cyclical nature of load.

3. Motor efficiencies estimated at 90 percent.

4. One EUPS battery charger is in service with the other battery charger in standby. Contribution to EDG loading is calculated considering only one battery charger.

5. During a LOOP-only EDG loading sequence, the EFW start is prevented until load step group six, which occurs at 30 seconds. At load step six, the start inhibit is removed and the EFW pump start sequence is based on steam generator low level initiation. If a steam generator low level initiation exists, EFW pump start is given priority over subsequent load steps.
   During a LOOP/LOCA condition, the EFW pump is started at the sequence step indicated.

6. The divisional safety chilled water pumps and chiller are assumed operating for EDG loading purposes.

7. Worst case EDG loading occurs during summer operation when safety chilled water loading is highest. Area heater loads are shown, but do not contribute to overall EDG loading since operating conditions where heater operation is expected does not reflect bounding EDG loading scenario.

8. Loads represented in load groups are assumed running during the time duration assumed for accident analysis and mechanical system operational requirements, with the exception of motor-operated valves and dampers. Motor-operated valves and dampers are momentary loads, and are powered within EDG short-term ratings. Manually connected intermittent loads are applied following load sequencing, in accordance with approved operating procedures and their load contributions are within EDG long-term rating.

9. Deleted.

10. Alternate feed loads contributing to EDG loading are shown in the automatic sequenced loads with alternate feed installed totals.

11. Load only operated if control room high radiation signal present.

12. Efficiency estimated at 90 percent for motor loads.

13. EDG output breaker closure of T=15 seconds is an estimated time. Subsequent timing steps are based on EDG output breaker and occur in the sequence time interval after the output breaker closure.

14. During a LOOP-only condition, load steps two, three and six (based on steam generator level) are omitted resulting in the loading of this step earlier than LOOP/LOCA condition.

A. During a LOOP only sequence the steps are at the indicated time:

1. Step 4 20 seconds
2. Step 5 25 seconds
3. Step 7 30 seconds
4. Step 8 35 seconds

B. If an SI actuation occurs before closure of the EDG output breaker, the LOOP/LOCA sequence is followed.

C. If an SI actuation occurs after closure of the EDG output breaker, the sequence is interrupted and the DBA/LOOP sequence load steps two through six are performed. Following performance of load step six, the sequence is re-started where interrupted and performed to completion.

15. Loads are safety-related loads, unless otherwise indicated.

16. Non-safety-related load that can be manually applied to the EDG. Contribution to EDG loading from non-safety-related loads is shown in total EDG loading column.

17. Load steps 2 and 3 are started by the load sequencer as indicated by an SI signal. Should a LOOP occur subsequent to starting LOCA mitigation loads, the sequence is reset and restarts at the closure of the EDG output breaker.

18. Non-safety-related load that is automatically applied to the EDG. Contribution to EDG loading from non-safety-related loads is shown in total EDG loading column.

19. The inrush current for motor starting studies during EDG load sequencing is represented by locked-rotor impedance, which draws the maximum possible current from the system and has the most severe effect on other loads. Following the acceleration period, the motors represented in the load step are changed to a constant KVA load.

20. Contribution to EDG loading is not credited in total division 2 EDG loading column as this load is not credited to operate concurrently with MHSI and LHSI at rated power.

21. One fuel pool cooling pump in service, the other pump is in standby. Contribution to EDG loading is calculated considering only the inservice pump.

22. The safety chilled water compressor consists of four 25 percent rated compressors. Contribution to EDG loading is calculated considering all four compressors running continuously.

**Table 8.3-6—Division 3 Emergency Diesel Generator Nominal Loads
Sheet 1 of 6**

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 1						
0	Start Signal					
15	EDG reaches rated speed and voltage/output breaker closes					
15	Emergency power generating building electric room supply fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building fuel oil storage tank room fan	480	13.4 Bhp		11.1	11.1
15	EDG starting air compressor	480	61 Bhp		50.6	50.6
15	EDG auxiliary loads	480	8.7 kW		8.7	8.7
15	Main control room air conditioning fan	480	27 Bhp		22.4	22.4
15	MHSI/LHSI room recirculation fan	480	5 Bhp		4.1	4.1
15	Main control room air conditioning heaters (7)	480	21 kW		14.7(2)	14.7(2)
15	Division 3 EUPS battery charger (4)	480	106 kW		106	106
15	KAA/LAR valve room cooling fan	480	5 Bhp		4.1	4.1
15	Safety chilled water pump (6)	480	100 Bhp		82.9	82.9
15	Safety chilled water pump (6)	480	100 Bhp		82.9	82.9
15	Safeguard building ventilation heaters	480	180 kW		0	0
15	Safeguard building ventilation supply fan	480	72 Bhp		59.7	59.7
15	Safeguard building ventilation return fan	480	43 Bhp		35.6	35.6
15	Safeguard building battery exhaust fan	480	6 Bhp		5	5

Table 8.3-6—Division 3 Emergency Diesel Generator Nominal Loads
Sheet 2 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Emergency feed water ventilation recirculation fan	480	2 Bhp		1.7	1.7
15	KAA pump room recirculation fan	480	2 Bhp		1.7	1.7
15	Emergency lighting panels (18)	480	155.7 kW		155.7	155.7
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Division 4 EUPS battery charger (4)	480	106 kW	106		
15	Annulus ventilation heating unit	480	6 kW	4.2 (2)		
15	Annulus ventilation fan	480	4.3 Bhp	3.6		
15	KAA/LAR valve room cooling fan	480	5 Bhp	4.1		
15	Extra boration room cooling fan	480	14 Bhp	11.6		
15	Fuel pool cooling pump room cooling fan	480	7.75 Bhp	6.4		
15	Fuel pool cooling pump room cooling fan	480	7.75 Bhp	6.4		

Table 8.3-6—Division 3 Emergency Diesel Generator Nominal Loads
Sheet 3 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Fuel building ventilation heating unit (7)	480	15 kW	0		
15	Main control room air conditioning fan	480	27 Bhp	22.4		
15	Main control room air conditioning filtration unit heater (11)	480	10 kW	7 (2)		
15	Main control room air conditioning iodine train fan (11)	480	10 Bhp	8.3		
15	Safeguard building ventilation heaters (7)	480	210 kW	0		
15	Safeguard building ventilation supply fan	480	78 Bhp	64.6		
15	Safeguard building ventilation return fan	480	43 Bhp	35.6		
15	Safeguard building battery exhaust fan	480	7 Bhp	5.8		
15	Emergency feed water room ventilation recirculation fan	480	2 Bhp	1.7		
15	Emergency lighting panels (18)	480	178.7 kW	178.7		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		

Table 8.3-6—Division 3 Emergency Diesel Generator Nominal Loads
Sheet 4 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Reactor building ventilation filtration fan	480	11 Bhp	9.1		
15	Reactor building filtration heating	480	25 kW	25		
15	Additional connected alternate feed loads	480	102.2 kW	102.2		
15	Safeguard building controlled-area ventilation system heating unit	480	21 kW	14.7 (2)		
15	Safeguard building controlled-area fan	480	9 Bhp	7.5		
15	Essential service water building ventilation and auxiliaries	480	110 kW		85.6 (2) (12)	85.6 (2) (12)
15	Essential service water building recirculation fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building supply fan 1	480	100 hp		82.9	82.9
15	Emergency power generating building supply fan 2	480	100 hp		82.9	82.9
15	Emergency power generating building exhaust fan 1	480	75 hp		62.2	62.2
15	Emergency power generating building exhaust fan 2	480	75 hp		62.2	62.2
	Additional connected loads	480	50.2 kW		50.2	50.2
15	Reserved for special use (18)	480	125 kW		125	125
15	Lighting (18)	480	300 kW		300	300

Table 8.3-6—Division 3 Emergency Diesel Generator Nominal Loads Sheet 5 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Load contribution from transformer and cable losses		160 kW	40	120	120
Subtotal Load Step Group 1				689.8 (10)	1644.5	1644.5
Load Step Group 2 (17)						
20	MHSI pump	6.9 kV	700 hp			580
Subtotal Load Step Group 2						580
Load Step Group 3 (17)						
25	LHSI pump	6.9 kV	500 hp			414
Subtotal Load Step Group 3						414
Load Step Group 4 (14)						
30	CCW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 4					1036	1036
Load Step Group 5 (14)						
35	ESW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 5					1036	1036
Load Step Group 6 (14)						
40	EFW pump	6.9 kV	700 hp		(5)	580
Subtotal Load Step Group 6					(5)	580
Load Step Group 7 (14)						
45	Division 3 safety chilled water compressor (22)	6.9 kV	~~900~~947 kW		~~1000~~947	~~1000~~947

Table 8.3-6—Division 3 Emergency Diesel Generator Nominal Loads Sheet 6 of 6

Time Seq. (s) [13]	Load Description [8] [15] [19]	Volts	Rating (hp/kW) [3]	Alternate Feed Load (kW) [1] [12]	Operating Load LOOP (kW) [1] [12]	Operating Load DBA/ LOOP (kW) [1] [12]
Subtotal Load Step Group 7					~~1000~~947	~~1000~~947
Load Step Group 8 [14]						
50	Essential service water UHS fan 1	480	250 hp		207.2	207.2
50	Essential service water UHS fan 2	480	250 hp		207.2	207.2
Subtotal Load Step Group 8					414.4	414.4
Subtotal Alternate Feed Loads				689.8		
Total Automatically Sequenced Loads without alternate feed installed					~~5131~~5078.1	~~6706~~6653.0
Total Automatically Sequenced Loads with alternate feed installed					~~5821~~5768.0	~~7395~~7342.9
Additional Manually Connected Loads						
	Extra boration pump	480	163 Bhp	0 [20]		
	Fuel pool cooling pump [21]	480	137 Bhp	113.6		
	Emergency pressurizer heaters [16]	480	144 kW		144	
Total Manually Connected Loads				113.6	144	
Total Division 3 EDG Loading					~~6078~~6025.5	~~7509~~7456.4

Notes:

1. The kW rating derived from hp rating multiplied by 0.746 conversion factor. Indicated hp is considered rated. Where brake horsepower (Bhp) is indicated, this is from the system mechanical requirements.

2. A diversity factor of 0.7 is assumed in load contribution due to cyclical nature of load.

3. Motor efficiencies estimated at 90 percent.

4. One EUPS battery charger is in service with the other battery charger in standby. Contribution to EDG loading is calculated considering only one battery charger.

5. During a LOOP-only EDG loading sequence, the EFW start is prevented until load step group six, which occurs at 30 seconds. At load step six, the start inhibit is removed and the EFW pump start sequence is based on steam generator low level initiation. If a steam generator low level initiation exists, EFW pump start is given priority over subsequent load steps.
During a LOOP/LOCA condition, the EFW pump is started at the sequence step indicated.

6. The divisional safety chilled water pumps and chiller are assumed operating for EDG loading purposes.

7. Worst case EDG loading occurs during summer operation when safety chilled water loading is highest. Area heater loads are shown, but do not contribute to overall EDG loading since operating conditions where heater operation is expected does not reflect bounding EDG loading scenario.

8. Loads represented in load groups are assumed running during the time duration assumed for accident analysis and mechanical system operational requirements, with the exception of motor-operated valves and dampers. Motor-operated valves and dampers are momentary loads, and are powered within EDG short-term ratings. Manually connected intermittent loads are applied following load sequencing, in accordance with approved operating procedures and their load contributions are within EDG long-term rating.

9. Deleted.

10. Alternate feed loads contributing to EDG loading are shown in the automatic sequenced loads with alternate feed installed totals.

11. Load only operated if control room high radiation signal present.

12. Efficiency estimated at 90 percent for motor loads.

13. EDG output breaker closure of T=15 seconds is an estimated time. Subsequent timing steps are based on EDG output breaker and occur in the sequence time interval after the output breaker closure.

14. During a LOOP-only condition, load steps two, three and six (based on steam generator level) are omitted resulting in the loading of this step earlier than LOOP/LOCA condition.

    A. During a LOOP-only sequence the steps are at the indicated time:

1. Step 4 20 seconds
2. Step 5 25 seconds
3. Step 7 30 seconds
4. Step 8 35 seconds

B. If an SI actuation occurs before closure of the EDG output breaker, the LOOP/LOCA sequence is followed.

C. If an SI actuation occurs after closure of the EDG output breaker, the sequence is interrupted and the DBA/LOOP sequence load steps two through six are performed. Following performance of load step six, the sequence is re-started where interrupted and performed to completion.

15. Loads are safety-related loads, unless otherwise indicated.

16. Non-safety-related load that can be manually applied to the EDG. Contribution to EDG loading from non-safety-related loads is shown in total EDG loading column.

17. Load steps 2 and 3 are started by the load sequencer as indicated by an SI signal. Should a LOOP occur subsequent to starting LOCA mitigation loads, the sequence is reset and restarts at the closure of the EDG output breaker.

18. Non-safety-related load that is automatically applied to the EDG. Contribution to EDG loading from non-safety-related loads is shown in total EDG loading column.

19. The inrush current for motor starting studies during EDG load sequencing is represented by locked-rotor impedance, which draws the maximum possible current from the system and has the most severe effect on other loads. Following the acceleration period, the motors represented in the load step are changed to a constant KVA load.

20. Contribution to EDG loading is not credited in total division 3 EDG loading column as this load is not credited to operate concurrently with MHSI and LHSI at rated power.

21. One fuel pool cooling pump in service, the other is in standby. Contribution to EDG loading is calculated considering only the inservice pump.

22. The safety chilled water compressor consists of four 25 percent rated compressors. Contribution to EDG loading is calculated considering all four compressors running continuously.

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 1 of 7

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 1						
0	Start Signal					
15	EDG reaches rated speed and voltage/output breaker closes					
15	Emergency power generating building electric room supply fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building fuel oil storage tank room fan	480	13.4 Bhp		11.1	11.1
15	EDG starting air compressor	480	61 Bhp		50.6	50.6
15	EDG auxiliary loads	480	8.7 kW		8.7	8.7
15	Vent stack monitoring	480	13 kW		13	13
15	Division 4 EUPS battery charger (13)	480	106 kW		106	106
15	Annulus ventilation heating unit	480	6 kW		4.2 (2)	4.2 (2)
15	Annulus ventilation fan	480	4.3 Bhp		3.6	3.6
15	KAA/LAR valve room cooling fan	480	5 Bhp		4.1	4.1
15	Extra boration room cooling fan	480	14 Bhp		11.6	11.6
15	Fuel pool cooling punp room cooling fan	480	7.75 Bhp		6.4	6.4
15	Fuel pool cooling punp room cooling fan	480	7.75 Bhp		6.4	6.4
15	Fuel building ventilation heating unit (7)	480	15 kW		0	0
15	Safety chilled water pump (6)	480	100 Bhp		82.9	82.9
15	Safety chilled water pump (6)	480	100 Bhp		82.9	82.9

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 2 of 7

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Safety chiller condenser fans (22)	480	~~240~~325 kW		~~240~~325	~~240~~325
15	Main control room air conditioning fan	480	27 Bhp		22.4	22.4
15	Main control room air conditioning filtration unit heater (11)	480	10 kW			7 (2)
15	Main control room air conditioning iodine filtration fan (11)	480	10 Bhp			8.3
15	Safeguard building ventilation heaters (7)	480	210 kW		0	0
15	Safeguard building ventilation supply fan	480	78 Bhp		64.7	64.7
15	Safeguard building ventilation return fan	480	43 Bhp		35.6	35.6
15	Safeguard building battery exhaust fan	480	7 Bhp		5.8	5.8
15	Emergency feed water room ventilation recirculation fan	480	2 Bhp		1.7	1.7
15	Emergency lighting panels (18)	480	178.7 kW		178.7	178.7
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 3 of 7

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Division 3 EUPS battery charger	480	106 kW	106		
15	KAA/LAR valve room cooling fan	480	5 Bhp	4.1		
15	Safeguard building ventilation heaters (7)	480	180 kW	0		
15	Safeguard building ventilation supply fan	480	72 Bhp	59.7		
15	Safeguard building ventilation return fan	480	43 Bhp	35.6		
15	Main control room air conditioning fan	480	27 Bhp	22.4		
15	Safeguard building battery exhaust fan	480	6 Bhp	5		
15	Emergency feed water ventilation recirculation fan KAA pump room recirculation fan	480	2 Bhp	1.7		
15	KAA pump room recirculation fan	480	2 Bhp	1.7		
15	Emergency lighting panels (18)	480	155.7 kW	155.7		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 4 of 7

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Additional connected alternate feed loads	480	39 kW	39		
15	Reactor building ventilation filtration fan	480	11 Bhp		9.1	9.1
15	Reactor building filtration heating	480	25 kW		25	25
15	Reactor building pit fan (18)	480	14 Bhp		11.6	11.6
15	Reactor building pit fan (18)	480	14 Bhp		11.6	11.6
15	MHSI/LHSI room recirculation fan	480	5 Bhp		4.1	4.1
15	JMU/KUL sample room recirculation fan	480	5 Bhp		4.1	4.1
15	Main control room air conditioning heaters (7)	480	21 kW		0	0
15	Severe accident sampling system	480	28 kW			28
15	Safeguard building ventilation recirculation fan	480	3 Bhp		2.5	2.5
15	Essential service water building ventilation and auxiliaries	480	110 kW		85.6(2) (12)	85.6(2) (12)
15	Essential service water building recirculation fan	480	10 Bhp		8.3	8.3
15	Safeguard building controlled-area ventilation system heating unit	480	21 kW			14.7 (2)
15	Safeguard building controlled-area fan	480	9 Bhp			7.5

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 5 of 7

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Emergency power generating building supply fan 1	480	100 hp		82.9	82.9
15	Emergency power generating building supply fan 2	480	100 hp		82.9	82.9
15	Emergency power generating building exhaust fan 1	480	75 hp		62.2	62.2
15	Emergency power generating building exhaust fan 2	480	75 hp		62.2	62.2
15	Additional connected loads	480	~~179.8~~189.8 kW		~~179.8~~189.8	~~179.8~~189.8
15	Load contribution from transformer and cable losses		160 kW	40	120	120
Subtotal Load Step Group 1				495.7 (10)	~~1725.4~~1820.4	~~1790.0~~1885.0
Load Step Group 2 (17)						
20	MHSI pump	6.9 kV	700 hp			580
Subtotal Load Step Group 2						580
Load Step Group 3 (17)						
25	LHSI pump	6.9 kV	500 hp			414
Subtotal Load Step Group 3						414
Load Step Group 4 (14)						
30	CCW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 4					1036	1036

**Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 6 of 7**

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 5 (14)						
35	ESW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 5					1036	1036
Load Step Group 6 (14)						
40	EFW pump	6.9 kV	700 hp		(5)	580
Subtotal Load Step Group 6					(5)	580
Load Step Group 7 (14)						
45	Division 4 safety chilled water compressor (23)	6.9 kV	~~900~~1105 kW		1105~~1000~~	1105~~1000~~
Subtotal Load Step Group 7					1105~~1000~~	1105~~1000~~
Load Step Group 8 (14)						
50	Essential service water UHS fan 1	480	250 hp		207.2	207.2
50	Essential service water UHS fan 2	480	250 hp		207.2	207.2
Subtotal Load Step Group 8					414.4	414.4
Subtotal Alternate Feed Loads				495.7		
Total Automatically Sequenced Loads without alternate feed installed					~~5212~~5412.1	~~6851~~7051.6
Total Automatically Sequenced Loads with alternate feed installed					~~5707~~5907.8	~~7347~~7547.3
Additional Manually Connected Loads						
	Emergency pressurizer heaters (16)	480	144 kW		144	
	Extra boration pump	480	163 Bhp		0 (20)	0 (20)
	Fuel pool cooling pump (21)	480	137 Bhp		113.6	113.6

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 7 of 7

Time Seq. (s) [13]	Load Description [8] [15] [19]	Volts	Rating (hp/kW) [3]	Alternate Feed Load (kW) [1] [12]	Operating Load LOOP (kW) [1] [12]	Operating Load DBA/ LOOP (kW) [1] [12]
	Severe accident heat removal pump [16]	6.9 kV	400 hp		0 [20]	0 [20]
Total Manually Connected Loads					257.6	113.6
Total Division 4 EDG Loading					~~5965~~6165.3	~~7460~~7660.8

Notes:

1. The kW rating derived from hp rating multiplied by 0.746 conversion factor. Indicated hp is considered rated. Where brake horsepower (Bhp) is indicated, this is from the system mechanical requirements.

2. A diversity factor of 0.7 is assumed in load contribution due to cyclical nature of load.

3. Motor efficiencies estimated at 90 percent.

4. One EUPS battery charger is in service with the other battery charger in standby. Contribution to EDG loading is calculated considering only one battery charger.

5. During a LOOP-only EDG loading sequence, the EFW start is prevented until load step group six, which occurs at 30 seconds. At load step six, the start inhibit is removed and the EFW pump start sequence is based on steam generator low level initiation. If a steam generator low level initiation exists, EFW pump start is given priority over subsequent load steps.
   During a LOOP/LOCA condition, the EFW pump is started at the sequence step indicated.

6. The divisional safety chilled water pumps and chiller are assumed operating for EDG loading purposes.

7. Worst case EDG loading occurs during summer operation when safety chilled water loading is highest. Area heater loads are shown, but do not contribute to overall EDG loading since operating conditions where heater operation is expected does not reflect bounding EDG loading scenario.

8. Loads represented in load groups are assumed running during the time duration assumed for accident analysis and mechanical system operational requirements, with the exception of motor-operated valves and dampers. Motor-operated valves and dampers are momentary loads, and are powered within EDG short-term ratings. Manually connected intermittent loads are applied following load sequencing, in accordance with approved operating procedures and their load contributions are within EDG long-term rating.

9. Deleted.

10. Alternate feed loads contributing to EDG loading are shown in the automatic sequenced loads with alternate feed installed totals.

11. Load only operated if control room high radiation signal present.

12. Efficiency estimated at 90 percent for motor loads.

13. EDG output breaker closure of T=15 seconds is an estimated time. Subsequent timing steps are based on EDG output breaker and occur in the sequence time interval after the output breaker closure.

14. During a LOOP-only condition load steps two, three and six (based on steam generator level) are omitted resulting in the loading of this step earlier than LOOP/LOCA condition.

    A. During a LOOP-only sequence the steps are at the indicated time:

        1. Step 4 20 seconds

        2. Step 5 25 seconds

        3. Step 7 30 seconds

        4. Step 8 35 seconds

    B. If an SI actuation occurs before closure of the EDG output breaker, the LOOP/LOCA sequence is followed.

    C. If an SI actuation occurs after closure of the EDG output breaker, the sequence is interrupted and the DBA/LOOP sequence load steps two through six are performed. Following performance of load step six, the sequence is re-started where interrupted and performed to completion.

15. Loads are safety-related loads, unless otherwise indicated.

16. Non-safety-related load that can be manually applied to the EDG. Contribution to EDG loading from non-safety-related loads is shown in total EDG loading column.

17. Load steps 2 and 3 are started by the load sequencer as indicated by an SI signal. Should a LOOP occur subsequent to starting LOCA mitigation loads, the sequence is reset and restarts at the closure of the EDG output breaker.

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18. Non-safety-related load that is automatically applied to the EDG. Contribution to EDG loading from non-safety-related loads is shown in total EDG loading column.

19. The inrush current for motor starting studies during EDG load sequencing is represented by locked-rotor impedance, which draws the maximum possible current from the system and has the most severe effect on other loads. Following the acceleration period, the motors represented in the load step are changed to a constant KVA load.

20. Contribution to EDG loading is not credited in total division 4 EDG loading column as this load is not credited to operate concurrently with MHSI and LHSI at rated power.

21. One fuel pool cooling pump in service, the other is in standby. Contribution to EDG loading is calculated considering only the inservice pump.

22. The safety chiller condenser fans consist of eight 12.5 percent rated fans. Contribution to EDG loading is calculated considering all eight fans running continuously.

23. The safety chilled water compressor consists of four 25 percent rated compressors. Contribution to EDG loading is calculated considering all four compressors running continuously.

A COL applicant that references the U.S. EPR design certification will provide site-specific information that identifies any additional local power sources and transmission paths that could be made available to resupply the power plant following an LOOP.

When offsite power is restored, the operators will manually shut down the SBODG. Site-specific procedures and training establish the necessary operator actions to cope with an SBO from onset until AC power is recovered and normal long-term core cooling is restored.

8.4.1.4 Periodic Testing

Periodic testing is performed to demonstrate continued capability and availability of the SBODG to perform its intended function. During this testing, complete generator protection is available to prevent equipment damage. Overload protection is provided by the output breaker overload trip circuitry and by reverse power logic. Each SBODG is also equipped with a synchronization check relay. The governor control system is capable of operation in either droop speed or isochronous speed control. At the end of any testing, including testing terminated due to an actual SBO event, the governor is transferred to isochronous speed control to allow performance of the AAC functions.

The periodic testing program verifies SBODG capability while minimizing the potential for a common cause failure with the preferred power source. The specific tests performed include:

- Every three months (based on Reference 1), the SBODG is started and brought to rated frequency and voltage to verify SBODG availability.
- Every refueling outage, a timed start of each SBODG will be conducted to verify its availability within ten minutes. This start will be followed by a capacity load test per manufacturer specifications. The continuous rating of ~~39~~4100 kW (or greater) is sufficient to supply the required loads for mitigating SBO conditions.

The AAC power system reliability target is for each SBODG to meet or exceed 95 percent as determined in NSAC-108 (Reference 7) or equivalent methodology.

8.4.2 Analysis

8.4.2.1 10 CFR 50.2 – Definitions and Introduction

As defined in 10 CFR 50.2, station blackout is defined as the complete loss of AC electric power to the non-safety-related and safety-related switchgear buses. An SBO does not include the loss of available power to buses fed by station batteries through inverters or by AAC sources, nor does it assume a concurrent single failure or DBA.

Table 8.4-1—Station Blackout Continuous Loading – Train 1 Estimated

Function	Power	Notes
Safety Chilled Water Compressor - Division 1	~~530~~715 kW	Division 1 is air cooled, which consists of four 25 percent compressors and eight 12.5 percent condenser fans; contribution to SBODG loading is calculated considering 50 percent of the rated capacity running continuously.~~ Even if powered, the Division 2 compressor does not run, because the component cooling water it requires is not available during SBO~~.
Emergency Feedwater Pump	580 kW	Nominal load adjusted higher for possible efficiency losses. No credit has been taken for the reduced flow rate and hydraulic load expected during SBO. The value listed is conservative.
Class 1E Battery Chargers	200 kW	Includes Division 1 and Division 2.
Class 1E 480 V Loads Except Battery Chargers -Division 1	820 kW	Includes 480 V loads powered from load centers 31BMB and 31BMC and MCCs 31BNB01, 31BNB02, 31BNB03, and 31BNC01.
Class 1E 480 V Loads Except Battery Chargers - Division 2	520 kW	Includes 480 V loads powered from load center 32BMB and MCCs 32BNB01, 32BNB02, and 32BNB03.
SBO DG Auxiliaries	230 kW	
Non-Class 1E Battery Chargers	320 kW	Non-Class 1E chargers may be turned off during SBO as needed to maintain load below SBODG continuous rating.
Provision for Site-Specific Non-Class 1E Loads	450 kW	
Total SBO Load	~~3650~~3835 kW	
Asset Protection	940 kW	Load present during LOOP without SBO. Individual loads removed during SBO as needed to maintain load below SBODG continuous rating

Table 8.4-2—Station Blackout Loading – Train 2 Estimated

Function	Power	Notes
Safety Chilled Water Compressor - Division 4	~~530~~715 kW	Division 4 is air cooled, which consists of four 25 percent compressors and eight 12.5 percent condenser fans; contribution to SBODG loading is calculated considering 50 percent of the rated capacity running continuously. ~~Even if powered, the Division 3 compressor does not run, because the component cooling water it requires is not available during SBO.~~
Emergency Feedwater Pump	580 kW	Nominal load adjusted higher for possible efficiency losses. No credit has been taken for the reduced flow rate and hydraulic load expected during SBO. The value listed is conservative.
Class 1E Battery Chargers	200 kW	Includes Division 3 and Division 4.
Class 1E 480 V Loads Except Battery Chargers - Division 4	1000 kW	Includes 480 V loads powered from load centers 34BMB and 34BMC and MCCs 34BNB01, 34BNB02, 34BNB03, and 34BNC01.
Class 1E 480 V Loads Except Battery Chargers - Division 3	550 kW	Includes 480 V loads powered from load center 33BMB and MCCs 33BNB01, 33BNB02, and 33BNB03.
SBO DG Auxiliaries	210 kW	Differs slightly from train 1 due to consideration of loads from the associated 480 V buses.
Non-Class 1E Battery Chargers	320 kW	Non-Class 1E chargers may be turned off during SBO as needed to maintain load below SBODG continuous rating.
Provision for Site-Specific Non-Class 1E Loads	450 kW	
Total SBO Load	~~3840~~4025 kW	
Asset Protection	30 kW	Differs from train 1 because most turbine-generator loads are on train 1. Load present during LOOP without SBO. Individual loads removed during SBO as needed to maintain load below SBODG continuous rating.

9.2.4 Potable and Sanitary Water Systems (PSWS)

The potable and sanitary water systems (PSWS) provide one type of water throughout the plant which is referred to as potable and sanitary water. The water is used for human consumption, sanitary and domestic purposes and it is also used as source water for other systems inside the Nuclear Island (NI) and the Conventional Island (CI). The PSWS makeup water is pretreated at the source (site-specific) to meet the required water quality specifications. Potable and sanitary water is supplied to the users by the PSWS distribution system.

9.2.4.1 Design Bases

The PSWS serve no safety-related function and therefore have no safety design basis. However, design requirements are incorporated so that failure of the PSWS do not initiate or perpetuate the failure of any nearby safety related systems. No potential failure of the PSWS will affect the safe operation of the plant.

The PSWS have no connection to systems having the potential for containing radioactive materials. This requirement meets the guidelines of 10 CFR 50, Appendix A, GDC 60.

The PSWS are designed for a single unit and are not shared with other units.

The PSWS mitigate the potential for flooding of the Safeguard Building (SB) by actuation of isolation valves for the NI portion of the PSWS.

9.2.4.2 System Description

9.2.4.2.1 General Description

The PSWS provide potable and sanitary water throughout the plant. The systems provide water for human consumption and sanitary purposes, and are also used by other systems as a water source inside the NI and the CI. This water is pretreated to meet the site-specific user water quality specifications during normal plant operations and outages. The PSWS incorporate water heaters to provide hot water to users in the NI and CI.

The PSWS transfer the water from the source of the water (site-specific) to the respective users throughout the power plant. The layout of the systems piping and valves are designed so that a failure of any component or equipment of the PSWS does not jeopardize the operation of safety-related systems or components.

Two remotely operated isolation valves are provided in the SB. Closure of these valves mitigates the potential for flooding of the SB by the PSWS.

The PSWS supplies pretreated water to users in the NI and in the CI.

The processing of raw water makeup for potable and sanitary water is site-specific. A COL applicant that references the U.S. EPR design certification will provide site-specific details related to the sources and treatment of makeup to the PSWS along with a simplified piping and instrumentation diagram.

9.2.4.2.2 Component Description

Table 3.2.2-1 provides the seismic and other design classifications for the components in the PSWS.

Piping and Valves

The PSWS have flexibility in the design of the piping and valving arrangements to accommodate required inspection, maintenance or testing of system components.

The installed piping is made of materials that have no harmful effects on the drinking water quality.

The PSWS outdoor distribution lines are protected against freezing.

Piping joints, with the exception of flanged connections, are silver-soldered or threaded connections. Soldering material that contains lead is not used.

Water Heaters

Local water heaters are used to generate warm water at necessary locations throughout the NI and CI. These heaters are self-regulating and the water temperature can be adjusted manually at the local heaters.

Isolation Valves

Two remotely operated valves are located inside the SB. The closure of these two isolation valves is actuated by a main control room (MCR) water leakage detection system signal (located near the toilet areas), or a MAX2 level signal from the KTE sumps., or on high humidity indication in the MCR brought about by a failure of the MCR air conditioning system (CRACS) or electrical division of the safeguard building ventilation system (SBVSE).

Backflow Preventers

Backflow prevention measures, such air gaps or reduced pressure backflow preventers, are provided to prevent possible contamination and backflow under abnormal conditions.

9.2.4.2.3 Operations

During normal plant operations (startup, power and shutdown/outage), the PSWS supply the plant with the necessary pretreated water for human consumption and sanitary flushing purposes.

During abnormal operating conditions, such as loss of offsite power, the PSWS will not be available.

9.2.4.3 Safety Evaluation

The PSWS serve no safety-related functions and require no safety evaluation. No failure of the PSWS will initiate or perpetuate the failure of any nearby safety-related systems and it is not connected to any other process system which could become contaminated. Potential failures of the PSWS do not affect the safe operation of the power plant.

All of the PSWS piping, venting, and valving arrangements are separated from other plant chemical or radiological processes, treatments and drainage systems. The separation is provided by not interconnecting PSWS piping with other piping that conveys radioactive materials. Where plant chemical processes, treatments or drainage conditions are involved, the PSWS is protected from contamination by the installation of backflow prevention measures, such as reduced pressure backflow prevention devices or air gaps, as necessary. These design features prevent the PSWS from potentially being contaminated with radioactive material and complies with the acceptance criteria relating to 10 CFR Part 50, Appendix A, GDC 60.

9.2.4.4 Inspection and Testing Requirements

Acceptance tests and in-service inspections of the PSWS are performed to verify the systems are installed in accordance with the acceptance criteria identified in the applicable plans, drawings and specifications for the structure, system and components. Preoperational testing is performed as described in Section 14.2, Test #225.

9.2.4.5 Instrumentation Requirements

Flow meters, pressure gauges and temperature sensors shall be located throughout the system piping based on requirements for systems operation.

Next File

9.2.8 Safety Chilled Water System

The safety chilled water system (SCWS) supplies refrigerated chilled water to the safety-related heating, ventilation and air conditioning (HVAC) systems and the low head safety injection system (LHSI) pumps and motors in Safeguard Buildings (SB) 1 and 4 and the fuel building ventilation system (FBVS). The SCWS consists of four trains, numbered 1 to 4. Train 1 and Train 2 are interconnected and Train 3 and Train 4 are interconnected.

9.2.8.1 Design Bases

The SCWS provides chilled water as a heat sink to the LHSI pumps and the safety-related HVAC systems, which in turn provides an acceptable environment for safety-related equipment and main control room (MCR) habitability in the event of a design basis accident (DBA) (GDC 44). The SCWS is classified as a safety-related system and has safety-related design functions. The system is designed Seismic Category I. Safety-related systems are required to function following a DBA and are required to achieve and maintain a safe shutdown condition.

Each SCWS train is protected from the effects of natural phenomena, such as earthquakes, tornadoes, hurricanes, and floods (GDC 2). The SCWS are located in Seismic Category I Safeguard Buildings, which are designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, external missiles, and other natural phenomena. The SCWS cross-tie piping will be routed through the stair tower structures between SB 1 and SB 2, and between SB 3 and SB 4. The stair tower structures are Seismic Category I and designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, external missiles, and other natural phenomena.

Each train remains functional and performs its intended functions for all postulated environmental conditions or dynamic effects, such as pipe breaks (GDC 4).

Safety functions are performed assuming a single active component failure coincident with the loss of offsite power (GDC 44).

The SCWS is not shared with any other plant unit (GDC 5).

Active components of the SCWS trains are capable of being periodically tested and required inspections can be performed during plant operation (GDC 45 and GDC 46).

The SCWS trains use design and fabrication codes consistent with the safety classification and seismic design criteria provided in Section 3.2. The quality group classification meets the requirements of RG 1.26. The seismic design of the system components meets the guidance of RG 1.29. The power and control functions are designed in accordance with RG 1.32.

The SCWS operates continuously as described for the safety-related function when the plant is in normal conditions of startup, shutdown, power operation, and outages.

9.2.8.2 System Description

9.2.8.2.1 General Description

The SCWS consists of four trains numbered 1 to 4. Each is located in one of the four SBs. Each SCWS train is a closed loop system that supplies chilled cooling water for specified area HVAC air handling units (AHU) and Division 1 and 4 low head safety injection system (LHSI) pump seal coolers and motor coolers. Each train consists of a refrigeration chiller unit, two pumps, expansion tank, valves, and the associated piping and controls.

Normally open, motor-operated, cross-tie valves (MOV) interconnect the supply and return piping of Train 1 with Train 2, and the supply and return piping of Train 3 with Train 4. Each SCWS train is sized to meet the system load requirements of two divisional trains.

The SCWS provides chilled water to the HVAC cooling coils of the main control room (MCR), the electrical division rooms (SBVSE) in the SBs, SB controlled-area ventilation system (SBVS), FBVS, and the LHSI pump seal coolers and motor coolers in SB Divisions 1 and 4.

Bounding system design parameters for all operating conditions are listed on Table 9.2.8-1—Safety Chilled Water Design Parameters for Cross-Tied Operation and Table 9.2.8-2—Safety Chilled Water Design Parameters Each Division Isolated. The SCWS flow diagram is shown in Figure 9.2.8-1—Safety Chilled Water System Diagram. Pipe diameters for the SCWS are based on limiting the flow velocity to a range of 4 to 10 ft/second for normal modes of operation that are expected to occur frequently.

Refer to Section 12.3.6.5.9 for safety chilled water system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

9.2.8.2.2 Component Description

The general description of the component design features for the SCWS is provided below. Table 3.2.2-1 provides the seismic and other design classifications for the components in the SCWS.

Chilled Water Pumps

Two SCWS pumps in the operating train in each SCWS divisional pair circulate chilled water between the SCWS users in two divisions and the evaporator of the chiller refrigeration unit.

The required flow rate of each SCWS pump is defined by the heat to be removed from the system loads. As a minimum, the pumps are designed to fulfill the corresponding minimal required design mass flow rate under the following conditions:

- Fluctuations in the supplied electrical frequency.
- Increased pipe roughness due to aging and fouling.
- Fouled debris filters.
- Maximum pressure drop through the system heat exchangers.
- Minimum water level in the expansion tank considers net positive suction head to prevent cavitation of the SCWS pump and prevent vortex effects.

Determination of the discharge head of the pumps is based on dynamic pressure losses and head losses of the mechanical equipment of the associated SCWS at full load operation.

Air-Cooled Chiller Refrigeration Unit

SCWS, Trains 1 and 4, each contain one air-cooled chiller refrigeration unit that functions to refrigerate chilled water to its design basis temperature of 41°F for supply to the system users. These chillers are located in dedicated rooms of the SBs. Each chiller contains a condenser, compressors, evaporator, and associated piping and controls. Environmentally safe refrigerants are used in these chillers.

Water-Cooled Chiller Refrigeration Unit

SCWS, Trains 2 and 3, each contain one water-cooled chiller refrigeration unit that functions to refrigerate chilled water to its design bases temperature of 41°F for supply to the HVAC users. These chillers are located in dedicated rooms of the SBs. Each chiller contains a condenser, compressors, evaporator, and associated piping and controls. Environmentally safe refrigerants are used in these chillers.

Diaphragm Expansion Tank

Each SCWS train contains a diaphragm expansion tank with a nitrogen fill connection in each of the SBs. The expansion tank provides for changes in volume, pump NPSH, and establishes a point of reference pressure for the closed-loop system. These tanks are provided with relief valve overpressure protection. The expansion tank nitrogen maintains the operating static pressure to keep the highest point in the SCWS filled. The expansion tank pressure also keeps the SCWS pump suction pressure well above the fluid vapor pressure to enhance available NPSH. The normal water volume in the expansion tank allows for volume displacement due to temperature changes and operating transitions. A complete loss of nitrogen or water volume in an expansion tank will close the cross-tie valves on MIN-2 pressure and trip the SCWS operating pumps of the affected chiller train after reaching MIN-3 pressure.

The SCWS diaphragm expansion tank will contain a reserve volume for seven days of normal SCWS leakage. The leakage rate for each cross-tie supply and return valve is 3.6 in^3/hr. Valve leakage is based on ASME QME-1 that identifies a nominal valve leak rate of 0.6 $in.^3$/hr/NPS of nominal valve size. The seven-day leakage volume also includes leakage of 0.1 gal /hr for valve stem packing, pump seal, tank diaphragm, and any remaining undefined leakage.

Each SCWS expansion tank will include a minimum water volume of 100 gallons to accommodate potential system leakage for seven days continuous for 24 hours with no makeup source in post-seismic conditions of 0.5 gal/hr.

In cross-tie operation, the expansion tank in the standby train in a divisional pair is not isolated from the system. Sluicing of water between two expansion tanks as system loads cycle or on trip of a chiller and start of the standby unit is precluded in the design due to the dampening effect of the diaphragm and the compressed nitrogen, resistance of the long length of piping between tanks, and resistance of the small diameter piping at the tank connection.

Cooling Coils

Multiple HVAC cooling coils in each train receive chilled water for heat removal from selected HVAC users. The SCWS also cools Train 1 and Train 4 LHSI motor cooler and pump seal cooler.

Fans

SCWS Trains 1 and 4 each has eight fans used for heat removal from the air cooled chiller refrigeration units. These fans are located in the safeguards buildings.

Relief Valves

A relief valve located in each SCWS train protects the chilled water closed loop against high pressure. The relief valve set point will prevent the SCWS pressure from exceeding the system design pressure. The design pressure is based on the total of pump shut-off head, the operating static pressure, and the lowest elevation in the SCWS. The setpoint is established in accordance with ASME Boiler and Pressure Vessel Code, Section III, Class 3 (Reference 1).

Check Dampers

Each of the eight air cooled chiller refrigeration unit heat removal fans has a check damper installed at the fan outlet. These dampers prevent air from flowing in the reverse direction, in the event that one or more of the fans is not in operation.

Chiller Bypass Valve

The chiller bypass valve installed in the operating SWCS train varies flow returning to the chiller to prevent freezing at the evaporator coil. Upstream filters are provided as a precaution to protect downstream control valves which contain internals sensitive to particle trapping.

Cross-Tie Valves

A cross-tie is established for normal operation between the supply and the return piping of each divisional pair (1/2 or 3/4) of SCWS trains that includes MOVs and associated controls. There are two isolation valves per train (one supply and one return) that are located in their respective Safeguards Buildings. The valves are divisionally powered. During normal operations the cross-tie isolation valves are normally open and only one chiller train is operating.

HVAC Cooling Coil Flow Control Valves

The flow rate through the cooling coils for the electrical division of the safeguards building ventilation system and the ventilation of the main control room air conditioning system are each regulated by a flow control valve positioned by room temperature or manually from the control room to provide the required flow. All other HVAC cooling coils and LHSI are supplied by fixed SCWS flow rates to confirm operability of all loads.

Filters

Liquid filters are installed upstream of the modulating flow control valves to protect throttling surfaces from minor corrosion debris, or debris from maintenance activities. A differential pressure limit across the filter, to allow for 30 days of operation post DBA, is maintained by normal maintenance.

9.2.8.3 System Operation

9.2.8.3.1 Normal Operation

During normal operation, at least one train of the divisional pair is in operation. Either Train 1 or Train 2 chiller provides safety chilled water cooling for all SCW loads within Safeguard Building Divisions 1 and 2, and the associated FBVS load. Likewise, the chiller from either Train 3 or 4 provides safety chilled water cooling for both

Safeguard Divisions 3 and 4 and the associated FBVS load. During normal operation, the cross-tie isolation valves (supply and return for both divisions) are normally open. The non-operating chiller and pump(s) are maintained in standby. This configuration also allows for maintenance on the non-operating chiller and pump(s). If the normal operating train pump or chiller fails, a switchover sequence to the standby train is automatically initiated. A planned switchover of the operating train is manually initiated from the MCR.

The chilled water distribution circuit operates with a variable flow rate that is governed by the position of the control valves associated with supplied user loads. A regulated chilled water bypass line is provided between the refrigeration–evaporator outlet line and the return line to prevent freezing. A diaphragm expansion tank is used for equalization of pressure and volumetric expansion and helps maintain the requisite static system pressure. A relief valve on the connecting line prevents the line design pressure from being exceeded. Piping voids associated with potential waterhammer are precluded by the constant pressure maintained in the nitrogen-charged expansion tank in each train.

The SCWS design minimizes the potential for dynamic flow instabilities and water hammer by avoiding high line velocities and has specified closing valve speeds that are slow enough to prevent damaging pressure increases. Vents are provided to vent to fully fill components and piping at high points in which voids could occur. The Nitrogen pressurized expansion tank confirms system high points are retained at positive pressure.

A manually operated make up demineralized water supply is used when water loss resulting from operational measures (e.g., venting and draining) is indicated by an expansion tank pressure instrument.

The SCWS is treated with hydrazine in low concentration for corrosion control. Monitoring of the water chemistry is provided by means of local sampling.

9.2.8.3.2 Abnormal Operation

In the event of a DBA with concurrent loss of offsite power (LOOP) the operating train of a divisional pair receives a “Start” signal to return the operating train to operation after load shed. If an active single failure occurs (assume either the EDG fails to start or the SCW train pump or chiller does not re-start), then the standby train receives a “Start” signal. This sequence confirms that one train of a divisional pair is operating.

The SCWS is powered from the emergency diesel generators (EDG) and continues to function during a DBA. Trains 1 and 4 of the SCWS provide a heat sink to Divisions 1 and 4 LHSI pumps and HVAC systems in the event of a severe accident or station blackout (SBO). Trains 1 and 4 are powered from motor control centers that are repowered by the station blackout diesels during an SBO event. The output of the SCWS Divisions 1 and 4 chillers is limited to a maximum of 50 percent during an SBO event.

Each SCWS expansion tank will maintain a defense in depth post-seismic emergency manual makeup spool piece connection to a seismic makeup water source post seven day water supply from the Seismic II fire water distribution system inside the Nuclear Island. The seismic makeup connection is shown on Figure 9.2.8-1. The fire water distribution system is designed to remain functional after a SSE as described in Section 9.5.1.2.1.

A mechanical or electrical failure of the running SCWS pump results in a switchover to the standby train.

Each refrigeration chiller in the four trains of the SCWS has four 25 percent capacity compressors. The SCWS is in a cross-tied configuration, which allows the SCWS to switch to the standby train in each divisional pair in the event of a compressor failure. Either Division 1 or 2 is capable of providing the design capacity for both Divisions 1 and 2. Either Division 3 or 4 is capable of providing the design capacity for both Divisions 3 and 4.~~three 50 percent capacity compressors to provide sufficient operating redundancy and flexibility in the event of a compressor failure. The two remaining chiller compressors provide 100 percent capacity as described in Section 9.2.8.2.1.~~

In case of loss of off-site power, each SCWS division is powered from its associated emergency diesel generator (EDG). To allow divisional maintenance (e.g., maintenance on EDGs), the SCWS safety-related motor operated flow control valves and the motor operated cross-tie valves are powered from the normal 1E power division or alternately fed from the adjacent class 1E power division. In cross-tie operation, this provides the capability to operate the SCWS flow control valves in two cross-tied trains, if necessary switch to the standby train in the divisional pair, or if necessary close the cross-tie valves. Division 2 is the alternate feed for Division 1 and vice versa. Division 4 is the alternate feed for Division 3 and vice versa.

9.2.8.4 Safety Evaluation

The SCWS is designed as Seismic Category I as described in Section 3.2 to operate in all plant modes of operation including design basis events. The SCWS divisions are located in SBs 1 to 4, respectively. The SBs are designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, external missiles, and other natural phenomena. Sections 3.3, 3.4, 3.5, 3.7, and 3.8 provide the bases for the adequacy of the structural design of these buildings.

The SCWS is designed to remain functional after a safe shutdown earthquake. Section 3.7 provides the design loading conditions that were considered. Sections 3.5, 3.6, and 9.5.1 provide the hazards analyses to make sure that a safe shutdown, as outlined in Section 7.4, can be achieved and maintained.

A four train design with interconnection of Train 1 and Train 2, and interconnection of Train 3 and Train 4 of the SCWS fulfills the single failure criteria. The four SCWS trains are backed up by the EDGs. Two of these trains, in Divisions 1 and 4, are also backed up by the SBO diesels. During an SBO event, Divisions 1 and 4 chillers are limited to a maximum of 50 percent output.

Structures, systems and components important to safety in the SCWS are not shared with any other co-located nuclear reactor units.

Preoperational testing of the SCWS is performed as described in Chapter 14.0. Periodic inservice functional testing is done in accordance with Section 9.2.8.5.

Section 6.6 provides the ASME Boiler and Pressure Vessel Code, Section XI (Reference 1) requirements that are appropriate for the SCWS.

Section 3.2 delineates the quality group classification and seismic category applicable to the safety-related portion of this system. Table 9.5.4-1 shows that the components meet the design and fabrication codes given in Section 3.2. All the power supplies and control functions necessary for safe function of the SCWS are Class IE, as described in Chapter 7 and Chapter 8.

Cooling diversity is created between the load heat sinks of Train 1 and Train 4, and Train 2 and Train 3. Train 1 and Train 4 chillers are air cooled, and Train 2 and Train 3 chillers are water cooled by the component cooling water system (CCWS).

A process radiation monitor is provided in Trains 1 and 4 of the SCWS, downstream of the LHSI pump mechanical seal cooler to monitor for possible leakage of radioactive fluid from the heat exchanger. Otherwise, migration of radioactive material from potentially radioactive systems is prevented with a minimum of two heat exchanger barriers. Radiation monitors are in the CCWS to detect radioactive contamination entering and exiting the system. Radiation monitors for the SCWS and the CCWS are specified in Table 11.5-1 Monitors R-59, R-60 (SCWS) and R-64 (CCWS).

9.2.8.5 Inspection and Testing Requirements

Prior to initial plant startup, a comprehensive performance test will be performed to verify that the design performance of the system and individual components is attained. Refer to Section 14.2, Test #052, for initial plant testing of the SCWS.

After the plant is brought into operation, periodic tests and inspections of the SCWS components and subsystems are performed to verify proper operation. Scheduled tests and inspections are necessary to verify system operability.

The installation and design of the SCWS provides accessibility for the performance of periodic inservice inspection and testing. Periodic inspection and testing of safety-related equipment verifies its structural and leak tight integrity and its availability and ability to fulfill its functions.

Inservice inspection and testing requirements are in accordance with Section XI of the ASME Code (Reference 1) and the ASME OM Code (Reference 2).

Sections 3.9.6 and 6.6 describe the inservice testing and inspection requirements, respectively. Refer to Section 16.0, Surveillance Requirement (SR) 3.7.9 for surveillance requirements that verify continued operability of the SCWS.

The SCWS expansion tank pressure indication is transmitted to the MCR for the provision of real time trending data on expansion tank pressure and volume equivalent to identify leakage. This provides the operators the ability to take corrective action prior to exceeding the maximum allowed seven day train leakage. The pressure differential in equivalent inches of water is obtained from the pressure indication at the top and bottom of the tank.

A Surveillance Requirement will verify SCWS train leakage on a 24 month frequency. Plant procedures and controls associated with leakage trending will be implemented by the COL applicant.

9.2.8.6 Instrumentation Requirements

The SCWS is controlled by the safety automation system (SAS). The normal indication, manual control, and alarm functions are provided by the process information and control system (PICS). Instrument display location, and input to alarm and automatic or manual functions for instruments shown in Figure 9.2.8-1 are provided in Table 9.2.8-3.

The chiller evaporator outlet temperature is monitored. An alarm occurs if temperature reaches high setpoint. An automatic switchover to the standby train occurs if temperature reaches high-high setpoint.

An automatic switchover to operate the opposite chiller train occurs if the chilled water flow through the evaporator reaches a MIN-2 set point for the running train. Then, if the cross-tie valves are open and the opposite chiller is in stand-by, the opposite (non-running) chiller pumps are automatically started. When differential pressure across the opposite chiller evaporator is greater than MIN-1, then the opposite chiller is automatically started and the initial running chiller train is stopped manually from the MCR.

The following automatic functions represent generic steps in train switchover to be performed or validated as a result of the abnormal condition in the affected train:

- Standby train prerequisites are met for train startup.

- Cross-tie MOVs are open-validate MOV position.
- Start standby train pump 1.
- Start standby train pump 2.
- Start standby train chiller unit.
- Enable the control loop for differential pressure across the evaporator, which starts system flow regulation by the bypass control valve in the standby train.
- Enable the pressure monitoring loop for system pressure.

Annunciation occurs on automatic switchover.

When the standby train is in operation, the following actions are manually initiated from the control room to stop the previously operating train:

- Standby train is in operation – validate operation.
- Stop operating chiller (if running).
- Stop operating train pump 1 (if running).
- Stop operating train pump 2 (if running).
- Disable the operating train pressure monitoring loop for system pressure.
- Close the operating train bypass control valve.
- Disable the operating train control loop for differential pressure across the evaporator.

System pressure is monitored with the aid of two pressure measurements for each train. The two measurements are combined in one measuring point. If the pressure falls to MIN-1, an alarm is issued for operators to check nitrogen charge or provide makeup with demineralized water. The SCWS expansion tank MIN-1 pressure alarm is below the lowest normal system operating pressure with sufficient margin to avoid a spurious alarm. SCWS expansion tank MIN-2 pressure is below MIN-1, but above the inventory margin required for seven days of normal operation. SCWS expansion tank MIN-3 pressure is below the seven day normal makeup margin, but high enough to provide sufficient NPSH and prevent pump cavitation and still retain sufficient inventory margin in the expansion tank.

If the system experiences excessive leakage in excess of system makeup capability, the cross-tie isolation MOVs are closed manually from the MCR on Low-2 system pressure. The non-operating standby train automatically starts on Low-2 pressure.

The train without excessive leakage returns to pressure and the train with excessive leakage is manually stopped from the DCS.

If the pressure falls to MIN-3, the following measures are initiated automatically for the affected train:

- Chilled water system “Protection OFF” alarms. The MIN-3 system pressure setpoint trip occurs before the pressure corresponding to the minimum required available NPSH is reached.
- Refrigeration unit shuts down.
- Chilled water circulating pump shuts down.

A humidity sensor is installed in the nitrogen region of the diaphragm expansion tank. This sensor issues a MAX-1 alarm indicating a leaky diaphragm if humidity exceeds a set limit.

To provide a constant water flow through the evaporator for the refrigeration unit, a controlled bypass is implemented between chilled water feed and chilled water return by means of a control valve. The controlled variable is differential pressure across the chiller evaporator.

The affected chilled water system pump and chiller is deactivated by a “Protection OFF” command in the case of the following faults:

- Pump failure.
- MIN-3.
- Minimum pressure limit for the system.
- Emergency power condition–under-voltage shutdown.

In the event of a DBA with LOOP the operating chiller and pumps will restart automatically after power is restored. In the event the operating train fails, the opposite stand-by train starts within one minute. In the event that the cross-tie valves close with one pump running in the operating SCWS division, the second standby pump starts within one minute if the running pump fails.

The SCWS pumps and chiller can be started manually assuming the SCWS is filled and pressurized to the normal operating range in the expansion tank, and if the cross-tie valves are open and the pumps in the opposite division of the pair are not running. If the cross-tie valves are shut and the paired divisions are isolated, then a pump in either or both divisions can be started with the SCWS filled to the normal operating pressure band in the expansion tank. Running pumps will trip on a pump fault, chiller fault, low evaporator flow (MIN-2), or MIN-3 pressure in the expansion tank. In the event of a running pump trip on a pump fault when the cross-tie valves are shut and the division train is operating separate from the other division pair, then the second pump is on stand-by and starts when the SCWS fills to the normal operating pressure band in the expansion tank.

In the event of a DBA with LOOP, the running pumps automatically restart under the EDG loading sequence. The pumps in the opposite train starts if the running pumps fail.

9.2.8.7 References

1. ASME Boiler and Pressure Vessel Code, Section XI: "Rules for Inservice Inspection of Nuclear Facility Components," The American Society of Mechanical Engineers, 2004.

2. ASME OM Code, "Code for Operation and Maintenance of Nuclear Power Plants," The American Society of Mechanical Engineers, 2004 edition.

Table 9.2.8-1—Safety Chilled Water Design Parameters for Cross-Tied Operation

Description	Technical Data
QKA 10/20/30/40 Evaporator refrigeration capacity	4,388,200 Btu/h
QKA 10/40 Condensing capacity	5,705,000 Btu/h
QKA 20/30 Condensing capacity	5,705,000 Btu/h
QKA 10/40 Condenser Air Flow	586,100 ft^3/min
QKA 10/40 Condenser Fan Power (~~3 50~~8-12.5% capacity fans per condenser)	~~95~~50 hp
QKA 20/30 Condenser CCW cooling flow	1140 gpm
QKA 10/20/30/40 Required Evaporator Chilled Water Flow	1130 gpm
QKA 10/20/30/40 Required Evaporator Chilled Water Outlet Temperature	41 °F
QKA 10/20/30/40 Required Evaporator Chilled Water Inlet Temperature	50 °F
QKA 10/20/30/40 Chilled Water Pump AP-107 Required Operating Flow (including margin)	565 gpm
QKA 10/20/30/40 Chilled Water Pump AP-107 Required Operating Head	171 ft
QKA 10/20/30/40 Chilled Water Pump AP-107 Shutoff Head	222 ft
QKA 10/20/30/40 Required Chilled Water Pump AP-107 Hydraulic Horsepower	25 h
SCWS Design Pressure	254 psig

Table 9.2.8-2—Safety Chilled Water Design Parameters Each Division Isolated

Description	Technical Data
QKA 10/40 Evaporator refrigeration capacity	2,394,200 Btu/h
QKA 20/30 Evaporator refrigeration capacity	1,994,000 Btu/h
QKA 10/40 Condensing capacity	3,112,500 Btu/h
QKA 20/30 Condensing capacity	2,592,200 Btu/h
QKA 10/40 Condenser Air Flow	319,740 ft^3/min
QKA 10/40 Condenser Fan Power (~~3-50~~8-12.5% capacity fans per condenser)	~~52~~50 hp
QKA 20/30 Condenser CCW cooling flow	475 gpm
QKA 10/20/30/40 Required Evaporator Chilled Water Flow	565 gpm
QKA 10/20/30/40 Required Evaporator Chilled Water Outlet Temperature	41 °F
QKA 10/20/30/40 Required Evaporator Chilled Water Inlet Temperature	50 °F
QKA 10/20/30/40 Chilled Water Pump AP-107 Required Operating Flow (including margin)	565 gpm
QKA 10/20/30/40 Chilled Water Pump AP-107 Required Operating Head	131.93 ft
QKA 10/20/30/40 Chilled Water Pump AP-107 Shutoff Head	172 ft
QKA 10/20/30/40 Required Chilled Water Pump AP-107 Hydraulic Horsepower	19 hp
Design Pressure	254 psig

Table 9.2.8-3—Safety Chilled Water Instrumentation
Sheet 1 of 5

MCR/RSS Display	Alarm/ Action	Function	Purpose
Expansion Tank Humidity Div 1	MAX-1	N/A	MAX-1 alarm alerts operator to leaking or failed tank diaphragm
Div. 1 System Pressure #1 and #2 combined	MAX-1 MAX-2 MIN-1 MIN-2 MIN-3	MIN-2 Manual Isolation Div. 1 and 2 MIN-3 Div 1 Chiller and Pump shutdown	MAX-2 relief/alarm prevent exceeding design pressure MAX-1 alarm alerts operator to high inventory MIN-1 alarm alerts operator to add inventory MIN-2 alarm alerts operators to close cross-tie valves for inventory protection of a division MIN-3 trips operating pumps at pump min NPSH
Evaporator ΔP Div 1	MIN-1 MIN-2 MAX-1	MODULATE Chiller Bypass Valve 30QKA10CG101	MIN-1 chiller freeze protection – incrementally opens valve MIN-2 alarm alerts operator to low evaporator ΔP. MAX-1 incrementally close valve to control flow
Evaporator Flow DIV 1	MIN-1 MIN-2	MIN-2 Train 1 to Train 2 Switchover	MIN-1 alarm alerts operator to low flow MIN-2 indicates normal flow loss in division and auto switch to alternate division
Tank Humidity Measurement DIV 2	MAX-1		MAX-1 alarm alerts operator to leaking or failed tank diaphragm

Table 9.2.8-3—Safety Chilled Water Instrumentation
Sheet 2 of 5

MCR/RSS Display	Alarm/ Action	Function	Purpose
Div. 2 System Pressure #1 and #2 combined	MAX-1 MAX-2 MIN-1 MIN-2 MIN-3	MIN-2 Manual Isolation Div. 1 and 2 MIN-3 DIV 2 Chiller and Pump shutdown	MAX-2 relief/alarm prevent exceeding design pressure MAX-1 alarm alerts operator to high inventory MIN-1 alarm alerts operator to add inventory MIN-2 alarm alerts operators to close cross-tie valves for inventory protection of a division MIN-3 trips operating pumps at pump min NPSH
Evaporator ΔP DIV 2	MIN-1 MIN-2 MAX-1	MODULATE Chiller Bypass Valve 30QKA20CG101	MIN-1 chiller freeze protection – incrementally opens valve MIN-2 alarm alerts operator to low evaporator ΔP. MAX-1 incrementally close valve to control flow
Evaporator Flow DIV 2	MIN-1 MIN-2	MIN-2 Train 2 to Train 1 Switchover	MIN-1 alarm alerts operator to low flow MIN-2 indicates normal flow loss in division and auto switch to alternate division
Tank Humidity Measurement DIV 3	MAX-1		MAX-1 alarm alerts operator to leaking or failed tank diaphragm

Table 9.2.8-3—Safety Chilled Water Instrumentation
Sheet 3 of 5

MCR/RSS Display	Alarm/ Action	Function	Purpose
Div. 3 System Pressure #1 and #2 combined	MAX-1 MAX-2 MIN-1 MIN-2 MIN-3	MIN-2 Manual Isolation Div. 1 and 2 MIN-3 DIV 3 Chiller and Pump shutdown	MAX-2 relief/alarm prevent exceeding design pressure MAX-1 alarm alerts operator to high inventory MIN-1 alarm alerts operator to add inventory MIN-2 alarm alerts operators to close cross-tie valves for inventory protection of a division MIN-3 trips operating pumps at pump min NPSH
Evaporator ΔP DIV 3	MIN-1 MIN-2 MAX-1	MODULATE Chiller Bypass Valve 30QKA30CG101	MIN-1 chiller freeze protection – incrementally opens valve MIN-2 alarm alerts operator to low evaporator ΔP MAX-1 incrementally close valve to control flow
Evaporator Flow DIV 3	MIN-1 MIN-2	MIN-2 Train 3 to Train 4 Switchover	MIN-1 alarm alerts operator to low flow MIN-2 indicates normal flow loss in division and auto switch to alternate division
Tank Humidity Measurement DIV 4	MAX-1		MAX-1 alarm alerts operator to leaking or failed tank diaphragm

Table 9.2.8-3—Safety Chilled Water Instrumentation
Sheet 4 of 5

MCR/RSS Display	Alarm/ Action	Function	Purpose
Div. 4 System Pressure #1 and #2 combined	MAX-1 MAX-2 MIN-1 MIN-2 MIN-3	MIN-2 Manual Isolation Div. 1 and 2 MIN-3 DIV 4 Chiller and Pump shutdown	MAX-2 relief/alarm prevent exceeding design pressure MAX-1 alarm alerts operator to high inventory MIN-1 alarm alerts operator to add inventory MIN-2 alarm alerts operators to close cross-tie valves for inventory protection of a division MIN-3 trips operating pumps at pump min NPSH
Evaporator ΔP DIV 4	MIN-1 MIN-2 MAX-1	MODULATE Chiller Bypass Valve 30QKA40CG101	MIN-1 chiller freeze protection – incrementally opens valve MIN-2 alarm alerts operator to low evaporator ΔP. MAX-1 incrementally close valve to control flow
Evaporator Flow DIV 4	MIN-1 MIN-2	MIN-2 Train 4 to Train 3 Switchover	MIN-1 alarm alerts operator to low flow MIN-2 indicates normal flow loss in division and auto switch to alternate division
Chiller Bypass Valve Position Div 1	N/A	Evaporator Flow Control	Valve position status
Chiller Bypass Valve Position Div 2	N/A	Evaporator Flow Control	Valve position status
Chiller Bypass Valve Position Div 3	N/A	Evaporator Flow Control	Valve position status
Chiller Bypass Valve Position Div 4	N/A	Evaporator Flow Control	Valve position status
SAC Coil Throttle Valve Position Div1	N/A	HVAC Coil Flow Control	Valve position status
SAC Coil Throttle Valve Position Div2	N/A	HVAC Coil Flow Control	Valve position status

Next File

Table 9.2.8-3—Safety Chilled Water Instrumentation
Sheet 5 of 5

MCR/RSS Display	Alarm/ Action	Function	Purpose
SAC Coil Throttle Valve Position Div3	N/A	HVAC Coil Flow Control	Valve position status
SAC Coil Throttle Valve Position Div4	N/A	HVAC Coil Flow Control	Valve position status
SAB Coil Throttle Valve Position Div1	N/A	HVAC Coil Flow Control	Valve position status
SAB Coil Throttle Valve Position Div2	N/A	HVAC Coil Flow Control	Valve position status
SAB Coil Throttle Valve Position Div3	N/A	HVAC Coil Flow Control	Valve position status
SAB Coil Throttle Valve Position Div4	N/A	HVAC Coil Flow Control	Valve position status
Division 1 To 2 Cross-connect Supply MOV Position	N/A	Switchover Valve OPEN/CLOSE Confirmation	Valve position status
Division 1to 2 Cross-connect Return MOV Position	N/A	Switchover Valve OPEN/CLOSE Confirmation	Valve position status
Div 2 To 1 Cross-connect Supply MOV POS	N/A	Switchover Valve OPEN/CLOSE Confirmation	Valve position status
Div 2 To 1 Cross-connect Return MOV POS	N/A	Switchover Valve OPEN/CLOSE Confirmation	Valve position status
Div 3 To 4 Cross-connect Supply MOV POS	N/A	Switchover Valve OPEN/CLOSE Confirmation	Valve position status
Div 3 To 4 Cross-connect Return MOV Position	N/A	Switchover Valve OPEN/CLOSE Confirmation	Valve position status
Div 4 To 3 Cross-connect Supply MOV POS	N/A	Switchover Valve OPEN/CLOSE Confirmation	Valve position status
Div 4 To 3 Cross-connect Return MOV POS	N/A	Switchover Valve OPEN/CLOSE Confirmation	Valve position status
LHSI Seal Cooler	N/A	OPEN/CLOSE Confirmation	Valve position status

Table 9.2.8-4—Safety Chilled Water System Failure Analysis
Sheet 1 of 5

Component	Component Function	Failure Mode	Failure Mechanism	Failure Symptoms/Effect	Can SCWS Satisfy Mission Success Criteria? Notes (1), (2), (3), (4)
SCWS 30QKA	Supply Chilled Water to User Exchangers	Passive failure, leak > makeup can handle	Mechanical	System pressure falls below minimum requirement.	Yes. If SCWS Train 1 is out for maintenance (see Note 3 typical) and a failure occurs in Train 2, there is a second SCWS cross-tied pair Trains 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4.
					Yes. If SCWS Train 1 is out for maintenance and a failure occurs in Train 4, Train 2 would remain supplying Div 1 and 2 user exchangers. Cooling function remains for Div 1 and 2. Train 3 can be administratively operated in independent division operation. Shut down 4. If this is performed along with the above, cooling function remains for Div 1, 2, and 3.
SCWS Expansion Tank 30QKA10/20/30/40 BB101	Maintains pressure in the system.	Tank diaphragm fails to maintain system pressure or loss of nitrogen pressure	Mechanical/I&C	System pressure falls below minimum requirement.	YES. For cross-tie operation, two expansion tanks are inter-connected by the cross-tie. Each expansion tank serves two SCWS divisions. If SCWS Train 1 is out for maintenance and a failure occurs in Train 2 tank, there is a second SCWS cross-tied pair Trains 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4.
					YES. For cross-tie operation, two expansion tanks are inter-connected by the cross-tie. Each expansion tank serves two SCWS divisions. If SCWS Train 1 is out for maintenance and a failure occurs in Train 4 tank, cooling function remains for Div 1 and 2 served by Train 2 tank and cooling function remains for Div 3 and 4 served by Train 3 tank. Train 3 can be administratively operated in independent division operation. Shut down 4. If this is performed along with the above, cooling function remains for Div 1, 2, and 3.
SCWS Pump 30QKA10/20/30/40 AP107/108	Provides flow of water to each user.	Pump fails during normal operation	Mechanical, Electrical, I&C	Loss of chilled water flow to the users.	Yes. If SCWS Train 1 is out for maintenance, and failure of one pump in Train 2 occurs, there is a second SCWS cross-tied pair 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4. Train 2 can be administratively operated with one remaining pump in independent division operation. If this is performed along with the above, cooling function remains for Div 2, 3 and 4. Note (5)
					Yes. If SCWS Train 1 is out for maintenance and failure of one pump in Train 4 occurs, start standby Train 3 SCWS which will continue to supply both Div 3 and 4. There is a second SCWS cross-tied pair 1 & 2 with SCWS Train 2 operating that serves Div 1 & 2 user exchangers. Cooling function remains for Div 1, 2, 3 and 4.
SCWS Air Cooled Chiller 30QKA10/40 AH112 Note (6)	Transfers heat from the SCWS water to the refrigerant then transfers heat from the refrigerant to the air flow which is the heat sink for SCWS 1 and 4.	Chiller fails during normal operation.	Mechanical, Electrical, I&C	Loss of ability to provide chilled water at design temperature.	Yes. If SCWS Train 1 is out for maintenance, and failure of the chiller in Train 2 occurs, there is a second SCWS cross-tied pair 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4. Note (7)
					Yes. If SCWS Train 1 is out for maintenance and failure of the chiller in Train 4 occurs, start standby Train 3 SCWS which will continue to supply both Div 3 and 4. There is a second SCWS cross-tied pair 1 & 2 with SCWS Train 2 operating that serves Div 1 & 2 user exchangers. Cooling function remains for Div 1, 2, 3 and 4

Table 9.2.8-4—Safety Chilled Water System Failure Analysis
Sheet 2 of 5

Component	Component Function	Failure Mode	Failure Mechanism	Failure Symptoms/Effect	Can SCWS Satisfy Mission Success Criteria? Notes (1), (2), (3), (4)
SCWS Ventilation Equipment for Air Cooled Chiller 30QKA10/40	Transfer heat from SCWS 1 and 4 to Outside Air	Ventilation fails during normal operation	Mechanical, Electrical, I&C	Loss of ability to provide chilled water at design temperature.	Yes. Bounded by the above two items for the SCWS air cooled chiller.
SCWS Water Cooled Chiller 30QKA20/30 AH112 Note (6)	Transfers heat from the SCWS water to the refrigerant then transfers heat from the refrigerant to Component Cooling Water System (CCWS) which is the heat sink for SCWS 2 and 3.	Chiller fails during normal operation.	Mechanical, Electrical, I&C	Loss of ability to provide chilled water at design temperature.	Yes. If SCWS Train 1 is out for maintenance, and failure of the chiller in Train 2 occurs, there is a second SCWS cross-tied pair 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4. Note (7) Loss of Division 2 of CCWS is equivalent to this case.
					Yes. If SCWS Train 1 is out for maintenance and failure of the chiller in Train 3 occurs, start standby Train 4 SCWS which will continue to supply both Div 3 and 4. There is a second SCWS cross-tied pair 1 & 2 with SCWS Train 2 operating that serves Div 1 & 2 user exchangers. Cooling function remains for Div 1, 2, 3 and 4. Loss of Division 3 of CCWS is equivalent to this case.
Bypass Control Valve 30QKA10/20/30/40 AA101	Prevents freezing of the evaporator tubes.	Does not modulate to desired position	Mechanical, Electrical, I&C	Freezing the evaporator tubes	Yes. If SCWS Train 1 is out for maintenance and failure occurs in Train 2 bypass valve, there is a second SCWS cross-tied pair 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4. Note (8)
					Yes, If SCWS Train 1 is out for maintenance and a failure occurs in Train 4 bypass valve, switch to the standby Train 3 in cross-tied pair 3 & 4. Train 2 would remain supplying Div 1 and 2 user exchangers. Cooling function remains for Div 1, 2, 3 and 4. Note (8)
				Valve inadvertently opens, bypassing too much flow. Either the operational division valve or stand-by division valve in each pair.	Yes. If SCWS Train 1 is out for maintenance and a failure occurs in Train 2 bypass valve, there is a second SCWS cross-tie pair 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4.
					Yes, If SCWS Train 1 is out for maintenance and a failure occurs in Train 4 bypass valve, train 2 would remain supplying Div 1 and 2 user exchangers. Cooling function remains for Div 1 and 2. Train 3 can be administratively operated in independent division operation. Shut down 4. If this is performed along with the above, cooling function remains for Div 1, 2 and 3.

Table 9.2.8-4—Safety Chilled Water System Failure Analysis
Sheet 3 of 5

Component	Component Function	Failure Mode	Failure Mechanism	Failure Symptoms/Effect	Can SCWS Satisfy Mission Success Criteria? Notes (1), (2), (3), (4)
Flow Control Valve for 30SAC01/02/03/04 AC001 Valve # 30QKC10/20/30/40 AA101	Controls flow through the HVAC cooling coil 30SAC01/02/03/04 AC001.	Does not modulate to desired position	Mechanical, Electrical, I&C	Loss of control of chilled water flow for the affected SAC exchanger in one division.	Yes. If SCWS Train 1 is out for maintenance and a failure occurs in Train 2 flow control valve, there is a second SCWS cross-tie pair 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4. If the maintenance in SCWS Train 1 does not affect the Train 1 flow control valve 30QKC10AA101, cooling function remains for Div 1, 3 and 4.
					Yes, If SCWS Train 1 is out for maintenance and a failure occurs in Train 4 flow control valve, train 2 would remain supplying Div 1 and 2 user exchangers. Cooling function remains for Div 1 and 2. If failure of the Train 4 flow control valve 30QKC40AA101 does not affect overall SCWS operation, cooling function remains for Div 1, 2, 3 and 4 except for the affected SAC user exchanger. If failure of the Train 4 flow control valve 30QK40AA101 affects overall SCWS operation, Train 3 can be administratively operated in independent division operation. Shut down 4. If this is performed along with the above, cooling remains for Div 1, 2 and 3.
Flow Control Valve for 30SAB01/02/03/04 AC001 Valve # 30QKB10/20/30/40 AA101	Controls flow through the HVAC cooling coil 30SAB01/02/03/04 AC001.	Does not modulate to desired position	Mechanical, Electrical, I&C	Loss of control of chilled water flow for the affected SAB exchanger in one SAB train.	Yes. If SCWS Train 1 is out for maintenance and a failure occurs in Train 2 flow control valve, there is a second SCWS cross-tie pair 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4. If the maintenance in SCWS Train 1 does not affect the Train 1 flow control valve 30QKB10AA101, cooling function remains for Div 1, 2 and 4.
					Yes, If SCWS Train 1 is out for maintenance and a failure occurs in Train 4 flow control valve, train 2 would remain supplying Div 1 and 2 user exchangers. Cooling function remains for Div 1 and 2. If failure of the Train 4 flow control valve 30QKB40AA101 does not affect overall SCWS operation, cooling function remains for Div 1, 2, 3 and 4 except for the affected user exchanger. If failure of the Train 4 flow control valve 30QKB40AA101 affects overall SCWS operation, Train 3 can be administratively operated in independent division operation. Shut down 4. If this is performed along with the above, cooling function remains for Div 1, 2 and 3.
Flow Control Valve for LHSI Pump Seal Cooler Valve # 30QKA10/40 AA025	Controls flow through the LHSI pump seal cooler.	Does not open.	Mechanical, Electrical, I&C	Loss of chilled water flow for the affected LHSI pump in one division.	Yes, If SCWS Train 1 is out for maintenance and a failure occurs in Train 4 flow control valve, there are two CCWS divisions that serve LHSI pumps 2 & 3. Shutdown Div 4 LHSI pump. Div 1 and Div 2 user exchangers continue to be supplied from cross-tied pair 1 & 2 supplied by SCWS Train 2. Continue to operate cross-tied pair 3 and 4. Cooling function remains for Div 1, 2 and 3 LHSI pumps. For other user exchangers, cooling function remains for Div 1, 2, 3 and 4.

Table 9.2.8-4—Safety Chilled Water System Failure Analysis Sheet 4 of 5

Component	Component Function	Failure Mode	Failure Mechanism	Failure Symptoms/Effect	Can SCWS Satisfy Mission Success Criteria? Notes (1), (2), (3), (4)
Cross-tie Valves 30QKA10/20/30/ 40AA102	Connect supply side of SCWS Div 1 to Div 2 and Div 3 to Div 4.	Fail open	Mechanical, Electrical, I&C	Prevents independent divisional operation which requires cross-tie valves to be closed.	Yes, the associated cross-tie valve in the divisional pair, which is in series with the affected valve, remains closed. No effect on cooling function.
		Fail closed	Mechanical, Electrical, I&C	Prevents cross-tie operation which requires cross-tie valves to be open.	Yes. If SCWS Train 1 is out for maintenance and a cross-tie valve fails closed in Train 2, there is a second SCWS cross-tie pair 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4. Train 2 can be administratively operated in independent division operation. If this is performed along with the above, cooling function remains for Div 2, 3 and 4.
					Yes. If SCWS Train 1 is out for maintenance and a cross-tie valve fails closed in Train 4, there is a second SCWS cross-tie pair 1 & 2 that serves its associated user exchangers. Cooling function remains for Div 1 and 2. Trains 3 and 4 can be administratively operated in independent division operation. If this is performed along with the above, cooling function remains for Div 1, 2, 3 and 4.
Cross-tie Valves 30QKA10/20/30/ 40AA103	Connect return side of SCWS Div 1 to Div 2 and Div 3 to Div 4	Fail open	Mechanical, Electrical, I&C	Prevents independent divisional operation which requires cross-tie valves to be closed.	Yes, the associated cross-tie valve in the divisional pair, which is in series with the affected valve, remains closed. No effect on cooling function.
		Fail closed	Mechanical, Electrical, I&C	Prevents cross-tie operation which requires cross-tie valves to be open.	Yes. If SCWS Train 1 is out for maintenance and a cross-tie valve fails closed in Train 2, there is a second SCWS cross-tie pair 3 & 4 that serves its associated user exchangers. Cooling function remains for Div 3 and 4. Train 2 can be administratively operated in independent division operation. If this is performed along with the above, cooling function remains for Div 2, 3 and 4.
					Yes. If SCWS Train 1 is out for maintenance and a cross-tie valve fails closed in Train 4, there is a second SCWS cross-tie pair 1 & 2 that serves its associated user exchangers. Cooling function remains for Div 1and 2 Trains 3 and 4 can be administratively operated in independent division operation. If this is performed along with the above, cooling function remains for Div 1, 2, 3 and 4.
SAC HVAC Cooling Coils	Heat transfer via SCWS.	Clogged tubes/ structural degradation/ tube rupture	Mechanical	Loss of heat transfer capabilities.	YES. Bounded by passive failure indicated in first item of this table.
SAB HVAC Cooling Coils	Heat transfer via SCWS.	Clogged tubes/ structural degradation/ tube rupture	Mechanical	Loss of heat transfer capabilities.	YES. Bounded by passive failure indicated in first item of this table.
KLC HVAC Cooling Coils	Heat transfer via SCWS.	Clogged tubes/ structural degradation/ tube rupture	Mechanical	Loss of heat transfer capabilities.	YES. Bounded by passive failure indicated in first item of this table.
KLL HVAC Cooling Coils	Heat transfer via SCWS.	Clogged tubes/ structural degradation/ tube rupture	Mechanical	Loss of heat transfer capabilities.	YES. Bounded by passive failure indicated in first item of this table.

Table 9.2.8-4—Safety Chilled Water System Failure Analysis
Sheet 5 of 5

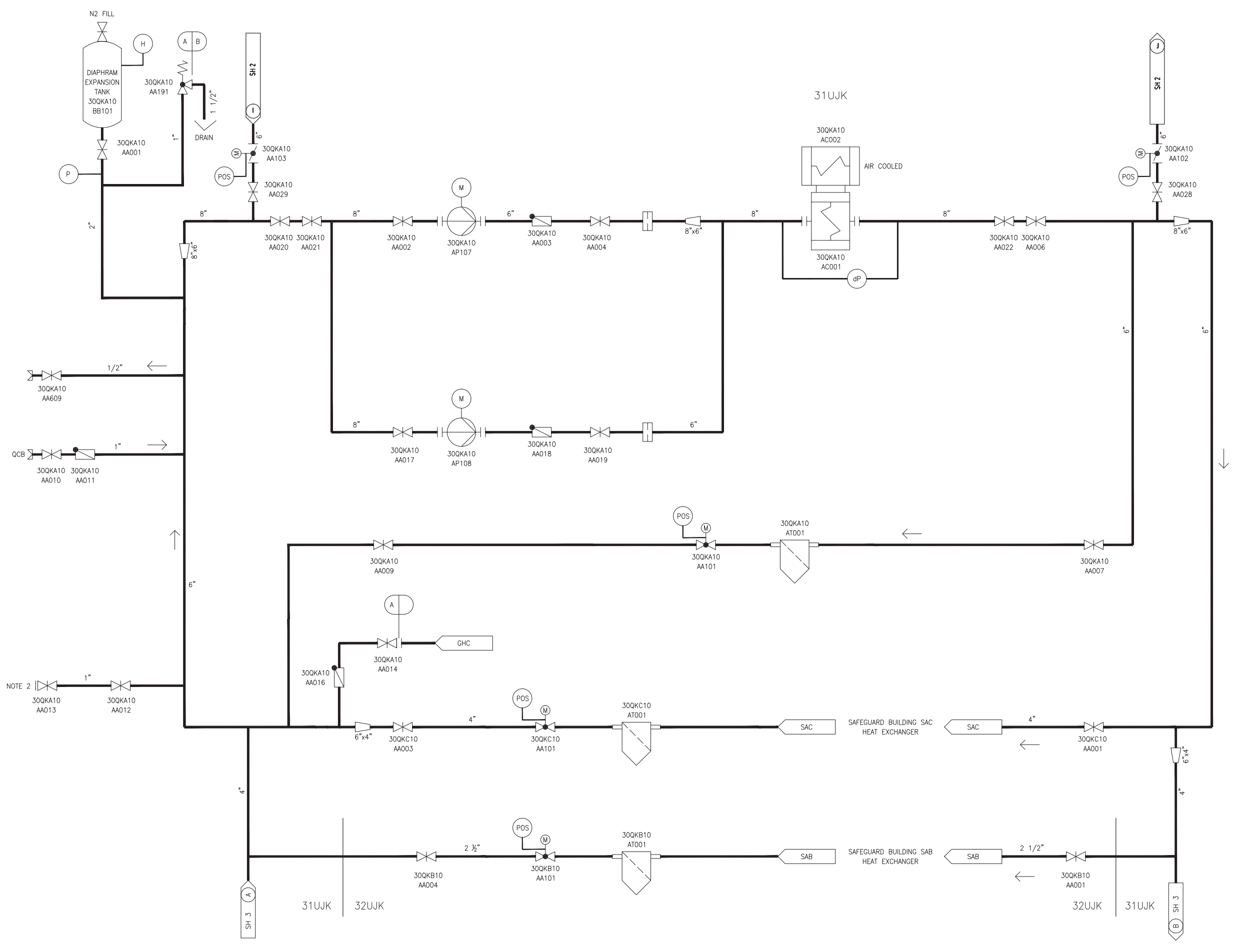
Component	Component Function	Failure Mode	Failure Mechanism	Failure Symptoms/Effect	Can SCWS Satisfy Mission Success Criteria? Notes (1), (2), (3), (4)
LHSI Pump Motor and Seal Coolers 30JNG10/40 AP001	Heat transfer via SCWS.	Clogged tubes/ structural degradation/ tube rupture	Mechanical	Loss of heat transfer capabilities. For LHSI pump seal cooler, tube rupture could result in contamination of SCWS.	YES. Bounded by passive failure indicated in first item of this table.

Notes:

1. This analysis considers safety chilled water system (SCWS) with loss of off-site power (LOOP) and one SCWS train unavailable due to maintenance with normal cross-tie operation.
2. Mission success requires, for all modes of operation, that SCWS supply chilled water to two divisions of SAC, SAB, and KLC; one division of KLL; and along with component cooling water system, supply two LHSI pumps motor and seal cooler.
3. One SCWS ~~T~~train ~~1~~is assumed to be out for maintenance with the following components out of service: SCWS chiller unit and/or two pumps.
4. SCWS Trains 1 and 4 are essentially identical. SCWS Trains 2 and 3 are essentially identical. The chilled water circuits of all four SCWS trains are essentially identical except for the HVAC user exchangers served. Therefore, this analysis will identify the identical components in the "Component" column and populate the table once.
5. In cross-tie operation two pumps in the operating train of each divisional pair provides flow to 2 user divisions. One pump in independent division operation provides flow to its division.
6. The chiller unit for each SCWS ~~T~~train 1ncludes the condenser, evaporator, compressors, and other refrigerant system components.
7. If there is a failure of one of the four 25 percent compressors in a specific train, the cross-tied configuration can switch to the standby train in each divisional pair. Either Division 1 or 2 is capable of providing the design capacity for both Divisions 1 and 2. Either Division 3 or 4 is capable of providing the design capacity for both Divisions 3 and 4.~~If failure is limited to one compressor, there is redundancy in the compressor units provided by three 50% capacity compressor units in each train. Two compressor units provide the design capacity for each SCWS train. The affected train can be administratively operated with the two remaining compressors.~~
8. In cross-tie operation the SCWS bypass valve in the operating train of each divisional pair provides the bypass function. The bypass valve in the standby division of each pair is closed.

Next File

Figure 9.2.8-1—Safety Chilled Water System Diagram
Sheet 1 of 4



GHC – DEMINERALIZED WATER DISTRIBUTION SYSTEM
QCB – MOBILE HYDRAZINE INJECTION SYSTEM FOR NUCLEAR ISLAND
QKA – SAFETY CHILLED WATER SYSTEM MAIN COMPONENTS
QKB – SAFETY CHILLED WATER DISTRIBUTION LINES TO MAIN CONTROL ROOM AIR CONDITIONING
QKC – SAFETY CHILLED WATER DISTRIBUTION LINES TO SAFEGUARD BUILDINGS
SAB – MAIN CONTROL ROOM AIR CONDITION SYSTEM
SAC – ELECTRICAL DIVISION OF SAFEGUARD BUILDING VENTILATION SYSTEM

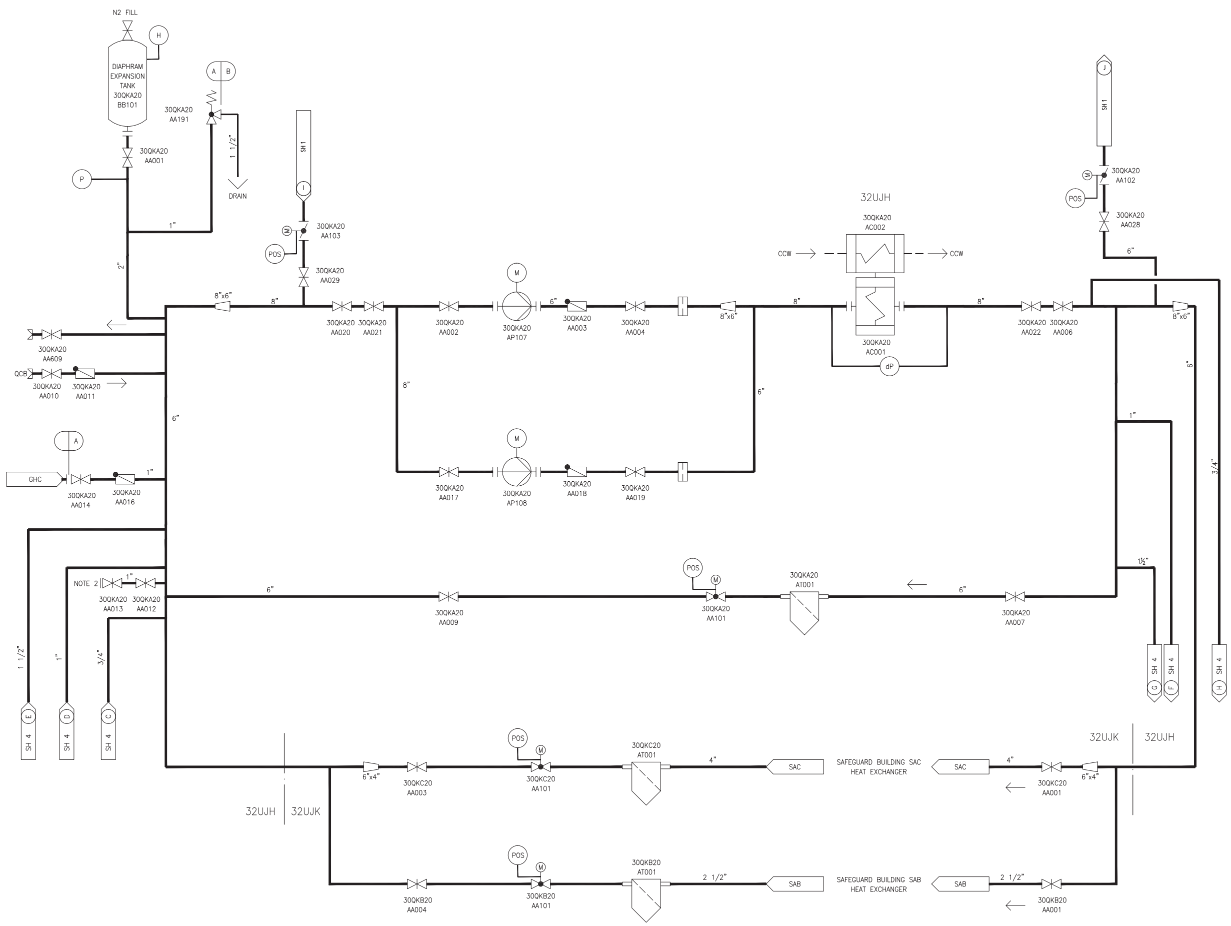
31UJK – SAFEGUARD BUILDING ELECTRICAL DIVISION 1
32UJK – SAFEGUARD BUILDING ELECTRICAL DIVISION 2

NOTES:
1. TRAIN 1 SHOWN IS REPRESENTATIVE OF TRAIN 4 WITH EXCEPTIONS AS NOTED.
2. FOR MANUAL CONNECTION TO SEISMIC MAKEUP WATER SOURCE.

B	C	I
A	C	I
DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS

REV 003
QKA01T2

Figure 9.2.8-1—Safety Chilled Water System Diagram
Sheet 2 of 4



GHC – DEMINERALIZED WATER DISTRIBUTION SYSTEM
QCB – MOBILE HYDRAZINE INJECTION SYSTEM FOR NUCLEAR ISLAND
QKA – SAFETY CHILLED WATER SYSTEM MAIN COMPONENTS
QKB – SAFETY CHILLED WATER DISTRIBUTION LINES TO MAIN CONTROL ROOM AIR CONDITIONING
QKC – SAFETY CHILLED WATER DISTRIBUTION LINES TO SAFEGUARD BUILDINGS
SAB – MAIN CONTROL ROOM AIR CONDITION SYSTEM
SAC – ELECTRICAL DIVISION OF SAFEGUARD BUILDINGS VENTILATION SYSTEM

32UJH – SAFEGUARD BUILDING MECHANICAL DIVISION 2
32UJK – SAFEGUARD BUILDING ELECTRICAL DIVISION 2

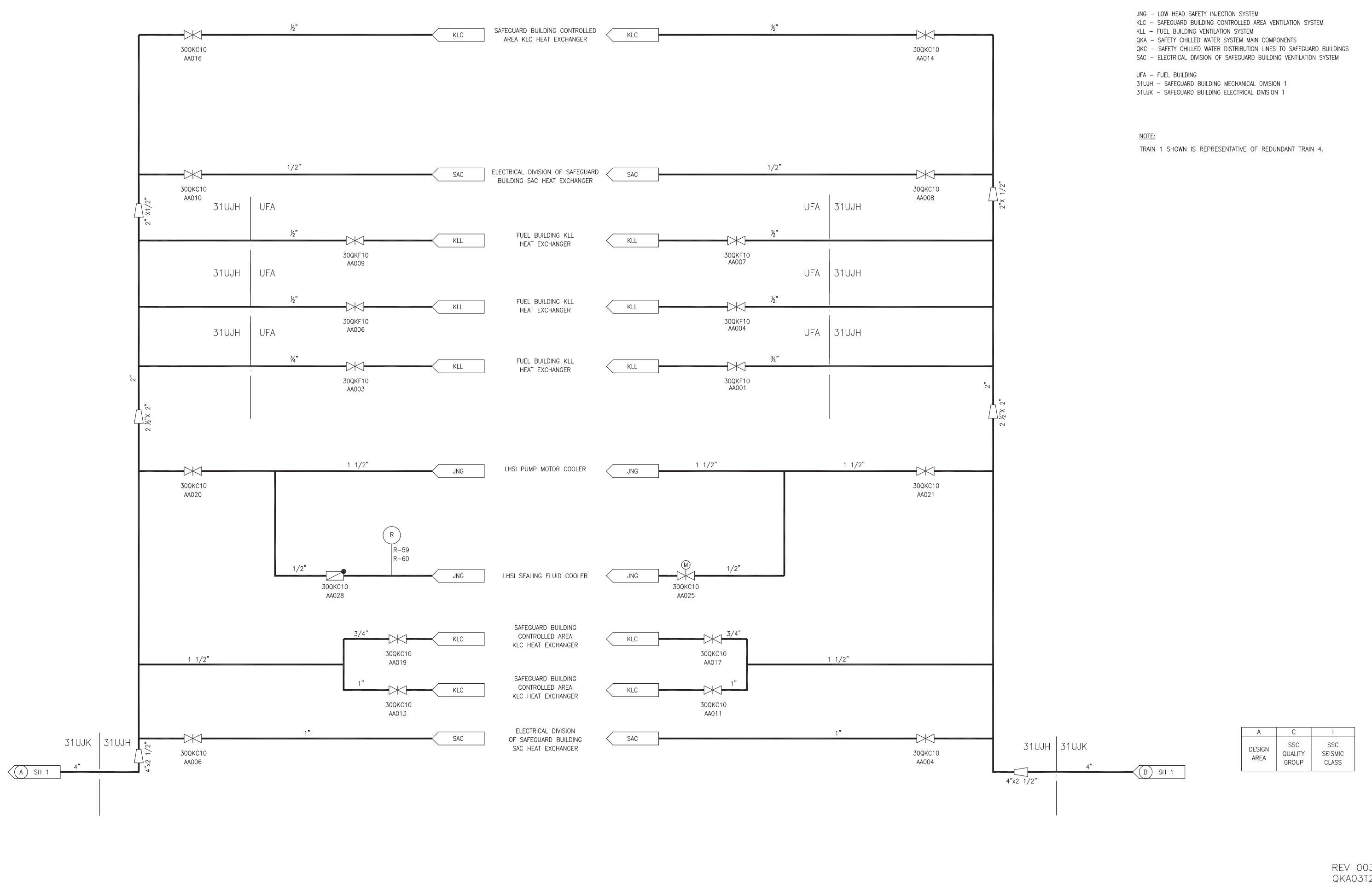
NOTES:

1. TRAIN 2 SHOWN IS REPRESENTATIVE OF TRAIN 3.
2. FOR MANUAL CONNECTION TO SEISMIC MAKEUP WATER SOURCE.

B	C	I
A	C	I
DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS

REV 003
QKA02T2

Figure 9.2.8-1—Safety Chilled Water System Diagram
Sheet 3 of 4



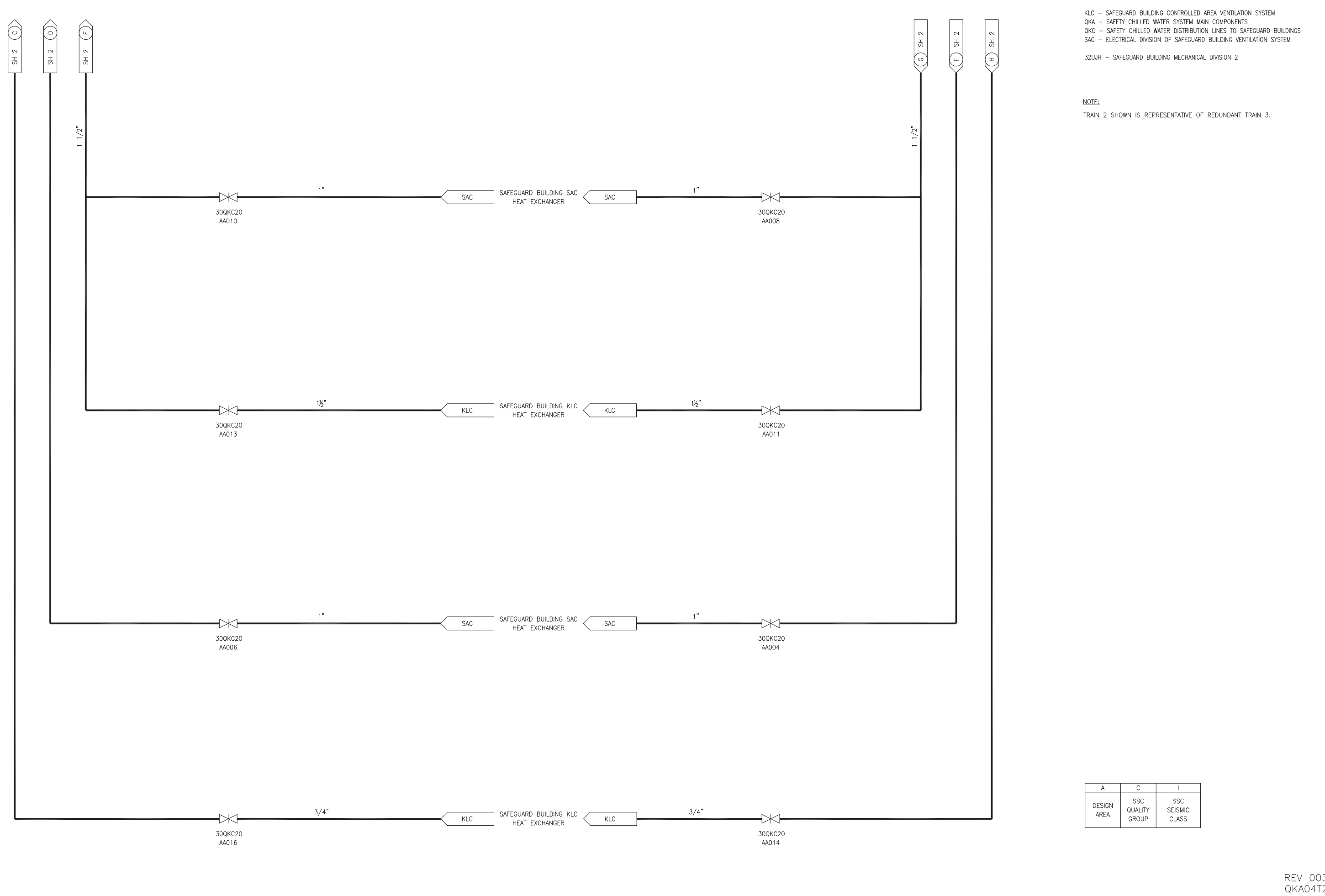
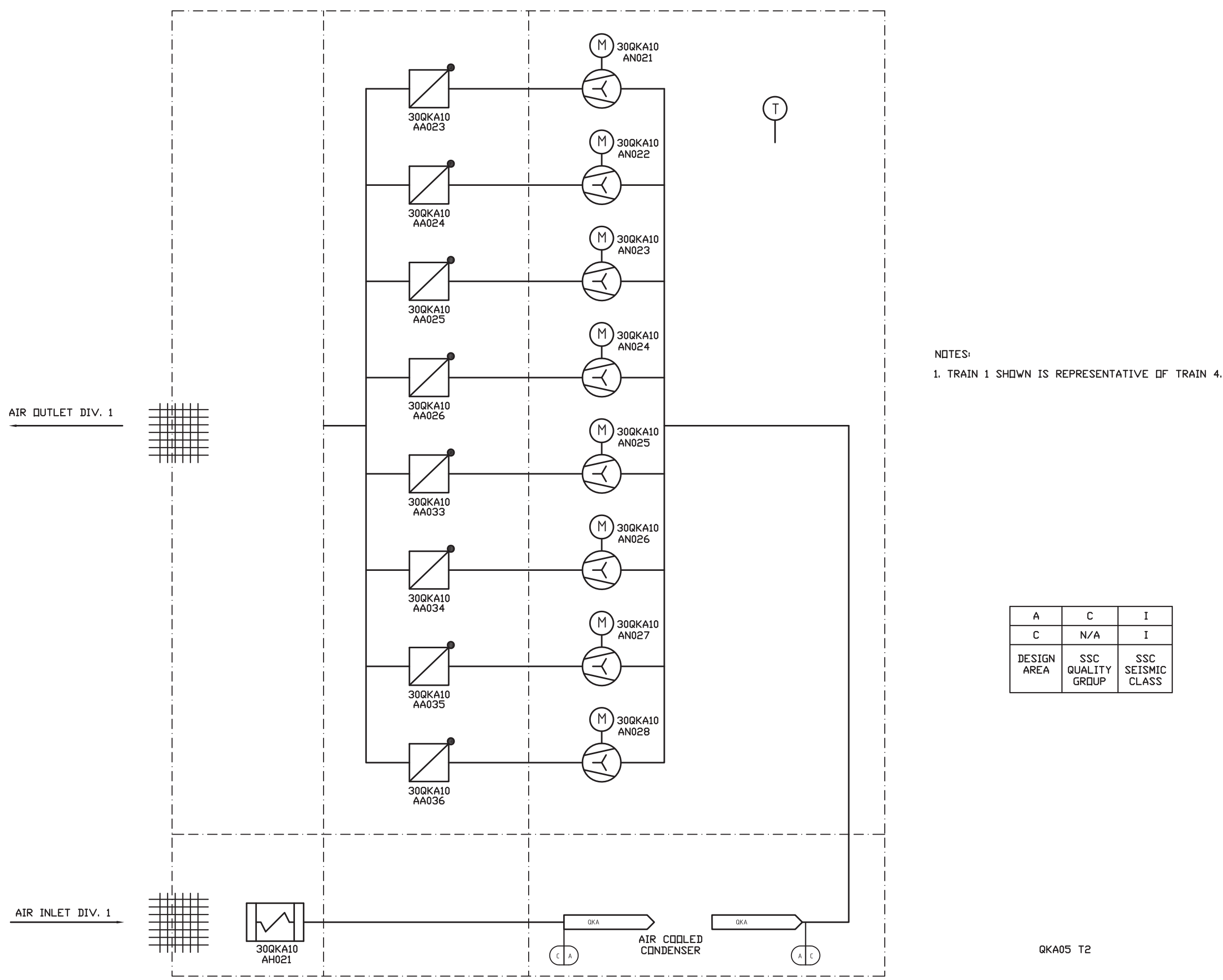


Figure 9.2.8-1—Safety Chilled Water System Diagram
Sheet 4 of 4

Next File

Figure 9.2.8-2—Safety Chilled Water System Air Cooled Division Diagram



9.4 Air Conditioning, Heating, Cooling and Ventilation Systems

The heating, ventilation, and air-conditioning (HVAC) system for each major building or area is provided in the following subsections.

9.4.1 Main Control Room Air Conditioning System

The main control room air conditioning system (CRACS) is designed to maintain a controlled environment in the control room envelope (CRE) area for the comfort and safety of control room personnel and to support operability of the control room components during normal operation, anticipated operational occurrences and design basis accidents. CRACS is also relied upon to cope with and recover from a station blackout (SBO) event.

Under normal operating conditions, the control room air conditioning system operates with fresh outside air (bypasses the control room emergency filtration (CREF) trains. The inlet air is pulled into the common recirculation plenum and mixes with air recirculated back from the rooms within the CRE. This mixture of outside air and recirculated air is pulled into the CRACS cooling units where it is filtered and cooled. The conditioned air is then supplied to CRE rooms. During a site radiological contamination event, the fresh air intake is redirected through the CREF iodine filtration trains. During an outside fire or smoke event, the fresh air intake at the location of the alarm is manually isolated.

The main control room (MCR) habitability system, including the definition of the CRE area, is addressed in Section 6.4.

9.4.1.1 Design Bases

The CRACS is primarily a safety-related system with portions serving non-safety-related functions. The non-safety-related portions of the CRACS are the restroom/kitchen exhaust fan and smoke detectors, with the exception of restroom/kitchen exhaust from the backdraft damper to SBVSE. This portion of the system is designated as safety-related to prevent potential backflow of SBVSE exhaust air into the CRACS duct.

The safety-related portions are designed to Seismic Category I criteria requirements.

~~The non-safety-related portions of the CRACS are the restroom/kitchen exhaust fan, and smoke detectors.~~

The U.S. EPR meets:

- GDC 2, as it relates to meeting the guidance of RG 1.29 (position C.1 for the safety-related portions of the CRACS and position C.2 for those non-safety-related portions of which failure could reduce the functioning of any safety-related or

Seismic Category I system components to an unacceptable safety level). The CRACS components are located inside the Safeguard Building (SB) divisions two and three. These buildings are designed to withstand the effect of natural phenomena, such as earthquake, tornados, hurricanes, floods, and external missiles

- GDC 4, as it relates to the CRACS by design, to protect against adverse environmental conditions and dynamic effects. The CRACS accommodates the effects of, and is compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents.

- GDC 5, as it relates to the CRACS system because safety-related components are not shared with any other nuclear power units.

- GDC 19, as it relates to the CRACS system to provide adequate protection against radiation releases and outside fire or smoke events to permit access to and occupancy of the control room under accident conditions. The control room occupancy protection requirements meet the guidance of RG 1.78. RG 1.52 and 1.140 (GDC 60). In case of an alarm from the inlet air radiation monitors (refer to Section 11.5.3.1.11 and Table 11.5-1, Monitors R-29 and R-30), the CRACS directs the air intake automatically through activated carbon filtration beds. The air from CRE areas can also be recirculated through the same activated carbon filtration beds. The evaluation of potential toxic chemical accidents is addressed by the COL applicant in Section 2.2.3 and includes the identification of toxic chemicals. As described in Section 6.4.1, the COL applicant evaluates the impact of toxic chemical accidents on control room habitability in accordance with RG 1.78.

- GDC 60, as it relates to the release of radioactive materials to the environment.

Consideration of the environmental and dynamic effects of internal and external missiles and postulated piping failures on the CRACS is addressed in Section 3.5.1.1, Section 3.5.2, and Section 3.6.1.

Capability for withstanding or coping with a SBO event is provided to comply with the requirements of 10CFR 50.63. Acceptance is based on meeting the applicable guidance of RG 1.155, including position C.3.2.4. Refer to Section 8.4 for a description of the design features to cope with the SBO event.

The CRACS maintains habitability of the CRE areas during a site radiological event (Refer to Section 6.4).

During a postulated event, the control room is maintained at a minimum positive pressure of greater than or equal to 0.125 inches water gauge relative to the surrounding environment to prevent uncontrolled incoming leakage.

During normal operation, the control room is maintained at a pressure above ambient.

The CRACS maintains system performance in the event of failure of a single active safety-related component.

The CRACS outside air intake is capable of detecting radiation (see Section 6.4.2.4), and smoke. Associated monitors actuate alarms in the MCR. Upon receipt of a containment isolation signal, or high radiation alarm signal in the outside air intake duct (Monitors R-29 and R-30, Table 11.5-1), the CREF (iodine filtration) train starts automatically and the outside air and CRE recirculation air are automatically diverted through the CREF (iodine filtration) train. The outside makeup air maintains a positive pressure inside the CRE area relative to the adjacent areas. The CRE air inlet and recirculation dampers operate automatically.

The CRACS is capable of isolating all non-safety-related system penetrations of the CRE boundary so that occupation and habitability of the control room is not compromised.

Air conditioning and heating loads for the CRE rooms is calculated using methodology identified in ASHRAE Handbook (Reference 8) as follows:

- Summer air conditioning loads are calculated with a maximum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope temperature (See Table 2.1-1). The analysis is completed for both a normal and accident plant alignment configuration.
- The CRACS cooling supply units are designed to provide cooling as required to prevent the CRE room temperatures from exceeding their maximum design temperature.
- Winter heating loads are calculated with the plant operating in an outage alignment configuration. Winter heat loads are calculated with a minimum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope temperature (See Table 2.1-1).

The CRACS supply air duct heaters are designed to operate for "comfort conditions only" as required when the CRE room temperature is less than the minimum "comfort temperature" set point value. The CRACS supply air duct heaters are not required to operate during accident conditions.

The CRACS maintains the following temperature and humidity ranges for the areas serviced:

Room	Temperature	Humidity
– Main Control Room:	68°F to 78°F	30 – 60%
– I&C Computer Rooms~~, Rest Rooms~~:	65°F to 78°F	30 – 60%
– HVAC Rooms:	50°F to 95°F	~~3~~20 – ~~6~~80%
– Other areas of CRE:	65°F to 78°F	20 – 80%

9.4.1.2 System Description

9.4.1.2.1 General Description

The CRACS is designed to maintain acceptable ambient conditions inside the CRE areas to provide for proper operation of equipment and for personnel access to conduct inspection, testing and maintenance. The CRE area is shown in Figures 6.4-1 through 6.4-3.

The CRACS consists of following subsystems:

- Air intake.
- CREF (iodine filtration) train.
- Air conditioning and recirculation air handling.
- CRE air supply and recirculation.
- Kitchen and restroom exhaust.

Refer to Section 12.3.6.5.6 for ventilation system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

Air Intake Subsystem

The air intake subsystem is illustrated in Figure 9.4.1-1—Control Room Air Intake and CREF (Iodine Filtration) Train Subsystem.

The CRACS has two outside air intakes. The train 1 intake is located in Safeguard Building 2 and the train 4 intake is located in Safeguard Building 3. Outside air is supplied by each outside air intake through a wire mesh grille. Each outside air intake is equipped with an electrically heated, weather protected grille to prevent ice formation. Smoke detectors and radiation monitors (refer to Section 11.5.3.1.11 and Table 11.5-1, Monitors R-29 and R-30) are installed in the outside air intake ducting.

Outside air intakes on each train are interconnected through ducting to allow the outside inlet air to travel through a CREF iodine filtration unit (filtered alignment), or the outside air can bypass the CREF iodine filtration unit (unfiltered bypass alignment).

Trains 1 and 4 outside air intakes each are equipped with a motor-operated isolation damper. These isolation dampers are normally open but they can be manually closed as necessary to isolate the outside air intake from the control room.

CREF (Iodine Filtration) Train Subsystem

The CREF (iodine filtration) train subsystem is illustrated in Figure 9.4.1-1.

The train 1 outside air inlet duct and train 1 CREF (iodine filtration) train is located in Safeguard Building 2. The train 4 outside air inlet duct and train 4 CREF (iodine filtration) train is located in Safeguard Building 3. Each CREF (iodine filtration) train pulls air from its respective outside air inlet. The outside inlet air for each CREF is ducted to allow the CREF (iodine filtration) train to operate in the filtered or the unfiltered (bypass) alignment.

In the CREF filtered alignment, a maximum of 1000 cfm of outside air mixes with 3000 cfm of CRE recirculated air and is pulled through the CREF (iodine filtration) train by the CREF booster fan and delivers this air to the common recirculation plenum. In the filtered alignment, the filter bypass duct has two motor-operated bypass dampers in series. In the filtered alignment both of these dampers close to provide redundancy and single-failure protection to prevent the outside air from bypassing the CREF (iodine filtration) trains.

In the CREF unfiltered (bypass) alignment, the CREF filtration unit inlet, outlet and CRE recirculation dampers are all closed and both bypass dampers are open. The outside unfiltered air bypasses the CREF iodine filtration unit. In the unfiltered (bypass) alignment, the outside air flows through a prefilter and a preheater that is temperature controlled. The outside air then flows through ducting and is pulled into the common recirculation plenum. In this unfiltered (bypass) alignment, the CREF booster fan does not operate and outside air is pulled into the common recirculation plenum by the CRACS air handling units.

Air Conditioning and Recirculation Air Handling Subsystem

The air conditioning and recirculation air handling subsystem is illustrated in Figure 9.4.1-2—Control Room Air Conditioning and Recirculation Air Handling Subsystem.

There are four recirculation air handling units located in Safeguard Buildings 2 and 3 (two trains in each building). Recirculated and fresh air is processed through these air handling units and supplied to a common supply air plenum. Each train includes an isolation damper, a volume control manual damper, a cooling coil, a moisture separator, fan suction and discharge silencers, a supply air fan, a HEPA filter, and a non-return damper. The cooling coil is supplied with chilled water from the safety chilled water system (SCWS).

During normal and emergency operation, each CRACS cooling unit provides 50 percent of the cooling for the rooms within the CRE. Each CRACS air handling unit is designed for 50 percent cooling of the normal and emergency cooling load to allow a single two CRACS air handling units to cool the CRE rooms during a station blackout (SBO) event. During an SBO, the single two CRACS air handling units prevents the CRE room temperature from exceeding 104°F.

The air conditioning system for the CRE area operates in the recirculation mode with fresh air makeup. The fresh air flow rate corresponds to the exhaust of kitchens and restrooms and the leakage rate in the CRE area due to controlled overpressure. The exhaust from the kitchen and restrooms is directed to the electrical division of the SB ventilation system (SBVSE) air outlet duct (refer to Section 9.4.6).

CRE Air Supply and Recirculation Subsystem

The CRE air supply and recirculation subsystem is illustrated in Figure 9.4.1-3—Control Room Envelope Air Supply and Recirculation Subsystem.

The common supply air plenum receives air from the operating CRACS air handling units and provides conditioned air to the CRE areas through the duct distribution network. Electric air heaters are installed in the supply air ducts to maintain individual room temperatures. The exhaust air from the CRE area, except from the kitchen and restrooms, flows through the recirculation air handling units. The exhaust from kitchen and restrooms is separated from the recirculated return air and is processed separately through the SBVSE.

9.4.1.2.2 Component Description

The major components of the CRACS are listed below, along with the applicable codes and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the CRACS.

Ductwork and Accessories

The main supply and exhaust air plenums are constructed of concrete with painted surfaces. The air supply and exhaust duct branches for each area are fed from the main supply and exhaust air plenum. These ducts are constructed of galvanized sheet steel and are structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction requirements per ASME AG-1 (Reference 1).

Electric Heaters (Duct Heaters)

The electric heaters (duct heaters) are installed in the supply duct to maintain room ambient conditions. These are controlled by local room temperature sensors and control circuits. The heaters meet the requirements of ASME AG-1 (Reference 1).

Moisture Separator

The moisture separator meets the requirements of RG 1.52 (Reference 12), ANSI/ASME N509 (Reference 16), and ASME AG-1 (Reference 1). The moisture separator is located upstream of the filter air heater and the prefilter to protect the HEPA filter and carbon adsorber from potentially high humidity level by removing the entrained water droplets from the inlet air stream. The moisture separator design shall be qualified by testing in accordance with the procedure described in ANSI/ASME N509.

~~Iodine~~ Filter ~~Unit~~ Air Heaters

Iodine filter unit air heaters are located upstream of iodine filters to prevent excessive moisture accumulation in the carbon filter beds. The heaters meet the requirements of ASME AG-1 (Reference 1).

~~HEPA Filter Unit~~ Prefilters

The ~~HEPA filter unit~~ prefilters are located upstream of the HEPA filters and collect large particles to increase the useful life of the ~~high efficiency~~HEPA filters. The prefilters meet the requirements of ANSI/ASHRAE Standard 52.2~~-1999~~ (Reference 2).

HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with ASME AG-1 (Reference 1). The periodic inplace testing of HEPA filters to determine the leak tightness is performed per ANSI/ASME N510~~-1989~~ (Reference 3).

Iodine Filters (Carbon Adsorbers)

Iodine filters are used to remove radioactive iodine from the supply of fresh and recirculated air. The efficiency of removal of methyl iodine is based on the decontamination efficiency assigned during the laboratory tests. The periodic inplace testing of carbon adsorbers to determine the leak tightness is performed per ANSI/ASME N510 (Reference 3).

Post Filters

The post filter is located downstream of the carbon adsorber. During operation of the carbon filtration exhaust, the air flow rate will be low through the carbon adsorber to prevent spread of the carbon dust. However, the post filter ensures that carbon dust or carbon fines are removed prior to the air being distributed further. The post filter meets the requirements of ASME AG-1 (Reference 1), and has an average atmospheric dust efficiency of 95% in accordance with ANSI/ASHRAE Standard 52.2 (Reference 2). The post filter is equipped with differential pressure measurement which indicates the degree of particulate loading and the need for filter change.

Fans

The supply and exhaust fans are centrifugal or vane axial type with electric motor drivers that are direct drive. Fan performance is rated in accordance with ANSI/AMCA 210-99 (Reference 4), ANSI/AMCA 211-1987 (Reference 5) and ANSI/AMCA 300-1985 (Reference 6).

Isolation dampers

Manual dampers are adjusted during initial plant startup testing to establish accurate air flow balance between the rooms. The motor-operated isolation dampers will fail as-isin position in case of power loss. Backdraft dampers prevent air flow to non-operating air supply and exhaust trains. The performance and testing requirements of the dampers are per ASME AG-1 (Reference 1).

Fire Dampers

Fire dampers are installed in fire barrier walls or floors. Fire damper design meets the requirements of UL 555 NFPA 80 (Reference 7) and NFPA 90A (Reference 18) and the damper fire rating is commensurate with the fire rating of the barrier penetrated. Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

Cooling Coils and Moisture Separator

The cooling coils are of the finned tube, coil type and are connected to the safety chilled water system (SCWS). The cooling coils have a total cooling capacity of 470473,000 Btu/hr and are designed in accordance with ASME AG-1 (Reference 1). The moisture separator collects condensate which is directed to the drain system.

9.4.1.2.3 System Operation

Normal Plant Operation

During normal plant operation, fresh air is admitted via air intake trains 1 and 4. The fresh air passes through the unfiltered bypass duct and bypass dampers. The fresh air is then mixed with the recirculated air from the CRE area, and the mixed air passes through a prefilter and electrical heater. Two sets of temperature sensors are located downstream of the electrical heater. One temperature sensor turns on the heater when the air inlet temperature drops below 37°F; the other temperature sensor turns off the heater when the air inlet temperature reaches 50°F.

The fresh and recirculated air is admitted through two of four air handling units which provide heating and cooling of the supply air. The conditioned air is then distributed through a ductwork distribution network to the CRE area. The room air conditioning is provided by the supply and exhaust air flows based on minimum air renewal rate, equipment and personnel heat loads and heat balance between the rooms.

Heating of air streams is provided by electric heaters located in the supply air ducts. The operation of heaters is automatically controlled by the temperature sensors located in the corresponding rooms.

The CRE area is maintained at a pressure above atmospheric pressure to provide habitability in the event of radioactive contamination of the environment.

Both CREF (iodine filtration) trains are isolated with outside air bypassing the CREF (iodine filtration) trains. The CREF iodine filtration train inlet and outlet motor operated isolation dampers are closed. In addition, the CRE recirculation motor operated isolation damper is closed to prevent the recirculation of air from the CRE rooms.

The air conditioning system for the CRE area operates in the recirculation mode with fresh air makeup. During the recirculation mode, the fresh air supply rate is equal to the rate of exhaust air from the kitchens and restrooms plus accounting for the leakage rate in the area due to controlled overpressure.

Exhaust air from the kitchen and restrooms is not recirculated. During normal operation, air is exhausted from the restrooms and the kitchen area to the SBVSE CREF (iodine filtration) air outlet. The CRACS has design features which will allow it to continue to maintain a ~~minimum~~ positive pressure of greater than or equal to 0.01 inches water gauge in the CRE. Approximately twice as much outside air is supplied to the CRE during normal operation compared to operation during accident conditions. Each train of the CRACS is equipped with a pressure control damper. This damper will open and close as required to increase or decrease the amount of outside air that enters the control room. During normal operation, air is exhausted from the restrooms and the kitchen area through a small throttle damper that minimizes the open CRE boundary area.

Abnormal Operating Conditions

Redundancy of air supply and air conditioning trains is provided. A loss of function or power to any single train or component does not affect overall system operation. The train separation and independent power source limit common mode failure of active multiple trains and abnormal operating conditions.

Loss of a single CRACS air conditioning train will not result in a loss of system functional capability because only two of the four cooling trains are required to operate for both normal and accident operation. The CREF (iodine filtration) trains do not operate during normal plant operation, but loss of a single CREF (iodine filtration) train during any design basis accident will not result in a loss of iodine filtration capability because two CREF (iodine filtration) trains are provided.

Loss of Coolant Accident

Upon receipt of a containment isolation signal, the following functions are initiated automatically:

- Opens Control Room Emergency Filtration (CREF) iodine filtration trains isolation dampers.
- Closes CREF iodine filtration trains bypass dampers.
- Opens Control Room Envelope (CRE) recirculation dampers to provide clean air and positive pressurization for the rooms within the CRE.

Loss of Offsite Power

During loss of offsite power (LOOP), the air intake and air conditioning and recirculation air handling electrical components located inside SB division two receive power for one train from the emergency diesel generators (EDG) of division two, and for the other train from the EDGs of division one. The electrical components located inside the SB division three receive power on one train from the EDGs of division three, and for the other train from the EDGs of division four.

During LOOP, the CREF (iodine filtration) train electrical components located inside the SB division two receive power from the EDGs of division one. The electrical components located inside the SB division three receive power from the EDGs of division four.

Station Blackout

- In the event of station blackout (SBO), the electrical components, which receive power from the EDGs of divisions one and two, are backed-up by alternate AC (AAC) power from the SBO diesel generator~~s~~ (SBODG) of ~~division~~ train one. The electrical components, which receive power from the EDGs of divisions three and four, are backed up by the AAC power from ~~the~~ a SBODG~~s~~ of ~~division~~ train four.
- In the event of a simultaneous SBO and site radiological event, the CRE area is isolated and CRACS is maintained in a full recirculation mode through the CREF (iodine filtration) train until site power is restored or EDGs are started. Power restoration is assumed to occur within eight hours following the occurrence of a SBO event.

Loss of Ultimate Heat Sink

The conditioned air supply is cooled by chilled water provided by the SCWS. Two water-cooled chillers are located in SB divisions two and three, and two air-cooled chillers are located in SB divisions one and four. In case of loss of ultimate heat sink (LUHS), the water-cooled chillers are not available. The safety chilled water is then supplied by air-cooled chillers which provide the cooling function for the filtration trains located in divisions one and four, which also include both CREF (iodine filtration) trains. The cooling function for any two of the four CRACS cooling units in divisions 1, 2, 3, and 4 will continue to be available.

Operation During Radiological Site Contamination

In the event of a radiological site contamination and receipt of high radiation alarm from either of the two CRACS outside air intake safety-related radiation monitors, the train 1 and train 4 CREF iodine adsorption filter units are automatically placed in the filtered alignment with all outside air going through the iodine adsorption units. A total of 4,000 cfm (1,000 cfm of outside air and 3,000 cfm of CRE recirculation air) is pulled through each CREF iodine adsorption unit. The CRE is maintained at a positive pressure of greater than or equal to 0.125 inches water gauge. This provides an unlimited stay by the CRE personnel.~~During a site radiological contamination event, the fresh air supply is automatically redirected through the CREF (iodine filtration) trains, instead of the normal intake air supply, by closing and opening the associated dampers. When one CREF (iodine filtration) train operates, the outside fresh airflow rate of 1000 cfm and CRE recirculation airflow rate of 3000 cfm (a total flow rate of 4000 cfm) provides an unlimited stay by the CRE personnel.~~

Exhaust from the kitchen and restrooms is stopped and all other exhaust air is recirculated.

The operation of CRACS creates ~~an minimum~~ pressure of greater than or equal to 0.125 inches of water gauge inside the CRE area with respect to the surrounding area. This limits unfiltered incoming air leakage into these areas.

Operation During External Fire or Smoke Release

In the event of an external fire and receipt of a smoke detection alarm in the MCR from one of the outside air intakes, the CREF iodine adsorption units are automatically placed in the filtered alignment mode and the outside inlet air dampers manually closed from the control room. With the outside air inlets closed, the CRACS air conditioning units will continue recirculating air to rooms in the CRE. ~~In the event of external fire or smoke, the outside inlet isolation damper (at the inlet location where smoke is detected) is closed manually from the control room. The CREF (iodine filtration) trains are placed in the filtered alignment manually from the control room.~~

9.4.1.3 Safety Evaluation

The CRACS is designed to maintain ambient conditions inside the CRE area for personnel comfort and to allow safe operation of the equipment during normal plant operation, outages, and under all anticipated occurrences including postulated accidental events (refer to Section 15.0.3 for a discussion of radiological consequences).

The CRACS keeps the CRE area at a positive pressure of greater than or equal to 0.125 inches water gauge ~~at a minimum~~ with respect to the surrounding area to provide habitability in the event of radioactive contamination of the environment, and to prevent uncontrolled incoming air leakage.

During a site radiological contamination event, the fresh air intake is redirected through the CREF (iodine filtration) trains. The CRACS also can be operated in full recirculation mode without fresh air during abnormal operation or postulated accident events.

Redundancy for air cooling and iodine filtration is provided by multiple independent trains for critical functions. Sufficient redundancy is provided for proper operation of the system when one active component is out of service.

In case of fire in any room within the CRE area, the room air supply and exhaust are isolated by fire dampers and, if necessary, the plant is controlled by the remote shutdown station (RSS). The four air conditioning trains are installed in four different fire zones. Two of these zones contain the two CREF (iodine filtration) trains.

Capability for withstanding or coping with an SBO event is met by the design of the AAC power source satisfying the ten minutes criteria; that is, the AAC power source can be started from the MCR within ten minutes after the onset of an SBO event. The SBODGs are designed to operate for a minimum of eight ~~twenty-four~~ hours with available onsite fuel supplies.

9.4.1.4 Inspection and Testing Requirements

The CRACS major components, such as dampers, motors, fans, filters, coils, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Test and analysis will be completed during normal operation with the system operating in an accident alignment. Analysis will use as-built information from equipment to extrapolate the performance of the air-conditioning system. Analysis will show that the equipment performance is adequate to maintain design conditions during plant operating conditions.

Initial in-place acceptance testing of the CRACS is performed as described in Section 14.2 (test abstracts #082 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The CRACS is designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of CRACS is performed to demonstrate system and component operability and integrity.

During normal operation, equipment rotation is utilized to reduce and equalize wear on redundant equipment during normal operation.

Isolation dampers are periodically inspected and damper seats replaced as required.

Per IEEE 334 (Reference 9), type tests of continuous duty class 1E motors for CREF are conducted to maintain ESF system operation and availability.

Air handling units are tested by manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 4, 5, and 6). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 2). Cooling coils are hydrostatically tested in accordance with ASME AG-1 (Reference 1) and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 10).

Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 11), ~~American Society of Mechanical Engineers,~~ ANSI/ASME N510 (Reference 3), ASME AG-1 (Reference 1), and RG 1.52 (Reference 12).

Outside air inlet heaters are tested in accordance with ASME AG-1, Section CA (Reference 1).

Emergency filtration units are tested by manufacturer for housing leakage, filter bypass leakage and airflow performance. Periodically and subsequent to each filter or adsorber material replacement, the unit is inspected and tested in-place in accordance with the requirements of RG 1.52 (Reference 12), ANSI/ASME N510 (Reference 3) and ASME AG-1 (Reference 1). The charcoal adsorber samples are tested for efficiency in accordance with RG 1.52 (Reference 12) and ASTM D3803 (Reference 13). Air filtration and adsorption unit heaters are tested in accordance with ANSI/ASME N510 (Reference 3).

In-service test program requirements, including the unfiltered in-leakage into the CRE testing will be performed per RG 1.197 (Reference 14) and ASTM E741-2000 (Reference 15).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

In-service test program and test frequency requirements are described in Chapter 16, "Technical Specification" Sections 3.7.10, 3.7.11 and per Ventilation Filter Test Program (VFTP) described in Chapter 16, "Technical Specification" Section 5.5.10.

9.4.1.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, and instrument indications and alarms are provided in the MCR. Fans, motor-operated dampers, heaters and cooling units are operable from the MCR. Local instruments are provided to monitor flow, temperature and pressure. The fire detection and sensor information are delivered to the fire detection system (refer to Section 9.5.1).

The minimum instrumentation, indication and alarms for CREF ESF filter system are provided in Table 9.4.1-1 per the requirements of ANSI/ASME N509 (Reference 16).

9.4.1.6 References

1. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000 "Housings" Addenda).

2. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," American National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

3. ANSI/ASME N510-1989 ~~(R1995)~~, "Testing of Nuclear Air-Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

4. ANSI/AMCA Standard ~~-~~210-99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, ~~December~~ 1999.

5. ~~ANSI/~~AMCA Publication 211-~~19~~87, "Certified Ratings Program – Air Performance," ~~American National Standards Institute/~~Air Movement and Control Association International, 1987.

6. ANSI/AMCA Standard ~~-~~300-~~19~~85, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, 1985.

7. NFPA 80, "Standard for Fire Doors and Other Opening Protectives," National Fire Protection Association Standards, 2007.~~UL 555, "Standard for Fire Dampers," Underwriters Laboratories, Sixth Edition, June 1999.~~

8. “ASHRAE Handbook Fundamentals,” American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc., 2005.

9. IEEE 334-1974, "IEEE Standard for Type Tests of Continuous-Duty Class 1E Motors for Nuclear Power Generating Stations," Institute of Electrical and Electronics Engineers, 1974.

10. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

11. "HVAC Air Duct Leakage Test Manual, "Sheet Metal and Air Conditioning Contractors' National Association, 1985.

12. NRC Regulatory Guide 1.52, Rev. 3, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post Accident Engineered Safety Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," 2001.

13. ASTM D3803-~~19~~89, ~~reapproved 1995,~~ "Standard Test Method for Nuclear Grade Activated Carbon," 1989.

14. NRC Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," 2003.

15. ASTM E741-2000, "Standard Test Methods for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution," 2000.

16. ANSI/ASME N509-1989, "Nuclear Power Plant Air Cleaning Units and Components," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

17. Deleted.~~ERDA 76-21, "Nuclear Air Cleaning Handbook," Oak Ridge National Laboratory, 1976.~~

18. NFPA 90A, “Standard for the Installation of Air Conditioning and Ventilation Systems,” National Fire Protection Association Standards, 2002.

Table 9.4.1-1—Minimum Instrumentation, Indication, and Alarm Features for CREF (Iodine Filtration) Train Subsystem

Sensing Location	Local Indication/Alarm	MCR Indication/Alarm
Inlet Outside Air	Radiation Indication	Radiation Indication / High Radiation Alarm
~~Unit Inlet Moisture Separator~~	~~Pressure Drop Indication~~	
Electric Heater Inlet	Temperature Indication	
Electric Heater	Status Indication	Status Indication
Electric Heater Outlet	Temperature Indication	Temperature Indication / High Temperature Alarm
Prefilter	Pressure Drop Indication / High Alarm	
~~Upstream~~ HEPA	Pressure Drop Indication / High Alarm	
Adsorber	Pressure Drop Indication / High Alarm	
Adsorber Outlet	Temperature Indication	Temperature Indication / High Temperature Alarm
Post Filter	Pressure Drop Indication / High Alarm	
System Filters Inlet to Outlet		Summation of pressure drop across entire filtration train (Indication / High Pressure Drop Alarm)
Fan	Pressure Drop Indication	Handswitch / Status Indication
Damper / Operator	Position Indication	Position Indication
Unit Outlet	Flow Rate Indication	Flow Rate (recorded indication, high alarm signal)

Next File

Figure 9.4.1-1—Control Room Air Intake and CREF (Iodine Filtration) Train Subsystem

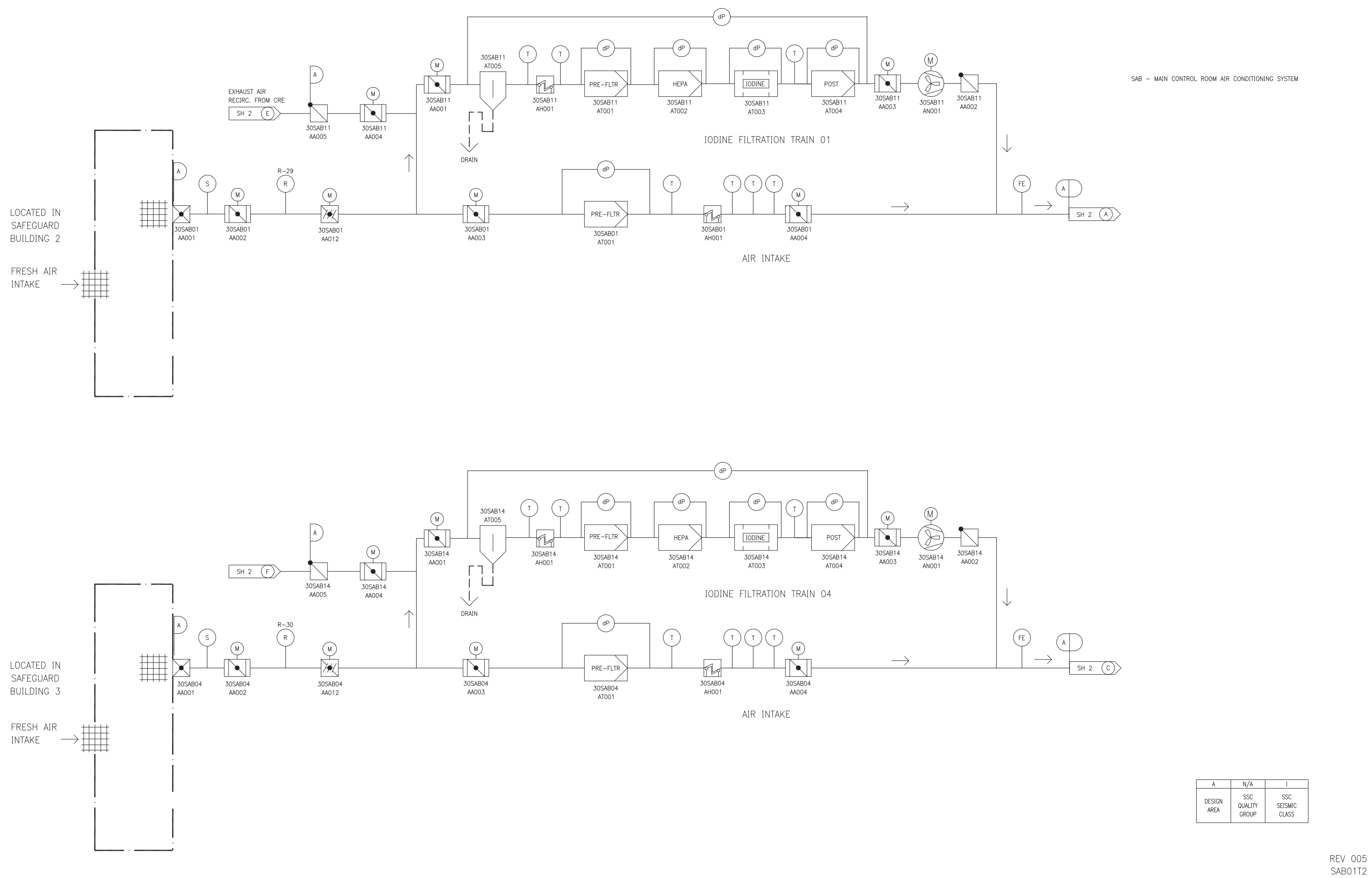


Figure 9.4.1-2—Control Room Air Conditioning and Recirculation Air Handling Subsystem

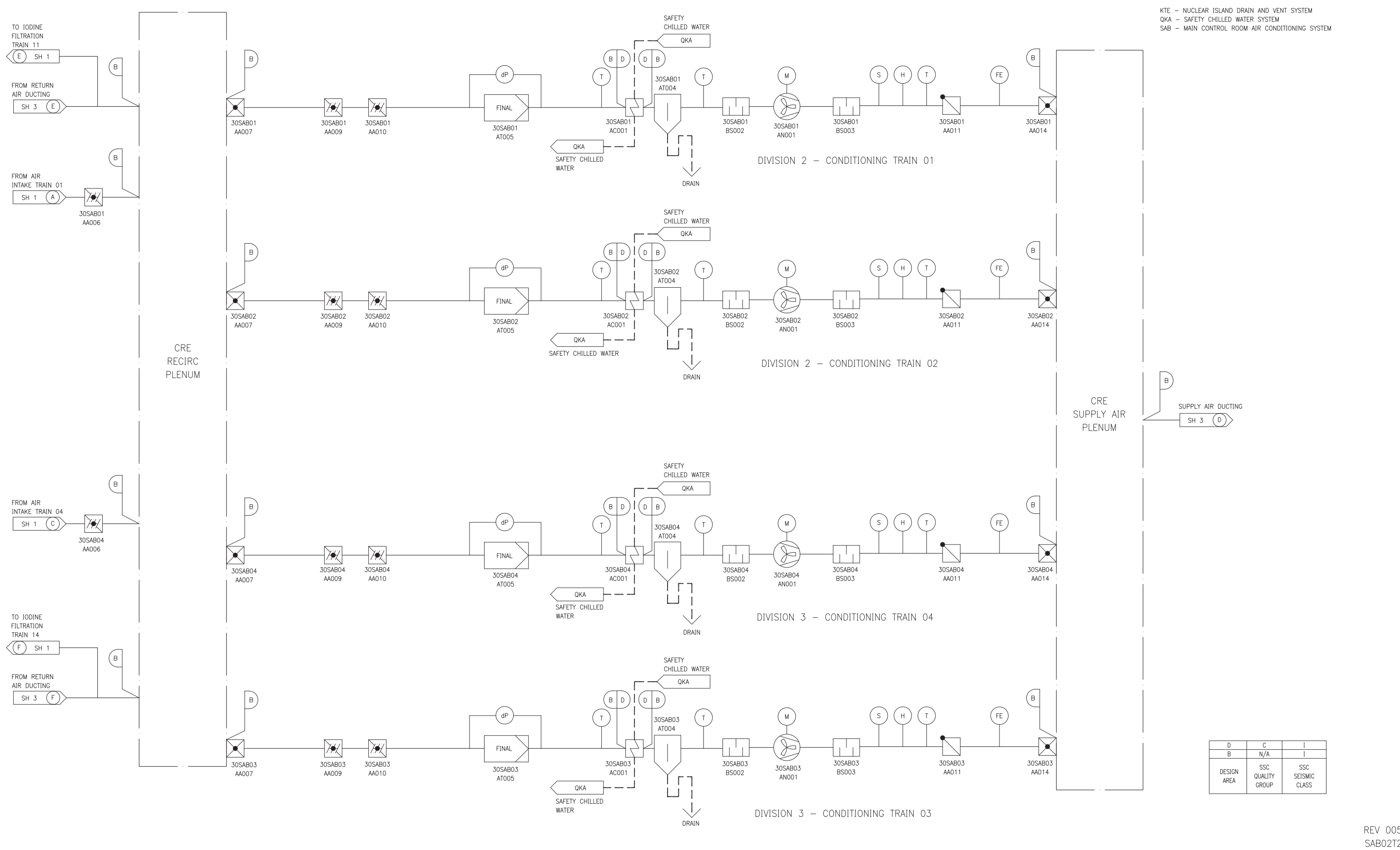
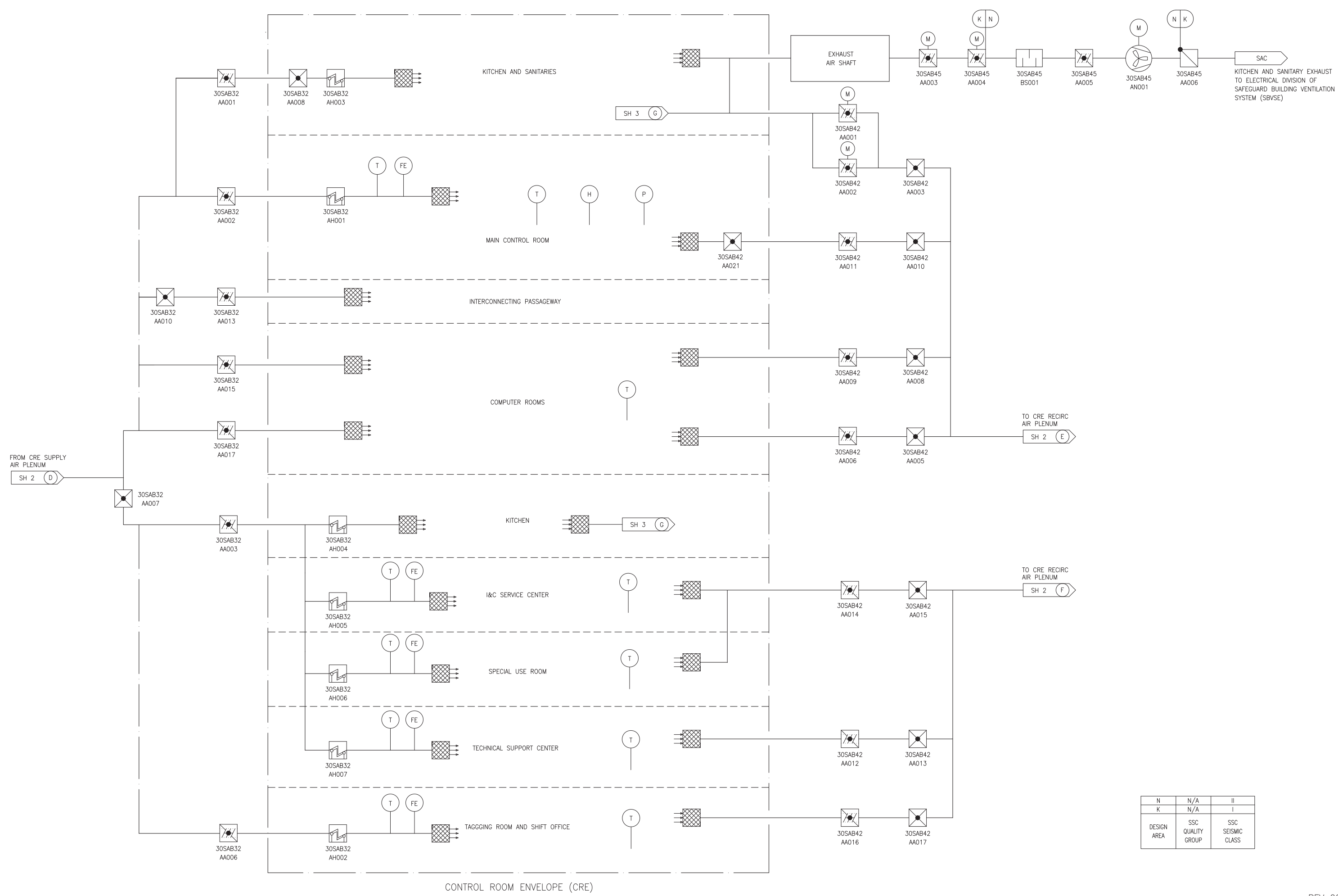


Figure 9.4.1-3—Control Room Envelope Air Supply and Recirculation Subsystem



N	N/A	II
K	N/A	I
DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS

Next File

9.4.2 Fuel Building Ventilation System

The fuel building ventilation system (FBVS) is designed to maintain acceptable ambient conditions in the Fuel Building (FB), to permit personnel access, and to control airborne radioactivity in the area during normal operation, anticipated occurrences, and following fuel handling accidents.

The conditioned air supply to the FB is provided by the nuclear auxiliary building ventilation system (NABVS) (refer to Section 9.4.3). The exhaust from the building is also processed by the NABVS through a filtration train, and the exhaust air is directed to the vent stack (refer to Section 9.4.3).

9.4.2.1 Design Bases

The following components are safety-related and designed to Seismic Category I requirements:

- Fuel pool floor ~~handling hall~~ isolation dampers.
- Isolation dampers for the fuel handling hall located in front of the equipment hatch.
- Isolation dampers for the room located in front of the emergency airlock.
- NABVS supply and exhaust isolation dampers to and from FBVS.
- FB isolation dampers to safeguard building ventilation system (SBVS).
- Electric fan heaters for heating of rooms that have safety-related systems, structures or components containing borated fluid and the rooms surrounding the extra borating system tanks.
- Recirculation cooling units in the extra borating system pump rooms, and fuel pool cooling system pump rooms.
- FBVS exhaust duct.

The FBVS air supply duct and other components of the FBVS are designated as Supplemental Grade (NS-AQ) safety class and Seismic Category II.

The FBVS components are located inside the FB structure, which is designed to withstand the effects of natural phenomena, such as earthquake, tornados, hurricanes, floods and external missiles (GDC-2).

The safety functions of the FB ventilation system can be performed assuming a single active component failure coincident with the loss of offsite power (LOOP). Upon receipt of a containment isolation signal, the FBVS supply and exhaust is isolated from the NABVS. Potential bypass leakage from primary containment is captured and filtered by the SBVS iodine filtration trains before being released into the environment.

The seismic design of the system components meets the guidance of RG 1.29 (Position C.1 for the safety-related portion and Position C.2 for the non-safety-related portion). Table 3.2.2-1 provides the seismic design and other design classifications for components in the FBVS.

The safety-related components and systems of the FB ventilation system are not shared among nuclear power units (GDC-5).

The release of radioactive material to the environment is controlled by meeting the guidance of RG 1.140, positions C.2 and C.3 (GDC-60). RG 1.52 is not applicable because the FBVS is not required to operate during post-accident engineered safety features (ESF) atmospheric cleanup. In case of high radiation alarm in the FB (refer to Table 11.5-1, Monitors R-17 and R-18), the system will automatically direct the building exhaust through activated charcoal filtration beds located in the NABVS.

The FBVS provides appropriate ventilation and filtration to limit potential release of airborne radioactivity to the environment from the fuel storage facility under normal operation and in the event of a fuel handling accident in the fuel pool area. The design of the ventilation system meets the guidance of RG 1.13, Position C.4 (GDC-61).

Air conditioning and heating loads for the FB Rooms are calculated using methodology identified in ASHRAE Handbook (Reference 3).

- Summer air conditioning loads will be calculated with a maximum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1). The analysis will be completed for both a normal and accident plant alignment configuration.
- The cooling supply units are designed to provide cooling as required to prevent the FB room temperatures from exceeding their maximum design temperature.
- Winter heating loads will be calculated with the plant operating in an outage alignment configuration. Winter heat loads will be calculated with a minimum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1).

The FBVS provides the following ~~important~~ non-safety-related functions:

- Controls and maintains a negative pressure during normal operation within the FB relative to the outside environment. Rooms identified as having possible radioactive contamination are designed to be at a negative pressure relative to the adjacent rooms to make sure air flows from areas of low radioactivity to areas of potentially higher radioactivity.

- Maintains these ambient conditions inside the FB during normal and fuel handling operation:
  - Minimum temperature: 50°F.
  - Maximum temperature: 113°F.
  - Humidity: 25 to 70 percent.

  The following ambient conditions are maintained in the fuel pool area:
  - Minimum temperature: 68°F.
  - Maximum temperature: 104°F.
  - Humidity: 25 to 70 percent.

  The following ambient conditions are maintained in the boric acid rooms:
  - Minimum temperature: 68°F.
  - Maximum temperature: 113°F.
  - Humidity: 25 to 70 percent.
- Provides heating via air supply duct heaters and fan heaters to maintain minimum ambient room temperature. Electric heaters in the fuel pool rooms prevent condensation on the walls. For non-safety-related equipment located in the same rooms with safety-related equipment, the seismic classification for the non-safety-related equipment is described in Section 3.7.3.8 for interaction of Seismic Category I subsystems.
- Maintains the airborne radioactivity levels within the FB below the maximum permissible concentrations limits of 10CFR20 and consistent with the as low as reasonably achievable (ALARA) dose objectives of 10CFR50, Appendix I (refer also to Sections 12.1 and 12.3.3).

9.4.2.2 System Description

A simplified diagram of the FBVS is shown in Figure 9.4.2-1—Fuel Building Ventilation System.

Refer to Section 12.3.6.5.6 for ventilation system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

9.4.2.2.1 General Description

The FBVS provides air distribution for ventilation of the FB. The air supply to, and exhaust from, each room of the FB is provided by a network of supply and exhaust ducts which are connected to the NABVS. The conditioned air is supplied to all levels of the building through a duct distribution network. The flow rate to each room is calculated based on the minimum air renewal rate, equipment heat loads, and heat balance between the rooms. This maintains ambient conditions during normal operation within prescribed limits for operation of equipment and personnel safety and comfort.

The supply air is the conditioned outside air that is filtered, cooled or heated, humidified by the NABVS, and delivered to the FB rooms through the FBVS supply duct network.

The FBVS exhaust system is designed to limit spread of the airborne contaminants and to maintain a negative pressure in the FB with respect to the outside environment. The FBVS exhaust is processed through the filtration trains of the NABVS prior to discharge through the vent stack. The FBVS is divided into two subsystems referred to as Cell 4 and Cell 5. The cells separate the ventilation systems serving the redundant systems in the FB and each cell serves approximately half of the building. The supply and exhaust duct branches to each room are fed from the main supply and exhaust HVAC shafts in the building. These HVAC shafts are connected to the NABVS.

If high radiation is detected within the FB (Monitors R-17 and R-18, Table 11.5-1), the exhaust air is diverted to the iodine filtration trains of the NABVS prior to discharge through the vent stack (refer to Section 9.4.3, Section 11.5.3.1.7, and Table 11.5-1, Monitors R-17 and R-18).

Isolation dampers are provided to isolate the supply and exhaust ducts of the room in front of the equipment hatch, fuel pool area, and the room in front of the emergency airlock.

Isolation dampers are also provided to isolate the FB from NABVS supply and exhaust ducts.

Electric heaters are provided for heating of the boron rooms and the rooms surrounding the extra borating system tanks to avoid boron crystallization in borating system piping. Electric heaters are also provided for the fuel pool room to prevent condensation on the walls, and other selected rooms to maintain room ambient conditions.

Recirculation cooling units are provided in the fuel pool cooling pump rooms and extra-borating system pump rooms to limit the maximum room temperature, allowing proper operation of the equipment in these rooms.

9.4.2.2.2 Component Description

The major components of the FBVS are described as follows. Table 3.2.2-1 provides the seismic design and other design classifications for components in the FBVS.

Individual codes and standards applicable to each component are also listed in the following paragraphs.

Ductwork and Accessories

The main supply and exhaust duct shafts for Cell 4 and Cell 5 in the FB are constructed of concrete with a painted surface. Ducting from the NABVS to the main supply and exhaust shafts is constructed of galvanized sheet steel.

The air supply and exhaust duct branches for each area are fed from the main supply and exhaust shafts. These ducts are constructed of galvanized sheet steel and are structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction requirements per ASME AG-1 (Reference 1).

Electrical Heaters

Unit heaters maintain the room ambient conditions. The heaters meet the requirements of ASME AG-1 (Reference 1).

Fan Heaters

Fan heaters consist of a fan section and an electrical heater section. The casing unit is constructed of heavy gauge steel. The fan is vane-axial design with electrical motor driver.

Recirculation Cooling Units

The recirculation cooling units consist of a fan section and a water cooling section. The casing unit is constructed of heavy gauge steel. The fan is electric motor driven. The condensate from the units is directed to the drain system. The cooling coils are designed in accordance with ASME AG-1 (Reference 1).

Dampers

Manual dampers are adjusted during initial plant startup testing to establish accurate air flow balance between rooms. The motor-operated isolation dampers will fail as-isin position in case of loss of power. The performance and testing requirements of the dampers will be per ASME AG-1 (Reference 1).

Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of UL 555NFPA 80 (Reference 2) and NFPA 90A (Reference 12) and the damper fire rating is commensurate with the fire rating of the barrier penetrated. Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

9.4.2.2.3 System Operation

Normal Plant Operation

During normal plant operation, fresh conditioned air is supplied to the FB rooms by the FBVS supply duct network. The supply air to the FB is provided by the NABVS. The room air conditioning is provided by the supply and exhaust air flows based on the minimum required air renewal rate, equipment heat load, and heat balance between the rooms. The air is heated or cooled to maintain the required ambient conditions of the rooms.

During normal operation, isolation dampers are open to provide ventilation of the FB. These isolation dampers also can be controlled by the NABVS.

During normal operation, system fire dampers are in the open position.

A negative pressure is maintained in the FB relative to the outside environment by regulating the FBVS supply and exhaust flows. A negative pressure is also maintained for rooms having the potential for radioactive contamination (principally due to iodine) relative to the adjacent rooms to provide air flows from areas of low radioactivity to areas of potentially higher radioactivity.

Electrical heaters operation is controlled by temperature sensors in the boron rooms and the fuel pool rooms. Non-safety-related electrical heaters are operated as needed, depending on the room temperatures.

Recirculation cooling units are used for fuel pool cooling system pump rooms, and extra-borating system pump rooms to make sure that acceptable temperatures are maintained within the rooms for proper operation of the components and safe personnel access. The recirculation cooling units for the fuel pool cooling system pump rooms operate when the pumps are in operation. The recirculation cooling units for the extra-borating system pump rooms operate based on room temperature to provide recycled cool air.

During plant outages, the supply and exhaust ducts of the room in front of the equipment hatch are isolated so that the air flow is from the FB to the Reactor Building (RB). When the equipment hatch is opened, this room is considered as part of the RB and is therefore ventilated by the RB ventilation system.

In the event radioactive contamination is detected in the FB (refer to Table 11.5-1, Monitors R-17 and R-18) during normal operation, or a potential airborne radioactive hazard exists during maintenance of equipment or systems, the exhaust air is diverted to iodine filtration trains of the NABVS prior to discharge through the vent stack (refer to Section 11.5.3.1.7 and Table 11.5-1, Monitors R-17 and R-18). Iodine activity is detected separately in each cell.

Abnormal Operating Conditions

Failure of Supply and Exhaust Air

The FBVS supply and exhaust air systems are non-safety related. Failure of supply and exhaust air systems in the NABVS will lead to the loss of supply and exhaust functions of FBVS. In this case, negative pressure with respect to the outside atmosphere and room temperatures of the FB cannot be maintained; however, the recirculation cooling units and heaters will maintain acceptable temperatures in the fuel pool cooling and extra borating system pump rooms.

Failure of Heaters and Recirculation Cooling Units

In each room provided with safety-related heaters, two 100 percent capacity heaters are provided to fulfill the single failure criteria of the heaters. For heaters serving a safety-related function, the required power has been calculated based on failure of an electrical division. Thus, failure of one electrical division will not prevent other divisions from supplying power and fulfilling their functions.

Failure of one recirculation cooling unit will lead to the loss of cooling in the corresponding room. As a result, the extra borating and fuel pool cooling system pumps located in that room may not operate properly. Redundant extra borating and fuel pool cooling system pumps located in a separate room and served from a separate train will, however, still be operational.

Failure of Isolation Dampers

For safety-related isolation functions, automatic isolation is provided in the design by placing two dampers in series, with power for each damper supplied by a different electrical division. Failure of one electrical division thus does not hinder the isolation function of the system.

Fuel Handling Accident in the Fuel Building

In the event of a fuel handling accident in the FB, the air exhaust and supply of the space above the fuel pools are isolated by closing the isolation dampers serving this room. This occurs automatically by the sampling activity monitoring system signal. Alternatively, this isolation also can be performed via local push buttons located in the fuel pool room.

To prevent spread of airborne contamination, the iodine filtration trains of the safeguard building ventilation are used to process the exhaust air and to maintain the required pressure in the FB fuel pool hall (refer to Section 9.4.5, Section 11.5.3.1.7, and Table 11.5-1, Monitor R-19). However, no credit is taken for iodine filtration in the fuel handling accident dose consequence analysis described in Section 15.0.3.10.2. The remainder of the FB is ventilated by the NABVS.

Fuel Handling Accident in the Containment Building

In the event of a fuel handling accident in the Containment Building, to preclude uncontrolled migration of contamination, the FB areas in front of the emergency airlock and in front of the equipment hatch are isolated by closing the air exhaust and supply dampers dedicated to these areas.

Prior to opening the emergency airlock during an outage, the air exhaust in front of the emergency airlock is isolated by closing the dampers dedicated to this area.

Prior to opening the equipment hatch during an outage, the air supply and exhaust for the equipment area in front of the hatch are isolated by closing the dampers dedicated to this area.

Loss of Coolant Accident (LOCA)

Upon receipt of a containment isolation signal, the following functions are initiated automatically:

- Closes FBVS exhaust air isolation dampers to NABVS.
- Closes FBVS supply air isolation dampers from NABVS.
- Opens FBVS exhaust air isolation dampers to exhaust air from the entire Fuel Building to the SBVS.
- Opens isolation dampers for the SBVS Accident Exhaust Iodine Filtration Trains.
- Starts SBVS iodine filtration train fans to pull air through SBVS Accident Exhaust Iodine Filtration Trains and to direct exhaust air to the vent stack. The SBVS maintains negative pressure in the Fuel Building.

Loss of Offsite Power (LOOP)

~~Upon loss of offsite power, all motorized dampers will fail as is, limiting pathways for potentially contaminated air to leak out to the environment.~~

The following equipment will remain operational during LOOP:

- Electric heaters in the extra borating pump rooms and pipe chase.
- Recirculation cooling units in the fuel pool cooling system pump rooms, and extra borating system pump rooms.
- Dampers for isolating the fuel pool room and FB.

The power for the equipment listed above is supplied from the corresponding emergency diesel generators.

Station Blackout (SBO)

In the event of SBO, the following equipment will remain operational:

- Electric heaters in the extra borating system pump rooms and pipe chase.
- Isolation dampers for the fuel pool room so that the dampers can be closed in the event of high temperature in the fuel pool.

The power for the equipment listed above is supplied from the SBO emergency diesel generators (SBODG).

9.4.2.3 Safety Evaluation

The FBVS provides the following safety-related functions:

- Automatic isolation of the FB from NABVS supply and exhaust ducts in the event of containment isolation signal. The SBVS maintains negative pressure in the FB and filters the FB atmosphere through SBVS iodine filtration trains.
- Maintains ambient conditions in the extra borating system pump rooms and pipe chase and the fuel pool cooling system pump rooms during normal, abnormal, and postulated accident events.

Safety-related components can function as required with failure of a single active component. The safety-related redundant components are powered from different electrical divisions so that the system can remain operable in case of failure of one of the electrical divisions.

9.4.2.4 Inspection and Testing Requirements

The FBVS major components, such as dampers, cooling units, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Test and analysis will be completed during normal operation with the system operating in an accident alignment. Analysis will use as-built information from equipment to extrapolate the performance of the air-conditioning system. Analysis will show that the equipment performance is adequate to maintain design conditions during plant operating conditions.

Initial in-place acceptance testing of the FBVS is performed as described in Section 14.2 (test abstracts #081 and #203), Initial Plant Test Program, to verify the system is build in accordance with applicable programs and specifications.

The FBVS is designed with adequate instrumentation and temperature indicating devices to enable testing and verification of equipment function and heat transfer capability.

During normal plant operation, periodic testing of FBVS is performed to demonstrate system and component operability and integrity.

Isolation dampers are periodically inspected and damper seats replaced as required.

Recirculation cooling units are tested by manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 4, 5, and 6). Cooling coils are hydrostatically tested in accordance with ASME AG-1 (Reference 1) and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 7).

Ductwork is leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 8), American Society of Mechanical Engineers, ANSI/ASME N510 (Reference 9), ASME AG-1 (Reference 1), and RG 1.52 (Reference 11).

Fan heaters are tested in accordance with ASME AG-1, Section CA (Reference 1).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

9.4.2.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the MCR. Fans, motor-operated dampers, heaters and cooling units are operable from the MCR. Local instruments are provided to measure flow, temperature, and pressure. The fire detection and sensors information is delivered to the fire detection system. The radiation instrumentation requirements for controlling airborne radioactivity releases via the vent stack are addressed in Section 11.5.3.1.7 and Table 11.5-1, Monitors R-17, R-18, and R-19.

9.4.2.6 References

1. ASME AG-1, “Code on Nuclear Air and Gas Treatment,” The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000 “Housings” Addenda).

2. NFPA 80, “Standard for Fire Doors and Other Opening Protectives,” National Fire Protection Association Standards, 2007.~~UL 555, “Standard for Fire Dampers,” Underwriter’s Laboratories, Sixth Edition, June 1999.~~

3. “ASHRAE Handbook Fundamentals,” American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc., 2005.

4. ANSI/AMCA Standard ~~-~~210-~~19~~99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, ~~December~~ 1999.

5. ~~ANSI/~~AMCA~~-~~ Publication 211-~~19~~87, "Certified Ratings Program – AirPerformance," ~~American National Standards Institute/~~Air Movement and Control Association International, ~~December~~ 1987.

6. ANSI/AMCA Standard ~~-~~300-~~19~~85, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, ~~December~~ 1985~~7~~.

7. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

8. "HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

9. ANSI/ASME N510-1989 ~~(R1996)~~, "Testing of Nuclear Air-Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

10. Deleted.~~ASME N509-1989, "Nuclear Power Plant Air Cleaning Units and Components," The American Society of Mechanical Engineers, 1989.~~

11. NRC Regulatory Guide 1.52, Rev. 3, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post Accident Engineered Safety Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," 2001.

12. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilation Systems," National Fire Protection Association Standards, 2002.

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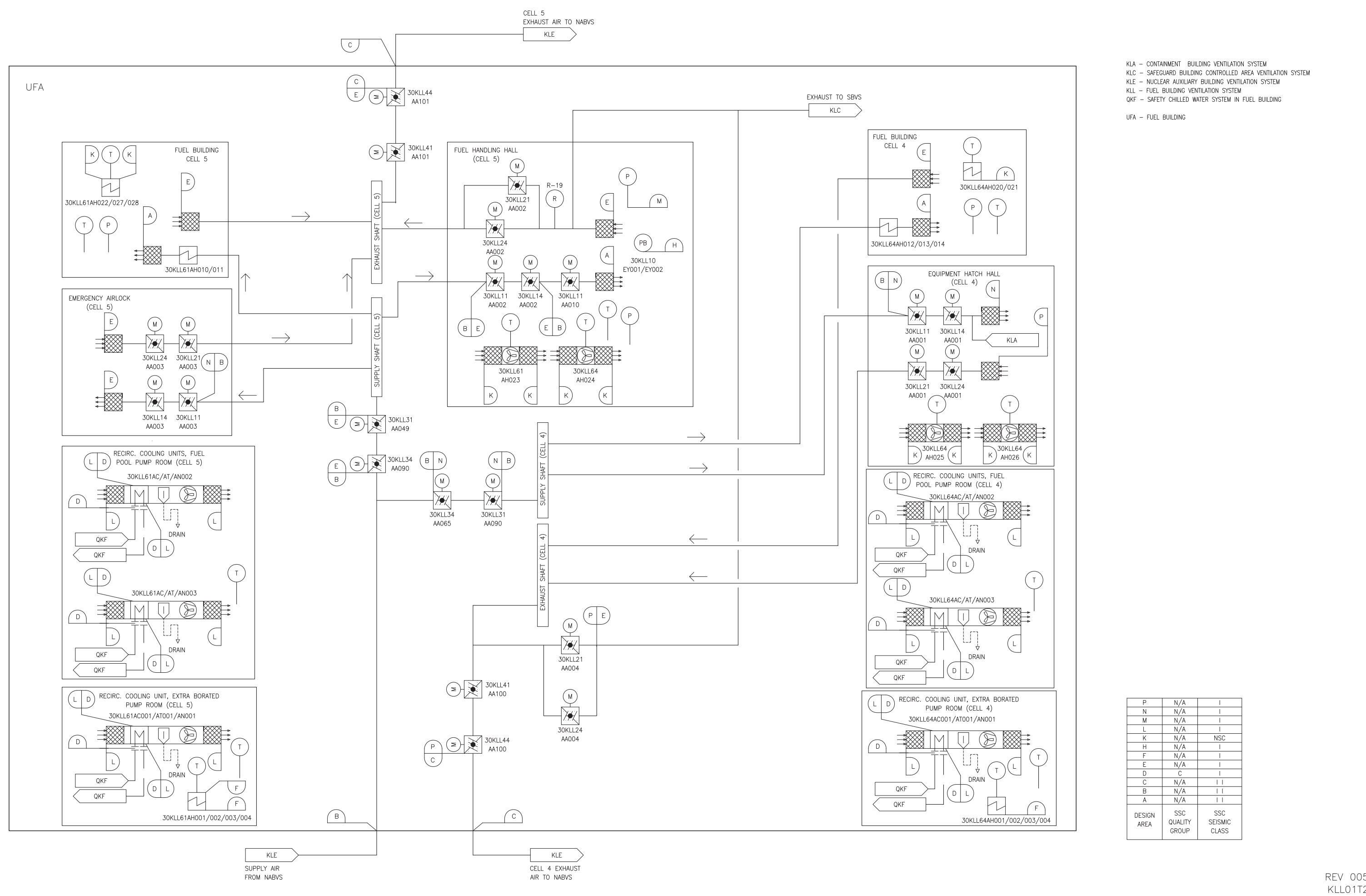
Figure 9.4.2-1—Fuel Building Ventilation System



9.4.3 Nuclear Auxiliary Building Ventilation System

The nuclear auxiliary building ventilation system (NABVS) provides conditioned air to the Nuclear Auxiliary Building (NAB) to maintain acceptable ambient conditions, to permit personnel access, and to control the concentration of airborne radioactive material during normal operations and anticipated occupational occurrences. The system also provides conditioned air to the Fuel Building (FB), Containment Building, and the annulus area between the Containment Building and the Shield Building.

The exhaust air from the NAB, FB, Safeguard Building (SB), Containment Building, and the annulus is processed through the NABVS filtration trains prior to release to the environment via the vent stack.

9.4.3.1 Design Basis

The NABVS provides a safety-related function to provide isolation between the vent stack and the NABVS exhaust. A safety-related Seismic Category I backdraft damper is located in the NABVS exhaust at the vent stack.

All remaining components of the NABVS are non-safety related and Non-Seismic, as specified in Section 3.2.

- The NABVS meets GDC-2 for all components as it relates to meeting the seismic design criteria based on the guidance of RG 1.29 Position C.2 (GDC-2).
- The NABVS has no shared systems or components with other nuclear power units (GDC-5).
- The NABVS meets GDC-60, as it relates to the ability of the system to limit release of gaseous radioactive effluents to the environment. The NABVS exhaust iodine filtration trains meet the guidance of RG 1.140 Positions C.2 and C.3. RG 1.52 is not applicable because the NABVS is not required to operate during post-accident engineered safety features (ESF) atmospheric cleanup. The air flow rate of a single cleanup filtration unit will not exceed 30,000 cfm.

The NABVS performs the following safety-related function:

- A safety-related backdraft damper is located in the NABVS exhaust at the vent stack. This backdraft damper isolates the NABVS as required from the other safety systems exhausting to the vent stack during accident operation.
- During accident conditions, the NABVS is shut down and the safety-related annulus ventilation system (AVS) and safeguard building (controlled area) ventilation system (SBVS~~ABVS~~) operate. Closure of the backdraft damper is initiated by a differential pressure between the plant vent stack and the NABVS duct.

- The remaining portions of the NABVS perform no safety-related functions and the system is not required to operate during a design basis accident.

The NABVS performs the following ~~important~~ non-safety-related system functions:

- Controls and maintains a negative pressure within the NAB relative to the outside environment.
- Maintains the following temperature and humidity ranges for the areas serviced:
  - Minimum temperature 50°F.
  - Maximum temperature 113°F.
  - Humidity ~~2~~1 5 to 70 percent.
- Laboratory
  - Minimum temperature 65°F.
  - Maximum temperature 79°F.
  - Humidity 30 to 70 percent.

9.4.3.2 System Description

9.4.3.2.1 General Description

The NABVS is divided into the following subsystems:

- Supply air.
- NAB air supply.
- Exhaust air.

Refer to Section 12.3.6.5.6 for ventilation system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

Supply Air Subsystem

The outside-conditioned air is supplied through a set of redundant filter trains consisting of HEPA filters, heating coils, and cooling coils. See Figure 9.4.3-1—Nuclear Auxiliary Building Supply Air Filtration and A/C Trains. The conditioned supply air maintains ambient conditions in the areas served by this system within prescribed limits for operation of equipment, and personnel safety and comfort. The NABVS provides conditioned air to the following areas:

- NABVS air distribution supply air shafts and ductwork.

- Containment building ventilation system (refer to Section 9.4.7).
- Fuel building ventilation system (refer to Section 9.4.2).
- Annulus ventilation system (refer to Section 6.2.3).

The outside air is provided through intake mesh grills and louver dampers. The outside air intake openings are equipped with electrically heated and weather protected grills to prevent ice formation and ingress of insects and debris. The intakes are designed to provide adequate outside air to meet the distribution requirements of supply air under design conditions of the plant.

The air intake plenum supplies air through three filtration trains. Each train consists of a preheater, prefilter, cooling coil, heater, silencer, and air dampers. Four supply air fans take suction from the supply fan inlet plenum and supply air to the outlet air shaft for further distribution to the supply shafts of different buildings.

The design supply air flow to serve the NAB, FB, annulus ventilation system, and Containment Building would require all three trains to be in operation. However, during normal operation, a reduced air flow rate can be used that requires only one supply train to be in operation.

Nuclear Auxiliary Building Air Supply Subsystem

This subsystem supplies air to the NAB to maintain ambient conditions within the prescribed limits for equipment operation and personnel access. See Figure 9.4.3-2—Nuclear Auxiliary Building Air Supply and Exhaust Subsystem.

The conditioned air is supplied to all levels of the building through air shaft cells and a duct distribution network. The flow rate to each room is calculated based on the room volume and equipment heat loads to maintain ambient conditions. The normal operation of the system is to maintain a negative pressure in the building with respect to the outside atmosphere to prevent leakage of potentially contaminated air to the environment. The air flow paths within the NAB are designed so that if radiation is detected, migration of contaminated air from areas of potentially high radioactivity to areas of potentially low radioactivity is limited.

The recirculation cooling units are provided for the rooms with high heat loads. Cooling coil units with fans provide recycled cooled air to the rooms where vapor compressors, electrical switchgear, and transformers are located.

Exhaust Air Subsystem

This subsystem processes exhaust air through filtration trains and charcoal filtration trains to limit airborne radioactivity released through the vent stack. See Figure 9.4.3-3—Nuclear Auxiliary Building Exhaust Filtration Trains Subsystem.

The system processes air exhaust from the following areas:

- FB Cell 5 exhaust (refer to Section 9.4.2).
- FB Cell 4 exhaust (refer to Section 9.4.2).
- NAB Cell 3 exhaust, including annulus exhaust.
- NAB Cell 2 exhaust.
- NAB Cell 1 exhaust.
- SB Cell 6 exhaust (refer to Section 9.4.5).
- Containment Building full flow purge exhaust (refer to Section 9.4.7).

The filtration trains to process exhaust air from the above areas are located inside the NAB. Each filter train consists of a prefilter and a HEPA filter. Under normal operating conditions, these flow paths open into a common exhaust plenum. Four exhaust fans take suction from this plenum and discharge into another exhaust plenum which directs the exhaust air to the vent stack for an elevated release.

If high radiation is detected in any of the rooms within the NAB (refer to Table 11.5-1, Monitors R-11, R-12, and R-13), FB (refer to Table 11.5-1, Monitors R-17 and R-18), or SBs (refer to Table 11.5-1, Monitor R-25), the NABVS exhaust is diverted to an iodine filtration plenum. It is then directed to one of the four redundant independent iodine filtration trainsunits. Each iodine filtration train unit includes fire dampers, preheater, iodine adsorber using activated carbon, HEPApost filters, dampers, and a booster fan. The exhaust air from the booster fan is directed to the exhaust plenum for discharge through the vent stack. See Figure 9.4.3-4—Nuclear Auxiliary Building Exhaust Iodine Filtration Train Subsystem.

The NABVS also has two iodine filtration train units and fans to serve the laboratory exhaust air. Each laboratory iodine filtration train unit includes preheater, prefilter, HEPA filters, iodine adsorber, post filter, motor-operated dampers, and booster fans. The exhaust air from the booster fans is directed to the exhaust plenum for discharge through the vent stack. See Figure 9.4.3-5—Nuclear Auxiliary Building Laboratory Iodine Exhaust Filtration Train.

Non-condensibles from the turbine gland steam condenser and the condenser evacuation system exhaust into the NABVS exhaust plenum. Air is pulled from the exhaust plenum by the NABVS exhaust fans and discharged at the vent stack.

9.4.3.2.2 Component Description

The major components of the NABVS are listed below, along with the applicable code and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the NABVS.

Ductwork and Accessories

The supply and exhaust air ducts are constructed of galvanized sheet steel and are structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction requirements per ASME AG-1 (Reference 1).

Heaters

Supply air trains have hot water heaters. The heater design is based on the minimum outside air design temperature and supply air temperature requirements. The coils are constructed and tested in accordance with ASME AG-1 (Reference 1). Electric heaters are located upstream of iodine filters to prevent excessive moisture accumulation in the charcoal beds.

Prefilters

The prefilters are located upstream of HEPA filters and collect large particles to increase the useful life of the ~~high efficiency~~HEPA filters. The prefilters will meet the requirements of ANSI/ASHRAE Standard 52.2~~-1999~~ (Reference 2).

HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with ASME AG-1 (Reference 1). The periodic in-place testing of HEPA filters to determine the leak-tightness is performed per ANSI/ASME N510~~-1989~~ (Reference 3).

Adsorbers

Carbon filters are used to remove radioactive iodine from the exhaust air. The efficiency for removal of methyl iodine is based on the decontamination efficiency assigned during the laboratory tests. The periodic in-place testing of the adsorbers to determine the leak-tightness is performed per ANSI/ASME N510 (Reference 3). The activated carbon total bed depth requirement will be 2 inches with a maximum assigned activated carbon decontamination efficiency of 95 percent.

Post Filters

The post filter is located downstream of the carbon adsorber. During operation of the carbon filtration exhaust, the air flow rate will be low through the carbon adsorber to prevent spread of the carbon dust. However, the post filter ensures that carbon dust or carbon fines are removed prior to the air being distributed further. The post filter meets the requirements of ASME AG-1 (Reference 1), and has an average atmospheric dust efficiency of 95% in accordance with ANSI/ASHRAE Standard 52.2 (Reference 2). The post filter is equipped with differential pressure measurement which indicates the degree of particulate loading and the need for filter change.

Fans

The supply and exhaust fans are centrifugal or vane-axial design with electrical motor drivers. Fan performance is rated in accordance with ANSI/AMCA 210-99 (Reference 4), ANSI/AMCA 211-1987 (Reference 5) and ANSI/AMCA 300-1985 (Reference 6).

Isolation Dampers

The isolation dampers are located upstream and downstream of each filtration train. The motor-operated dampers will fail as-isto “close” or “open” position in case of loss of power, depending on the safety function of the dampers. Backdraft dampers prevent air flow to non-operating air supply and exhaust trains. The performance and testing requirements of the dampers are per ASME AG-1 (Reference 1).

Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of UL 555NFPA 80 (Reference 7) and NFPA 90A (Reference 13) and the damper fire rating is commensurate with the fire rating of the barrier penetrated. Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

Recirculation Units

The recirculation units are comprised of chilled water cooling coils and fans, which are designed to process and supply cool air for the compressor, switchgear and transformer rooms.

9.4.3.2.3 System Operation

Normal Plant Operation

Under normal plant operation, the NABVS continuously draws, conditions, and supplies outside air to maintain the required ambient conditions in various rooms of the NAB, FB, and annulus, and low-flow purge ventilation of the Containment Building. Two of the four supply fans are able to provide the required air flow during normal plant operation.

The NABVS exhausts sufficient air to maintain a negative pressure inside the NAB relative to the outside environment. The exhaust air from the NAB, FB, SB, and

Containment Building is processed through a dedicated filtration train to a common exhaust plenum, and subsequently directed by two of the four exhaust fans to the vent stack.

The laboratory exhaust is processed through one of the two iodine filtration trains, with one of two exhaust fans operating, prior to its discharge through the vent stack.

All system fire dampers are in the open position.

When the plant is in cold shutdown, the NABVS operates in combination with the containment building ventilation system to purge the containment service compartments. The exhaust is processed through a specific NABVS exhaust train.

Abnormal Operating Conditions

Failure of Iodine Adsorber Train

Failure of a fan in an operating iodine adsorber train initiates the operation of another iodine train; thus, the single failure has no effect on the functioning of the system. For the laboratory exhaust system, two filter trains are provided; in the event of a failure in one of the trains, the other train will start automatically.

Iodine Activity Detection

In the event iodine is detected in the NAB, FB, or SB, the affected exhaust flow paths are redirected through the iodine filtration train prior to discharge through the vent stack. Iodine activity is detected separately in each cell.

Fuel Handling Accident in the Fuel Building

In the event of a fuel handling accident in the FB, the FB exhaust and supply are isolated by closing the appropriate dampers (refer to Section 9.4.2). To prevent spread of airborne contamination, the iodine filtration trains of the SB ventilation system process the exhaust air to maintain the required pressure in the FB pool hall (refer to Section 9.4.5). The remainder of the FB is ventilated by the NABVS. During and after the fuel handling accident, proper NABVS supply and exhaust flow rates are maintained by adjusting the control dampers.

Fuel Handling Accident in the Containment Building

In the event of a fuel handling accident in the Containment Building, the CBVS full and low flow purge supply and the full flow purge exhaust containment isolation valves are closed and low flow purge exhaust is filtered through the low flow purge exhaust subsystem filtration trains (refer to Section 9.4.7). ~~the containment isolation valves close (refer to Section 9.4.7). Exhaust from the Containment Building is routed~~

to the iodine filtration trains of the CBVS. Excess air supply from the NABVS is redirected by adjusting the supply air control dampers.

Operation of Safety Injection System during LOCA

In the event of a loss of coolant accident (LOCA), leakages in the safety injection system (SIS) can lead to iodine activity levels that are above the limits of the NABVS iodine filtration trains. In such a case, the SB exhaust is routed through the SB ventilation system (refer to Section 9.4.5). Excess air supply from NABVS is redirected by adjusting the supply air control damper. The NABVS supply and exhaust to the FB are isolated (refer to Section 9.4.2).

Loss of Offsite Power (LOOP)

A LOOP results in a loss of power to the NABVS electrical components, such as fans, dampers, cooling units, and heaters. The NABVS system is not provided with emergency power.Upon loss of offsite power, the isolation dampers fail to the closed position, preventing any pathway for potentially contaminated air to leak out to the environment.

Station Blackout (SBO)

In the event of SBO, there will be no power to any of the electrical components of the NABVS. Isolation dampers with spring return will fail to the closed position. Other isolation dampers will fail "as-is".

9.4.3.3 Safety Evaluation

The backdraft damper located in the NABVS exhaust at the vent stack is the only component in the NAVBVS that performs a nuclear safety-related function. None of the other NABVS components are required to operate during a design basis accident (DBA). In case of a DBA, the NABVS is isolated from the HVAC systems of other buildings by isolation dampers. The backdraft damper prevents exhaust air flow from the AVS and SBVS from discharging into the NABVS.

The NABVS provides adequate capacity and redundant trains to maintain proper temperature levels in the NAB, FB, Containment Building, and annulus.

9.4.3.4 Inspection and Testing Requirements

The NABVS major components, such as dampers, motors, fans, filters, coils, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Initial in-place acceptance testing of the NABVS is performed as described in Section 14.2 (test abstracts #079 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The NABVS is designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of NABVS is performed to demonstrate system and component operability and integrity.

During normal operation, equipment rotation is utilized to reduce and equalize wear on redundant equipment during normal operation.

Isolation dampers are periodically inspected and damper seats replaced as required.

Fans and air handling units are tested by manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 4, 5, and 6). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 2). Cooling coils are hydrostatically tested and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 8).

Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 9), American Society of Mechanical Engineers, ANSI/ASME N510 (Reference 3), ASME AG-1 (Reference 1), and RG 1.140 (Reference 10).

Outside air inlet heaters are tested in accordance with ASME AG-1, Section CA (Reference 1).

Carbon filtration units are tested by manufacturer for housing leakage, filter bypass leakage and airflow performance. Periodically and subsequent to each filter or adsorber material replacement, the unit is inspected and tested in-place in accordance with the requirements of RG 1.140 (Reference 10), ANSI/ASME N510 (Reference 3) and ASME AG-1 (Reference 1). The charcoal adsorber samples are tested for efficiency in a laboratory in accordance with RG 1.140 (Reference 10) and ASTM D3803 (Reference 11). Air filtration and adsorption unit heaters are tested in accordance with ASME AG-1, Section CA (Reference 1).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

9.4.3.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the MCR. Fans, motor-operated dampers, heaters, and cooling units are operable from the MCR. Local instruments are provided to measure differential pressure across filters, flow, temperature and pressure.

The fire detection and sensors information is delivered to the fire detection system.

All instrumentation provided with the filtration units is as required by RG 1.140.

The radiation instrumentation requirements for controlling airborne radioactivity releases via the vent stack are addressed in Section 11.5.3.1.6 and Table 11.5-1.

9.4.3.6 References

1. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, "Housings" Addenda).

2. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," ~~ANSI~~American National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

3. ANSI/ASME N510-1989 ~~(R1995)~~, "Testing of Nuclear Air-Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

4. ANSI/AMCA Standard ~~-~~210-99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, ~~December~~ 1999.

5. ~~ANSI/~~AMCA~~-~~ Publication 211-~~19~~87, "Certified Ratings Program – Air Performance," ~~American National Standards Institute/~~Air Movement and Control Association International, 1987.

6. ANSI/AMCA Standard ~~-~~300-~~19~~85, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, 1985.

7. NFPA 80, "Standard for Fire Doors and Other Opening Protectives," National Fire Protection Association Standards, 2007.~~UL 555, "Standard for Fire Dampers," Underwriter's Laboratories, Sixth Edition, June 1999.~~

8. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

9. "HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

Next File

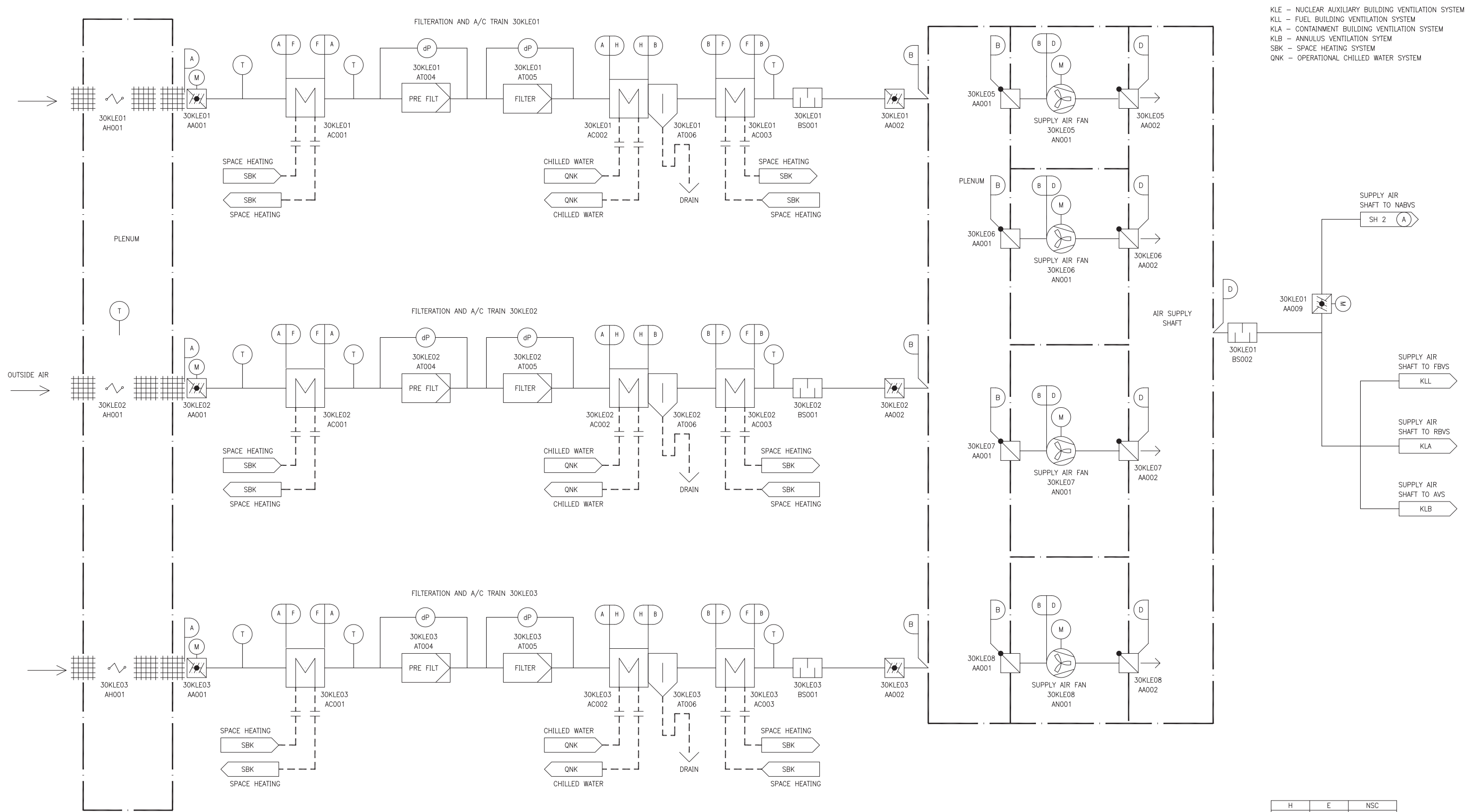
10. NRC Regulatory Guide 1.140, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Normal Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," 2001.

11. ASTM D3803-1989, reapproved 1995, "Standard Test Method for Nuclear Grade Activated Carbon," 1989.

12. Deleted.ASME N509-1989, "Nuclear Power Plant Air Cleaning Units and Components," The American Society of Mechanical Engineers, 1989.

13. NFPA 90A, “Standard for the Installation of Air Conditioning and Ventilation Systems,” National Fire Protection Association Standards, 2002.

Figure 9.4.3-1—Nuclear Auxiliary Building Supply Air Filtration and A/C Trains



DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS
H	E	NSC
F	E	NSC
D	N/A	NSC
B	N/A	NSC
A	N/A	NSC

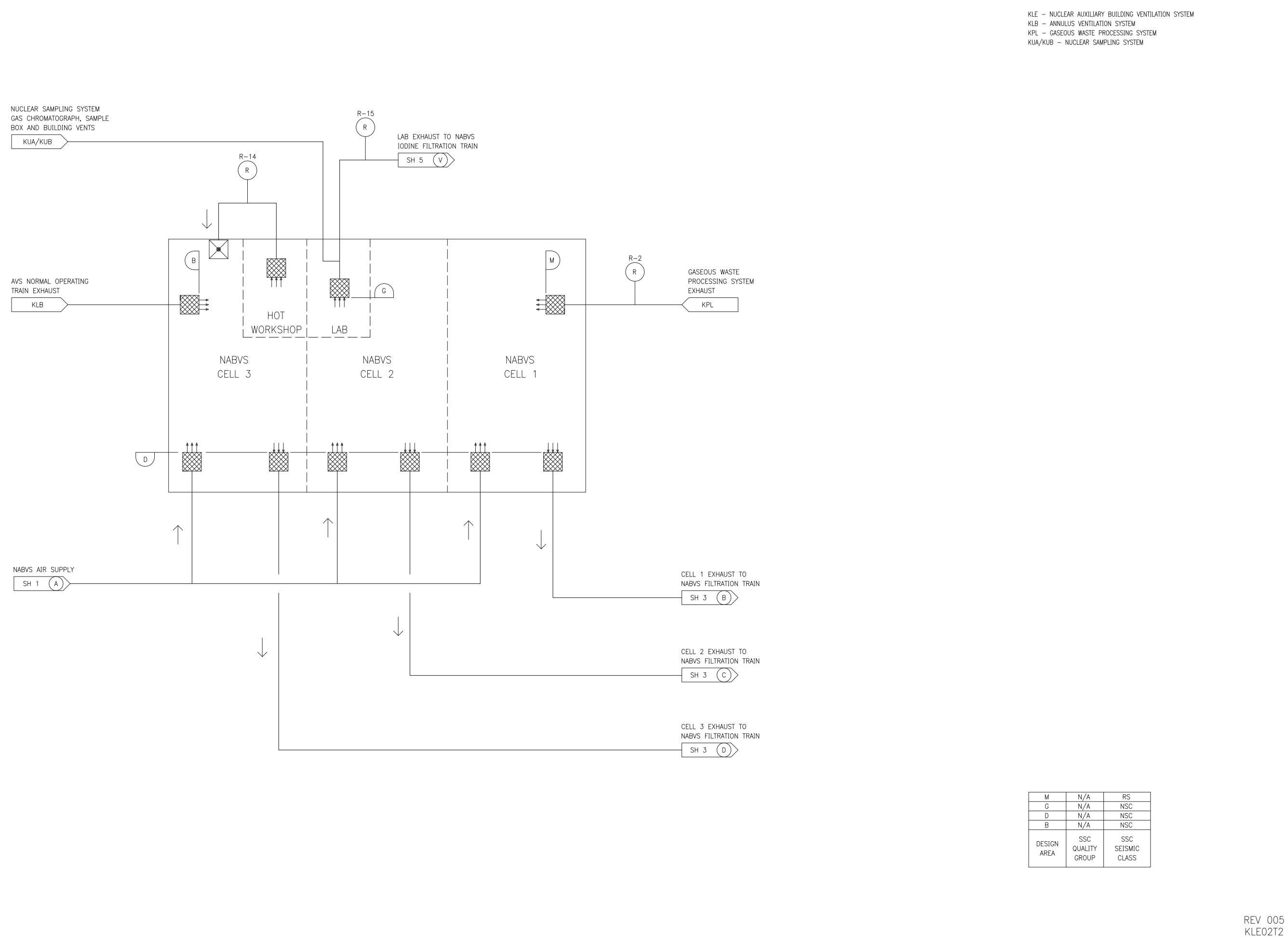


Figure 9.4.3-2—Nuclear Auxiliary Building Air Supply and Exhaust Subsystem

Figure 9.4.3-3—Nuclear Auxiliary Building Exhaust Filtration Trains Subsystem

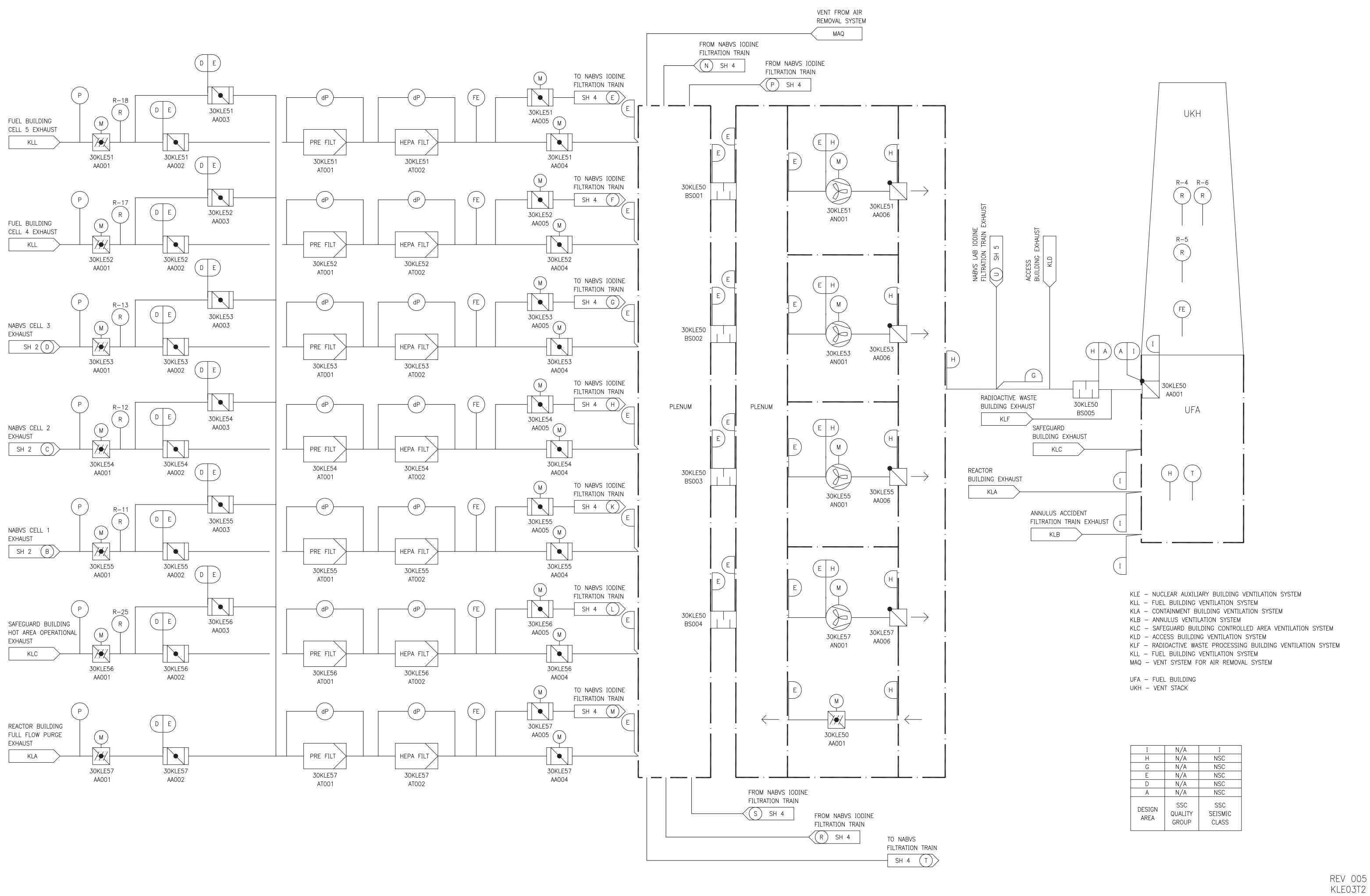


Figure 9.4.3-4—Nuclear Auxiliary Building Exhaust Iodine Filtration Train Subsystem

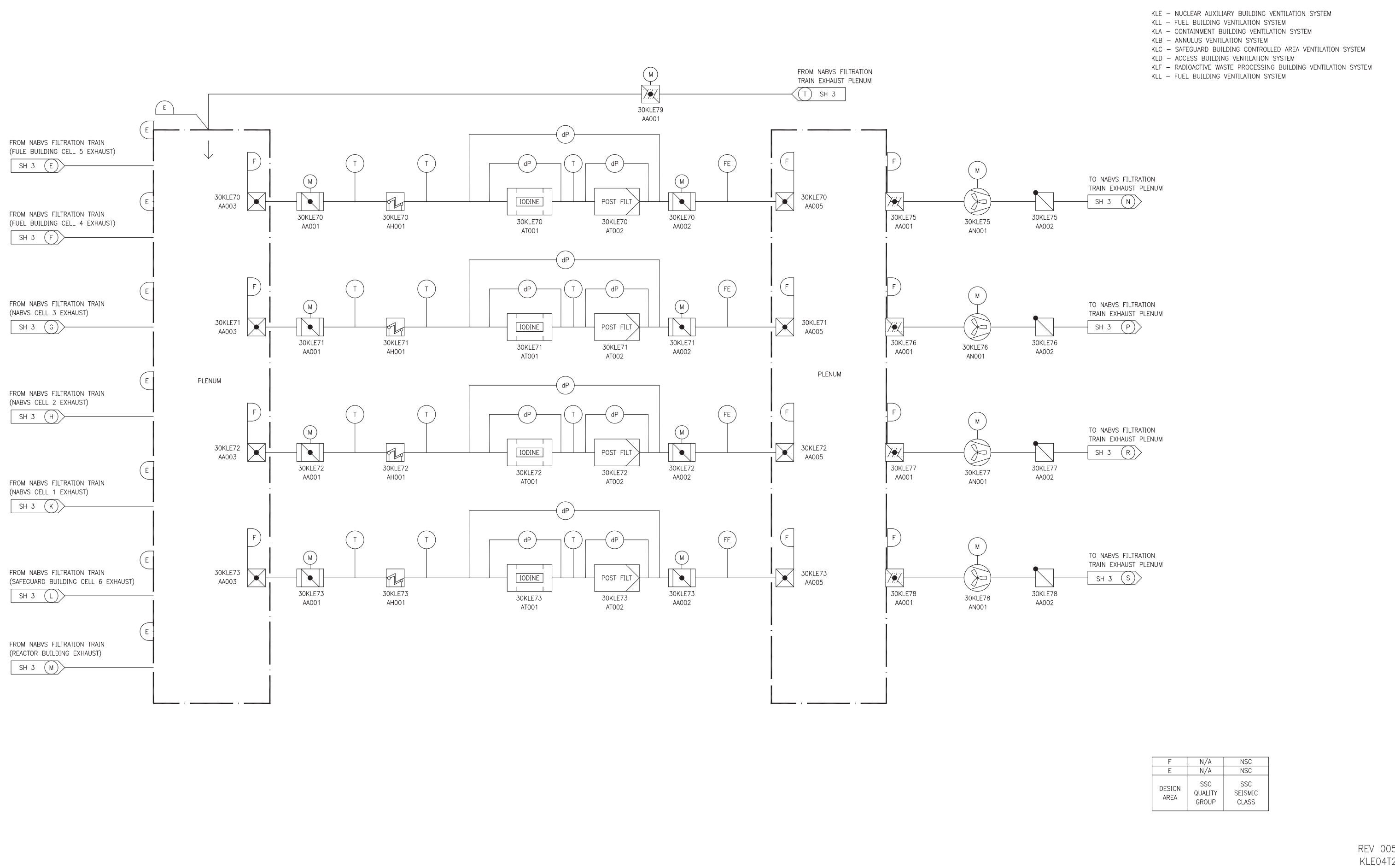
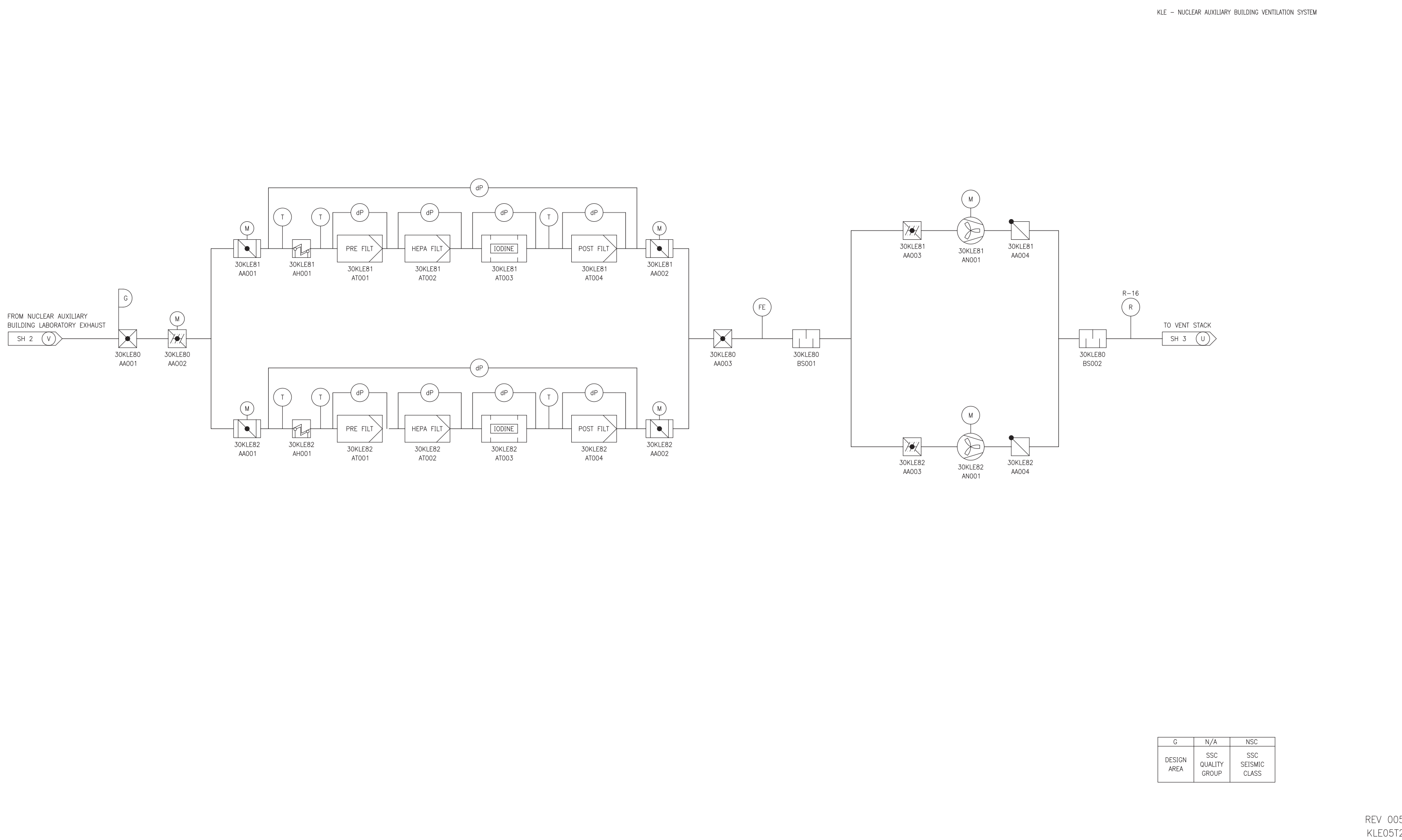


Figure 9.4.3-5—Nuclear Auxiliary Building Laboratory Iodine Exhaust Filtration Train



9.4.4 Turbine Island Ventilation Systems

Ventilation systems for the turbine island consists of the turbine building ventilation system (TBVS) and the switchgear building ventilation system, turbine island (SWBVS).

The turbine building ventilation system (TBVS) provides heating and ventilation in the Turbine Building (TB) for normal operating modes as well as during refueling outages. The TBVS supplies conditioned air to maintain TB temperatures within the operating requirements for equipment operation and provides an acceptable environment for personnel who operate and maintain the equipment within the building. The TBVS is classified as a non-safety-related system; it does not provide accident response nor does it provide radioactive effluent control functions for the U.S. EPR.

The TBVS does not exhaust turbine gland seal or condenser evacuation. These gaseous exhausts are directed to the NABVS, where they are exhausted through the vent stack and monitored. Refer to Sections 10.4.2 and 10.4.3 for a description of main condenser evacuation system exhaust and turbine gland sealing system exhaust.

As noted in Table 1.8-1—Summary of U.S. EPR Plant Interfaces with Remainder of Plant, the TB and its associated ventilation system is an interface with the U.S. EPR standard design. A COL applicant that references the U.S. EPR design certification will provide site-specific design information for the TBVS.

The switchgear building ventilation system, turbine island (SWBVS) provides heating and ventilation in the remainder of the Switchgear Building (SWGB) for normal operating modes as well as during refueling outages. The SWBVS supplies conditioned air to maintain SWGB temperatures within the operating requirements for equipment operation and provides an acceptable environment for personnel who operate and maintain the equipment within the building. The SWBVS is classified as a non-safety-related system; it does not provide accident response nor does it provide radioactive effluent control functions for the U.S. EPR.

As noted in Table 1.8-1—Summary of U.S. EPR Plant Interfaces with Remainder of Plant, the SWBVS is an interface with the U.S. EPR standard design. A COL applicant that references the U.S. EPR design certification will provide site-specific design information for the SWBVS.

Next File

9.4.5 Safeguard Building Controlled-Area Ventilation System

Each of the four safeguard divisions is separated into two functional areas:

- Hot mechanical area (controlled area) serviced by the safeguard building controlled-area ventilation system (SBVS).
- Electrical, instrumentation and control (I&C) and heating, ventilation and air conditioning (HVAC) area serviced by the electrical division of the safeguard building ventilation system (SBVSE). Refer to Section 9.4.6.

The SBVS provides a suitable and controlled environment, in the hot mechanical areas of the Safeguard Buildings (SB) where engineered safety feature components are located, for personnel access and to allow safe operation of the equipment during normal plant operation, outages, under anticipated operational occurrences, and postulated accidental events.

The SBVS, through its interconnections to the SBVSE and the nuclear auxiliary building ventilation system (NABVS), provides conditioned air for ventilation to the ~~mechanical part~~controlled area of the SBs. The conditioned air supply to all four divisions of SB controlled areas is provided independently for each division by the SBVSE (refer to Section 9.4.6). The exhaust air (normal exhaust) from the four divisions of the SB is processed by the NABVS (refer to Section 9.4.3).

9.4.5.1 Design Bases

The SBVS is safety-related and designed to Seismic Category I requirements, except the following:

- Electric ~~air heating convectors (fan~~ heaters~~)~~ which are non-safety-related and non-seismic. These heaters are located in stairwell and service access areas and are used for personnel comfort only. For non-safety-related equipment located in the same room with safety-related equipment, the seismic classification for the non-safety-related equipment is described in Section 3.7.3.8 for interaction of Seismic Category I subsystems.

The safety-related components of the SBVS are located inside the SB that is designed to withstand the effect of natural phenomena, such as earthquake, tornados, hurricanes, floods and external missiles (GDC 2). ~~The SBVS vents and louvers are supplied by the SBVSE for supply and the NABVS for exhaust air.~~

The safety-related components of the SBVS are appropriately protected against dynamic effects and designed to accommodate the effects of, and to be compatible with, the environmental conditions associated with normal operation, maintenance, testing and postulated accidents. The safety-related components of the SBVS remain functional and perform their intended safety function after anticipated operational occurrences and design basis accidents, such as a fire, internal missiles, or pipe break

(GDC 4). Refer to Section 3.5.1.1, Section 3.5.1.4, Section 3.5.2, and Section 3.6.1 for information on compliance with GDC 4 as it relates to protection from missiles and postulated piping failures.

The safety-related components and systems of the SBVS are not shared among nuclear power units (GDC 5).

The essential onsite electrical power systems meet the guidance of NUREG-CR/0660 (subsection A–item 2, and subsection C-item 1) (Reference 1) for protection of essential electrical components (such as contactors, relays, circuit breakers) from failure due to the accumulation of dust and particulate materials (GDC 17). This is accomplished by the roughing prefilters and filters of the supply air units of the SBVSE as described in Section 9.4.6.

The release of radioactive materials to the environment is controlled by meeting the guidance of RG 1.52 (position C.3) (GDC 60). Upon receipt of a high radiation alarm in the hot mechanical areas of the SBs (refer to Table 11.5-1, Monitor R-25), the SBVS will direct the exhaust air (accident exhaust) through NABVS activated charcoal filtration beds located in the NAB prior to release through the ~~plant~~vent stack.~~–~~

Filtration during normal operation is provided by the NABVS by meeting the guidance of RG 1.140 (positions C.2 and C.3). Refer to Section 9.4.3.

Capability for withstanding or coping with a station blackout (SBO) event is provided to comply with the requirements of 10 CFR 50.63. Acceptance is based on meeting the applicable guidance of RG 1.155, including position C.3.2.4. Refer to Section 8.4 for a description of the design features to cope with the SBO event.

The SBVS provides isolation and confinement of the hot mechanical areas of the SBs. The system also provides reduction of a possible radioactive release into the environment.

In case of fuel handling accident in the FB, the exhaust air (accident air) from the FB fuel pool area ~~and the hot mechanical area of the SB~~ is directed through the SBVS activated charcoal filtration beds located in the FB prior to release through the vent ~~plant~~ stack.

On receipt of containment isolation signal, the SB hot mechanical areas are isolated and the SBVS iodine filtration trains are initiated. ~~the NABVS supply and exhaust isolation dampers are closed to limit leakage out of the FB.~~ The SBVS maintains negative pressure in the FB and SB hot mechanical areas to capture potential bypass leakage from primary containment. The exhaust air is directed to the SBVS iodine filtration trains before being released into the environment ~~air from the FB is directed to the SBVS iodine filtration trains~~ (refer to Section 9.4.2).

The SBVS can be used for containment building ventilation system (CBVS) low flow containment purge in an emergency for redundancy to the CBVS iodine filtration trains (refer to Section 9.4.7).

The seismic design of the system meets the guidance of RG 1.29 (position C.1 for the safety-related portions and position C.2 for the non-safety-related portions).

Air conditioning and heating loads for the SBVS rooms are calculated using methodology identified in ASHRAE Handbook (Reference 11).

- Summer air conditioning loads will be calculated with a maximum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1). The analysis will be completed for both a normal and accident plant alignment configuration.
- The recirculation cooling units are designed to provide cooling as required to prevent the SBVS room temperatures from exceeding their maximum design temperature.
- Winter heating loads are calculated with the plant operating in an outage alignment configuration. Winter heat loads will be calculated with a minimum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1).

~~The SBVS performs the following important non-safety-related system functions:~~

- With outside air ambient design temperature conditions of -40°F to 115°F, the SBVS maintains the following temperature and humidity ranges for the areas serviced.
  - Minimum temperature 50°F.
  - Maximum temperature 104°F.
  - Humidity ~~25~~10 to 60~~70~~ percent.
- ~~Controls and maintain a negative pressure within the hot mechanical areas of Safeguard Buildings relative to the outside environment.~~

The SBVS performs the following safety-related system functions:

- Controls and maintains a negative pressure within the hot mechanical areas of Safeguard Buildings and Fuel Building relative to the outside environment during accident conditions.
- Maintains acceptable ambient conditions for the safety-related components in the hot mechanical rooms in the SB during accident conditions, taking into account internal and external heat loads.

- Maintains acceptable ambient conditions inside the emergency feed water system (EFWS) pumps and component cooling water system (CCWS) ~~component~~valve rooms of the SB during accident conditions, taking into account internal and external heat loads.

- Maintains a negative pressure and filters the hot mechanical areas of Safeguard Buildings and Fuel Building upon receipt of a containment isolation signal

The SBVS performs the following ~~important~~ non-safety-related system functions:

- Controls and maintains a negative pressure within the hot mechanical areas of Safeguard Buildings relative to the outside environment during normal plant operation and plant maintenance.

- Maintains acceptable ambient conditions (temperature and humidity) in the SB hot mechanical rooms for equipment operation and personnel comfort during normal plant operation and plant maintenance.

- Ventilates the hot mechanical rooms in the SB to maintain a good working environment for personnel in these areas during normal plant operation and plant maintenance.

- Provides personnel comfort heating for the service access areas and the stairwell areas during normal plant operation and plant maintenance.

9.4.5.2 System Description

9.4.5.2.1 General Description

The SBVS is composed of following subsystems:

- SB controlled-area air supply subsystem (see Figure 9.4.5-1).

- SB controlled-area exhaust air subsystem (see Figure 9.4.5-2).

The SBVS provides ventilation and cooling to the hot mechanical areas of the four divisions of the SBs. The SB divisions one and four are located on opposite sides of the RB, while SB divisions two and three are housed together and located next to the RB.

~~The SBVS supplies conditioned air for ventilation to the mechanical area of the SB, divisions one, two, three and four.~~ During normal operation the conditioned air supply to the hot mechanical areas of the SBs ~~SB divisions~~ is provided independently for each division by the SBVSE (refer to Section 9.4.6). The supply duct of each SB division is equipped with two isolation dampers and one pressure ~~volume~~ control damper. The conditioned air is supplied to the ~~cold and~~ hot mechanical areas ~~at all levels of the four SBs~~ via a ductwork distribution network. The flow rate to each room is calculated based on the minimum air renewal rate, equipment heat loads and heat balance between the rooms to make sure that ambient conditions are maintained within prescribed limits for operation of equipment and the safety and comfort of personnel.

The SBVS air supply and exhaust flows are designed to prevent the spread of airborne contamination and to maintain a negative pressure in the hot mechanical areas of the SBs with respect to the outside environment.

The SBVS has two separate modes of exhaust:

- Operational Air Exhaust Mode–The exhaust air (normal exhaust) from all four divisions of the SBs (hot mechanical areas) connects to a single concrete duct in the annulus, which then runs via the FB and connects to the exhaust duct of the NABVS. The exhaust duct of each SBVS train ~~division~~ is equipped with two isolation dampers and one volume control damper. The exhaust air is processed by the NABVS through a filtration train prior to release through the vent~~plant~~ stack (refer to Section 9.4.3). If high radiation is detected in the SBVS exhaust duct by monitor R-25, the exhaust is diverted to one of the NABVS iodine filtration trains and released through the vent stack.

- Accident Air Exhaust Mode–If airborne contamination is detected in any of the four hot mechanical areas of the SBs or there is a containment isolation signal, the SBVS will automatically direct the exhaust air (accident exhaust) via four separate exhaust air ducts, ~~and~~ each with two parallel isolation dampers, to one common concrete duct in the annulus. This exhaust duct connects to two accident iodine exhaust filtration trains located in the FB. The exhaust air is processed through one of two redundant and independent iodine filtration trains prior to release through the vent ~~plant~~ stack. Each iodine filtration train includes inlet and outlet dampers, moisture separator, two stage electric heater, prefilter, ~~inlet and outlet~~ high efficiency particulate air (HEPA) filter~~s~~, carbon adsorber, post filter, exhaust fan, and backdraft damper. The fans direct the exhaust air to the vent~~plant~~ stack.

In case of a fuel handling accident in the FB, the accident exhaust air from ~~these buildings~~the FB fuel pool area is directed and filtered through the SBVS iodine exhaust filtration trains located in the FB, and released through the vent ~~plant~~ stack. (Refer to Section 9.4.2.)

In case of a fuel handling accident in containment, the SBVS can act as backup to the CBVS low flow purge exhaust system (Refer to Section 9.4.7).

In case of containment isolation signal, the SBVS maintains a negative pressure and filters all areas of the FB and the hot mechanical area of the SB in addition to performing the SBVS accident air exhaust filtration function.

The supply and exhaust duct network of the hot mechanical area in the SBs is equipped with isolation dampers to isolate the following areas from the other rooms:

- Rooms where safety injection and residual heat removal system components in divisions one through~~and~~ four are installed.

- Rooms where severe accident heat removal system components in division four are installed.
- Personnel air lock area in division two.

Recirculation cooling units are provided for the following rooms where high heat load equipment is located:

- Rooms in the SB, divisions one through four, where safety injection and residual heat removal system components are installed.
- Valve rooms in the SB, divisions one through four, where component cooling water system and emergency feedwater system components are installed.
- Rooms where hydrogen and containment atmosphere monitoring system (divisions one ~~and~~ through four), and severe accident sampling system (division four) components are installed.

Electric ~~air heating convectors~~heaters are provided in the service corridors, interconnecting passageway, and stairways to maintain the minimum allowable temperatures in these areas.

The SBVS is designed to circulate sufficient air to prevent accumulation of flammable or explosive gas or fuel-vapor mixture from components such as storage batteries and stored fuel.

Refer to Section 12.3.6.5.6 for ventilation system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

9.4.5.2.2 Component Description

The major components of the SBVS are listed below, along with the applicable code and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the SBVS.

Ductwork and Accessories

The main supply and exhaust air shafts are constructed of concrete with painted surfaces. The air supply and exhaust duct branches for each area are fed from the main supply and exhaust air shafts. These ducts are constructed of steel and structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction requirements per ASME AG-1 (Reference 2).

Electric ~~Air Heating Convectors (Area~~ Heaters~~)~~

~~The e~~Electric~~al~~ ~~air heating convectors~~ heaters are installed to maintain room ambient conditions. The ~~convectors~~ heaters are controlled by local room temperature sensors and control circuits.

Moisture Separator

The moisture separator meets the requirements of RG 1.52 (Reference 10), ANSI/ASME N509 (Reference 9), and ASME AG-1 (Reference 2). The moisture separator is located upstream of the filter air heater and the prefilter to protect the HEPA filter and carbon adsorber from potentially high humidity level by removing the entrained water droplets from the inlet air stream. The moisture separator design shall be qualified by testing in accordance with the procedure described in ANSI/ASME N509.~~The moisture separator is a combination of moisture separator and prefilter. The moisture separator must meet the requirements of RG 1.52 (Reference 10), ASME N509 (Reference 9), and ASME AG-1 (Reference 2). The moisture separator is located upstream of the filter air heater and the HEPA prefilter. The moisture separator shall be a design that has been qualified by testing in accordance with the procedures described in Reference 9.~~

Filter Air Heaters

Two stage electric heaters are located upstream of HEPA and iodine filtration units to prevent excessive moisture accumulation in the charcoal filter beds. At the start of an accident, full power of two stage electric heater is switched on when the fans start and filter bank isolation dampers open. As the negative pressure is drawn in the FB and SB, and when the temperature downstream of heater increases to 158°F, one step of heater power is switched off automatically. As the temperature downstream of heater reaches 176°F, second step of the heater is also switched off automatically. The heaters meet the requirements of ASME AG-1 (Reference 2).

Prefilters

The prefilters are located upstream of the HEPA filters and collect large particles to increase the useful life of the ~~high efficiency~~ HEPA filters. The prefilters meet the requirements of ANSI/ASHRAE Standard 52.2~~-1999~~ (Reference 3).

HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with ASME AG-1 (Reference 2). The periodic inplace testing of HEPA filters to determine the leak tightness is performed per ANSI/ASME N510~~-1989~~ (Reference 4).

Adsorbers

Carbon adsorbers are used to remove radioactive iodine from the exhaust air. The efficiency for removal of methyl iodine is based on the decontamination efficiency assigned during the laboratory tests. The periodic inplace testing of adsorbers to determine the leak-tightness is performed per Reference 4.

Post Filters

The post filter is located downstream of the carbon adsorber. During operation of the carbon filtration exhaust, the air flow rate will be low through the carbon adsorber to prevent spread of the carbon dust. However, the post filter ensures that carbon dust or carbon fines are removed prior to the air being distributed further. The post filter meets the requirements of ASME AG-1 (Reference 2), and has an average atmospheric dust efficiency of 95% in accordance with ANSI/ASHRAE Standard 52.2 (Reference 3). The post filter is equipped with differential pressure measurement which indicates the degree of particulate loading and the need for filter change.

Fans

The supply and exhaust fans are centrifugal or vane-axial design with electrical motor drivers. Fan performance is rated in accordance with ANSI/AMCA 210-99 (Reference 5), ANSI/AMCA 211-1987 (Reference 6), and ANSI/AMCA 300-1985 (Reference 7).

Isolation Dampers

Manual dampers are adjusted during initial plant startup testing to establish accurate air flow balance between the rooms. The motor-operated isolation dampers will fail as-is in position in case of power loss. Backdraft dampers prevent air flow to non-operating air supply and exhaust trains. The performance and testing requirements of the dampers are per ASME AG-1 (Reference 2).

Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of UL 555NFPA 80 (Reference 8) and NFPA 90A (Reference 17) and the damper fire rating is commensurate with the fire rating of the barrier penetrated. Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

Recirculation Cooling Units

The recirculation cooling units consist of a fan section, a water cooling section, and a moisture separator. The fan is driven by an electric motor. The cooling coils are finned coil type and are connected to the safety chilled water system (SCWS). The total cooling capacity for the SBVS recirculation cooling units is as follows:

- KLC 51/54 AN001

  64,800 Btu/hr.

- KLC 51/54 AN002

32,400 Btu/hr.

- KLC 51/54 AN003

  21,600 Btu/hr.

- KLC 52/53 AN001

  54,000 Btu/hr.

- KLC 52/53 AN002

  32,400 Btu/hr.

The cooling coils are designed in accordance with ASME AG-1 (Reference 2). The moisture separator collects condensate which is directed to drain system.

9.4.5.2.3 System Operation

Normal Plant Operation

During normal plant operation, the fresh conditioned air is supplied to four divisions of the SBs independently for each division by the SBVSE (refer to Section 9.4.6). The isolation dampers on each supply duct are in the open position and the pressure~~volume~~ control dampers on each supply duct are set to a flow rate in order to maintain a negative pressure in the controlled areas compared to the atmospheric pressure.

The room air conditioning is obtained by the supply and exhaust air flows based on the minimum air renewal rate, equipment heat load, and heat balance between the rooms. The air is heated or cooled to maintain the required ambient conditions of the rooms.

The operational air exhaust from the four divisions of the SBs (hot mechanical area) is processed by the NABVS. The isolation dampers on each exhaust duct are in open position, and the volume control dampers on each exhaust duct are pre-set to an air flow rate that maintains a~~set to a flow rate in order to maintain~~ negative pressure in the controlled areas.

The accident air exhaust isolation dampers are in open position, and the iodine filtration trains located in the FB are in a standby mode.

Isolation dampers for switching the fuel handling accident exhaust from both FB and Containment Building are in the closed position.

The associated dampers for the following areas are in the open position:

- Supply and exhaust air flow to the rooms where safety injection and residual heat removal system equipment is located in divisions 1 through~~and~~ 4.

- Supply and exhaust air flow to the rooms where severe accident heat removal system components are located in division 4.
- Supply and exhaust air flow to and from the personnel air lock area in division 2.

A negative pressure is maintained in the SB controlled areas. A negative pressure is also maintained for the iodine risk rooms (safety injection, residual heat removal, and severe accident heat removal systems equipment rooms) relative to the outside environment. The air supplied to the SB controlled areas by the electrical division of the safeguard building ventilation system (SBVSE) is automatically adjusted by a damper in the supply air ducting that receives a pressure control signal, which maintains a negative pressure in the SB controlled areas, relative to the outside environment (ambient pressure). The SBVS maintains the non-controlled areas of the SB Electrical Division at ambient pressure. This system design configuration maintains potentially contaminated SB controlled areas at a negative pressure, relative to the clean areas of the non-controlled areas of the SB Electrical Division.

The electrical air heating convectors heaters are used in the service corridors, interconnecting passageway, and stairways to maintain comfortable temperatures in these areas. The operation of convectorsfan heaters is automatically controlled by the temperature sensors located in these areas.

The recirculation cooling units provide recycled cool air to the rooms where high heat load equipment is located. The operation of recirculation cooling units is automatically controlled by the temperature sensors located in these rooms.

Plant Outage Condition

During the plant outage condition, the system configuration will remain the same as during normal plant operation except the following:

- Air supply and exhaust of the rooms where the safety injection and residual heat removal systems equipment are located in hot mechanical areas of the SB divisions 1 throughand 4 are isolated by closing the associated dampers.
- If the personnel air lock is open, the supply air flow continues in service and the associated isolation dampers remain open. The exhaust air from the personnel air lock area is stopped by closing the associated exhaust isolation damper. The supply air travels through the air lock into the containment and is exhausted by the containment building ventilation system.the air supply and exhaust air flow to and from the personnel air lock area is placed in service by manually closing or opening the associated dampers.
- If maintenance is performed on the equipment or systems which pose delayed iodine release hazard, the exhaust air from these areas is diverted to the iodine filtration plenum of the NABVS prior to discharge through the ventplant stack (refer to Section 9.4.3).

Abnormal Operating Conditions

Loss of Recirculation Cooling or Area Ventilation

Failure of recirculation cooling or area ventilation in one SB division has no effect on safety function of SBVS since other three unaffected SB divisions are capable of performing the necessary safety function.

Two supply and exhaust dampers are provided for isolation of the hot mechanical area of each SB division. If one damper fails, the other damper can perform the safety function.

Loss of an Accident Iodine Exhaust Filtration Train

The SBVS provides two accident exhaust iodine filtration trains. Failure of one filtration train has no effect since the unaffected train can perform the necessary filtration function.

Redundant switching dampers are arranged in parallel configuration. As such failure of one damper has no consequence since the unaffected damper can perform the necessary function.

The fuel handling accident exhaust in the RB can be provided by the exhaust filtration trains of CBVS (refer to Section 9.4.7).

Loss of Offsite Power

The following equipment will remain operational during loss of offsite power (LOOP). The power supply for this equipment is supplied from the corresponding emergency diesel generators.

- Dampers in all SBVS trains~~divisions of SB~~.
- Iodine exhaust filtration trains located in the FB.
- Dampers to the zones that need to be isolated and confined.

Station Blackout

Station black out (SBO) does not lead to release of radioactivity inside the SB, FB and RB. The system filtering function is therefore not required during SBO. However, the following components are supplied from the SBO diesel generators alternate AC (AAC) power:

- Normal operation ~~S~~supply and exhaust air ~~control~~isolation dampers ~~to~~for the ~~controlled~~hot mechanical areas in SB divisions one ~~and~~through four~~,~~ to isolate ~~air supply~~these areas when exhaust is not in operation due to SBO.

- Recirculation cooling units in the SB divisions one and four, where the EFW valves are located.

Loss of Ultimate Heat Sink

During loss of ultimate heat sink (LUHS), the air flow of the recirculation cooling units is cooled by the chilled water provided by the SCWS. Two water-cooled chillers are located in SB divisions two and three, and two air-cooled chillers are located in SB divisions one and four. In case of LUHS, the water-cooled chillers are not available. With the safety chilled water divisions 1/2 or divisions ~~and~~ 3/4 interconnect, the safety chilled water is then supplied by air-cooled chillers which provide the cooling function for the recirculation cooling units located in divisions one, two, three and four.

Loss of Coolant Accident

Upon receipt of a containment isolation signal, the following functions are initiated automatically:

- Closes SBVS supply air isolation dampers from SBVSE.
- Closes SBVS exhaust air isolation dampers to NABVS.
- Opens SBVS exhaust air isolation dampers to exhaust air from the hot mechanical areas of SB and the FB to the SBVS Accident Exhaust Iodine Filtration Trains (located in the FB).
- Opens isolation dampers for the SBVS Accident Exhaust Iodine Filtration Trains.
- Starts SBVS iodine filtration train fans to pull air through SBVS Accident Exhaust Iodine Filtration Trains and to direct exhaust air to the vent stack.

In the event of a LOCA, the containment isolation signal initiates isolation of the FB from NABVS supply and exhaust duct to limit leakage into the FB. The SBVS maintains a negative pressure in the FB and exhaust air from the FB is directed to the SBVS iodine filtration trains (refer to Section 9.4.2).

Iodine Presence in the SB Rooms

In the event of a failed fuel element and residual heat removal pump seal leakage, high iodine is expected to be present in only one of the four SB divisions at a time, and it is necessary to purify the air in this division for personnel access. The air supply and exhaust flow for the affected division is increased to purge the possibly contaminated areas, while air supply and exhaust for the other three divisions is decreased. This is achieved by ~~opening or closing the isolation dampers and~~ partially opening the exhaust volume control dampers and by partially closing the exhaust volume control dampers of the other three divisions in order to maintain an acceptable total exhaust air flow to the NABVS iodine filtration train. The airflow is diverted within the normal exhaust pathway to the NABVS iodine filtration train on a high activity alarm from the radiation detector in the NABVS normal exhaust duct.

Fuel Handling Accident in the FB

In the event of a fuel handling accident in the FB, the exhaust air from the FB is processed through the SBVS iodine filtration trains located in the FB. The damper configuration is as follows:

- Associated dampers in the ducts from the FB to the SBVS filtered exhaust are in the open position.
- Associated dampers in the ducts from the RB to the SBVS filtered exhaust are in the closed position.
- Associated dampers for the SBVS accident air exhaust to the SBVS filtered exhaust are in the closed position.
- One (or both) SBVS iodine filtration trains are in service.

Fuel Handling Accident in the RB

In the event of a fuel handling accident in the Reactor Building, the personnel air lock isolation dampers are automatically closed. In the event of a fuel handling accident in the RB, ~~the exhaust air from the RB is processed through~~ the SBVS ~~iodine filtration trains located in the FB~~can provide backup filtration for the CBVS. The damper configuration is as follows:

- Associated dampers in the ducts from the RB are in the open position.
- Associated dampers in the ducts from the FB are in the closed position.
- Associated dampers for the SBVS accident air exhaust from the SB are in the closed position.
- One (or both) SBVS iodine filtration trains are in service.

Residual Heat Removal System Break outside Containment

The rooms inside SB divisions one through ~~and~~ four containing the residual heat removal (RHR) equipment and piping are equipped with isolation dampers in the supply and exhaust air ducts. These dampers are manually closed during RHR operation to prevent the spread of steam and airborne contamination due to a pipe failure.

Operation of Containment Heat Removal System in Severe Accidents

The rooms inside SB division four containing the severe accident heat removal system equipment are isolated from the other rooms by closing the associated dampers located in the supply air ducts for each room.

9.4.5.3 Safety Evaluation

The SBVS is designed to maintain ambient conditions in ~~areas of~~ the hot mechanical areas of the SB divisions one through four (refer to Section 11.5.3.1.9 and Table 11.5-1, Monitor R-25) one through four where engineered safety equipment is located. This permits personnel access and allows safe operation of the equipment during normal plant operation, outages, and under all anticipated occupational occurrences, including postulated accident events.

The SBVS provides isolation and confinement of the hot mechanical areas of the SBs (refer to Section 11.5.3.1.9 and Table 11.5-1, Monitor R-25). Two isolation dampers and one volume control damper are provided in the supply and exhaust ducts to make sure that hot mechanical areas can be purged or isolated without any leakage. The hot mechanical areas of the SBs and Fuel Building are maintained at negative pressure with respect to the outside atmospheric air pressure. The system also provides reduction of radioactive release into the environment.

Each recirculation cooling unit for SB divisions one through four operates independently of the recirculation cooling unit in the other divisions. In case of a recirculation cooling unit failure of one train~~inside one division~~, the recirculation cooling units for the other three trains ~~divisions~~ are unaffected.

Upon receipt of a high radiation alarm in the hot mechanical areas of the SBs (refer to Section 11.5.3.1.9 and Table 11.5-1, Monitor R-25), the SBVS directs the exhaust through the NABVS activated charcoal filtration beds located in the NAB prior to release through the vent ~~plant~~ stack. Sufficient redundancy provides reasonable assurance of proper system operation with one active component out of service.

Confinement of the four SB hot mechanical areas and startup of the SBVS accident iodine filtration trains is initiated by the safety automation system (SAS) signal.

Isolation dampers in the supply and exhaust ducts are provided for the SB division one through four rooms where safety injection and residual heat removal system equipment is located. These dampers close during RHR operation to prevent the spread of steam and airborne contamination due to a RHR system pipe failure.

Redundant components are powered from different electrical divisions to remain available in case of failure of one division. As a backup, power is supplied to the engineered safety equipment by the emergency diesel generators (EDG).

Capability for withstanding or coping with an SBO event is met by the design of the AAC power source satisfying the ten minute criteria; (i.e., the AAC power source can be started from the main control room (MCR) within ten minutes of the onset of an SBO event). The SBO diesel generators are designed to operate for a minimum of eight ~~twenty-four~~ hours with available onsite fuel supplies.

9.4.5.4 Inspection and Testing Requirements

The SBVS major components, such as dampers, motors, fans, filters, coils, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Test and analysis will be completed during normal operation with the system operating in an accident alignment. Analysis will use as-built information from equipment to extrapolate the performance of the air-conditioning system. Analysis will show that the equipment performance is adequate to maintain design conditions during plant operating conditions.

Initial in-place acceptance testing of the SBVS is performed as described in Section 14.2 (test abstracts #083 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The SBVS designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of SBVS is performed to demonstrate system and component operability and integrity.

Isolation dampers are periodically inspected and damper seats replaced as required.

Per IEEE 334 (Reference 12), type tests of continuous duty class 1E motors for SBVS are conducted to confirm ESF system operation and availability.

Recirculation cooling units and fans are tested by manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 5, 6, and 7). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 3). Cooling coils are hydrostatically tested in accordance with ASME AG-1 (Reference 2) and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 13).

Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 14), American Society of Mechanical

Engineers, ANSI/ASME N510 (Reference 4), ASME AG-1 (Reference 2), and RG 1.52 (Reference 10).

Emergency filtration units are tested by manufacturer for housing leakage, filter bypass leakage and airflow performance. Periodically and subsequent to each filter or adsorber material replacement, the unit is inspected and tested in-place in accordance with the requirements of RG 1.52 (Reference 10), ANSI/ASME N510 (Reference 4) and ASME AG-1 (Reference 2). The charcoal adsorber samples are tested for efficiency in accordance with RG 1.52 (Reference 10) and ASTM D3803 (Reference 15). Air filtration and adsorption unit heaters are tested in accordance with ANSI/ASME N510 (Reference 4).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

In-service test program and test frequency requirements are described in Section 16, "Technical Specification" Subsection 3.7.12 and per Ventilation Filter Test Program (VFTP) described in Section 16, "Technical Specification" Subsection 5.5.10.

9.4.5.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the MCR. Fans, motor-operated dampers, heaters and cooling units are operable from the MCR. Local instruments are provided to measure differential pressure across filters, flow, temperature and pressure. The fire detection and sensors information is delivered to the fire detection system. The radiation instrumentation requirements for controlling airborne radioactivity releases via the ~~plant~~vent stack are addressed in Section 11.5.3.1.9 and Table 11.5-1, Monitor R-25.

The minimum instrumentation, indication and alarms for the SBVS ESF filter system are provided in Table 9.4.5-1 per the requirements of ANSI/ASME N509 (Reference 9).

9.4.5.6 References

1. NUREG-CR/0660, Boner, G.L. and Hanners, H.W., “Enhancement of Onsite Emergency Diesel Generator Reliability,” (subsection A–item 2, and subsection C-item 1), University of Dayton Research Institute UDR-TR-79-07 for U.S. Nuclear Regulatory Commission, January 1979.

2. ASME AG-1, “Code on Nuclear Air and Gas Treatment,” The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, “Housings” Addenda).

3. ANSI/ASHRAE Standard 52.2-1999, “Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size,” American National

Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

4. ANSI/ASME N510-1989 (R1995), "Testing of Nuclear Air-Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

5. ANSI/AMCA Standard -210-99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, December 1999.

6. ANSI/AMCA Publication -211-1987, "Certified Ratings Program – Air Performance," American National Standards Institute/Air Movement and Control Association International, 1987.

7. ANSI/AMCA Standard -300-1985, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, 1985.

8. NFPA 80, "Standard for Fire Doors and Other Opening Protectives," National Fire Protection Association Standards, 2007.UL 555, "Standard for Fire Dampers," Underwriters Laboratories, Sixth Edition, June 1999.

9. ANSI/ASME N509-1989, "Nuclear Power Plant Air Cleaning Units and Components," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

10. Regulatory Guide 1.52, Revision 3, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," U.S. Nuclear Regulatory Commission, June 2001.

11. "ASHRAE Handbook Fundamentals," American Society of Heating, Refrigeration, and Air Conditioning Engineers, Inc., 2005.

12. IEEE 334-1974, "IEEE Standard for Type Tests of Continuous-Duty Class 1E Motors for Nuclear Power Generating Stations," Institute of Electrical and Electronics Engineers, 1974.

13. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

14. "HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

15. ASTM D3803-1989, reapproved 1995, "Standard Test Method for Nuclear Grade Activated Carbon," 1989.

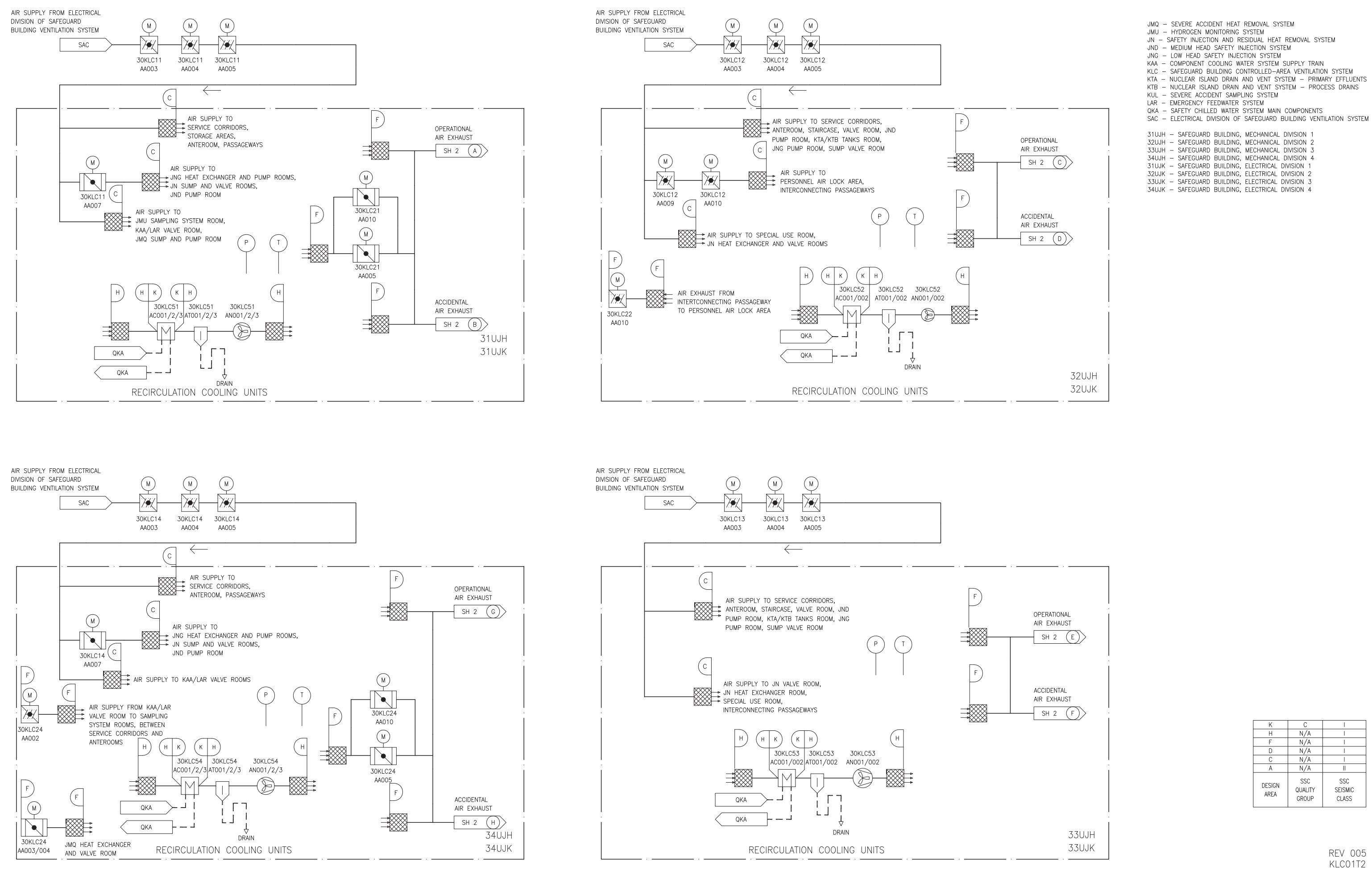
16. Deleted.ERDA 76-21, "Nuclear Air Cleaning Handbook," Oak Ridge National Laboratory, 1976.

17. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilation Systems," National Fire Protection Association Standards, 2002.

Table 9.4.5-1—Minimum Instrumentation, Indication and Alarm Features for SBVS (Accident Iodine Exhaust Filtration Trains)

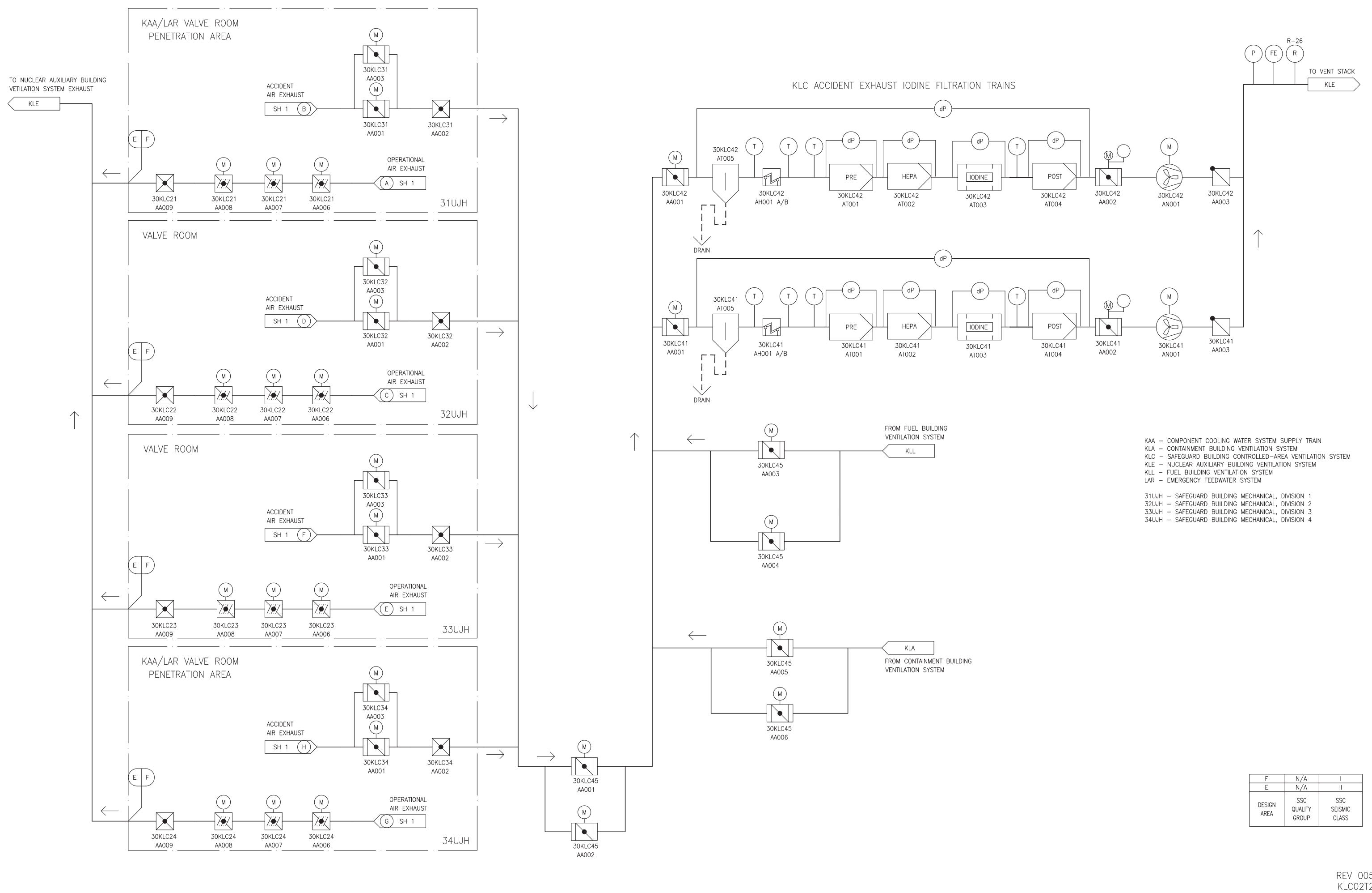
Sensing Location	Local Indication/Alarm	MCR Indication/Alarm
~~Unit Inlet Moisture Separator~~	~~Pressure Drop Indication~~	
Electric Heater Inlet	Temperature Indication	
Electric Heater	Status Indication	Status Indication
Electric Heater Outlet	Temperature Indication	Temperature Indication / High Temperature Alarm
Prefilter	Pressure Drop Indication / High Alarm	
~~Upstream~~ HEPA	Pressure Drop Indication / High Alarm	
Adsorber	Pressure Drop Indication / High Alarm	
Adsorber Outlet	Temperature Indication	Temperature Indication / High Temperature Alarm
Post Filter	Pressure Drop Indication / High Alarm	
System Filters Inlet to Outlet		Summation of pressure drop across entire filtration train (Indication / High Pressure Drop Alarm)
Fan	Pressure Drop Indication	Handswitch / Status Indication
Damper / Operator	Position Indication	Position Indication
Unit Outlet	Flow Rate Indication	Flow Rate (recorded indication, high alarm signal)
Unit Outlet	Radiation Indication	Radiation Indication / High Radiation Alarm

Figure 9.4.5-1—Safeguard Building Controlled-Area Ventilation System Air Supply Subsystem



DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS
K	C	I
H	N/A	I
F	N/A	I
D	N/A	I
C	N/A	I
A	N/A	II

Figure 9.4.5-2—Safeguard Building Controlled-Area Ventilation System Exhaust Air Subsystem



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9.4.6 Electrical Division of Safeguard Building Ventilation System (SBVSE)

The electrical division of the Safeguard Building (SB) ventilation system (SBVSE) is designed to maintain the ambient conditions for the safety-related electrical equipment, emergency feedwater pump rooms and component cooling water system component rooms in the SB during normal plant operation and accident conditions. The SBVSE also maintains the ambient conditions in the SB during maintenance operations and provides ventilation for the remote shutdown station (RSS) which is located in division 3 of the SB. Ventilation of the RSS can be provided by the SBVSE of the SB division 2 or division 3.

9.4.6.1 Design Bases

The SBVSE is primarily a safety-related system with portions serving non-safety-related functions. The safety-related portion is designed to Seismic Category I criteria. The non-safety-related portion of the SBVSE is designated as Non-Seismic category.

The U.S. EPR meets:

- GDC 2, as it relates to meeting the guidance of RG 1.29 (position C.1 for the safety-related portions of the SBVSE and position C.2 for those non-safety-related portions of which failure could reduce the functioning of any safety-related or Seismic Category I system components to an unacceptable safety level).
- GDC 3, as it relates to the SBVSE remaining functional following the postulated hazards of a fire. The SBVSE accomplishes this by the design and location of the system components to minimize the effect of fires and explosions. Noncombustible and heat-resistant materials are used wherever practical.
- GDC 4, as it relates to the SBVSE, by design, to protect against adverse environmental conditions and dynamic effects. The SBVSE accommodates the effects of, and is compatible with, the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents.
- GDC 5, as it relates to the SBSVE system because safety-related components are not shared with any other nuclear power units.
- GDC 17, as it relates to the SBVSE because the U.S. EPR design has an onsite electric power system and an offsite electric power system to permit functioning of structures, systems, and components important to safety in the event of postulated accidents and anticipated operational occurrences. In addition, the SBVSE maintains a minimum of 20 feet from the bottom of all fresh air intakes to grade elevation and the electrical cabinets are provided with suitable seals or gaskets. This is provided to maintain the proper functioning of the essential electric power system by meeting the guidelines of NUREG-CR/0660 (Reference 1) as related to the accumulation of dust and particulate material.

- 10CFR 50.63, as it relates to the SBSVE because during a station blackout (SBO), two of the four SBs are backed up by the SBO diesel generators alternate AC (AAC) power. An analysis to determine capability for withstanding or coping with a station blackout event as described by RG 1.155, position C.3.2.4, will be performed. The safety chilled water system (SCWS) chillers which provide cooling to the ~~division~~ trains 1 and 4 SBVSE air coolers and recirculation units are also powered by the SBO diesels and are available.

The SBVSE maintains acceptable ambient conditions in the SB during normal and SBO conditions. It ventilates the battery rooms in the SB during normal and SBO conditions to maintain the hydrogen concentration below the maximum allowable limits of RG 1.128 (Reference 11) and IEEE Std 484 (Reference 10). The SBVSE maintains hydrogen concentration levels in the battery rooms below one percent by volume. The SBVSE also ventilates the SCWS rooms during normal and SBO conditions to maintain the refrigerant concentration below the maximum allowable limits.

During normal plant operation, the SBVSE supplies air to the SB controlled areas. The flow of air is automatically adjusted by a damper in the supply air ducting that receives a pressure control signal, which maintains a negative pressure in the SB controlled areas, relative to the outside environment. The SBVS maintains the SBVSE ~~Electrical Division~~ at ambient pressure. With a negative pressure maintained in the SB controlled areas and an ambient pressure maintained in the SB Electrical Division, a clean air environment is sustained within the SB Electrical Division.

Following the receipt of a containment isolation signal, supply air to the SBVS~~E~~ is automatically closed to maintain isolation between the clean areas of the SB Electrical Division and the potentially contaminated SB controlled areas.

The SB Electrical Division is maintained as a clean air environment. In the event of an RCP thermal barrier failure or if radiation is detected within the component cooling water system (CCWS), the SBVSE can be shut down and isolated from the main control room. The affected areas can then be isolated to prevent the potential release of contaminants.

The SCWS chillers which provide cooling to the ~~division~~ trains 1 and 4 SBVSE air coolers and recirculation units are also powered by the SBO diesels and are available.

Air conditioning and heating loads for the SBVSE rooms are calculated using methodology identified in ASHRAE Handbook (Reference 3).

- Summer air conditioning loads will be calculated with a maximum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1). The analysis will be completed for both a normal and accident plant alignment configuration.

- The cooling supply units are designed to provide cooling as required to prevent the SBVSE room temperatures from exceeding their maximum design temperature.

- Winter heating loads will be calculated with the plant operating in an outage alignment configuration. Winter heat loads will be calculated with a minimum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1).

- The SBVSE supply air duct heaters are designed to operate as required when the supply air temperature is less than the minimum set point value.

With outside air ambient design temperature conditions of -40°F to 115°F, the SBVSE maintains the following temperature and humidity ranges for the areas serviced.

Room	Temperature	Humidity
Rest Rooms, changing rooms	65°F - 78°F	10 - 60%
RSS	65°F - 78°F	10 - 60%
Switchgear Rooms	59°F - 104°F	10 - 60%
Cable Floor	41°F - 95°F	10 - 60%
I&C Equipment Room	68°F - 82°F	10 - 60%
Battery Rooms	65°F - 77°F	10 - 60%
HVAC Rooms	50°F - 95°F	10 - 80%
All other areas~~Cold Mechanical Areas, Emergency Feedwater Pump Rooms, and Component Cooling Water Pump Rooms~~	41°F - 104°F	10 - 60%
~~Corridors~~	~~50°F - 104°F~~	~~10 - 60%~~

The SBVSE performs the following safety-related system functions:

- Maintains acceptable ambient conditions for the safety-related components in the electrical and instrumentation and controls (I&C) rooms in the SB during accident conditions, taking into account internal and external heat loads.

- Maintains acceptable ambient conditions inside the emergency feed water system (EFWS) pumps and component cooling water system (CCWS) component rooms of the SB during accident conditions, taking into account internal and external heat loads.

- Ventilates the battery rooms and SCWS rooms in the SB to maintain the hydrogen and refrigerant concentration below maximum allowable limits during accident conditions.

The SBVSE performs the following ~~important~~ non-safety-related system functions:

- Maintains acceptable ambient conditions (temperature and humidity) in the SB for equipment operation and personnel comfort during normal plant operation and plant maintenance.
- Ventilates the battery rooms and safety chilled water system rooms in the SB to maintain the hydrogen concentration and the refrigerant concentration below maximum allowable limits during normal plant operation and plant maintenance.

For non-safety-related equipment located in the same room with safety-related equipment, the seismic classification for the non-safety-related equipment is described in Section 3.7.3.8 for interaction of Seismic Category I subsystems.

9.4.6.2 System Description

9.4.6.2.1 General Description

The heating, ventilation and air conditioning (HVAC) of each electrical division (SBs 1 through 4) is provided by a separate and independent SBVSE train. In the normal operation state of the system, these functions are provided by a safety-related train. The SBVSE schematic diagram is shown in Figure 9.4.6-1 through Figure 9.4.6-4. Figure 9.4.6-1 and Figure 9.4.6-2 are simplified diagrams of the air intake, and the air supply and exhaust for SB divisions 1 and 4. Similarly, the simplified diagrams for SB divisions 2 and 3 are provided in Figure 9.4.6-3 and Figure 9.4.6-4.

During maintenance, the SBVSE functions are provided by a maintenance train. One maintenance train is located in division 1, the other in division 4. The maintenance train located in division 1 is common for divisions 1 and 2 and the maintenance train located in division 4 is common for divisions 3 and 4. An independent exhaust maintenance train is provided for the battery rooms and SCWS rooms for each division, 1 through 4.

The SBVSE consists of a supply and exhaust circuit with the ability to operate in recycling mode with fresh air makeup. The system can be operated with or without recycled air depending on the outside air temperature.

The system also ventilates the remote shutdown station (RSS) which is located in division 3. Ventilation of the RSS can be provided by SBVSE of division 2 or division 3.

The EFWS and CCWS pump rooms have high internal heat loads when the pumps are running and are provided with recirculation cooling units.

Additional electric heaters installed in supply air ducts are used to maintain the minimum temperatures in battery rooms and toilet rooms.

For each traindivision, the SBVSE consists of:

- A single air intake equipped with a damper and grilles. The SBVSE air intakes in SB divisions 2 and 3 are common for the main control room (MCR) air conditioning system (CRACS) (refer to Section 9.4.1) and with the smoke confinement system (SCS) of the same division (refer to Section 9.4.13).

- A safety-related air conditioning train. Mixing is done with control dampers, filtration with filters, heating with electric air heater, and cooling with air cooling coil,. The train also has the associated exhaust air train, with exhaust fan and control damper.

- A connection with a non-safety-related air conditioning train. Mixing is done with control dampers, filtration with filters, heating with electric air heater, cooling with air cooling coil, and ventilation with supply air fan. The train also has the associated exhaust air train, with exhaust fan and control damper.

- Cross-connected ducts between divisions 1 and 2 and divisions 4 and 3 for the HVAC supply and exhaust with the non-safety-related maintenance trains for use when one SBVSE safety-related train of division 2 or 3 is unavailable. Manual isolation dampers equipped with "opened" and "closed" limit switches are installed in the cross-connected ducts (i.e., supply and exhaust ducts of division 1 and 2 and division 3 and 4).

- Connections providing air to the mechanical controlled area (interface with SBVS).

- A single ductwork providing air to the electrical rooms and mechanical non-controlled rooms.

- Two independent exhaust ductworks:

  - The first exhaust ductwork is used for the rooms in the non-controlled area of the SB, except for rooms served by the second exhaust ductwork. It is connected to one of the two recirculation-exhaust fans. One of the fans is a safety-related fan and is located in the same division. The other is a non-safety-related fan for maintenance operation, which is common for the two combined divisions 1 and 2 (located in division 1) and the two combined divisions 3 and 4 (located in division 4). The exhaust air of transformers and inverters is directly exhausted through exhaust hoods above the equipment.

  - The second exhaust ductwork is used for the rooms which could accumulate specific gas (hydrogen in the battery rooms and refrigerant gas in the rooms of the SCWS) and for the non-controlled mechanical area. The air is directly exhausted outside using one of two exhaust fans (one safety-related fan, or one non-safety-related maintenance fan). For the battery rooms, a bypass connection to the recirculation/exhaust air path is provided with an isolation damper.

- A single air outlet equipped with dampers and air intake grilles (common for the entire exhaust air of all non-controlled HVAC systems of the same division, except toilet exhaust air of divisions 1 and 4).
- One independent exhaust duct used for toilets, the air being exhausted outside using one non-safety-related exhaust fan via a separate air outlet (divisions 1 and 4 only).
- One safety-related recirculation cooling unit (equipped with a cooling coil, droplet separator, and recirculation fan) for the emergency feedwater pump room.
- One safety-related recirculation cooling unit (equipped with a cooling coil, droplet separator, and recirculation fan) for the CCWS components rooms.

Refer to Section 12.3.6.5.6 for ventilation system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

9.4.6.2.2 Component Description

The major components of the SBVSE are described in the following paragraphs. Table 3.2.2-1 provides the seismic design and other design classifications for components in the SBVSE.

Supply Air System – Safety-Related Train

The supply air units are located in divisions 1 and 4 at elevation +39 ft and in divisions 2 and 3 at elevation +69 ft (also elevation +96 ft for air intake components). The components are installed in a sheet metal structure.

Each air conditioning train includes:

- Weather protection grilles, electrically heated to prevent ice formation.
- Dampers.
- Insect protection screens.
- Isolation damper, manually operated.
- Set of control dampers with electrical actuator.
- Prefilter.
- Final filter.
- Electric heater, with tubular elements, comprised of four heating stages.

- Air cooling coil of finned tube coil type has a total cooling capacity of 1,134,900 Btu/hr, supplied with chilled water by the SCWS of the same division.
- Droplet separator, connected to the nuclear island drain and vent system (NIDVS).
- Silencer on fan suction side, splitter type.
- Supply air fan, free wheel radial type, direct driven, with a design air flow of 29,500 scfm.
- Non-return damper.
- Silencer on fan discharge side, splitter type.

Recirculation-Exhaust Air – Safety-Related Train

The recirculation and exhaust air trains are located in divisions 1 and 4 at elevation +39 ft and in divisions 2 and 3 at elevation +69 ft.

Each train includes:

- Isolation dampers, manually operated.
- Recirculation and exhaust air fan, radial type, direct driven, with a design air flow of 29,500 scfm.
- Control damper with electrical actuator.
- Non-return damper.
- Isolation damper, manually operated.
- Dampers.
- Weather protection grilles.

Exhaust Air for Battery-Safety Chilled Water Room and Non-controlled Mechanical Area – Safety-Related Train

The exhaust air trains are located in divisions 1 and 4 at elevation +39 ft and in divisions 2 and 3 at elevation +69 ft.

Each train includes:

- Isolation damper, manually operated.
- Exhaust air fan, radial type, direct driven.
- Non-return damper.

- Isolation damper with electrical actuator.

Supply Air System – Maintenance Train

The maintenance train is non-safety-related. The supply air units are located in divisions 1 and 4 at elevation +39 ft. The components are installed in a sheet metal structure.

Each air conditioning train includes:

- Insect protection screen.
- Isolation damper, manually operated.
- Set of control dampers with electrical actuator.
- Prefilter.
- Roughing filter.
- Electric heater, with tubular elements, comprised of four heating stages.
- Air cooling coil of finned tube coil type, has a total cooling capacity of 1,134,900 Btu/hr supplied with chilled water by the operational chilled water system (OCWS).
- Droplet separator, connected to the NIDVS.
- Silencer on fan suction side, splitter type.
- Supply air fan, free wheel radial type, direct driven, with a design air flow of 29,500 scfm.
- Non-return damper.
- Silencer on fan discharge side, splitter type.

Recirculation-Exhaust Air – Maintenance Train

The maintenance train is non-safety related. The recirculation-exhaust air trains are located in divisions 1 and 4 at elevation +39 ft.

Each train includes:

- Isolation dampers, manually operated.
- Recirculation and exhaust air fan, radial type, direct driven, with a design air flow of 29,500 scfm.
- Control damper with electrical actuator.

- Non-return damper.
- Isolation damper, manually operated.

Exhaust Air for Battery/Safety Chilled Water Room and Non-controlled Mechanical Area – Maintenance Train

The maintenance train is non-safety related. The exhaust air trains are located in divisions 1 and 4 at elevation +39 ft and in divisions 2 and 3 at elevation +69 ft.

Each train includes:

- An isolation damper, manually operated.
- Exhaust air fan, radial type, direct driven.
- Non-return damper.
- Isolation damper with electrical actuator.

Recirculation Cooling Units – Safety Related

One recirculation cooling unit is provides cooling to the emergency feedwater pump room in the non-controlled mechanical area of each SB (1 through 4) at elevation -28 ft, 2 ½ in. Each of the four units consists of the following main components:

- Air cooling coil of finned tube coil type, supplied with chilled water by the SCWS.
- Droplet separator connected to the NIDVS.
- Recirculation fan, axial type, direct driven.

One recirculation cooling unit is assigned to the rooms of the component cooling water system equipment in the non-controlled mechanical area of each SB (1 through 4) and is located at elevation -28 ft, 2 ½ in. Each of the four units is designed as a fan coil unit and consists of the following main components:

- Air cooling coil of finned tube coil type, supplied with chilled water by the SCWS.
- Droplet separator, connected to the NIDVS.
- Recirculation fan, radial type, direct driven.

Exhaust Air – Non-Safety Related

One exhaust fan is assigned to the toilet rooms located in divisions 1 and 4 at elevation + 55 ft. The fans are located at elevation +81 ft with the following components:

- Exhaust fan, axial type, direct driven.

- Non-return damper.
- Isolation damper, manually operated.

9.4.6.2.3 System Operation

Normal Plant Operation

The SBVSE operates during normal plant operation and during outage conditions. The HVAC for each division (1 to 4) is provided by an air supply train and associated exhaust train (with the same safety classification). The normal operation for each division follows:

- The safety-related train is in service to provide filtration, heating, and cooling. Outside makeup air is supplied to each train of the SBVSE through a separate air intake. This outside air mixes with the recirculated air upstream of the supply air filters. The amount of outside air admitted depends on the outside air temperature and is automatically adjusted by control dampers. If required, air heating is performed by the electric ~~air~~ heater. Air cooling is performed by the air cooling coil. The supply air fan supplies the air to the rooms of the SB division.
- The maintenance train (non-safety-related) for supply air and exhaust air is shut down.
- Air is supplied to the non-contaminable rooms of the SB plus the hot (controlled) mechanical area, which is exhausted by the SBVS.
- Air is exhausted from all rooms, except the controlled area exhausted by the SBVS.
- Air is released from the rooms representing the risk of accumulation of specific gas (i.e., hydrogen in battery rooms and refrigerant gas in SCWS room) and the rooms of the ~~cold (i.e.,~~ non-controlled~~)~~ mechanical area to the outside by a dedicated exhaust fan.
- Exhaust air is released from the toilet rooms of division 1 and 4 to the outside, also by a dedicated exhaust fan.
- The exhaust air of the remaining rooms is collected and directed to the recirculation-exhaust fan where a portion of the air can be recirculated or directly discharged to the outside. The amount of air to be recirculated depends on the outside air temperature and is automatically adjusted by the control damper.
- Ventilation tasks of the RSS, located in division 3, are provided by the SBVSE of the neighboring division 2.
- The recirculation cooling units are in automatic operation, and the fans are operated in ON-OFF mode depending on the room temperature.
- Electric heaters in supply air ducts, for example for battery rooms, are in automatic operation and are operated in ON-OFF mode depending on the room temperature.

In summer, the SBVSE operates in an open circuit (i.e., fresh air) or in recirculation mode with fresh air makeup depending on the outside temperature. In winter, the system operates in recirculation mode with fresh air makeup depending on the outside temperature.

In the event that maintenance needs to be performed in one division of the SB, the operator shuts down the safety-related train of the affected division and switches over to the maintenance train. The function is provided by the non-safety-related maintenance train common for two divisions. During maintenance, operation of the SBVSE is the same as in normal operation except for the position of some isolation dampers, depending on the division where the maintenance is being performed.

Functionally, operation of the maintenance air conditioning train and exhaust train is identical to the operation of the safety-related air conditioning train and exhaust train.

Switchover can only be performed manually because the two HVAC trains are not redundant. The chilled water for the maintenance air conditioning train is supplied by the OCWS.

The combination of divisions in maintenance will not include divisions 1 and 2 at the same time, or divisions 3 and 4 at the same time. For this reason, the operation of the SBVSE is the same during maintenance of one division.

During simultaneous operation of the safety and maintenance trains (i.e., both trains of division 1 or both trains of division 4), the maintenance trains operate in recirculation mode with fresh air makeup.

Abnormal Operating Conditions

Ventilation Failures

The failure of a SBVSE component could result in the loss of one SBVSE train. For this reason the SBVSE trains of the four divisions are redundant. Three other safety-related trains are available. Because the safety-related trains are not connected to each other, the failure of one train will not affect another division. The concept of SBVSE train redundancy follows the general design concept of the four redundant SBs and safety systems contained therein.

Each SBVSE train is located in a separate enclosure and is independently powered to limit common mode active failures of multiple trains. Common mode failures of the SBVSE are minimized due to the diversity of fans of the safety-related trains (i.e., divisions 1 and 4 as opposed to divisions 2 and 3) and because of the diversity of the cooling and the heat sinks for the associated SCWS.

Failure of a SBVSE component will not adversely affect the operation of the interfacing systems SCWS or OCWS.

If the SBVSE in one division fails, switchover from the safety-related train to the maintenance train of either division 1 or 2 or division 3 or 4 is possible. Therefore, ventilation of electrical and I&C equipment in all divisions is provided even in case of failure of one of the four divisions.

Additionally, the SCWS has the same configuration as the SBVSE. If the SCWS in one division fails, switchover from the safety-related train to the maintenance train in either division 1 and 2 or division 3 and 4 is possible.

If a failure of a safety-related train of the SB is postulated during maintenance of an SB HVAC train, two SB trains remain available.

Loss of Offsite Power (LOOP)

In case of LOOP, fans and actuators of each safety-related train of the SBVSE (division 1 to division 4) are backed up by the corresponding emergency diesel generator.

Loss of Ultimate Heat Sink (LUHS)

For the SBVSE, the chilled water to the safety trains is provided by the SCWS, with the following key features:

- Two water-cooled chillers, cooled by the CCWS, in divisions 2 and 3.
- Two air-cooled chillers at elevation +39 ft in divisions 1 and 4.

In case of loss of ultimate heat sink (LUHS), the SCWS air-cooled chillers will continue to provide the cooling function of the SBVSE of the two divisions 1, 2, 3, and 4.

9.4.6.3 Safety Evaluation

The safety-related portion of the SBVSE is located in the associated SB. The SB is a Seismic Category I structure that is designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, external missiles, and other appropriate natural phenomena. Sections 3.3, 3.4, 3.5, 3.7, and 3.8 provide the bases for the adequacy of the structural design of this building.

The safety-related portion of the SBVSE is designed to remain functional after a safe shutdown earthquake (SSE). Sections 3.7 and 3.9 provide the design loading conditions. Sections 3.5, 3.6 and 9.5.1 provide the hazards analyses to demonstrate that a safe shutdown, as outlined in Section 7.4, can be achieved and maintained.

Structures, systems and components important to safety in the SBVSE are not shared with any other nuclear reactor units.

The design of the SBVSE provides for complete redundancy with four independent divisions; therefore, a single failure in any portion of the SBVSE will not compromise the ability of the system to perform its safety function. Vital power can be supplied from either onsite or offsite power systems, as described in Section 8.2 and Section 8.3. Initial testing and periodic inservice functional testing are carried out in accordance with Section 9.4.6.5.

The power supplies and control functions necessary for safe function of the SBVSE are Class IE, as described in Section 7.1 and Section 8.3.

Section 9.4.6.3 describes provisions made to identify and isolate leakage or malfunction and to provide isolation of the non-safety-related portions of the system.

9.4.6.4 Inspection and Testing Requirements

The SBVSE major components, such as dampers, motors, fans, filters, coils, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Test and analysis will be completed during normal operation with the system operating in an accident alignment. Analysis will use as-built information from equipment to extrapolate the performance of the air-conditioning system. Analysis will show that the equipment performance is adequate to maintain design conditions during plant operating conditions.

Initial in-place acceptance testing of the SBVSE is performed as described in Section 14.2 (tests ~~abstracts~~ #078 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The SBVSE is designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of SBVSE is performed to demonstrate system and component operability and integrity.

Isolation dampers are periodically inspected and damper seats replaced as required.

Fans and air handling units are tested by manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 4, 5, and 6). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 7). Cooling coils are hydrostatically tested in accordance with ASME AG-1 (Reference 2) and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 8). Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 9), and ASME AG-1 (Reference 2).

Outside air inlet and battery room heaters are tested in accordance with ASME AG-1, Section CA (Reference 2).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

In-service test program and test frequency requirements are described in Chapter 16, "Technical Specification," Section 3.7.13 and per Ventilation Filter Test Program (VFTP) described in Chapter 16, "Technical Specification," Section 5.5.10.

9.4.6.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the MCR. Fans, motor-operated dampers, heaters and cooling units are operable from the MCR. Local instruments are provided to measure differential pressure across filters, flow, temperature and pressure. The fire detection and sensors information is delivered to the fire detection system.

9.4.6.6 References

1. NUREG-CR/0660, Boner, G.L. and Hanners, H.W., “Enhancement of Onsite Emergency Diesel Generator Reliability,” University of Dayton Research Institute UDR-TR-79-07 for U.S. Nuclear Regulatory Commission, January 1979.

2. ASME AG-1, “Code on Nuclear Air and Gas Treatment,” The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, “Housings” Addenda).

3. “ASHRAE Handbook Fundamentals,” American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc., 2005.

4. ANSI/AMCA Standard -210-1999, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, December 1999.

5. ANSI/AMCA Publication -211-1987, "Certified Ratings Program-Air Performance," American National Standards Institute/Air Movement and Control Association International, December 1987.

6. ANSI/AMCA Standard -300-1985, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, December 19857.

7. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," American National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning, 1999.

8. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

9. "HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

10. IEEE Std 484-2002, "IEEE Recommended Practice for Installation Design and Installation of Vented Lead-Acid Batteries for Stationary Applications," Institute of Electrical and Electronics Engineers, 2002.

11. Regulatory Guide 1.128, Rev. 2, "Installation Design and Installation of Vented Lead Acid Storage Batteries for Nuclear Power Plants." U.S. Nuclear Regulatory Commission.

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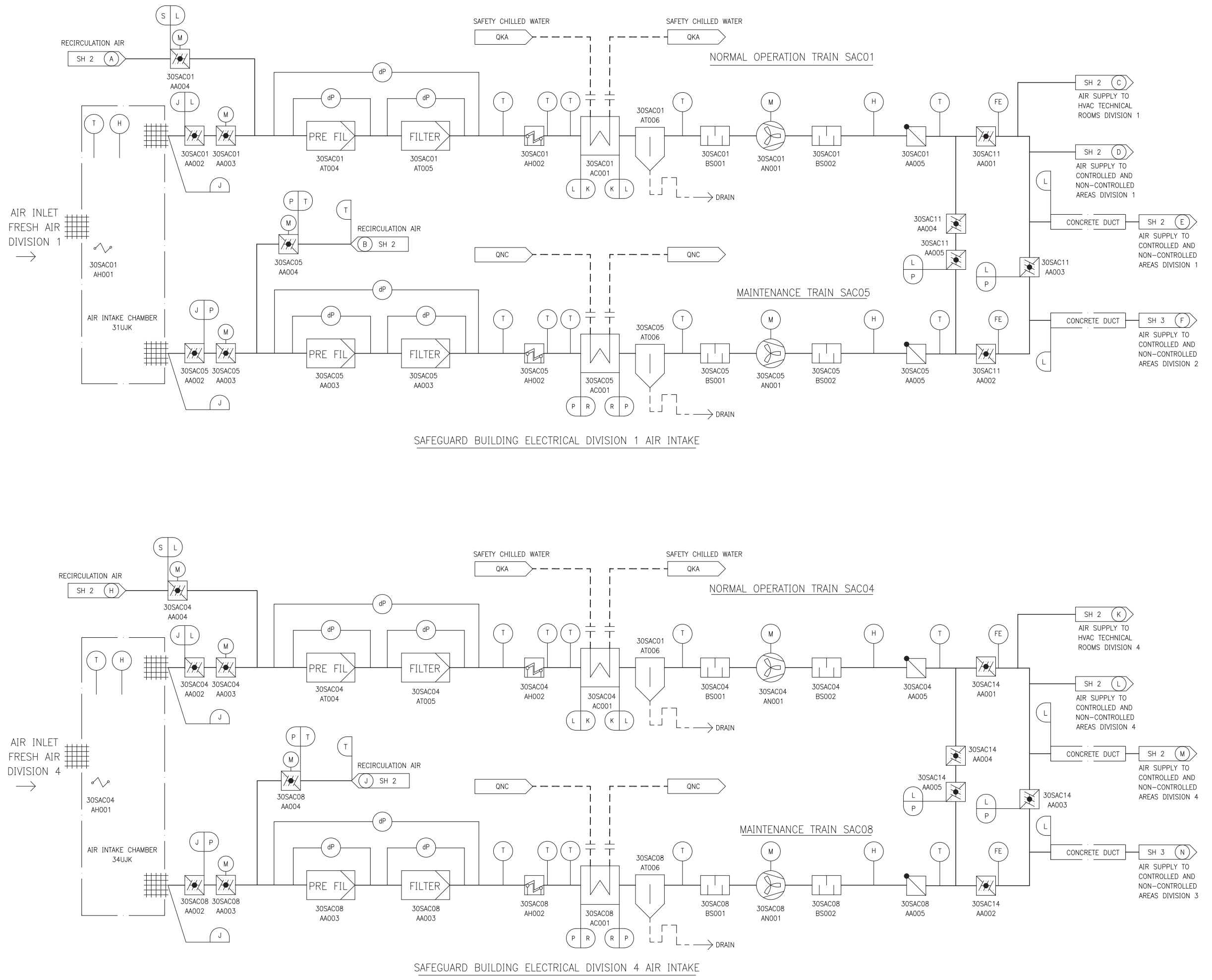
Figure 9.4.6-1—Safeguard Building Electrical Divisions 1 and 4 Air Intake



DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS
T	N/A	NSC
S	N/A	I
R	E	NSC
P	N/A	NSC
L	N/A	I
K	C	I
J	N/A	I
A	N/A	I

Figure 9.4.6-2—Safeguard Building Electrical Divisions 1 and 4 Air Supply and Exhaust

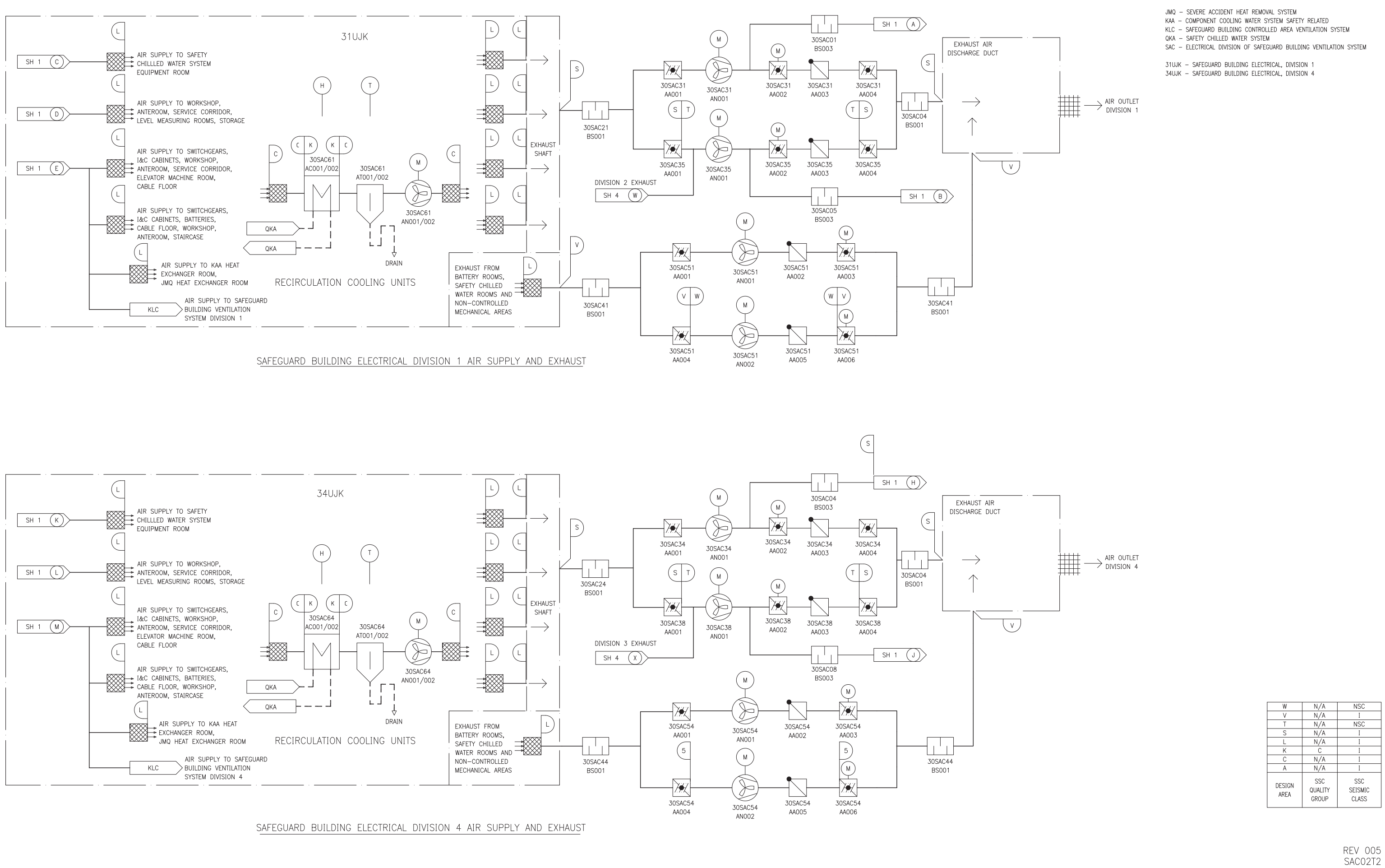


Figure 9.4.6-3—Safeguard Building Electrical Divisions 2 and 3 Air Intake

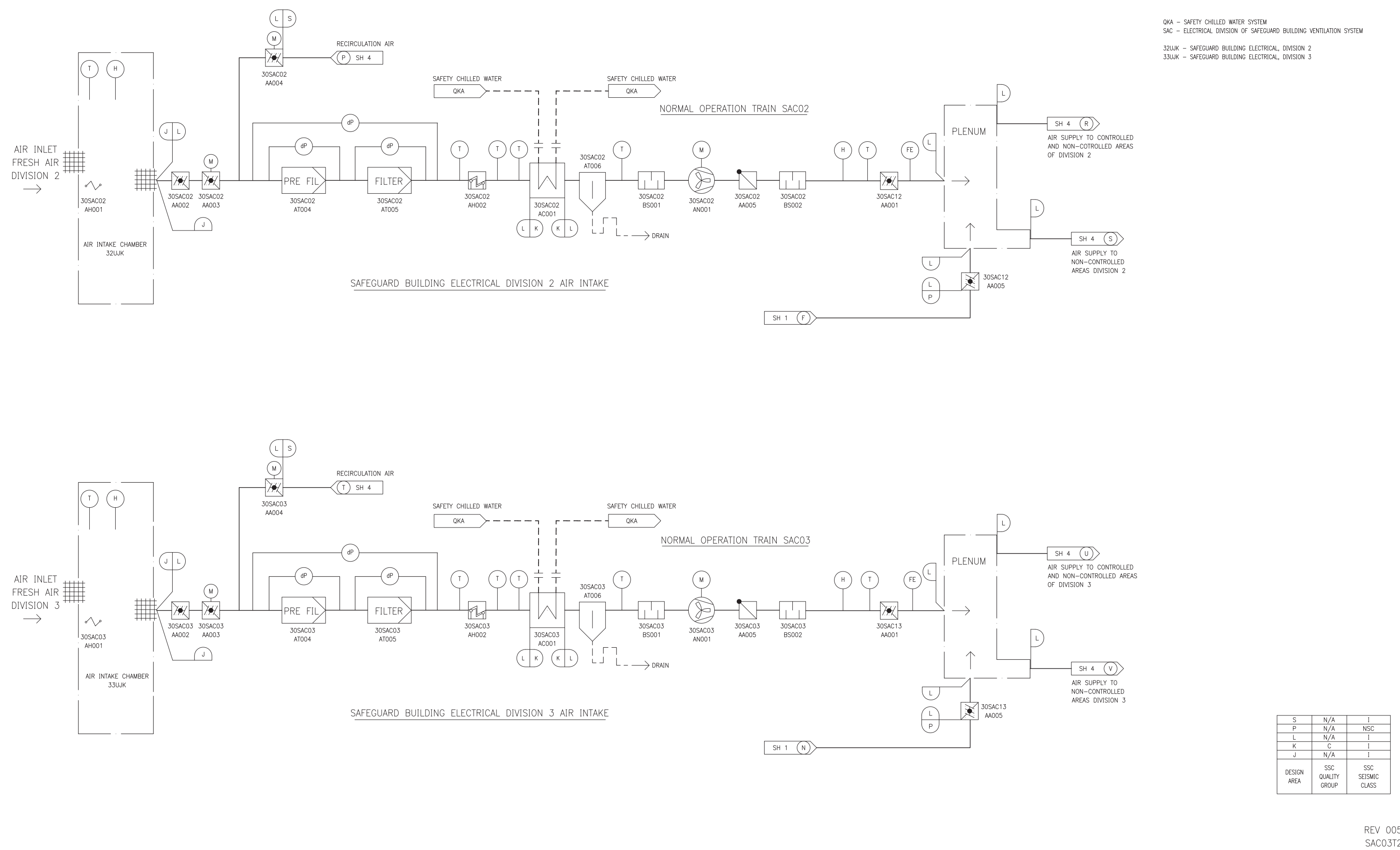
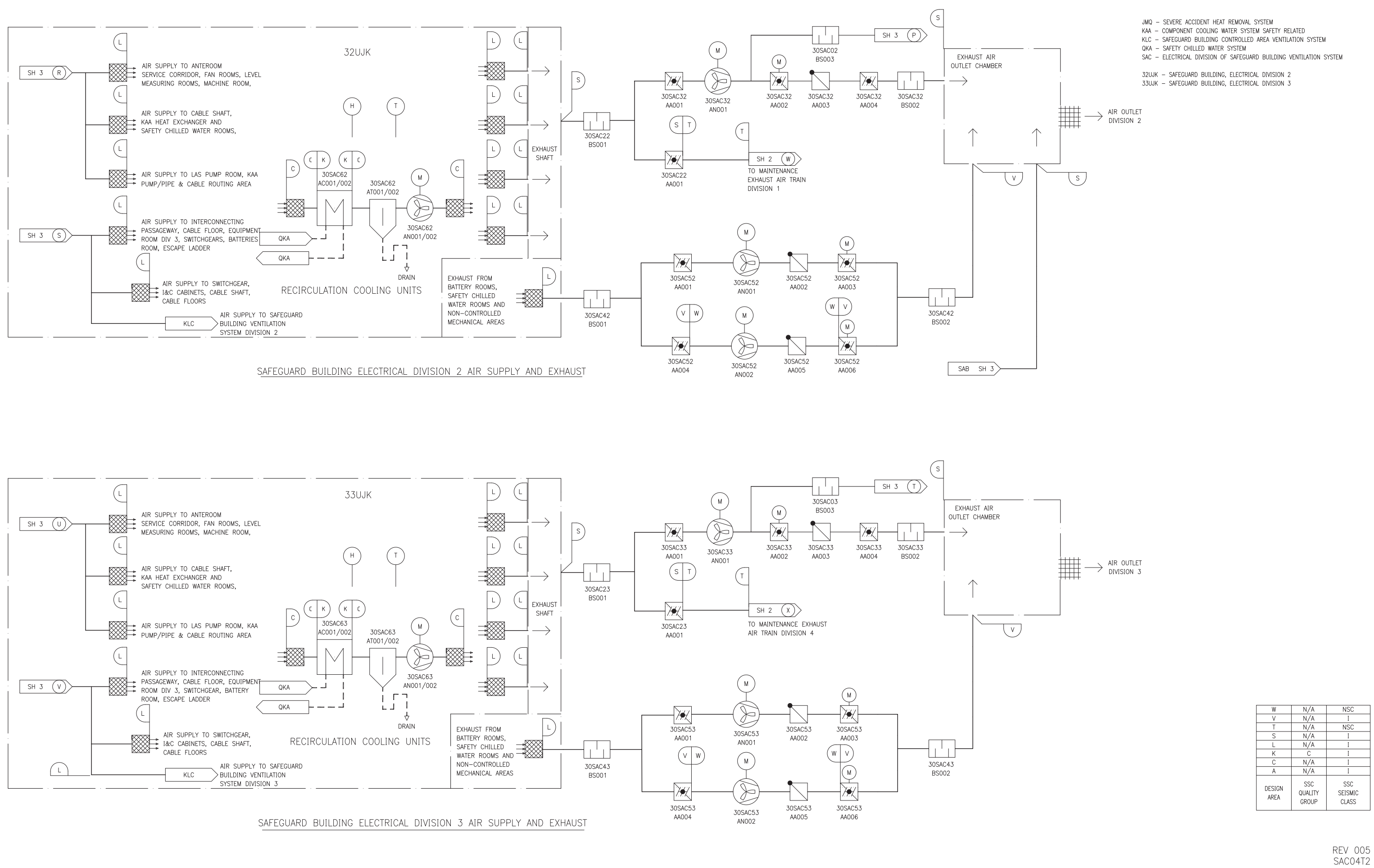


Figure 9.4.6-4—Safeguard Building Electrical Divisions 2 and 3 Air Supply and Exhaust



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9.4.7 Containment Building Ventilation System

The containment building ventilation system (CBVS) is designed to maintain acceptable ambient conditions inside the Containment Building for proper operation of equipment and instrumentation during normal plant operation and normal shutdown (i.e., outages). The CBVS also provides acceptable ambient conditions for personnel access to the service compartment during normal plant operation, and equipment compartment during outage for conducting inspections, tests and maintenance during normal plant operation.

9.4.7.1 Design Bases

The containment low flow purge exhaust subsystem outside of Containment is designated as a safety-related, Seismic Category I, ESF ventilation system.

This exhaust subsystem serves a safety function when operating in a low flow purge alignment (during power operation) and upon receipt of a containment isolation signal. During the short period of time required to close the containment isolation valves, exhaust air from containment flows through the CBVS purge iodine filtration units and is exhausted to the plant vent stack.

The containment penetration isolation valves are safety related and designed to Seismic Category I requirements. The internal filtration system components are non-safety related but designed to Seismic Category I requirements. The reactor pit cooling fans are non-safety related, but are designed to Seismic Category II requirements. Other CBVS components are non-safety related and Non-Seismic.

The CBVS components are located inside buildings that are designed to withstand the effects of natural phenomena such as earthquakes, tornados, hurricanes, floods, and external missiles (GDC 2).

The containment low flow purge exhaust subsystem removes radioactive materials via iodine filtration trains prior to release to the atmosphere (GDC 41). The filtration system is designed to allow periodic inspection (GDC 42).

The internal filtration subsystem filters airborne radioactive materials from the equipment compartments during normal operation.

The containment isolation valves are automatically closed within five seconds upon receipt of a containment isolation signal after receiving a signal from the PACS module, in accordance with BTP 6-4 (Reference 8), to maintain the integrity of the containment boundary and to limit the potential release of radioactive material.

The reactor pit area temperature is maintained less than 150°F under postulated accident conditions to prevent concrete degradation.

The CBVS performs the following ~~important~~ non-safety-related system functions:

- Controls and maintains a negative pressure in the Containment Building when the CBVS purge subsystem is operating.
- Maintains the following ambient conditions in the accessible areas (service compartments) for personnel accessibility and equipment operability during normal operation ~~refueling and shutdown~~:
  - A minimum temperature of 59°F.
  - A maximum temperature of 86°F.
  - 30 percent to 70 percent humidity.
- Maintains the following ambient conditions in the non-accessible areas (equipment compartments) for protection and safe operation of the equipment:
  - A minimum temperature of 59°F.
  - A maximum temperature of 122°F.
  - Humidity: Non-condensing.
  - Supports reactor coolant pressure boundary (RCPB) leakage detection.
- Provides an unfiltered vent path from containment to the vent stack during ELAP event.

9.4.7.2 System Description

9.4.7.2.1 General Description

The supply air for the containment building ventilation system is conditioned outside air that is filtered, cooled, or heated~~, and humidified~~ by the nuclear auxiliary building ventilation system (NABVS) as described in Section 9.4.3. The supply air is delivered to the Containment Building through the Fuel Building plenum. The supply air is then distributed through the CBVS supply duct network if the containment purge subsystem is operating.

The CBVS is composed of the following separate subsystems:

- Containment purge subsystem.
- Internal filtration subsystem.
- Containment Building cooling subsystem.
- Service compartment cooling subsystem.

The containment isolation system is addressed in Section 6.2.4.

Refer to Section 12.3.6.5.6 for ventilation system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

Containment Purge Subsystem

The containment purge subsystem includes low flow and full flow purge supply and exhaust systems. See Figure 9.4.7-1—Containment Building Low Flow and Full Flow Purge Supply Subsystem and Figure 9.4.7-2—Containment Building Low Flow and Full Flow Purge Exhaust Subsystem.

The containment low flow purge subsystem is normally not in operation during the plant normal operation. However, the low flow purge subsystem can be used during normal operation and outage conditions. The containment full flow purge subsystem is used during plant outages. The supply side ducts receive air from NABVS (refer to Section 9.4.3) through the Fuel Building (FB) concrete plenum. The supply air is then directed through the containment annulus penetration ducts into the containment plenum which discharges air into the service compartments of the Containment Building. The service compartments include technical rooms, instrument rooms, staircases, tank rooms, annular space at the operating floor, and annular space at the lower level. With the purge subsystem in operation, the air from the service compartments flows into equipment compartments as a result of pressure differential.

The low flow purge exhaust subsystem contains two redundant filtration trains located in the FB. Radiation monitors are located upstream of the filtration trains for monitoring the containment exhaust air prior to filtration (refer to Section 11.5.3.1.4 and Table 11.5-1, Monitors R-7 and R-8). The filtration trains receive air from the exhaust duct of the low flow purge exhaust subsystems. ~~The full flow purge exhaust is directed to the NABVS d~~During a fuel handling accident in the RB, the full flow and low flow purge supply and the full flow purge exhaust containment isolation valves are closed, and low flow purge exhaust is filtered through the low flow purge exhaust subsystem filtration trains. The CBVS low flow purge exhaust can also be directed to the safeguard building controlled-area ventilation system (SBVS) iodine filtration trains in an emergency for redundancy (refer to Section 9.4.5). Each filtration train consists of a moisture separator, ~~an~~ electric heater, prefilter, ~~upstream~~ HEPA filter~~s~~, carbon adsorber, ~~downstream HEPA~~ post filter~~s~~, and exhaust fan. The exhaust air from the filtration trains is directed to the plant vent stack. The radiation monitor located downstream of the CBVS low flow purge iodine filtration trains monitors and records the release of radioactive contaminants to the vent stack (refer to Section 11.5.3.1.4 and Table 11.5-1, Monitor R-9). The full flow purge exhaust subsystem directs the containment exhaust air through the NABVS exhaust filtration train (refer to Section 9.4.3).

The dampers downstream of the supply plenum regulate pressure inside the Containment Building. The equipment compartment exhaust dampers regulate differential pressure between the service and equipment compartments when the low flow purge subsystem is operating.

The containment purge subsystems provide automatic isolation of containment atmosphere by quick closure of containment isolation valves and closure of the air supply in front of the hatch.

The containment purge subsystem is designed in accordance with ASME AG-1 (Reference 1) and RG 1.52 for atmospheric cleanup.

The low flow purge exhaust duct provides a vent path from the containment to the vent stack through a bypass vent path around the ESF filters and fans for use during an ELAP event.

Internal Filtration Subsystem

The internal filtration subsystem (See Figure 9.4.7-3—Containment Building Internal Filtration Subsystem) limits the release of radioactive material by reducing radioactive iodine contamination inside the equipment compartment with air circulation and filtration during normal plant operation. The internal filtration subsystem contains one filtration train which consists of an electric heater, prefilter, ~~upstream~~ HEPA filter, carbon adsorber~~s~~, and ~~a downstream HEPA~~ post filter; with two redundant fans downstream of the filtration train. The air is drawn from the equipment compartments, filtered, and returned to the equipment compartments.

Radiation monitors are located upstream of the filtration trains for monitoring the radiation in the equipment compartments prior to filtration (refer to Section 11.5.3.1.5 and Table 11.5-1, Monitor R-10).

The system is designed in accordance with ASME AG-1 (Reference 1) and RG 1.140 (Reference 14).

Containment Building Cooling Subsystem

The containment building cooling subsystem (See Figure 9.4.7-4—Containment Building Cooling Subsystem) provides cool air into a stainless steel sheet metal circular header located above the residual heat removal-safety injection room, and into the reactor pit cooling fan plenum. The containment building cooling subsystem provides cool air to the reactor coolant pumps, steam generators, chemical volume control system (CVCS), control rod drive mechanism system (CRDMS), and vent and drain system. There are two trains of two main fans and four cooling coils located in the equipment compartments. The cooling coils receive cold water from the operational chilled water system (OCWS).

Two trains of two reactor pit cooling fans located in the equipment compartments supply cool air to the reactor pit area. These fans are used to ventilate the reactor pit during normal and station blackout (SBO) conditions. The reactor pit is cooled by air from a plenum between the main fans and the reactor pit cooling fans. The supply air subsystem to the reactor pit is composed of a 16 duct layout around the main coolant piping.

The exhaust from these areas is recycled through the cooling coils located in the equipment compartments.

The system is designed in accordance with ASME AG-1 (Reference 1).

Service Compartments Cooling Subsystem

The service compartment cooling subsystem (See Figure 9.4.7-5—Containment Building Service Compartments Cooling Subsystem) contains 12 recirculating cooling units. Each air cooling unit is equipped with a cooling coil connected to the OCWS. The recirculation cooling units provide ventilation and cooling for the service compartments. The service compartments include safety injection system valve rooms, steam generator blowdown system tank and heat exchanger rooms, instrument measuring cabinets and table rooms, and containment dome and annular space.

The system is designed in accordance with ASME AG-1 (Reference 1).

9.4.7.2.2 Component Description

The major components of the CBVS are listed in the following paragraphs, along with the applicable code and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the CBVS.

Ductwork and Accessories

The supply and exhaust air ducts are structurally designed for fan shutoff pressures. The ductwork is designed, tested and constructed in accordance with ASME AG-1 (Reference 1).

The low flow purge exhaust duct from the CI valves through the filter bypass duct and to the vent stack is designed for a pressure of 35 psig and a temperature of 280°F.

Moisture Separators

The moisture separator meets the requirements of RG 1.52 (Reference 12), ANSI/ASME N509 (Reference 15), and ASME AG-1 (Reference 1). The moisture separator is located upstream of the filter air heater and the prefilter to protect the HEPA filter and carbon adsorber from potentially high humidity level by removing the entrained water droplets from the inlet air stream. The moisture separator design shall be qualified by testing in accordance with the procedure described in ANSI/ASME N509.

Filter Air ~~Electric~~ Heaters

The filter air ~~electric~~ heaters are located upstream of iodine filters to prevent excessive moisture accumulation in the carbon adsorbers. The heaters are constructed and tested in accordance with ASME AG-1 (Reference 1).

Prefilters

The prefilters are located upstream of HEPA filters and collect large particles to increase the useful life of the ~~high efficiency~~ HEPA filters. The prefilters are designed in accordance with ANSI/ASHRAE Standard 52.2~~-1999~~ (Reference 2).

HEPA Filters

HEPA filters are constructed, qualified, and tested in accordance with ASME AG-1 (Reference 1). The periodic inplace testing of HEPA filters to determine the leak-tightness is performed per ANSI/ASME N510~~-1989~~ (Reference 3).

Adsorbers

Carbon adsorbers are used to remove radioactive iodine from the exhaust air. The efficiency for removing methyl iodine is based on the decontamination efficiency assigned during the laboratory tests. The periodic in-place testing of adsorbers to determine the leak-tightness is performed per ANSI/ASME N510 (Reference 3).

Post Filters

The post filter is located downstream of the carbon adsorber. During operation of the carbon filtration exhaust, the air flow rate will be low through the carbon adsorber to prevent spread of the carbon dust. However, the post filter ensures that carbon dust or carbon fines are removed prior to the air being distributed further. The post filter meets the requirements of ASME AG-1 (Reference 1), and has an average atmospheric dust efficiency of 95% in accordance with ANSI/ASHRAE Standard 52.2 (Reference 2). The post filter is equipped with differential pressure measurement which indicates the degree of particulate loading and the need for filter change.

Fans

The supply and exhaust fans are centrifugal or vane-axial designed with electric motor drivers. Fan performance is rated in accordance with ANSI/AMCA 210~~-99~~ (Reference 4), ~~ANSI/~~AMCA 211 (Reference 5), and ANSI/AMCA 300 (Reference 6).

Isolation Dampers

Manual dampers are adjusted during initial plant startup testing to establish accurate air flow balance between rooms. The motor-operated isolation dampers will fail as-is in position in case of power loss. The performance and testing requirements of the dampers will be conducted in accordance with ASME AG-1 (Reference 1).

Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of UL 555NFPA 80 (Reference 7) and NFPA 90A (Reference 17) and the damper fire rating is commensurate with the fire rating of the barrier penetrated. Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

A combination fire and smoke damper is required in the containment vent path. The damper has a temperature override option. This allows normal closure of the damper assembly at 165°F and the ability to override the 165°F closure command and remain open provided the temperature does not exceed 350°F.

Recirculation Cooling Units

The recirculation cooling units consist of a fan section, a water cooling section, and a moisture separator. The housing is constructed of heavy gauge steel. The fan is driven by an electric motor. The cooling coils are finned coil type and are connected to the operational chilled water system. The cooling coils are designed in accordance with ASME AG-1 (Reference 1). The moisture separator collects condensate which is directed to drain system.

9.4.7.2.3 System Operation

Normal Plant Operation

The containment low flow purge subsystem can operate during normal operation. The containment building negative pressure is maintained by controlling the supply air flow through the motorized dampers. The internal filtration subsystem equipment compartment is isolated unless airborne radioactivity contamination is detected (refer to Section 11.5.3.1.5 and Table 11.5-1, Monitor R-10) and personnel access is required in the service compartment. When the low flow purge subsystem is in operation, a negative pressure is maintained between the equipment and service compartments. The containment air exhaust stream is monitored for gaseous activity prior to filtration by effluent radiation monitors (refer to Section 11.5.3.1.5 and Table 11.5-1, Monitors R-7 and R-8). Downstream of the low-flow purge iodine filtration trains, the exhaust is again monitored for contaminants prior to release. Radiation monitor R-9 also provides for automatic actuation of Fuel Building air dampers and iodine filtration units (refer to Section 11.5.3.1.5 and Table 11.5-1, Monitor R-9).

When the reactor is in cold shutdown, ventilation in the Containment Building is provided by both low flow and full flow purge subsystems. The negative pressure in containment is regulated by the supply air flow of both low flow and full flow purge subsystems.

The internal filtration subsystem is in operation during plant operation to detect activity level in the building, and air flow purges the equipment compartment in a recirculation mode (refer to Section 11.5.3.1.5 and Table 11.5-1, Monitor R-10). This system is not required during outages since there are no fission products being produced.

The containment building cooling subsystem operates during normal and shutdown conditions to remove heat generated in the equipment compartments. This system operates continuously to maintain ambient conditions in the equipment compartments. If the supply air temperature downstream of fans is 82°F or higher, the cooling coils provide cool air.

The service compartment cooling subsystem also operates during normal and shutdown conditions to maintain acceptable room temperatures in the service compartments.

Abnormal Operating Conditions

The containment isolation valves located on the low flow and full flow purge supply and exhaust ducts automatically close when a containment isolation signal is initiated. In the event of loss of the internal filtration subsystem, the exhaust air can be filtered through the containment low flow purge exhaust subsystem prior to release to the vent ~~plant~~ stack.

In the event of loss of the chilled water system, the component cooling water system (CCWS) provides a water supply to the cooling coils.

In the event of failure of the containment building cooling subsystem fans, the fresh air to the annular space and the operating floor and equipment compartment can be supplied by the full flow purge subsystem in conjunction with a reconfiguration of the dampers.

Loss of Ultimate Heat Sink

In case of loss of ultimate heat sink (LUHS) or the loss of CCWS, the cooling fans in the Containment Building are kept in operation to avoid localized areas of high temperature.

Loss of Offsite Power

Alternate onsite power sources provide power to the valves to close in time to achieve safety functions in case of a loss of offsite power. The dampers on the internal filtration subsystem and containment building cooling subsystem fail to the "as-is" position. The power supply to main fans and reactor pit cooling fans is supplied from corresponding emergency diesel generators. Air cooling unit fans stop in the service compartment cooling subsystem.

Fuel Handling Accident in the Containment Building

In the event of a fuel handling accident in the Containment Building, the containment isolation valves ~~on the containment purge subsystem~~ for the full flow and low flow purge supply and the full flow purge exhaust can be manually closed by pushing the emergency push button located in the fuel handling area inside the Containment Building. The KLA supply air damper~~s~~ to the equipment hatch area and the KLL exhaust damper at the emergency airlock are closed ~~when the hatch is opened~~. The low flow purge exhaust subsystem is used to avoid the spread of contamination by keeping a negative pressure in the Containment Building and filtering the exhaust through the low flow purge exhaust subsystem iodine filtration trains~~. To achieve this safety function, the low-flow purge subsystem exhaust is switched over to the iodine filtration trains of the safeguard building controlled-area ventilation system~~ (refer to Section 9.4.5, Section 11.5.3.1.4, ~~Section 11.5.4.8,~~ and Table 11.5-1, Monitors ~~R-10~~R-7, R-8, R-9). The SBVS iodine filtration trains can be used as backup.

High Pressure Level or Safety Injection Signal

In case of high-pressure level or a safety injection signal, the containment penetration valves on the containment purge subsystem are closed and air flow in the Containment Building is stopped.

Station Blackout

In the event of an SBO, the reactor pit area is air cooled to prevent degradation of the concrete structure. The reactor pit cooling fans take air from the supply air shaft. The air is supplied to the bottom of the pit and transferred through openings in the pit wall around the main coolant piping to maintain a temperature less than 150°F. The power supply to the reactor pit cooling fans is provided by the SBO diesel generators.

Small-Break Loss-of-Coolant Accident and Loss-of-Coolant Accident

In the event of a small-break loss-of-coolant accident (SBLOCA) or loss-of-coolant accident (LOCA), containment isolation valves automatically close after receipt of the containment isolation signal. These valves are designed to perform their isolation function under LOCA conditions and will close within five seconds after receipt of a containment isolation signal from the PACS module.

ELAP

In the event of a loss of all AC power, the low flow purge exhaust duct may be used to vent the containment. Compressed air is provided to the CI valves to allow them to open. A bypass duct around the ESF filters and fans is used to direct the containment air to the vent stack.

9.4.7.3 Safety Evaluation

The CBVS maintains proper temperatures in the Containment Building during normal operations and shutdown conditions. Sufficient redundancy is included for proper operation of the system when one active component is out of service. The CBVS is an engineered safety feature and the safety-related functions are closure of the CBVS containment isolation valves (CIV) and filtration of the low flow purge prior to closure of the CIVs during a postulated rod ejection accident.

The CBVS low flow purge removes radioactive materials via two 100 percent iodine filtration trains prior to release to the plant vent stack. Each train operates independently. A failure in one train will not prevent the remaining train from providing the required engineered safety feature function.

The containment purge subsystem supply and exhaust penetrations through the containment annulus are equipped with two normally open isolation valves, each connected to separate control trains. A failure in one train will not prevent the remaining isolation valve from providing the required capability. The valves automatically close within five seconds after receipt of a containment isolation signal from the PACS module. The isolation valves and containment penetrations are the only portions of the CBVS that are safety related.

9.4.7.4 Inspection and Testing Requirements

The CBVS major components, such as dampers, motors, fans, filters, coils, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Initial in-place acceptance testing of the CBVS is performed as described in Section 14.2 (test abstracts #073 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The CBVS is designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of CBVS is performed to demonstrate system and component operability and integrity.

During normal operation, equipment rotation is utilized to reduce and equalize wear on redundant equipment during normal operation.

Isolation dampers are periodically inspected and damper seats replaced as required.

Per IEEE 334 (Reference 9), type tests of continuous duty class 1E motors for CBVS are conducted to ensure ESF system operation and availability.

Fans and air handling units are tested by manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 4, 5, and 6). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 2). Cooling coils are hydrostatically tested in accordance with ASME AG-1 (Reference 1) and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 10).

Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 11), American Society of Mechanical Engineers, ANSI/ASME N510 (Reference 3), ASME AG-1 (Reference 1), and RG 1.52 (Reference 12).

Emergency filtration units are tested by manufacturer for housing leakage, filter bypass leakage and airflow performance. Periodically and subsequent to each filter or adsorber material replacement, the unit is inspected and tested in-place in accordance with the requirements of RG 1.52 (Reference 12), ANSI/ASME N510 (Reference 3) and ASME AG-1 (Reference 1). The charcoal adsorber samples are tested for efficiency in accordance with RG 1.52 (Reference 12) and ASTM D3803 (Reference 13). Air filtration and adsorption unit heaters are tested in accordance with ANSI/ASME N510 (Reference 3).

Internal carbon filtration units are tested for housing leakage, filter bypass leakage and airflow performance. Periodically and subsequent to each filter or adsorber material replacement, the unit is inspected and tested in-place in accordance with the requirements of RG 1.140 (Reference 14), ANSI/ASME N510 (Reference 3) and ASME AG-1 (Reference 1). The charcoal adsorber samples are tested for efficiency in accordance with RG 1.140 (Reference 14) and ASTM D3803 (Reference 13). Air filtration and adsorption unit heaters are tested in accordance with ASME AG-1, Section CA (Reference 1).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

In-service test program requirements are described per Ventilation Filter Test Program (VFTP) in Chapter 16, "Technical Specification" Section 5.5.10. ESF filtration unit testing will be completed at least once every 24 months.

9.4.7.4.1 Preoperational Tests

Refer to Section 14.2 (test abstracts #073, #075, #076, and #203) for initial plant startup test program. Initial in-place acceptance testing of CBVS components will be performed in accordance with ASME AG-1 (Reference 1), ANSI/ASME N510 (Reference 3), and RG 1.52 (Reference 12).

9.4.7.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the main control room (MCR). Fans, motor-operated dampers, heaters and cooling units are operable from the MCR. Local instruments are provided to measure differential pressure across filters, flow, temperature and pressure. The fire detection and sensors information is delivered to the fire detection system.

The minimum instrumentation, indication and alarms for CBVS ESF filter system are provided in Table 9.4.7-1 per the requirements of ANSI/ASME N509 (Reference 15).

The radiation instrumentation requirements for controlling airborne radioactivity releases via the vent ~~plant~~ stack are addressed in Sections 11.5.3.1.4, 11.5.3.1.5, Section 11.5.4.8, and Table 11.5-1, Monitors R-7, ~~and~~ R-8, R-9 (Low Purge Subsystem), and R-10 (Internal Filtration Subsystem).

9.4.7.6 References

1. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, "Housings" Addenda).

2. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," ~~ANSI~~American National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

3. ANSI/ASME N510-1989 ~~(R1995)~~, "Testing of Nuclear Air-Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

4. ANSI/AMCA Standard ~~-~~210-99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, ~~December~~ 1999.

5. ANSI/AMCA Publication -211-1987, “Certified Ratings Program – Air Performance,” American National Standards Institute/Air Movement and Control Association International, 1987.

6. ANSI/AMCA Standard -300-1985, “Reverberant Room Method of Testing Fans for Rating Purposes,” American National Standards Institute/Air Movement and Control Association International, 1985.

7. NFPA 80, “Standard for Fire Doors and Other Opening Protectives,” National Fire Protection Association Standards, 2007.UL 555, “Standard for Fire Dampers,” Underwriter’s Laboratories, Sixth Edition, June 1999.

8. NUREG-0800, BTP 6-4, Revision 3, “Containment Purging During Normal Plant Operations,” U.S. Nuclear Regulatory Commission, March 2007.

9. IEEE 334-1974, "IEEE Standard for Type Tests of Continuous-Duty Class 1E Motors for Nuclear Power Generating Stations," Institute of Electrical and Electronics Engineers, 1974.

10. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

11. "HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

12. Regulatory Guide 1.52, Revision 3, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants", U.S. Nuclear Regulatory Commission, June 2001.

13. ASTM D3803-1989, reapproved 1995, "Standard Test Method for Nuclear Grade Activated Carbon," 1989.

14. Regulatory Guide 1.140, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Normal Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants", U.S. Nuclear Regulatory Commission, June 2001.

15. ANSI/ASME N509-1989, "Nuclear Power Plant Air Cleaning Units and Components," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

16. Deleted.ERDA 76-21, "Nuclear Air Cleaning Handbook," Oak Ridge National Laboratory, 1976.

17. NFPA 90A, “Standard for the Installation of Air Conditioning and Ventilation Systems,” National Fire Protection Association Standards, 2002.

Table 9.4.7-1—Minimum Instrumentation, Indication and Alarm Features for CBVS (Low Flow Purge Exhaust Subsystem)

Sensing Location	Local Indication / Alarm	MCR Indication / Alarm
~~Unit Inlet Moisture Separator~~	~~Pressure Drop Indication~~	
Electric Heater Inlet	Temperature Indication	
Electric Heater	Status Indication	Status Indication
Electric Heater Outlet	Temperature Indication	Temperature Indication / High Temperature Alarm
Prefilter	Pressure Drop Indication / High Alarm	
~~Upstream~~ HEPA	Pressure Drop Indication / High Alarm	
Adsorber	Pressure Drop Indication / High Alarm	
Adsorber Outlet	Temperature Indication	Temperature Indication / High Temperature Alarm
Post Filter	Pressure Drop Indication / High Alarm	
System Filters Inlet to Outlet		Summation of pressure drop across entire filtration train (Indication / High Pressure Drop Alarm)
Fan	Pressure Drop Indication	Handswitch / Status Indication
Damper / Operator	Position Indication	Position Indication
Unit Outlet	Flow Rate Indication	Flow Rate (recorded indication, high alarm signal)
Unit Outlet	Radiation Indication	Radiation Indication / High Radiation Alarm

Next File

Figure 9.4.7-1—Containment Building Low Flow and Full Flow Purge Supply Subsystem

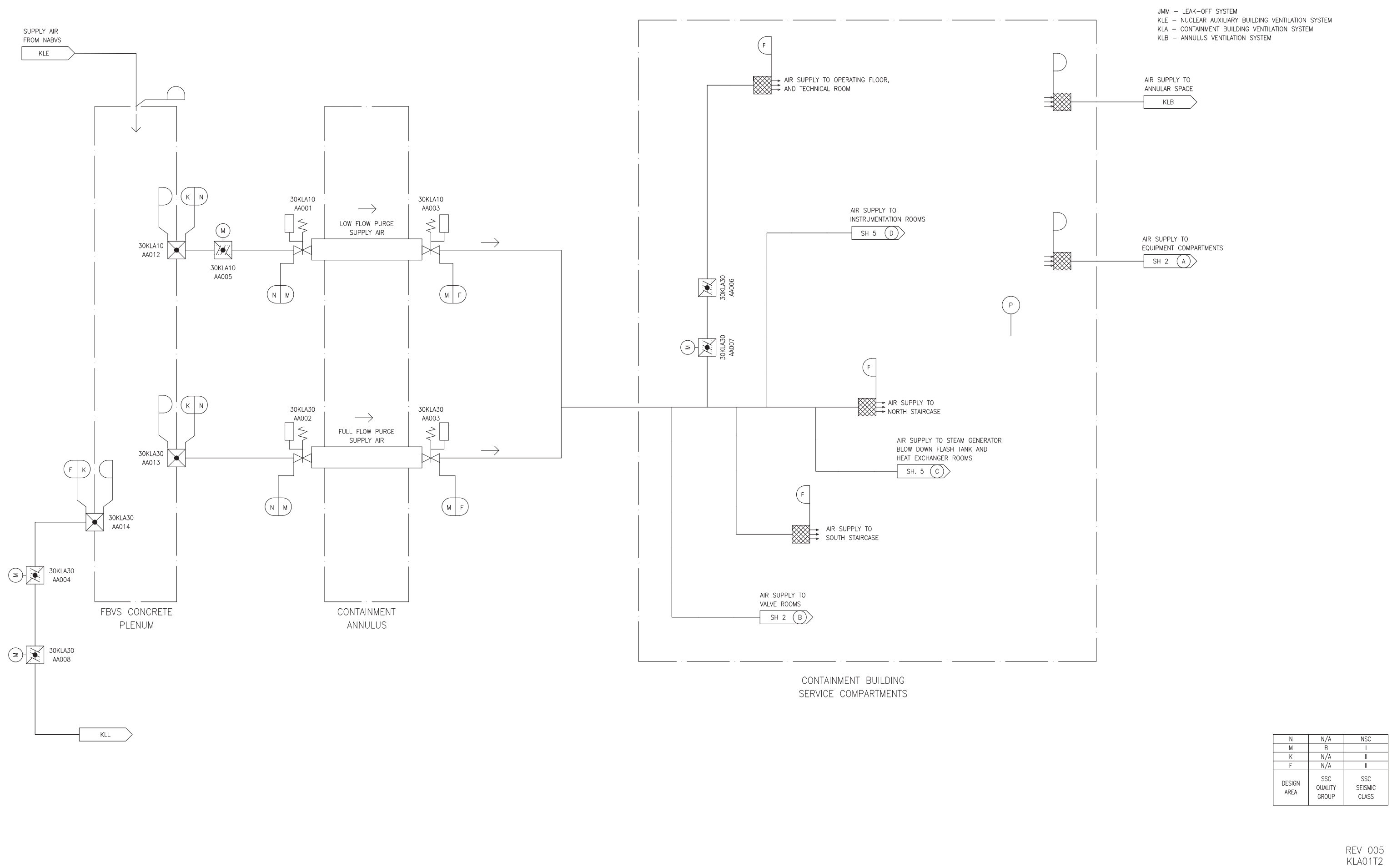
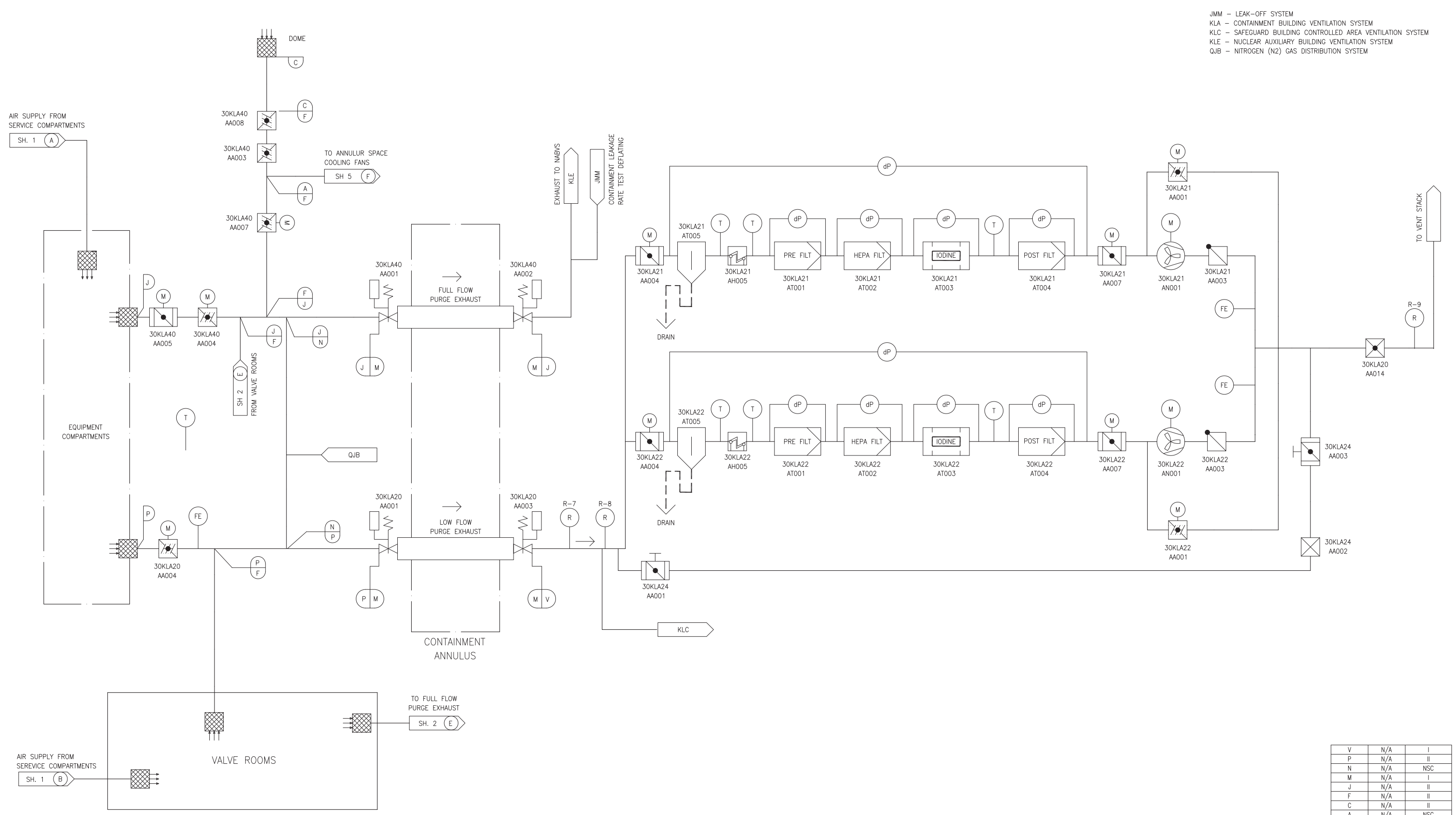
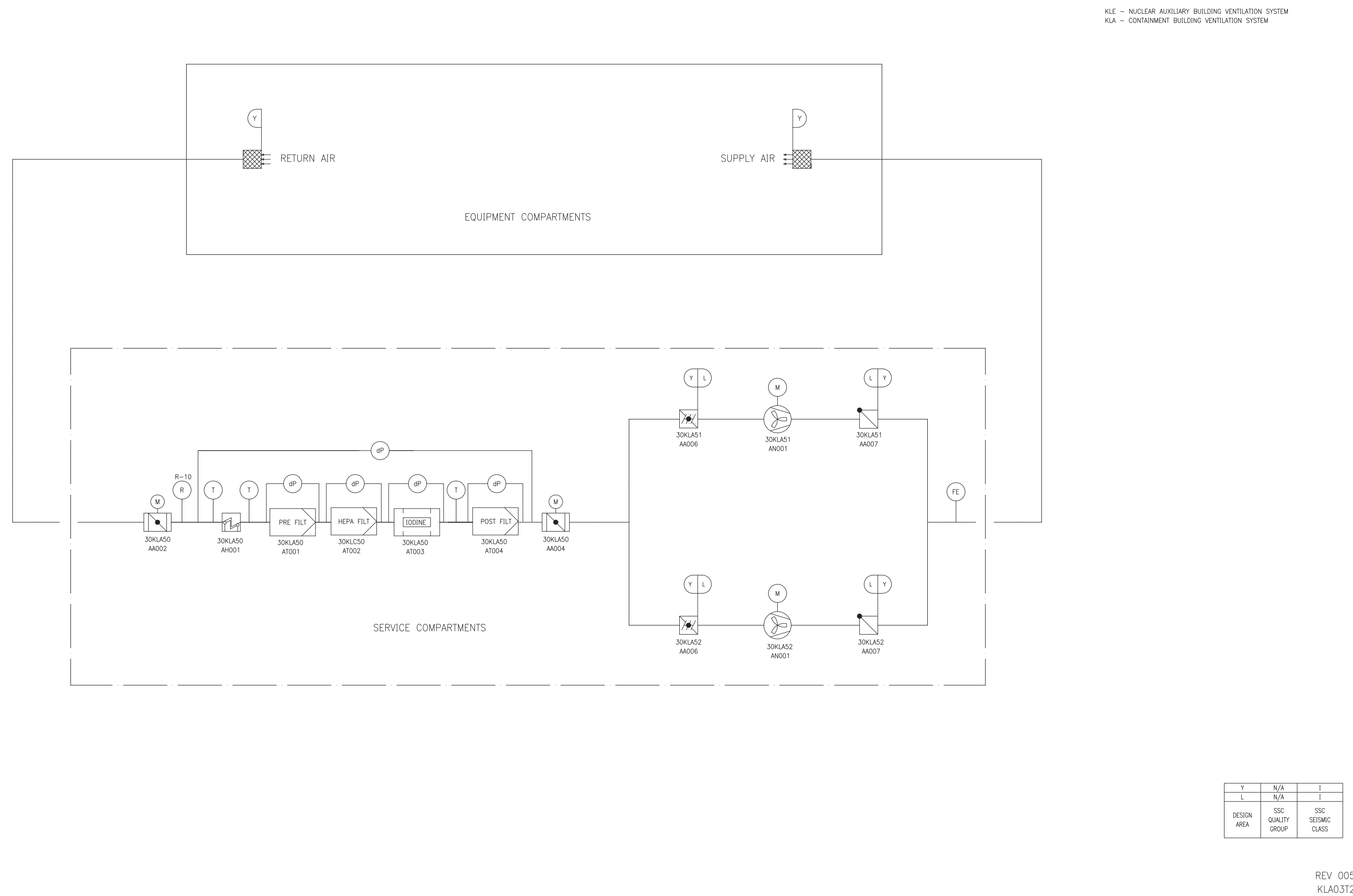


Figure 9.4.7-2—Containment Building Low Flow and Full Flow Purge Exhaust Subsystem



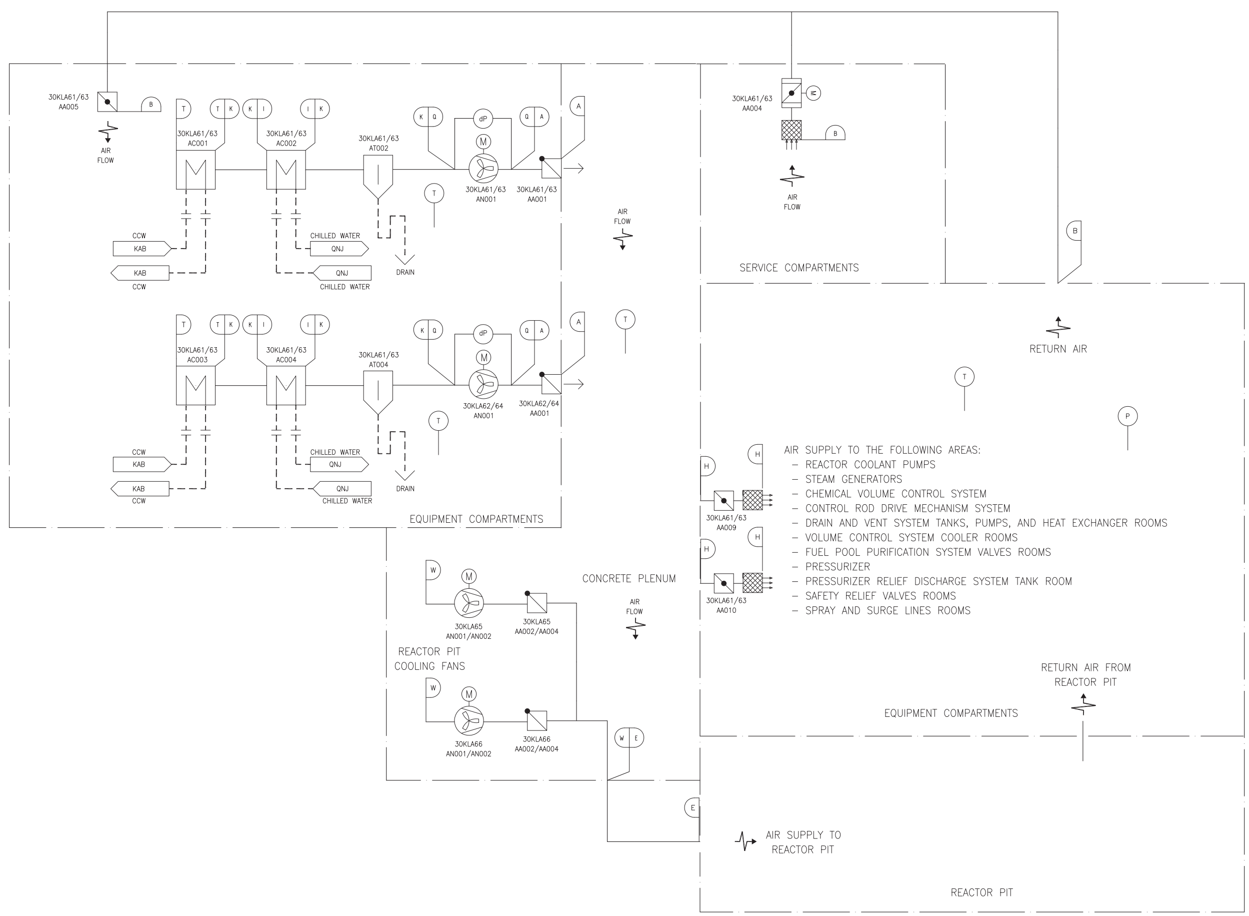
DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS
V	N/A	I
P	N/A	II
N	N/A	NSC
M	N/A	I
J	N/A	II
F	N/A	II
C	N/A	II
A	N/A	NSC

Figure 9.4.7-3—Containment Building Internal Filtration Subsystem



Y	N/A	I
L	N/A	I
DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS

Figure 9.4.7-4—Containment Building Cooling Subsystem



KLA – CONTAINMENT BUILDING VENTILATION SYSTEM
KAB – COMPONENT COOLING WATER SYSTEM
QNJ – SUPPLY TO CONTAINMENT BUILDING VENTILATION SYSTEM COOLING COILS IN REACTOR BUILDING

DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS
T	C	I
W	N/A	II
Q	N/A	NSC
K	N/A	NSC
I	E	NSC
H	N/A	II
E	N/A	II
B	N/A	NSC
A	N/A	NSC

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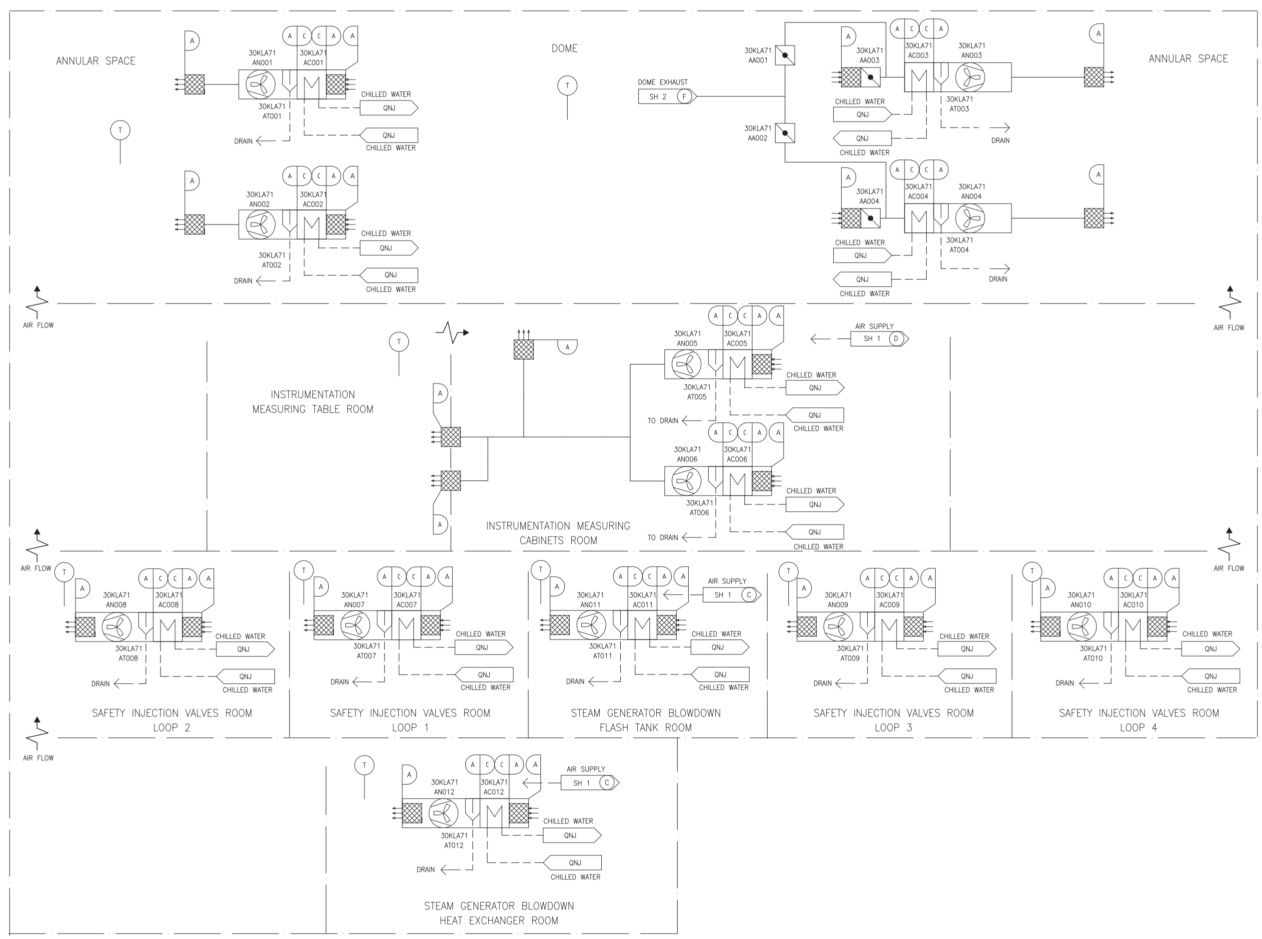
Figure 9.4.7-5—Containment Building Service Compartments Cooling Subsystem



KLA – CONTAINMENT BUILDING VENTILATION SYSTEM
KAB – COMPONENT COOLING WATER SYSTEM
QNJ – SUPPLY TO CONTAINMENT BUILDING VENTILATION SYSTEM COOLING COILS IN REACTOR BUILDING

C	E	NSC
A	N/A	NSC
DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS

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9.4.8 Radioactive Waste Processing Building Ventilation System

The radioactive waste processing building ventilation system (RWBVS) provides fresh conditioned air to the Radioactive Waste Processing Building (RWB) to maintain acceptable ambient conditions within the building. There are two exhaust air systems - system exhaust air, which draws air from locations where radioactivity is likely, and room exhaust air (Cells 1 and 2), which draws air from locations not normally expected to contain radioactivity. The RWBVS provides filtration of exhaust from the RWB to limit the release of airborne contaminants exhausted from the ~~plant~~ vent stack. Additionally, the RWBVS maintains sub-atmospheric pressure in the RWB, to prevent the release of airborne contaminants into the outside atmosphere. The RWBVS functions during normal plant operation.

9.4.8.1 Design Bases

The RWBVS is non-safety-related and is located in a building that is not Seismic Category I. The U.S. EPR meets:

- GDC 2, as it relates to meeting the guidance of RG 1.29 for radioactive waste management systems to be designed in accordance with RG 1.143.
- GDC 5, as it relates to the RWBVS because there are no safety-related components that are shared with any other nuclear power units.
- GDC 60, as it relates to the ability of the system to limit the release of gaseous radioactive effluents to the environment. The RWBVS exhaust filtration units are designed, tested, and maintained in accordance with RG 1.140. The air flow rate of a single cleanup filtration unit will not exceed 30,000 cfm.

The RWBVS performs no safety-related function and is Non-Seismic. Failure of the system does not affect the reactor coolant system (RCS) pressure boundary or the safe shutdown of the plant; nor is the system required to mitigate the consequences of a 10 CFR Part 100 release.

The RWBVS performs the following ~~important~~ non-safety-related system functions:

- Maintains the RWB at sub-atmospheric pressure. Maintaining the building sub-atmospheric is accomplished by flow balancing of the intake and exhaust air flow with air dampers.
- Maintains adequate building temperatures for personnel in the working areas and removes waste heat from the equipment located in the building. The RWBVS maintains the following temperature and humidity values in the RWB permanent working areas based on normal outdoor temperatures specified in Table 2.1-1:
  - Temperature from 68° to 91°F.
  - Humidity from ~~3~~10 to 70 percent.

- Removes radioactivity from the system exhaust air by the use of high efficiency particulate air (HEPA) filters and iodine adsorption charcoal filtration units.

9.4.8.2 System Description

9.4.8.2.1 General Description

The RWBVS supplies conditioned outside air and processes and removes the exhaust from the RWB. This once-through ventilation system has no air recirculation capability except for the evaporator, instrumentation and controls (I&C), and the vehicle access rooms. A simplified sketch of the RWBVS is shown in Figure 9.4.8-1 and Figure 9.4.8-2.

The outside air is provided through intake mesh grilles and louver dampers. The outside air intake openings are equipped with electrically heated and weather protected grilles to prevent ice formation and ingress of insects and debris.

Depending on outdoor conditions, the supply air to the RWB is filtered, cooled and dehumidified or filtered, and heated and humidified by the supply air system. A humidifier, which provides minimum air humidity, is installed in the common air supply duct of the RWB to treat the supply air. The humidifier is supplied steam from the air humidification system (AHS) to perform its function. If required, electrical air heaters installed in the supply air ductwork provide additional heating of the supply air.

The supply air system shown in Figure 9.4.8-1 consists of two air handling units; both units supply air to two supply fans. Each air handling unit consists of a preheater, prefilter, cooling coil, system heater, fan, and back draft damper. The back draft damper prevents short cycling supply air through the non-operating supply fan. Downstream of the air handling units in the common supply air duct is a humidifier. Downstream of the humidifier is a motor-driven supply damper that maintains the sub-atmospheric pressure in the RWB by decreasing or increasing the supply air flow as required. The air handling units, supply fans, common humidifier, and supply damper are located in the RWB at elevation +36 ft.

The operational chilled water system (OCWS) supplies chilled water to the air cooling coil. The preheater and the system heater are supplied with hot water by the space heating system (SHS). The air cooling coil and system heater condition the supply air to maintain RWB temperatures. The preheater prevents freezing during cold weather conditions. In the event the preheater cannot prevent freezing, a signal is generated by a temperature sensor indicating that the air temperature leaving the preheating coils is low, the supply air fans shut down automatically and the air inlet dampers on the air intake close automatically to avoid freezing the equipment.

During normal operation, the RWBVS provides fresh air to the RWB stairwells.

Radiation Monitors R-23 (decontamination room) and R-24 shown in Figure 9.4.8-1 provide airborne and sampling points (refer to Section 11.5.3.1.8 and Table 11.5-1). The radiation monitors (R-23 and R-24) provide local and control indications, but do not initiate any automatic control functions.

The RWB has two exhaust air systems–system exhaust air and room exhaust air (see Figure 9.4.8-2).

System exhaust air draws air from RWB locations where radioactivity is likely. The exhaust air and gases from activity-bearing systems, vented air from tanks and releases from working areas and machinery are collected by the system exhaust air. The exhaust air is monitored by the sampling activity monitoring system (SAMS) prior to entering the system exhaust air filtration system. System exhaust air is continuously filtered by two filter systems consisting of prefilters, HEPA filters, ~~and~~ iodine adsorption charcoal filters, and post filters. The treated air is then exhausted to the ~~plant~~ vent stack by two exhaust fans located in the RWB at elevation +36 ft. Air temperature and relative humidity are maintained within design requirements by water droplet separators and electrical heaters installed upstream of the filter trains. The system exhaust air has no automatic isolation functions. In the event of a high radiation alarm from the SAMS (refer to Section 11.5.3.1.8 and Table 11.5-1, Monitor R-21), operators can manually shutdown the RWBVS from the main control room (MCR).

Room exhaust air serves the rooms in RWB that are not normally expected to contain radioactivity. Room air is monitored by the SAMS prior to entering the filtration units. During normal operation, the clean room exhaust air bypasses the filtration units, and the exhaust air is directed to the vent stack. If radioactivity is detected by the SAMS (refer to Section 11.5.3.1.8 and Table 11.5-1, Monitors R-20 and R-22) in any of the rooms served by the room exhaust air system, the contaminated air is automatically rerouted through the iodine filtration unit prior to release to the vent stack. There are two parallel 50 percent filtration units. Each filtration train consists of two motor operated isolation dampers, heater, prefilter, HEPA filter, carbon adsorber, and post filter. The exhaust air is directed through two 50 percent exhaust fans to the vent stack.~~Room exhaust air serves rooms in the RWB that are not normally expected to contain radioactivity. Room exhaust air is monitored by the SAMS prior to entering the filter section. The room exhaust air is continuously filtered by five parallel filter trains. Each filter train consists of a prefilter and a HEPA filter. Room exhaust air from these filter trains can be directed to two room exhaust fans or to a filter system consisting of a carbon adsorber and a HEPA filter. Normal operation of the room exhaust air bypasses the carbon adsorber and HEPA filter system. If radioactivity is detected by the SAMS (refer to Section 11.5.3.1.8 and Table 11.5-1, Monitors R-20 and R-22), in any of the rooms served by the room exhaust air system, the contaminated air is automatically rerouted to pass through the iodine filtration system.~~

~~The iodine filter unit, installed at the RWB at elevation +36 ft, consists of one air train equipped with two manually operated isolation dampers, one electric heater, one carbon adsorber, one HEPA filter, and two booster fans connected in parallel.~~

Refer to Section 12.3.6.5.6 for ventilation system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

9.4.8.2.2 Component Description

The major components of the RWBVS are described in the following paragraphs. Table 3.2.2-1 provides the seismic design and other design classifications for components in the RWBVS.

Ductwork and Accessories

The supply and exhaust air ducts are structurally designed for fan shutoff pressures. The ductwork is designed, tested, and constructed in accordance with ANSI/ASME N509 (Reference 11) and ANSI/ASME N510 (Reference 3)

Supply Air Handling Units

Each of the two supply air handling units consists of a housing, a preheater, a heater, a cooler, a prefilter, and a filter. The outlets of the air handling units combine into a common duct that provides supply air to two parallel supply fans. The outlet of the two supply fans combine into a common duct ~~with a supply air humidifier~~.

System Exhaust Air Handling Units

Each of the two exhaust air handling units consists of an airtight housing, electric heater, ~~a~~ prefilter, ~~a~~ HEPA filter, ~~a~~ carbon adsorber, ~~a HEPA~~ post filter, and motor operated inlet and outlet dampers. The outlets of both air handling units join into a single line and then separate to supply the inlets of the two parallel exhaust fans, allowing each air handling unit to supply either exhaust fan. ~~Upstream of the two exhaust air handling units in the common duct are electric heaters to maintain proper air inlet temperature to the filtration system.~~

~~Room Exhaust Air Handling Units~~

~~Each of the five parallel room exhaust air filtration units consists of an air-tight housing, a prefilter, a HEPA filter, and the associated manual dampers. The manual dampers align the filter units to the room exhaust fans or the iodine filtration unit. These parallel air filtration units supply air to two parallel room exhaust fans. The units can also be aligned to a single room exhaust air iodine filtration unit.~~

Room Exhaust Air Iodine Filtration Unit

Each of the two parallel room exhaust iodine filtration units consist of an air-tight housing, electric heater, prefilter, HEPA filter, carbon adsorber, post filter, and motor operated inlet and outlet isolation dampers. The exhaust air is routed through two parallel exhaust fans to the vent stack. ~~The room exhaust air iodine filtration unit consists of an air-tight housing, an electric air inlet heater, a carbon adsorber, a HEPA post-filter, and associated manual air dampers. The manual air dampers reroute air to the two parallel iodine filter booster fans, which supply air to the inlet of the room exhaust air fans.~~

Supply, System Exhaust, Room Exhaust, and Iodine Filter Unit Booster Fans

The supply, exhaust, and iodine filter unit booster fans are centrifugal type fans and are directly driven by the shaft of an electric motor. The fans are designed and rated in accordance with ANSI/AMCA 210 (Reference 4), ~~ANSI/~~AMCA 211 (Reference 5), and ANSI/AMCA 300 (Reference 6).

Isolation Dampers

The isolation dampers are located upstream and downstream of each filtration train. The motor-operated dampers will fail as-is ~~to "close" or "open" position~~ in case of loss of power~~, depending on the safety function of the dampers~~. Backdraft dampers prevent air flow to non-operating air supply and exhaust trains. The performance and testing requirements of the dampers are per ASME AG-1 (Reference 1).

Electric Heaters

Electric heaters meet the requirements of ASME AG-1 (Reference 1).

Heating and Cooling Coils

Preheating, heating, and cooling coils are of the continuous tube type, which are made of finned tubes with return bends providing continuous and uninterrupted flow of water within each tube.

Prefilters

The prefilters are located upstream of HEPA filters and collect large particles to increase the useful life of the ~~high efficiency~~ HEPA filters. The prefilters meet the requirements of ANSI/ASHRAE Standard 52.2~~-1999~~ (Reference 2).

HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with ASME AG-1 (Reference 1). The periodic in-place testing of HEPA filters to determine the leak-tightness is performed per ANSI/ASME N510~~-1989~~ (Reference 3).

Adsorbers

Carbon adsorbers are used to remove radioactive iodine from the exhaust air. The efficiency for removal of methyl iodine is based on the decontamination efficiency assigned during the laboratory tests. The periodic inplace testing of the adsorbers to determine the leak-tightness is performed per ANSI/ASME N510 (Reference 3). The activated carbon total bed depth requirement will be 2 inches with a maximum assigned activated carbon decontamination efficiency of 95 percent.

Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of ~~UL 555~~ NFPA 80 (Reference 7) and NFPA 90A (Reference 13) and the damper fire rating is commensurate with the fire rating of the barrier penetrated. Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

9.4.8.2.3 System Operation

Normal Operation

The RWBVS exhaust air fan and room exhaust air fan are started manually. With the exhaust fans running, a building supply air fan is manually started. The supply air fan draws outside air through the preheater and filters the air through medium efficiency particulate filters, either cooling the air with a chilled water cooling coil or heating the air with a hot water heating coil, ~~then humidifying the air through a humidifier~~ and distributing the conditioned air throughout the RWB.

The supply air trains are equipped with temperature ~~and humidity~~ sensors that control the cooling water flow for the cooling coils, the hot water flow for the preheater and the system heater~~, and steam flow for the humidifier~~. The preheater is equipped with a freeze protection temperature sensor, which shuts down supply air fans and closes air inlet dampers if the supply air temperature decreases below a predetermined set point. ~~The steam humidifier is controlled by a moisture sensor in the supply air duct.~~

The RWBVS exhaust fans are started manually. During normal operation, a system exhaust air fan ~~and a room air exhaust fan~~ runs continuously. The standby fans are actuated upon a failure of the running fan, when maintenance is being performed on their respective running fans~~, or if iodine booster fans are required~~.

The system exhaust air is drawn through a filter train that consists of a heater, prefilter, ~~a~~ HEPA filter, ~~a~~ carbon adsorber, post filter, and exhaust air fan. The air is then exhausted to the ~~plant~~ vent stack. The discharge of the system exhaust fans is monitored for radioactivity. In the event of a high radioactivity level alarm (refer to

Table 11.5-1, Monitor R-21), the system can be manually shut down and isolated. To maintain a constant exhaust air flow, the system exhaust air fans work in conjunction with the system exhaust air control damper to adjust for increasing pressure resistance of the filters.

Room exhaust air serves the rooms in RWB that are not normally expected to contain radioactivity. Room air is monitored by the SAMS prior to entering the filtration units. During normal operation, the clean room exhaust air bypasses the filtration units, and the exhaust air is directed to the vent stack. If radioactivity is detected by the SAMS (refer to Section 11.5.3.1.8 and Table 11.5-1, Monitors R-20 and R-22) in any of the rooms served by the room exhaust air system, the contaminated air is automatically rerouted through the iodine filtration unit prior to release to the vent stack. There are two parallel 50 percent filtration units. Each filtration train consists of two motor operated isolation dampers, heater, prefilter, HEPA filter, carbon adsorber, and post filter. The exhaust air is directed through two 50 percent exhaust fans to the vent stack.~~The room exhaust air, which takes exhaust air from the areas that do not normally contain radioactivity, is monitored for radioactivity concentrations in the air upstream of the room exhaust air filter units. The exhaust air is drawn through five parallel filter trains (four are required for normal operation) by one of the two room exhaust fans. Each of the filter trains consists of a medium efficiency filter and a HEPA filter. The air is then exhausted to the plant stack. The room exhaust air fans work in conjunction with the room exhaust air control damper to adjust for the increasing pressure resistance of the filters to maintain constant air flow. In the event that the monitored radioactivity reaches the high radioactivity alarm setpoint (refer to Table 11.5-1, Monitors R-20 and R-21), the exhaust from the rooms exhibiting radioactivity is manually directed to the iodine filtration unit. The iodine filtration unit consists of a heater, a carbon adsorber, a HEPA post-filter, and one of two booster fans that discharge to the room exhaust air fans and then to the plant stack.~~

Abnormal Operation

The RWBVS is not required to operate during a loss of offsite power (LOOP) or station blackout (SBO) and the RWBVS is not required to operate during or after a design basis accident; therefore the system is provided with no emergency or backup power. A failure in the SHS, ~~AHS,~~ OCWS, or the SAMS has no major impact on the RWBVS. A failure in the RWBVS has no impact on the above support systems.

9.4.8.3 Safety Evaluation

The RWBVS is not required for the safe shutdown of the plant or for mitigating the consequences of a design basis accident or a 10 CFR Part 100 event. Therefore, the RWBVS has no safety-related function.

9.4.8.4 Inspection and Testing Requirements

The RWBVS major components, such as dampers, motors, fans, filters, coils, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Initial in-place acceptance testing of the RWBVS is performed as described in Section 14.2 (test abstracts #080 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The RWBVS is designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of RWBVS is performed to demonstrate system and component operability and integrity.

During normal operation, equipment rotation is utilized to reduce and equalize wear on redundant equipment during normal operation.

Isolation dampers are periodically inspected and damper seats replaced as required.

Fans are tested by the manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 4, 5, and 6). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 2). Cooling coils are hydrostatically tested and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 12).

Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 9), American Society of Mechanical Engineers, ANSI/ASME N510 (Reference 3), ASME AG-1 (Reference 1), and RG 1.140 (Reference 8).

Heaters are tested in accordance with ASME AG-1, Section CA (Reference 1). Carbon filtration units are tested for housing leakage, filter bypass leakage and airflow performance. Periodically and subsequent to each filter or adsorber material replacement, the unit is inspected and tested in-place in accordance with the requirements of RG 1.140 (Reference 8), ANSI/ASME N510 (Reference 3) and ASME AG-1 (Reference 1). The charcoal adsorber samples are tested for efficiency in accordance with RG 1.140 (Reference 8) and ASTM D3803 (Reference 10). Air filtration and adsorption unit heaters are tested in accordance with ASME AG-1, Section CA (Reference 1).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

9.4.8.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the MCR. Fans, motor-operated dampers, heaters, and cooling units are operable from the MCR. Local instruments are provided to measure differential pressure across filters, flow, temperature and pressure.

The fire detection and sensors information is delivered to the fire detection system.

The radiation instrumentation requirements for controlling airborne radioactivity releases via the ~~plant~~ vent stack are addressed in Section 11.5.3.1.8 and Table 11.5-1, monitor/sample points R-20, R-21, R-22, and R-23 and R-24.

All instrumentation provided with the filtration units is as required by RG 1.140.

9.4.8.6 References

1. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, "Housings," Addenda).

2. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," ~~ANSI~~American National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

3. ANSI/ASME N510-1989 ~~(R1995)~~, "Testing of Nuclear Air-Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

4. ANSI/AMCA Standard ~~-~~210-99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, ~~December~~ 1999.

5. ~~ANSI/~~AMCA Publication ~~-~~211-~~19~~87, "Certified Ratings Program – Air Performance," ~~American National Standards Institute/~~Air Movement and Control Association International, 1987.

6. ANSI/AMCA Standard ~~-~~300-~~19~~85, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, 1985.

7. NFPA 80, "Standard for Fire Doors and Other Opening Protectives," National Fire Protection Association Standards, 2007.~~UL 555, "Standard for Fire Dampers," Underwriters Laboratories, Sixth Edition, June 1999.~~

Next File

8. NRC Regulatory Guide 1.140, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Normal Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," 2001.

9. HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

10. ASTM D3803-~~19~~89, ~~reapproved 1995,~~ "Standard Test Method for Nuclear Grade Activated Carbon," 1989.

11. ANSI/ASME N509-1989, "Nuclear Power Plant Air Cleaning Units and Components," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

12. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," American National Standards Institute/Air Conditioning and Refrigeration Institute, 2001.

13. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilation Systems," National Fire Protection Association Standards, 2002.

Figure 9.4.8-1—Radioactive Waste Building Ventilation System Air Supply

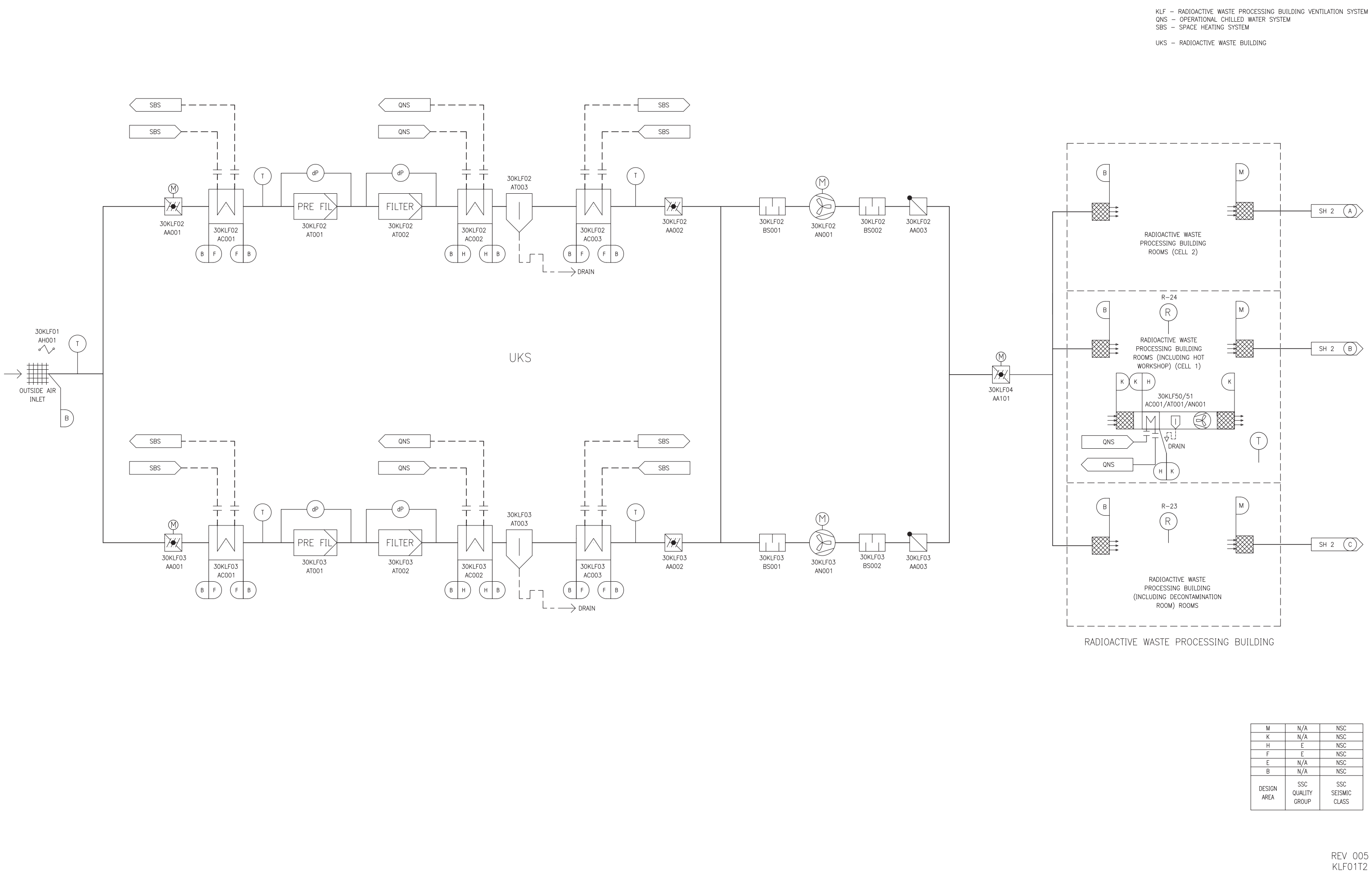
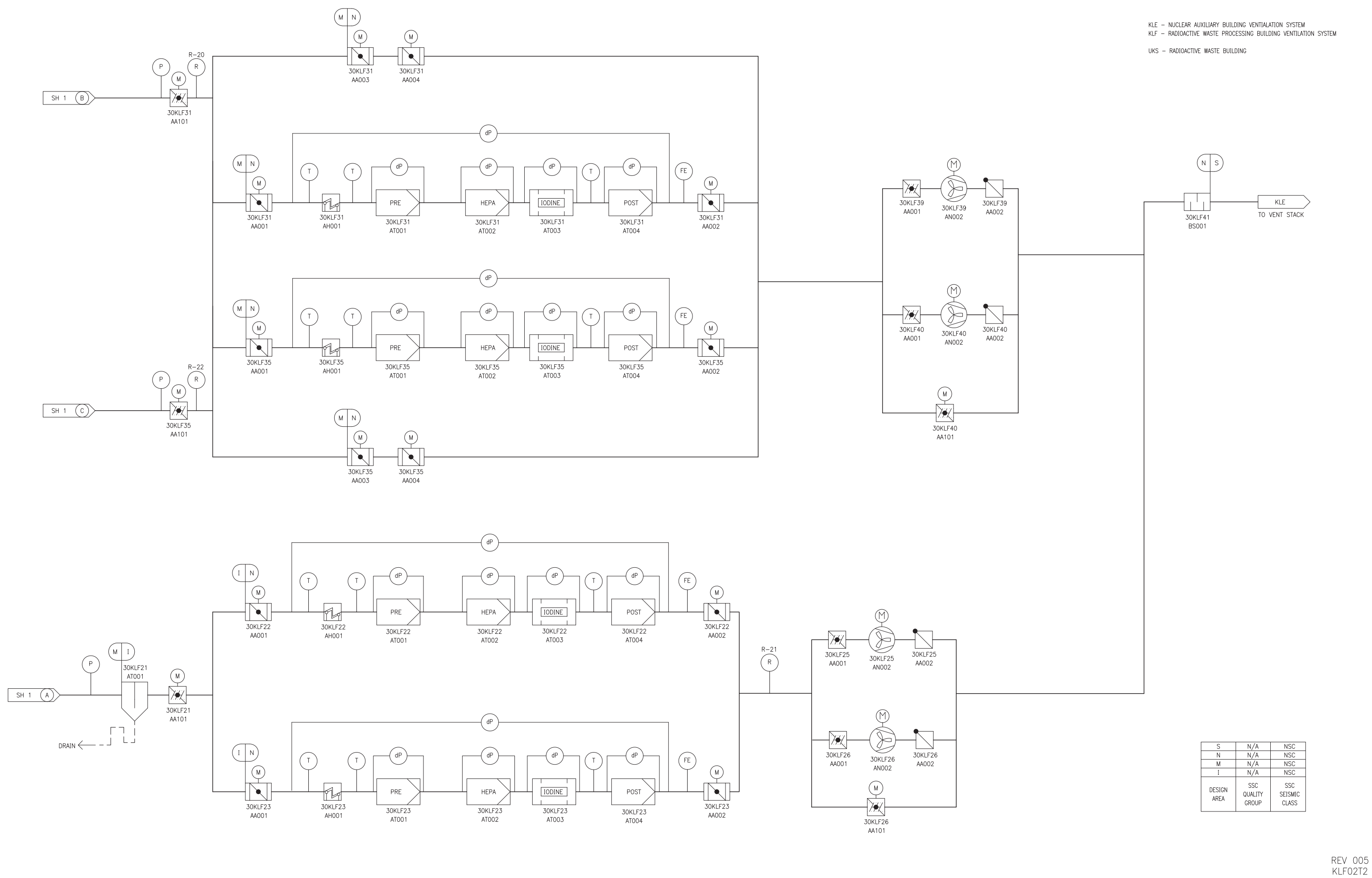


Figure 9.4.8-2—Radioactive Waste Building Ventilation System Exhaust Air Station



9.4.9 Emergency Power Generating Building Ventilation System

The emergency power generating building ventilation system (EPGBVS) maintains acceptable ambient conditions and air renewals of the diesel hall, electrical room, and main tank room of each of the four divisions of the Emergency Power Generating Buildings (EPGB). Each division has its own independent heating, ventilation and air conditioning (HVAC) system which is not connected to other divisions. Two divisions are located in each of the two EPGBs.

9.4.9.1 Design Bases

The EPGBVS consists of safety-related and non-safety-related air supply and exhaust systems. The safety-related portion is designed to Seismic Category I requirements, and the non-safety-related portion is designed to Seismic Category II requirements. The EPGBVS performs the following safety-related system function and complies with the general design criteria (GDC) indicated below:

- The EPGBVS maintains acceptable temperatures and air renewals in each of the four divisions to support the operation of the emergency diesel generators (EDG) and electrical control panels. The EDGs are required to provide onsite emergency power for the safety-related equipment to achieve and maintain the plant in a safe shutdown condition following a design basis accident, including loss of offsite power (LOOP).

- In accordance with GDC 2, the EPGBVS components are located inside the EPGBs, which are designed to withstand the effects of natural phenomena, such as earthquakes, tornados, hurricanes, floods and external missiles.

- In accordance with GDC 4, the EPGBVS components remain functional and continue to perform their intended safety function after anticipated operational occurrences and design basis accidents, such as fire, internal missiles, or pipe breaks.

- In accordance with GDC 5, the safety-related components and systems of the EPGBVS are not shared with other nuclear power units.

- In accordance with GDC 17, the U.S. EPR contains an onsite and offsite electric power system that supports the functioning of structures, systems, and components important to safety in the event of postulated accidents and anticipated operational occurrences. The EPGBVS maintains a minimum clearance of 20 feet from the bottom of fresh air intakes to grade elevation, and electrical cabinets are provided with suitable seals or gaskets, These features maintain proper functioning of the essential electric power system by meeting the guidelines of NUREG-CR/0660 (Reference 1), as related to the accumulation of dust and particulate material.

  The essential onsite electrical power systems meet the guidance of NUREG-CR/0660 for protection of essential electrical components (such as contactors, relays, circuit breakers) from failure due to the accumulation of dust and particulate materials. This is accomplished by the use of filters and supply air units in the EPGBVS.

Air conditioning and heating loads for the EDG rooms are calculated using methodology identified in ASHRAE Handbook (Reference 8).

- Summer cooling loads will be calculated with a maximum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1). The analysis will be completed for both a normal and accident plant alignment configuration with EDG in operation.

- The cooling supply units are designed to provide outside air for cooling as required to prevent the EDG room temperatures from exceeding their maximum design temperature.

- Winter heating loads will be calculated with the plant operating in an outage alignment configuration, without diesel operation. Winter heat loads will be calculated with a minimum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1).

Though the EDGs are in standby mode during normal plant operation, the EPGBVS is available in any plant operating condition. With outside air ambient design temperature conditions of -40°F to 115°F, the EPGBVS is designed to meet the following safety-related functional criteria:

- – Maintains the diesel hall temperature between 59°F and 140°F.
- – Maintains the electrical room temperature between 40°F and 113°F with 10~~35~~ to ~~7~~60 percent relative humidity.
- – Maintains the main tank room temperature between 59°F and 120°F.

The EPGBVS performs the following non-safety system functions:

- Provide outside air and cooling to the diesel hall when the EDGs are not in operation, or safety-related supply and exhaust fans are not required to operate.

- Provide outside air and cooling to the electrical room.

9.4.9.2 System Description

9.4.9.2.1 General Description

The EPGBVS ventilates the diesel generators using outside air as the cooling medium. Air is supplied into the building to slightly pressurize the building, and is then vented from the building through exhaust air louver openings.

The EPGBVS includes ventilation of diesel divisions 1 through 4. Divisions 1 and 2 are located inside the EPGB located on one side of the Reactor Building (RB), and divisions 3 and 4 are located inside the EPGB located on the opposite side of the RB. Each division has a separate and independent HVAC system. The HVAC systems for each of the four divisions are identical.

The air intake and exhaust stack of the EPGBVS are located such that exhaust gases being drawn into the air inlet stream are limited to an insignificant level. The exhaust stack is located approximately 70 feet from the air intake, and the exhaust air flow is directed away from the air intake flow.

One of the divisions of the EPGBVS is illustrated in Figure 9.4.9-1—Emergency Power Generating Building Ventilation System. The other three divisions are identical.

The EPGBVS consists of following subsystems for each division:

- Ventilation of diesel hall.
- Ventilation of electric room.
- Ventilation of main tank room.

Ventilation of Diesel Hall

The outside air is drawn into the HVAC supply room through an air intake screen or grill which prevents large objects from entering the air intake. The fresh air intake is located approximately fifty feet above grade elevation and is protected against tornado missiles. The screen or grill is heated during the winter to prevent ice buildup.

The air from the HVAC supply room is supplied through two separate air trains which include back draft damper, prefilter, and supply fan. Each diesel hall supply and exhaust fans maintain the diesel hall temperature between 59°F and 140°F. The supply air is delivered through ductwork to the diesel hall.

An additional non-safety-related air supply and exhaust ventilation system to the diesel hall is also installed that operates when the large safety-related supply and exhaust system is not required to operate during maintenance or when the moderate outside temperature does not allow the large supply and exhaust fans to operate. The non-safety-related air supply is drawn from the HVAC supply room, the system includes an air intake screen or grill, backdraft damper, prefilter, supply fan, motor operated damper, and manual damper. The non-safety-related air exhausts to the HVAC air exhaust room, the system includes a motor operated damper, exhaust fan and backdraft damper.

The non-safety-related ventilation system prevents frequent starting and stopping of the large safety-related supply and exhaust fans. A safety-related temperature sensor in the diesel hall controls operation of one or both safety-related supply/exhaust fans as required to maintain design temperature in the diesel hall. Initially, the non-safety fans operate, and as the diesel hall temperature increases both safety-related supply/exhaust fans start operating. Operation of safety-related fans shuts down the non-safety fans and closes the motor operated dampers. A separate safety-related temperature sensor in the diesel hall provides low/high room temperature alarm in the MCR. This sensor also closes the safety-related motor operated dampers located on the non-safety-related air supply/exhaust system when the diesel hall temperature reaches at or below 59°F.

During winter conditions, when the EDGs are not in operation, the air in the diesel hall is recirculated through four electrical ~~air~~ fan heaters. These fans are controlled by local thermostats to maintain the required minimum temperature.

The exhaust air from the diesel hall is directed to the HVAC exhaust room through two separate ducts which include an exhaust fan and a back draft damper. The exhaust plenum is split into two sections: one is for the diesel engine exhaust, and the other is for HVAC exhaust. This separation of exhaust prevents diesel exhaust back pressure from affecting the HVAC exhaust ventilation fans. This boundary prevents inadvertent entry of diesel engine exhaust into the diesel room if one of the HVAC exhaust damper fails to close. This partition also protects the HVAC equipment and improves working environment inside the area.

Ventilation of Electric Room

A non-safety-related inlet air supply for the electrical room is drawn from outside air through a motor operated damper, manual damper, prefilter, refrigerant evaporator cooler, and fan. The operation of this unit is automatically controlled by a room thermostat that maintains the electrical room temperature between 40°F and 113°F. A safety-related temperature sensor located outside under a tornado protective hood, sends a signal to open or close the safety-related motor operated damper that is located on the non-safety-related inlet air supply. This damper automatically closes when outside air temperature is below 50°F or above 100°F. This prevents entry of hot or cold outside air. The non-safety-related cooling system operates only when the EDGs are not operating. A backdraft damper is installed at the boundary of electrical room and diesel hall to allow the electrical room air to exhaust to the diesel hall.

A safety-related cooling system for the electrical room operates when the EDGs are also operating. This system recirculates the electrical room air through an air conditioning unit that consists of ~~fire dampers,~~ manual damper, prefilter, HEPA filter, cooling coil, moisture separator, and supply fan. The fan air flow maintains electrical room temperature within the design temperature limits of 40°F and 113°F. The water for the cooling coil is supplied from the ESW system. The recirculated air from the electrical room is controlled to maintain ambient conditions inside the electrical room.

Ventilation of Main Tank Room

The air supply to the main tank room is drawn from the diesel hall or HVAC supply air room through an electric louver damper, a back draft damper, and a fire damper. The exhaust air from the main tank room is directed through louver damper, exhaust fan, and a back draft damper. The exhaust air is then directed to the building exhaust through an outlet screen or grill. The exhaust fan is designed to maintain the required ventilation rate of the main tank room. The main tank room exhaust design air flow is 3,200 scfm. During winter, local heaters maintain the required minimum temperature inside the main tank room. These heaters are controlled by local thermostats.

9.4.9.2.2 Component Description

The major components of the EPGBVS are listed in the following paragraphs, along with the applicable codes and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the EPGBVS.

Ductwork and Accessories

The supply and exhaust air ducts are constructed of galvanized or stainless steel plates or sheets, and structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction requirements of ASME AG-1 (Reference 1).

Electric ~~Air Heating Convectors (Area~~ Heaters~~)~~

The electric ~~area~~ heaters are installed in the main tank room to maintain room ambient conditions and controlled by local room temperature sensors. Electrical heating coils are fin tubular type and meet the requirements of ASME AG-1 (Reference 1).

Fan Heaters

Fan heaters are used in the diesel hall to maintain acceptable temperature in the area. The fan heaters include a fan and electric heater. These fan heaters are controlled by a thermostat.

Prefilters

Prefilters are located upstream of HEPA filters and on all supply air inlets. The prefilters meet the requirements of ANSI/ASHRAE Standard 52.2 (Reference 2).

HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with ASME AG-1 (Reference 1). The periodic inplace testing of HEPA filters to determine the leak-tightness is performed in accordance with ANSI/ASME N510 (Reference 3).

Fans

The supply and exhaust fans are centrifugal or axial type with electrical motor drivers. Fan performance is rated in accordance with ANSI/AMCA 210-99 (Reference 4), ANSI/AMCA 211-1987 (Reference 5), and ANSI/AMCA 300-1985 (Reference 6).

Isolation Dampers

Manual dampers are adjusted during initial plant testing to establish accurate flow balance between the rooms. The motor-operated dampers will fail in the "as-is" position in the case of power loss. Backdraft dampers prevent air flow to non-operating air supply and exhaust trains. The performance and testing requirements of the dampers are in accordance with ASME AG-1 (Reference 1).

Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of UL 555 NFPA 80 (Reference 7) and NFPA 90A (Reference 11) and the damper fire rating is commensurate with the fire rating of the barrier penetrated. The fire dampers are included in the discussion of the EPGB fire protection system (refer to Appendix 9A.3.6).Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

Cooling Coils

Cooling coils are installed in the supply and recirculation train for cooling of the electrical room. The cooling coils are of finned tube coil type and designed in accordance with ASME AG-1 (Reference 1). The coil in the non-safety air cooling system is cooled using a refrigerant evaporator cooler. The safety recirculation cooling coil is cooled by the ESW system.

Moisture Separator

The moisture separator is installed in the air conditioning train to collect condensate, which is directed to the drain system.

9.4.9.2.3 System Operation

Normal Plant Operation

The EPGBVS maintains acceptable ambient conditions in the diesel hall, electric room, and main tank room of each of the four EPGB divisions. During normal plant operation, the EDGs do not operate. However, outside air is supplied to the diesel hall to maintain an acceptable ambient temperature for the startup of the EDGs and personnel comfort. In winter conditions, four fan heaters are available to maintain the required minimum temperature in the diesel hall. When the EDGs are in operation, the exhaust air removes the heat generated in the diesel hall. The operation of air supply fans and the opening of dampers depend on the diesel hall temperature detected by the sensors. The diesel hall temperature is kept in the appropriate band by controlling the position of dampers and operating the air supply fans.

Air renewals for the diesel hall and main tank room are maintained as needed to obtain the required ambient temperatures. The non-safety-related split system air conditioner supplies the electrical room with outside air that is mixed with the recycled air from the electrical room. The mixed air is then processed through the air conditioning train and supplied to the electrical room. The safety-related ESW cooling unit will operate only when the EDGs are operating or during the tests of EDGs.

The main tank room is ventilated by air supplied from the HVAC supply air room or diesel hall. The main tank room air is discharged through the exhaust duct to an exhaust fan and then out of the building. The main tank room is heated by a local electric heater, which is activated by a thermostat to maintain a minimum required room temperature.

Fire dampers are located on the ventilation system to avoid fire propagation in the building. The rooms are completely isolated in case of a fire in the room. ~~Fire is detected by a fire alarm system which automatically closes the corresponding fire damper.~~

Abnormal System Operating Conditions

Failure of Diesel Hall Air Supply

If one or more components of the diesel hall supply air fail, the EPGBVS is not able to maintain the required ambient conditions. At lower outside temperature, the system uses only one supply fan to provide sufficient ventilation for the proper operation of the EDGs. Since there are four redundant EPGB divisions, the failure of the diesel hall air supply in one division does not affect the other three divisions.

Failure of Diesel Hall Fan Heater

The diesel hall has four fan heaters. In the case of failure of one heater fan, the other three fans are able to maintain the required temperature in the diesel hall.

Failure of Electric Room Safety-Related Air Cooling Unit

In the case of failure of a component on the safety-related air conditioning train for the electric room, the required ambient conditions are not maintained in the electric room when EDG is operating. However, other unaffected divisions are available to provide necessary power during this event.

Failure of Exhaust Components

In the case of failure of any of the EPGBVS exhaust components, proper ambient conditions are not maintained. However, other unaffected divisions are available to provide necessary power during this event.

Loss of Offsite Power

In the event of LOOP, the emergency power to the safety-related EPGBVS components is supplied by the corresponding supported diesel generator. Therefore the safety-related ventilation system is not affected by the LOOP. The safety-related EPGBVS actuators are supplied with emergency power. During operation of the diesel generators with a maximum outside air ambient design temperature of 115°F, the room temperature may rise to a maximum of 140°F.

Station Blackout

In the event of a station blackout (SBO), diesel generator power is not available. The EPGBVS is not functional during the SBO event. Since the diesel generators are not operating, the temperature within the building will increase only slightly because no significant heat loads are present. The temperature within the EPGBs will remain at an acceptable level to support the operability of the diesels.

9.4.9.3 Safety Evaluation

The EPGBVS is designed to maintain ambient conditions inside the EPGB to allow safe operation of the diesel generators. The maximum temperature of 140°F in the diesel hall is the design temperature based on an outside ambient temperature of 115°F and heat loads due to operating EDGs and other electrical loads. The equipment inside the diesel hall is designed to a temperature of 140°F. The ambient conditions inside the EPGB are normally maintained acceptable for personnel access.

The EPGBVS is located inside of the EPGB, which is designed to withstand effects of earthquake, tornadoes, hurricanes, floods, external missiles and other natural phenomena. Chapter 3 provides the bases for adequacy of the structural design of the EPGBs.

The EPGBVS remains functional after a safe shutdown earthquake (SSE) event. Chapter 3 provides the design loading conditions, and Section 7.4 addresses the systems required for safe shutdown.

Redundancy is provided for the EPGBVS components and no single failure compromises the safety function of the system. Vital power is supplied from onsite or offsite power systems.

9.4.9.4 Inspection and Testing Requirements

The EPGBVS major components, such as dampers, motors, fans, filters, coils, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Test and analysis will be completed during normal operation with the system operating in an accident alignment. Analysis will use as-built information from equipment to extrapolate the performance of the air-conditioning system. Analysis will show that the equipment performance is adequate to maintain design conditions during plant operating conditions.

Initial in-place acceptance testing of the EPGBVS is performed as described in Section 14.2 (test abstracts #084 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The EPGBVS is designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of EPGBVS is performed to demonstrate system and component operability and integrity.

Isolation dampers are periodically inspected and damper seats replaced as required.

Fans are tested by manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 4, 5, and 6). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 2). Cooling coils are hydrostatically tested in accordance with ASME AG-1 (Reference 1) and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 9).

Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 10), and ASME AG-1 (Reference 1).

Heaters are tested in accordance with ASME AG-1, Section CA (Reference 1).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

9.4.9.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the MCR. Fans, motor-operated dampers, heaters and cooling units are operable from the MCR. Local instruments are provided to measure differential pressure across filters, flow, temperature and pressure. The fire detection and sensors information is delivered to the fire detection system.

9.4.9.6 References

1. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, "Housings," Addenda).

2. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," ~~ANSI~~American National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

3. ANSI/ASME N510-1989 ~~(R1995)~~, "Testing of Nuclear Air-Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

4. ANSI/AMCA Standard ~~-~~210-99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, ~~December~~ 1999.

5. ~~ANSI/~~AMCA Publication ~~-~~211-~~19~~87, "Certified Ratings Program – Air Performance," ~~American National Standards Institute/~~Air Movement and Control Association International, 1987.

6. ANSI/AMCA Standard ~~-~~300-~~19~~85, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, 1985.

7. NFPA 80, "Standard for Fire Doors and Other Opening Protectives," National Fire Protection Association Standards, 2007.~~UL 555, "Standard for Fire Dampers," Underwriter's Laboratories, Sixth Edition, June 1999.~~

8. "ASHRAE Handbook Fundamentals," American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc., 2005.

9. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

10. "HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

11. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilation Systems," National Fire Protection Association Standards, 2002.

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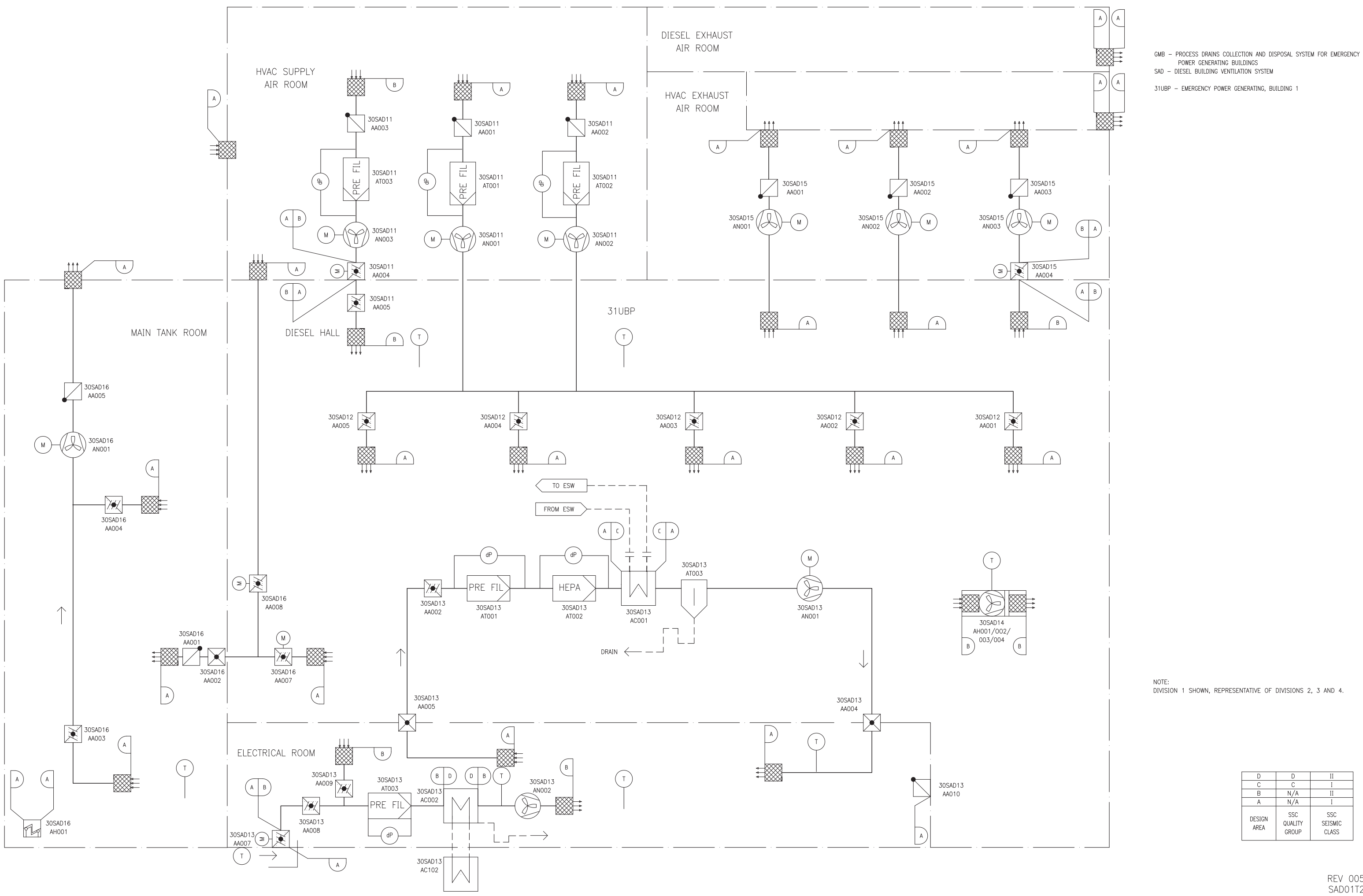
Figure 9.4.9-1—Emergency Power Generating Building Ventilation System



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9.4.10 Station Blackout Room Ventilation System

The station blackout room ventilation system (SBORVS) provides ventilation to the station blackout diesel generator (SBODG) ~~divisions~~ trains 1 and 2 located inside the Switchgear Building, including the diesel hall, fuel tank room, and associated electrical rooms. The SBORVS is available to operate during all plant operating conditions, and provides ventilation to remove heat generated by the SBODGs and associated electrical equipment when in operation. During normal operation, the SBODGs are in standby.

9.4.10.1 Design Bases

The SBORVS does not perform any safety-related function. All components of the SBORVS are non-safety related and Non-Seismic. The SBODGs are required only for beyond design basis events (BDBEs).

The SBORVS maintains acceptable ambient temperatures and air renewals in the station blackout (SBO) divisions to support operation of the SBODGs and associated electrical equipment which provide an onsite alternate AC (AAC) emergency power source to achieve and maintain the plant in a safe shutdown condition following a BDBE (refer to Section 8.4). The SBORVS maintains the following ambient conditions inside the SBO diesel trains~~divisions~~:

- Diesel hall and fuel tank room:
  - 50°F to 115°F.
  - No humidity control.
- Electric room:
  - 59°F to ~~95~~104°F.
  - ~~35~~10 to 70 percent humidity.

9.4.10.2 System Description

9.4.10.2.1 General Description

The SBORVS includes ventilation of the SBODG ~~divisions~~trains 1 and 2. Each ~~division~~ train has its own independent and identical heating, ventilation and air conditioning (HVAC) system. The SBORVS provides ventilation of the diesel hall, fuel tank room, and associated electrical rooms using outside air as the cooling medium.

The SBORVS consists of following subsystems for each SBODG train~~division~~:

- Ventilation of diesel hall and fuel tank room.
- Ventilation of electrical rooms.

Ventilation of Diesel Hall and Fuel Tank Room

The outside air is drawn to the SBODG train ~~division~~ through an air intake screen and grill, which prevents large objects from entering the air intake. The screen and grill are heated during cold weather to prevent ice buildup. The outside air is supplied through supply fans which are designed to provide the required air delivery flow rates. During winter conditions, when the SBODGs are not in operation, the air in the diesel hall is recirculated through the electric fan heaters to maintain the required minimum temperature. The exhaust air from the diesel hall and fuel tank room is exhausted outside the building.

Ventilation of Electrical Room

The inlet air supply for the electrical room is drawn from a common air supply shared with the diesel hall. The inlet air is then directed through an air conditioning unit. The conditioned air is supplied to the electrical room. The electric heaters increase the supply air temperature during cold weather conditions. The exhaust air from the electrical room is recirculated back through the air conditioning unit.

9.4.10.2.2 Component Description

The major components of the SBORVS are listed as follows, along with the applicable codes and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the SBORVS.

Ductwork and Accessories

The supply and exhaust air ducts are constructed of sheet steel and are structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction specifications of ASME AG-1 (Reference 1).

Electric Heaters

The electric heaters are installed to maintain room ambient conditions, which are controlled by local room temperature sensors. The electric heaters are designed to commercial standards.

Prefilters

The prefilters are located upstream of the fans to prevent large particles from entering the system. The prefilters meet the specifications of ANSI/ASHRAE Standard 52.2 (Reference 2).

Fans

The supply and exhaust fans include electric motor drivers. Fan performance is rated in accordance with ANSI/AMCA 210~~-99~~ (Reference 3), ~~ANSI/~~AMCA 211~~-1987~~

(Reference 4), and ANSI/AMCA 300-1985 (Reference 5).

Isolation Ddampers

Manual dampers are adjusted during initial plant testing to establish accurate flow balance between the rooms. The motor-operated dampers fail as-is in case of power loss. The performance and testing requirements of the dampers are per ASME AG-1.

Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of UL 555NFPA 80 (Reference 6) and NFPA 90A (Reference 9) and the damper fire rating is commensurate with the fire rating of the barrier penetrated. Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

Cooling Coils

The cooling coils are installed in the supply train for cooling the electrical room. The cooling coils are designed in accordance with ASME AG-1. A packaged chiller provides a cooling medium of cold water to the cooling coils.

Humidifiers

Humidifiers are installed to maintain ambient humidity conditions in the electrical room. Humidity levels are controlled by the humidity sensors in the room.

9.4.10.2.3 System Operation

Normal Plant Operation

The SBORVS maintains the required ambient conditions in the diesel hall, fuel tank room and electrical room SBODG Divisionstrains 1 and 2. During normal plant operation, the SBODGs are in standby. However, outside air is supplied to the diesel hall to prepare for startup of the SBODGs and for personnel comfort. During cold weather conditions, the fan heaters are available to maintain the required minimum temperature. When the SBODGs are in operation, the exhaust air removes the excess heat generated in the diesel hall.

The electrical components are located in a separate room that has a separate air supply train. The electrical room air supply provides conditioned air to maintain the required ambient temperature and humidity. The outside air is mixed with the recycled air from the electrical room, and the mixed air is then processed through the air conditioning train. The mixed air supply temperature and humidity are maintained by the electrical heater, and cooling coils, and humidifier located in the air conditioning train.

The exhaust air is discharged through the duct to an exhaust fan, then exhausted from the Switchgear Building. Air renewals for the electrical room, diesel hall, and fuel tank room are maintained as needed to obtain the required ambient temperatures.

Fire dampers are located in the ventilation system to avoid fire propagation within the SBODG trainsdivisions. These rooms are completely isolated from each other in case of a fire in an individual room. Fire is detected by a fire alarm system, which automatically closes the corresponding fire damper.

Abnormal Operating Conditions

Failure of a Component

If one or more components of the SBODG train division fail, the SBORVS is not able to maintain the required ambient conditions in the affected SBO traindiesel division. Because there are two redundant trainsdivisions, the failure of a component in one train division does not affect the other traindivision.

Station Blackout

In the event of SBO, the SBODGs are started. Each of the two SBORVS divisions receives power from its associated SBODG.

9.4.10.3 Safety Evaluation

There are no safety-related components for the SBORVS. The SBODGs are required only for BDBEs.

9.4.10.4 Inspection and Testing Requirements

The SBORVS major components, such as dampers, motors, fans, filters, coils, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Initial in-place acceptance testing of the SBORVS is performed as described in Section 14.2 (test abstracts #086 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The SBORVS is designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of SBORVS is performed to demonstrate system and component operability and integrity.

Isolation dampers are periodically inspected and damper seats replaced as required.

Fans are tested by the manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 3, 4, and 5). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 2). Cooling coils are hydrostatically tested and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 7). Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 8).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

9.4.10.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the main control room (MCR). Fans, motor-operated dampers, heaters and cooling units are operable from the MCR. Local instruments are provided to measure differential pressure across filters, flow, temperature and pressure. The fire detection and sensors information is delivered to the fire detection system.

9.4.10.6 References

1. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, "Housings'" Addenda).

2. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," ~~ANSI~~American National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

3. ANSI/AMCA Standard ~~-~~210-99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, ~~December~~ 1999.

4. ~~ANSI/~~AMCA Publication ~~-~~211-~~19~~87, "Certified Ratings Program – Air Performance," ~~American National Standards Institute/~~Air Movement and Control Association International, 1987.

5. ANSI/AMCA Standard ~~-~~300-~~19~~85, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, 1985.

6. NFPA 80, "Standard for Fire Doors and Other Opening Protectives," National Fire Protection Association Standards, 2007.~~UL 555, "Standard for Fire Dampers," Underwriter's Laboratories, Sixth Edition, June 1999.~~

7. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

8. "HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

9. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilation Systems," National Fire Protection Association Standards, 2002.

Next File

9.4.11 Essential Service Water Pump Building Ventilation System

The essential service water pump building ventilation system (ESWPBVS) provides conditioned air to the essential service water system (ESWS) pump areas and associated electrical equipment areas. The ESWPBVS provides an environment suitable for the operation of the ESWS pumps (refer to Section 9.2.1) and associated electrical equipment by maintaining acceptable temperature conditions in each of the four ESWS Pump Buildings. Each building has its own independent ventilation system and is not connected to the other buildings.

9.4.11.1 Design Bases

The ESWPBVS consists of -a safety-related cooling system and room air heaters and a non-safety related -cooling unit. The safety-related portion is designed to Seismic Category I criteria. The non-safety-related portion is designed to Seismic Category II. The ESWPBVS performs the following safety-related system functions and complies with the general design criteria (GDC) indicated below:

- The ESWPBVS maintains acceptable temperature limits to support operation of the ESWS pumps that are required to operate during design basis accident conditions. The ESWPBVS maintains a minimum temperature of 41°F and a maximum temperature of 113°F in the ESWS Pump Buildings for personnel accessibility and to support operation of the ESWS pumps. This temperature range maintains a mild environment in these buildings, as defined in Section 3.11.

- The ESWPBVS components are located inside the ESWS Pump Buildings, which are designed to withstand the effects of natural phenomena, such as earthquakes, tornadoes, hurricanes, floods, and external missiles (GDC 2).

- The ESWPBVS components are appropriately protected against dynamic effects and designed to accommodate the effects of, and to be compatible with, the environmental conditions associated with normal operation, maintenance, testing and postulated accidents. The components of the ESWPBVS remain functional and perform their intended safety function after anticipated operational occurrences and design basis accidents, such as a fire, internal missiles, or pipe break (GDC 4).

- The safety-related components and systems of the ESWPBVS are not shared among nuclear power units (GDC 5).

- The essential onsite electrical power systems meet the guidance of NUREG-CR/0660 (Reference 1) (subsection A–item 2, and subsection C-item 1) for protection of essential electrical components (such as contactors, relays, circuit breakers) from failure due to the accumulation of dust and particulate materials (GDC 17).

- Power and control functions are designed in accordance with RG 1.32.

Air conditioning and heating loads for the ESWS pump rooms are calculated using methodology identified in ASHRAE Handbook (Reference 8).

- Summer air conditioning loads will be calculated with a maximum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1). The analysis will be completed for both a normal and accident plant alignment configuration.
- The safety-related cooling supply units are designed to provide cooling as required to prevent the ESWS pump room temperatures from exceeding their maximum design temperature.
- Winter heating loads will be calculated with the plant operating in an outage alignment configuration. Winter heat loads will be calculated with a minimum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1).

The ESWPBVS performs the following non safety-related system functions:.

- Provides outside air and cooling to the ESWPB when the ESW pumps are not operating.

9.4.11.2 System Description

9.4.11.2.1 General Description

A drawing of the ESWPBVS applicable to each of the four ESWS Pump Buildings is shown in Figure 9.4.11-1—Essential Service Water Pump Building Ventilation System.

The ESWPBVS supplies the recirculation air for cooling or heating of the ESWS pump area and electrical equipment area located inside each of the four ESWS Pump Buildings. Each building has its own independent ventilation system.

This ventilation system is not expected to contain or interface with any radioactive materials, and so is not considered an Engineered-Safety-Feature Atmospheric Clean-Up System.

Safety-Related Cooling and Heating

The safety-related cooling units operate when the ESW pump is operating in that building. Room air is drawn through an air inlet grill and processed through an air conditioning train. The conditioned air is supplied to the ESWS pump area and electrical equipment area. The room air is then returned to the air conditioning train. The air conditioning train for each building is comprised of the following components:

- Recirculation supply air ductwork.

- Manual balancing damper.
- Prefilter.

Each ESWPB has two safety-related room air heater units to prevent freezing within the ESW pump rooms during winter.

- Cooling coils, which cool the recirculation air to the required supply air temperature, have a total cooling capacity of ~~619,400~~640,000 Btu/hr. The cooling coils are supplied with water from the ESWS pump and the water is discharged into the respective cooling tower basin. Manual isolation valves are provided to isolate the cooling coils for maintenance.
- Moisture separator, which drains the condensate to the cooling tower basin.
- Heaters, which heat the recirculation air during winter conditions to maintain the minimum required temperature.
- Supply air recirculation fans, are designed to provide an air flow rate of ~~30,000~~ 115,000 scfm.
- Supply air louver dampers.
- Motor operated outside air inlet and outlet isolation dampers.

Non-Safety Related Cooling Unit

The non-safety-related cooling units in each pump house pull in outside air through a grille protected by a tornado barrier. The outside air is mixed with recirculated room air through balancing dampers and processed through an air conditioning train. The non-safety-related air conditioning train for each building is comprised of the following components:

- Supply ducting with bird screen.
- Manual balancing dampers.
- Prefilters.
- Split system refrigerant air conditioning cooling coil.
- Supply air fan.

9.4.11.2.2 Component Description

The major safety-related components of the ESWPBVS are listed in the following paragraphs, along with the applicable codes and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the ESWPBVS.

Ductwork and Accessories

The supply air duct is constructed of galvanized sheet steel and is structurally designed for the fan shutoff pressure. The ductwork meets the design, construction and testing requirements of ASME AG-1 (Reference 2).

Cooling Coils

The cooling coils are designed in accordance with ASME AG-1 (Reference 2).

Cooling Coil Isolation Valves

The cooling coil isolation valves are designed to meet ASME Boiler and Pressure Vessel Code, Section III, Class 3 (Reference 7).

Moisture Separators

Each moisture separator is installed to collect the condensate which is directed to the cooling tower basin.

Air Supply Fan

The fan is centrifugal or axial type with an electrical motor driver. Fan performance is rated in accordance with ANSI/AMCA 210 (Reference 4), ~~ANSI/~~AMCA 211 (Reference 5), and ANSI/AMCA 300 (Reference 6).

Balancing Dampers

Manual dampers are adjusted during initial plant testing to establish an accurate flow balance. The performance and testing requirements of the dampers are per Reference 2.

Motor Operated Isolation Dampers

The motor operated isolation dampers will fail as-is ~~in position~~ in case of power loss. The outside air inlet/outlet motor operated isolation dampers are designed to ASME AG-1 (Reference 2) damper isolation leakage class II requirements.

Electric Heaters

The electric heaters meet the requirements of ASME AG-1 (Reference 2).

9.4.11.2.3 System Operation

Normal Plant Operation

During normal plant operation, the non-safety-related cooler maintains the ESW Pump Room between 50°F and 100°F, during summer months when the ESW pumps are not in operation. The safety-related cooler for a particular ESWPB will operate when the ESW pump in that building is in operation. The non-safety-related cooler can operate concurrent with the safety-related cooler with or without the ESW pumps in operation. A safety-related temperature sensor (located outside under the tornado protective hood for inlet outside air) sends a signal to open or close the safety-related inlet and outlet motor operated isolation dampers when the outside air temperature is above 100°F or below 50°F. This will prevent the entry of the hot or cold outside air, which could allow the temperature in the ESW building to fall above or below the maximum/minimum design temperature of 113°F/410°F.

During winter, the room air is heated by two safety-related wall mounted electric heaters. Local thermostats start and stop the safety-related heater units to maintain the ESW pump room temperature between 50°F and 100°F.

Abnormal Operating Conditions

If one or more components of the ESWPBVS fail, the ESWPBVS is not able to maintain the required ambient conditions in the affected building. Because there are four independent ESWS pump buildings, the failure in one building does not affect the other three buildings.

Loss of Off-Site Power

In the event of loss of offsite power (LOOP), the safety-related ESWPB cooling system and room air heaters continue to operate. The power is supplied from the Class 1E emergency power supply system (EPSS).

Station Blackout

In the event of station blackout (SBO), the ESWPBVS is not operable.

Plant Accident Conditions

The safety-related ESWPB cooling system and room air heaters are required to operate during design basis accident conditions. Even if the ESWS pumps are not required to operate, the safety-related ESWPBVS maintains conditions in the ESWS pump buildings in case the ESWS pumps are required to operate.

9.4.11.3 Safety Evaluation

The ESWPBVS has sufficient cooling capacity to maintain the pump room temperature below 113°F when the ESWS pump motors are operating at rated load and the outside air is at the maximum site design ambient temperature of 115°F. The heater is controlled by a local temperature control system having a predetermined temperature setpoint.

The ESWPBVS is located in the ESWS Pump Building, which is designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, external missiles, and other similar natural phenomena. Section 3.3, Section 3.4, Section 3.5, Section 3.7, and Section 3.8 provide the bases for the adequacy of the structural design of these buildings.

The components of the ESWPBVS remain functional and perform their intended safety function after anticipated operational occurrences and design basis accidents, such as a fire, internal missiles, or pipe break (GDC 4). Section 3.5.1.1 provides the bases for this determination for internally generated missiles outside containment. For missiles generated by tornadoes and extreme winds, see Section 3.5.1.4 and Section 3.5.2. Piping failures due to high energy line breaks are addressed in Section 3.6.1.

Since redundancy of the ESWPBVS is provided, no single failure compromises the safety functions of the system. Vital power is supplied from either onsite or offsite power systems, as described in Chapter 8.

The power supplies and control functions necessary for safe function of the ESWPBVS are from a Class 1E system, as described in Chapter 7 and Chapter 8.

9.4.11.4 Inspection and Testing Requirements

The ESWPBVS major components, such as dampers, motors, fans, filters, coils, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Test and analysis will be completed during normal operation with the system operating in an accident alignment. Analysis will use as-built information from equipment to extrapolate the performance of the air-conditioning system. Analysis will show that the equipment performance is adequate to maintain design conditions during plant operating conditions.

Initial in-place acceptance testing of the ESWPBVS is performed as described in Section 14.2 (test abstracts #088 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The ESWPBVS is designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of ESWPBVS is performed to demonstrate system and component operability and integrity.

Isolation dampers are periodically inspected and damper seats replaced as required.

Fans are tested by the manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 4, 5, and 6). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 9). Cooling coils are hydrostatically tested in accordance with ASME AG-1 (Reference 2) and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 10).

Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 11), and ASME AG-1 (Reference 2).

Heaters are tested in accordance with ASME AG-1, Section CA (Reference 2).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

9.4.11.5 Instrumentation Requirements

Indication of the operational status of the equipment, instrument indications and alarms are provided in the main control room (MCR). Fans and heaters are operable from the MCR. Local instruments are provided to measure flow, temperature and pressure. The fire detection and sensors information is delivered to the fire detection system.

9.4.11.6 References

1. NUREG-CR/0660, Boner, G.L. and Hanners, H.W., "Enhancement of Onsite Emergency Diesel Generator Reliability," University of Dayton Research Institute UDR-TR-79-07 for U.S. Nuclear Regulatory Commission, January 1979.

2. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, "Housings," Addenda).

3. ANSI/ASME N510-1989 (R1995), "Testing of Nuclear Air-Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

4. ANSI/AMCA Standard -210-99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, ~~December~~ 1999.

5. ~~ANSI/~~AMCA Publication -211-~~19~~87, "Certified Ratings Program – Air Performance," ~~American National Standards Institute/~~Air Movement and Control Association International, 1987.

6. ANSI/AMCA Standard ~~-~~300-~~19~~85, “Reverberant Room Method of Testing Fans for Rating Purposes,” American National Standards Institute/Air Movement and Control Association International, 1985.

7. ASME Boiler and Pressure Vessel Code, Section III, “Rules for Construction of Nuclear Facility Components,” Class 3 Components, The American Society of Mechanical Engineers, 2004.

8. “ASHRAE Handbook Fundamentals,” American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc., 2005.

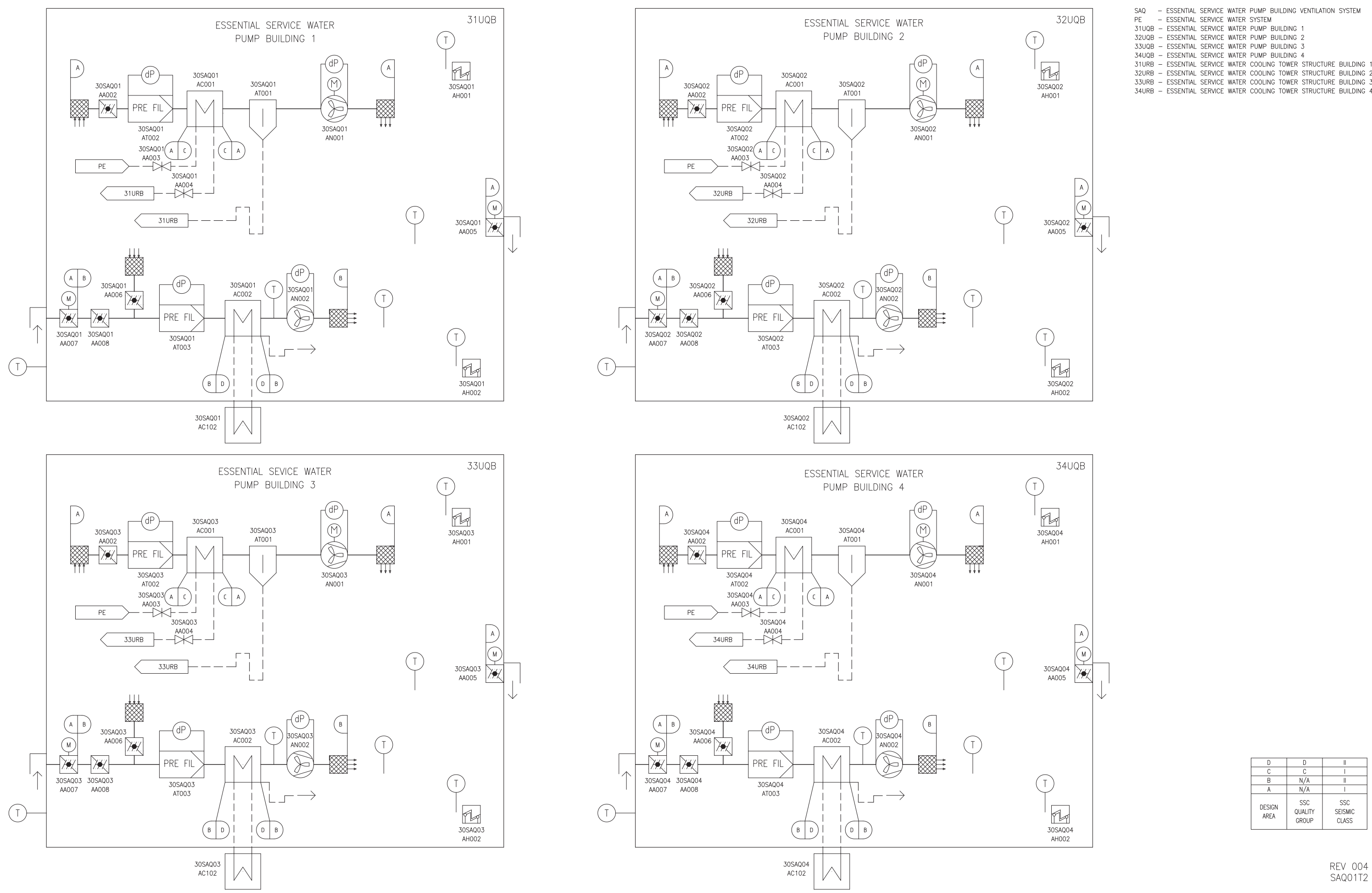
9. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," ~~ANSI~~American National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

10. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

11. "HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

Next File

Figure 9.4.11-1—Essential Service Water Pump Building Ventilation System



9.4.12 Main Steam and Feedwater Valve Room Ventilation System

The main steam and feedwater valve room ventilation system (VRVS) is designed to maintain ventilation and ambient temperatures to allow personnel access for the following areas:

- Main steam valve rooms.
- Feedwater valve rooms.
- Steam generator blowdown valve room.

9.4.12.1 Design Bases

The VRVS performs no safety-related functions and the system is not required to operate during a design basis accident (DBA). The safety and seismic classification of VRVS components is provided in Section 3.2.

For non-safety-related equipment located in the same room with safety-related equipment, the seismic classification for the non-safety-related equipment is described in Section 3.7.3.8 for interaction of Seismic Category I subsystems.

The VRVS is designed to maintain a minimum temperature of 50°F and a maximum temperature of 104°F in the valve rooms for personnel accessibility during normal plant operation and planned shutdowns.

9.4.12.2 System Description

9.4.12.2.1 General Description

A simplified diagram of the VRVS for divisions 1, 2, 3 and 4, is shown in Figure 9.4.12-1—Main Steam and Feedwater Valve Room Ventilation System.

The room air flow rates are calculated based on the heat released by operating equipment, lighting, external loads, and heat loads from adjacent rooms.

The recirculation cooling unit for each valve room is comprised of the following components:

- Recirculation ductwork to supply and extract air to and from the rooms.
- Cooling coils connected to operational chilled water system.
- Moisture separator.
- Recirculation fan.

The room hot air is recirculated by the recirculation fan through the air inlet duct and cooling coils. The cool air is supplied back to the room through the air outlet duct. Electric heaters are located in each room to maintain the minimum room temperature during normal operations.

9.4.12.2.2 Component Description

The major components of the VRVS, along with their applicable codes and standards, are described in the following paragraphs. Table 3.2.2-1 provides the seismic design and other design classifications for components in the VRVS.

Ductwork

The supply and exhaust air ducts are constructed of sheet steel and are structurally designed for the fan shutoff pressure. The ductwork meets the design, testing and construction requirements per ASME AG-1 (Reference 1).

Recirculation Cooling Units

The recirculation cooling units consist of a fan section and a water cooling section. The condensate from the cooling section is directed to the drain system. The cooling coils are designed in accordance with ASME AG-1 (Reference 1).

Fans

The recirculation fans are centrifugal or vane-axial design with electrical motor driver. Fan performance is rated in accordance with ANSI/AMCA 210 (Reference 2), ~~ANSI/~~ AMCA 211~~-1987~~ (Reference 3), and ANSI/AMCA 300 (Reference 4).

Electric Heaters

The electric heaters have tubular sheathed elements arranged in a housing.

9.4.12.2.3 System Operation

Normal Plant Operation

The VRVS operates during normal operation and shutdown conditions. Recirculation cooling units for each valve room operate automatically. Room air is recirculated through the cooling units to maintain an acceptable room temperature. Operation of the recirculation fans is controlled by room temperature sensors. The recirculation cooling units start automatically when the room temperature exceeds 100°F, and stop when the temperature falls below 91°F.

Electric heater operation is controlled by room temperature sensors. Unit heaters start automatically when the room temperature drops below the temperature setpoint.

Abnormal Operating Conditions

Failure of Recirculation Cooling Units

In case of loss of a recirculation cooling unit for a specific room, equipment function will not be affected since the equipment is designed for higher temperatures. A high temperature alarm is generated in the main control room (MCR) for operator action.

Failure of Electric Heaters

Redundant heaters are provided in each of the main steam valve rooms. If a heater fails, the redundant heater in the room will operate to maintain the temperature above the minimum value of 50°F.

Redundant heaters are not provided in the feedwater valve rooms and the steam generator blowdown valve room. If a heater fails in a one of these rooms, equipment function will not be affected since the equipment is designed for lower temperatures. A low temperature alarm is generated in the MCR for operator action.

Loss of Offsite Power

Recirculation cooling units and electric heaters for the valve rooms are not provided with emergency power; these components will not operate during loss of offsite power (LOOP). The operation of these components is not required for equipment operability in these rooms.

Station Blackout

Recirculation cooling units and electric heaters for valve rooms are not supplied from the alternate alternating current (AAC) source; therefore these components will not operate during a station blackout (SBO). The operation of these components is not required for equipment operability in these rooms.

9.4.12.3 Safety Evaluation

The operation of VRVS is not required for the safe shutdown of the plant or for mitigating the consequences of a DBA; therefore the system has no safety-related function.

9.4.12.4 Inspection and Testing Requirements

The VRVS major components, such as motors, fans, coils, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Initial in-place acceptance testing of the VRVS is performed as described in Section 14.2 (test abstracts #089 and #203), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

During normal plant operation, periodic testing of VRVS is performed to demonstrate system and component operability and integrity.

Fans are tested by the manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 2, 3, and 4). Cooling coils are hydrostatically tested and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 5).

Housings and ductwork are leak-tested in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 6).

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

9.4.12.5 Instrumentation Requirements

Indication of the operational status of the equipment, instrument indications and alarms are provided in the MCR. Fans, heaters and cooling units are operable from the MCR. Local instruments are provided to measure flow, temperature and pressure. The fire detection and sensors information is delivered to the fire detection system.

9.4.12.6 References

1. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 1997 (including the AG-1a-2000, "Housings," Addenda).

2. ANSI/AMCA Standard ~~–~~210-99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, ~~December~~ 1999.

3. ~~ANSI/~~AMCA Publication ~~–~~211-~~19~~87, "Certified Ratings Program – Air Performance," ~~American National Standards Institute/~~Air Movement and Control Association International, 1987.

4. ANSI/AMCA Standard ~~–~~300-~~19~~85, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, 1985.

5. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

6. "HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

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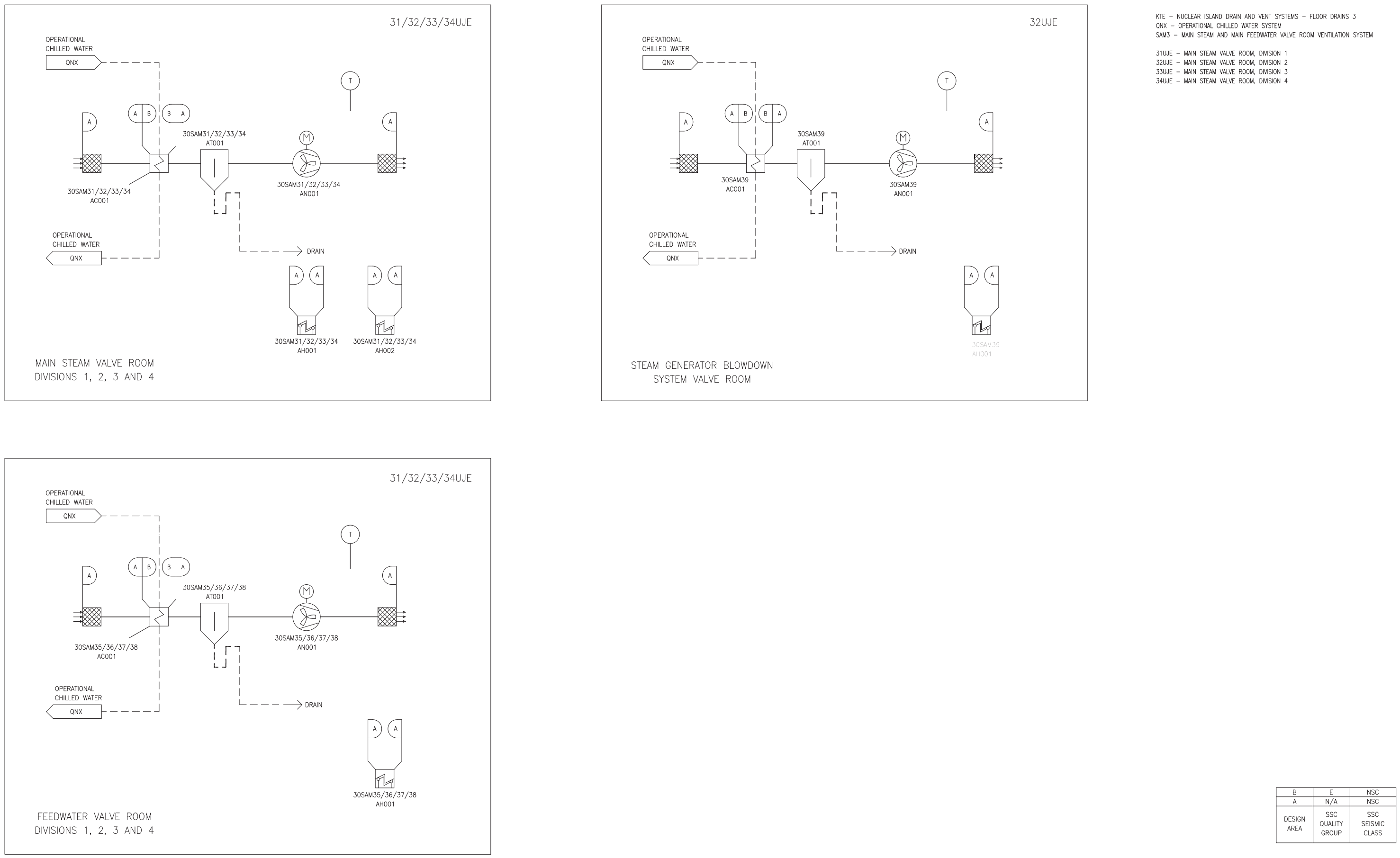
Figure 9.4.12-1—Main Steam and Feedwater Valve Room Ventilation System



DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS
B	E	NSC
A	N/A	NSC

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9.4.13 Smoke Confinement System

The smoke confinement system (SCS) operates to mitigate the effects of smoke or gases that could result from fire in the MCR and adjacent rooms. The SCS functions in close coordination with the fire protection system. Refer to Section 9.5.1 for a description of the fire protection program. The SCS maintains the emergency egress paths free of smoke. The SCS is normally switched off and remains in a standby mode for operation in the event of a fire.

The SCS is designed to protect rescue routes against the inflow of smoke from fire inside the adjacent rooms by supplying fresh outdoor air and pressurizing the rescue routes and staircases in relation to the adjacent rooms.

The SCS applies to the following areas and buildings of the NI:

- Safeguard Building (SB) divisions 2 and 3 interconnected passageway (egress path between MCR and RSS).

The SCS is not required to operate during simultaneous events involving a potential release of radioactive contamination and fire. Airborne radioactivity is processed by the applicable building ventilation systems prior to release to the environment.

9.4.13.1 Design Bases

All components of the SCS are non-safety related and Non-Seismic, as specified in Section 3.2. The SCS performs no safety-related functions and is not required to operate during a design basis accident.

The SCS performs the following ~~important~~ non-safety-related system functions:

- Prevents smoke, hot gases, or fire suppressant agents from migrating from one area to another to the extent that they could adversely affect the safe-shutdown capabilities, including operator action. The environmental control systems are physically separated to satisfy these requirements, per SECY-90-016, Issue II.D (Reference 1).
- Protects access and egress pathway between the MCR and RSS for habitability by maintaining higher pressure than adjacent areas to minimize smoke infiltration during a fire.

9.4.13.2 System Description

9.4.13.2.1 General Description

In the event of a fire, the SCS is initiated either automatically through the plant fire alarm system signal or manually by the fire brigade. The system is designed to protect rescue routes between the MCR and RSS against inflow of smoke from fire inside the adjacent rooms by supplying fresh outdoor air, pressurizing these areas in relation to adjacent rooms.

The SCS consists of the following subsystems:

- The supply and exhaust air subsystem for the interconnecting passageway between SB division 2 and division 3.

Supply and Exhaust Air Subsystem for the Interconnecting Passageway between Safeguard Building Division 2 and Division 3

The interconnecting passageway between SB division 2 and division 3 is supplied with intake air through a fire-resistant concrete air intake ventilation chase with a motor-operated isolation damper and a supply fan as shown in Figure 9.4.13-1. The intake air opening located at the top of the building has weather-protected grilles.

The air from the supply fan is directed through a galvanized steel ductwork to the bottom of the escape ladder shaft and to the interconnecting passageway.

A pressure control damper and motor-operated isolation damper installed on the exhaust ductwork provide pressure control in the interconnecting passageway and associated rooms.

9.4.13.2.2 Component Description

The major components of the SCS are listed in the following paragraphs.

Table 3.2.2-1 provides the seismic design and other design classifications for components in the SCS.

Supply Air Fans

The supply air fans have an axial design with an electrical motor driver.

Isolation Dampers

Motorized bubble-tight dampers are used to isolate each exhaust and supply duct from outside air during normal plant operation (i.e., SCS not in operation).

Back Draft Dampers

Back draft dampers are used to isolate smoke exhaust ducts from outside air during normal plant operation (i.e., SCS not in operation).

Fire Dampers

Fire dampers are installed where SCS ductwork penetrates a fire barrier. Fire damper design meets the requirements of ~~UL 555~~NFPA 80 (Reference 2) anbd NFPA 90A

(Reference 4) and the damper fire rating is commensurate with the fire rating of the barrier penetrated.

~~Fire in a room is detected by the fire detection system.~~ Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

Pressure Control Dampers

Adjustable pressure relief dampers are used to limit and control overpressurization inside the interconnecting passageways.

Ducts

The ductwork is made of galvanized steel.

9.4.13.2.3 System Operation

Normal Operating Conditions

The SCS is normally switched off and is in standby mode during normal plant operations. Only the systems or subsystems related to a specific area operate in the event of a fire in that area. The systems in that area are switched on either automatically by the plant fire alarm system or manually by the fire brigade. Other components or systems that are not associated with the area remain closed and in standby mode.

The SCS protects rescue routes against the inflow of smoke from fire inside the adjacent rooms, supplies fresh outdoor air, pressurizes the rescue routes to control spread of fire or smoke.

Abnormal Operating Conditions

Plant abnormal operating conditions have no impact on the operation of SCS since the system is in standby mode and operates only in the event of a fire in a specific area. During a fire, the SCS provides habitable conditions for the fire brigade. These dampers open during a fire in a specified fire area.

9.4.13.3 Safety Evaluation

The system is not required for the safe shutdown of the plant or for mitigating the consequences of a design basis accident; the system has no safety-related function.

The SCS is powered by the normal power supply system.

9.4.13.4 Inspection and Testing Requirements

Refer to Section 14.2 (test abstract #085) for initial plant startup test program. Initial inplace acceptance testing of the SCS will be performed in accordance with NFPA 92A (Reference 3).

9.4.13.5 Instrumentation Requirements

The plant fire alarm system controls electrical components of the SCS. Indication of the operational status of the equipment is provided in the main control room (MCR).

9.4.13.6 References

1. SECY-90-016, "Evolutionary LWR Certification Issues and Their Relationship to Current Regulatory Requirements," U.S. Nuclear Regulatory Commission, January 1990.

2. NFPA 80, "Standard for Fire Doors and Other Opening Protectives," National Fire Protection Association Standards, 2007.~~UL 555, "Standard for Fire Dampers," Underwriter's Laboratories, Sixth Edition, June 1999.~~

3. NFPA 92A ~~(06)~~, "Recommended Practice for Smoke-Control Systems," National Fire Protection Association, 2006.

4. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilation Systems," National Fire Protection Association Standards, 2002.

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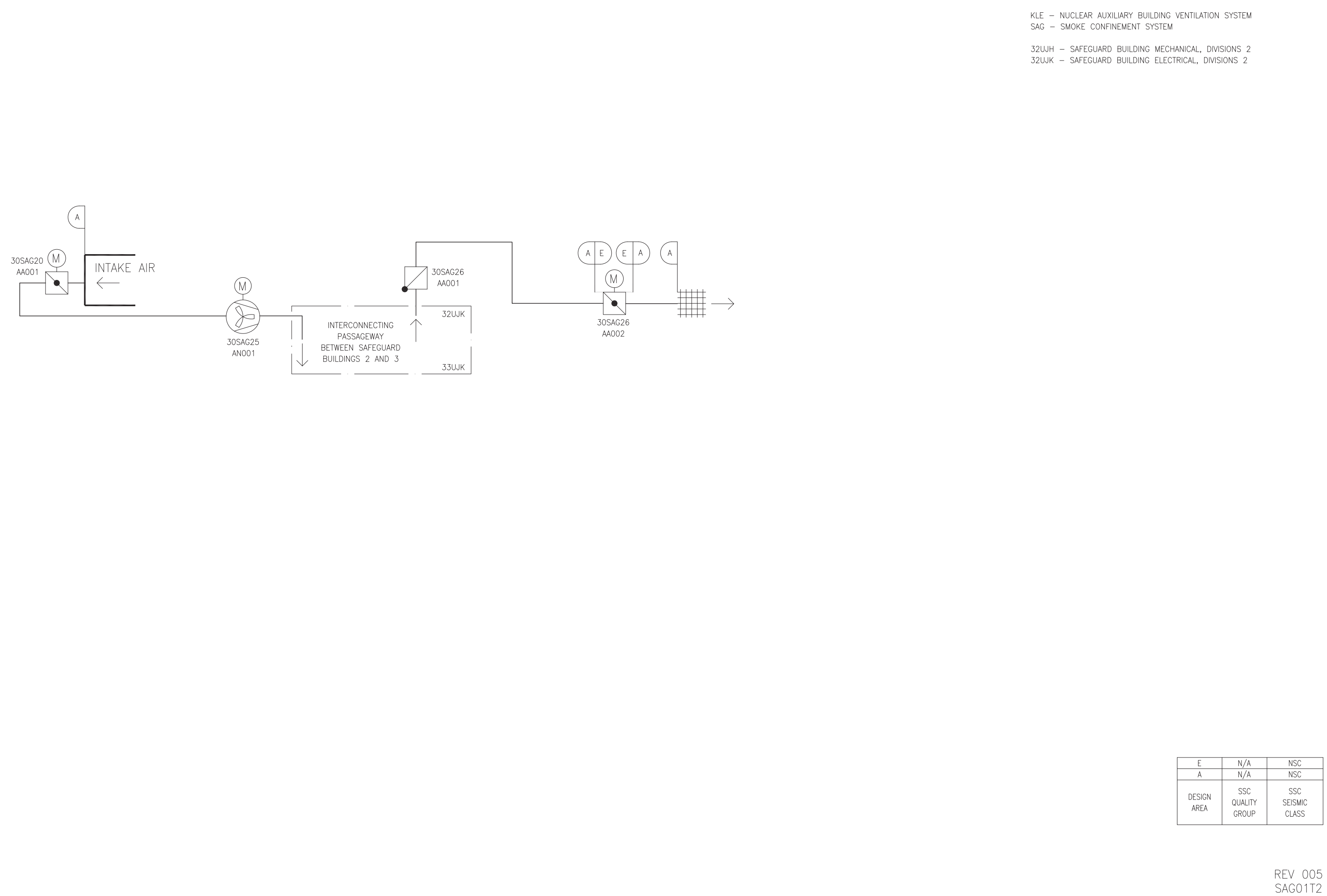
Figure 9.4.13-1—~~Typical Configuration of~~ Smoke Confinement System



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9.4.14 Access Building Ventilation System

The access building ventilation system (ABVS) maintains room ambient conditions inside the Access Building to permit personnel access to the Nuclear Island (NI), and to control the concentration of airborne radioactive material in the controlled areas of the building during normal operation, including maintenance and refueling shutdowns, and during anticipated operational occurrences. The ABVS is composed of the following three ~~subdivisions~~subsystems:

- The supply of fresh air to all areas of the Access Building and the prestressing gallery underneath the Reactor Building (RB).
- The controlled area exhaust with radiation classification.
- The supervised areas exhaust with no radiation classification.

9.4.14.1 Design Bases

The ABVS performs no safety-related functions and is not required to operate during a design basis accident (DBA).

The ABVS monitors the controlled area exhaust air for potential radioactivity upstream of the prefilter and high efficiency particulate air (HEPA) filters by the sampling activity monitoring system (SAMS) prior to discharge into the plant vent stack. This complies with the requirements of GDC-60.

The controlled areas in the Access Building are maintained at a negative pressure, while the adjacent supervised areas are maintained at ambient pressure. Clean air from the supervised areas will flow to potentially contaminated areas in the controlled area, is filtered by a HEPA filtration unit, and is then exhausted to the plant vent stack.

The ABVS environmental operating conditions are specified in Table 9.4.14-1—ABVS Environmental Conditions.

9.4.14.2 System Description

9.4.14.2.1 General Description

Two of the three ABVS ~~subdivisions~~subsystems are located in the Access Building:

- The supervised areas (i.e., non-controlled areas with no radiation classification).
- The controlled areas (i.e., areas with radiation classification).

The ABVS also provides supply and exhaust air to the prestressing gallery, located in the RB at elevation -50 ft. The ventilation system is designed for fresh supply air and exhaust air operation; there is no air recirculation.

Refer to Section 12.3.6.5.6 for ventilation system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

Supply Air Subsystem

The ABVS supplies air to the Access Building and to the prestressing gallery underneath the RB. Figure 9.4.14-1—Access Building Ventilation System – Supply Air Subsystem, provides a simplified diagram of the supply air subsystem of the ABVS. Depending on the outdoor air conditions, the supply air can be cooled or heated, and humidified. The supply air is filtered with prefilters and roughing filters.

The supply air subsystem upstream of the fans is a two-train system arranged in a parallel configuration. Horizontal air ducts and vertical air shafts distribute the fresh air to both the supervised and controlled areas. The negative pressure in the controlled areas is maintained by a control damper in the controlled area supply air duct after the separation from the general supply air.

A pressure control damper is located in the supply ducting that provides ventilation air to the controlled areas in the Access Building. This damper modulates between open and close to adjust the supply of air flow, as required, to maintain a negative pressure in the controlled areas.

Controlled Area Exhaust Air Subsystem

The controlled area exhaust air subsystem of the ABVS is shown in Figure 9.4.14-2—Access Building Ventilation System – Supply and Exhaust Air Subsystem. The ABVS controlled area exhaust subsystem has the following functions:

- Maintains a negative pressure in the controlled areas of the Access Building, with respect to adjacent areas.
- Reduces airborne radioactivity by filtration of exhaust air from the controlled areas.
- Maintains airflow within the Access Building from the clean areas towards the controlled areas.

The exhaust air from the controlled areas of the Access Building is brought together through air ducts and vertical shafts. The combined exhaust air is routed through filter banks that consist of three trains of prefilters and HEPA filters, each designed for 50 percent of the volumetric air flow. The exhaust air filtering takes place continuously. After passing through the filters, the controlled area exhaust air is routed through a concrete duct outside the Access Building to the Nuclear Auxiliary Building (NAB) where two fans discharge the exhaust air to the vent stack. The controlled area exhaust is monitored for potential radioactivity upstream of the filters by the sampling activity monitoring system (SAMS).

The supervised areas adjacent to the controlled areas are maintained at ambient pressure, while the controlled areas are maintained at a negative pressure. The clean air from the supervised areas will flow towards the controlled areas, where it is filtered by a HEPA filter and then exhausted to the vent stack.

If contamination is detected by radiation monitors downstream of the HEPA exhaust filtration units, the control room receives an alarm. To prevent the release of potential airborne contaminants to the vent stack, the control room operators will shut down the ABVS supply fans, exhaust fans, inlet isolation dampers, and exhaust isolation dampers.

Supervised Area Exhaust Air Subsystem

The supervised area exhaust air subsystem of the ABVS is also shown in Figure 9.4.14-2. The ABVS supervised area exhaust subsystem exhausts the air of the Access Building cold rooms. The air is collected in ducts and vertical shafts. There are two exhaust fans, each sized for 100 percent of the volumetric flow. The supervised area exhaust air is discharged directly to the atmosphere.

The exhaust air unit of the prestressing gallery is considered part of the supervised area exhaust system. The prestressing gallery has its own exhaust fan that discharges directly to the atmosphere.

9.4.14.2.2 Component Description

The major components of the ABVS are described in the following paragraphs. Table 3.2.2-1 provides the seismic design and other design classifications for components in the ABVS.

Fans

The supply air fans, the controlled area exhaust fans, and the supervised area exhaust fans are centrifugal and are directly connected to the motor shaft. These fans are equipped with local heating units. The exhaust air fan of the prestressing gallery is axial. The fan operating characteristics (i.e., flow rate and pressure) provide required air delivery flow rates.

Dampers

The actuator-driven control damper is located in the supply air duct of the controlled area. The damper maintains a constant sub-pressure inside the controlled area of the Access Building by gradual reduction or increase of supply air flow. The actuator-driven control damper maintains a constant exhaust flow rate, compensating for the increased pressure loss through the exhaust air filters by gradually increasing the damper opening.

Manually adjusted dampers are tuned and permanently positioned during the initial plant startup period to establish accurate air flow balance between the rooms. These dampers fulfill the function of "baffles" and are considered part of the duct system and are therefore not explicitly coded or shown in the simplified diagrams.

Air Heaters

The space heating coils are used as preheaters and system heaters and are supplied with hot water from the space heating system (SHS). The heater maintains the Access Building above the minimum air temperature limits.

Air Coolers

The cooling coils are supplied with chilled water from the operational chilled water system (OCWS) to cool the fresh air to the required supply air temperature. The air coolers maintain the Access Building between the air temperature limits.

Air Prefilters

The supply air prefilters filter dust and airborne particulates from the fresh air and are located downstream of the preheaters. The exhaust air prefilters are used for exhaust air filtration and are located upstream of the HEPA filters. The supply and exhaust prefilters increase the service life of the roughing filters and HEPA filters. The prefilters are equipped with locally installed differential pressure gauges that indicate the degree of load and the need for filter change.

Air Filters

The supply air roughing air filters for fresh air filtration are located downstream of the prefilters to clean the supply air to the required cleanliness for personnel habitability. The filters are equipped with locally installed differential pressure gauges that indicate the degree of load and the need for filter change.

HEPA Filters

The exhaust air HEPA filters are installed in the controlled area exhaust air system for filtration of the entire air flow. These filters remove fine discrete particulate matter from the air stream. The HEPA filters are equipped with local differential pressure gauges that indicate the degree of load and the need for filter change.

~~Steam Humidifier~~

~~The steam humidifier provides moisture to the supply air prior to being routed to the rooms. The operation of the steam humidifier is generally limited to the cold season when the preheated air is too dry to meet the moisture requirements in the specified areas. The humidifier arrangement is shown in Figure 9.4.14-1.~~

Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of UL 555NFPA 80 (Reference 1) and NFPA 90A (Reference 12). tThe damper fire rating is commensurate with the fire rating of the barrier penetrated. Fire dampers are equipped with fusible links for automatic closure when the temperature reaches a predetermined setpoint.

Ducts

The supply air ducts are folded galvanized steel ducts. The exhaust air ducts are similar with the exception that the ducts inside the filter rooms are of air-tight welded construction.

9.4.14.3 System Operation

9.4.14.3.1 Normal Operation

Supply Air Subsystem

The ABVS supply air subsystem operates continuously. The ABVS supply air subsystem, as well as the controlled area and supervised area exhaust subsystems, are each operated from the main control room (MCR). A pressure control damper is located in the supply ducting that provides ventilation air to the controlled areas in the Access Building. This damper controls the supply airflow, as required, to maintain a negative pressure in the controlled areas, while the ABVS exhaust fan provides continuous exhaust from this area. The system is designed for fresh supply air and exhaust air operation; there is no air recirculation.

During operation, only one of the two supply air fans is running; the second is in standby. The supply air subsystem conditions the air by filtration, heating or cooling, and humidification, as required. The subsystem also supplies air to the supervised area, controlled area, and the prestressing gallery.

Air filter loading is monitored by regular inspection of the local differential pressure instrumentation at the filters. The prefilters and roughing filters can be replaced with the plant in operation or shutdown. Before a supply air filter train is taken out of service the damper in the supervised area exhaust air subsystem is moved to a predefined maintenance position. The train that requires the filter replacement is isolated while the other train remains in operation.

Controlled Area Exhaust Air Subsystem

The controlled area exhaust air subsystem operates continuously. The subsystem is operated from the MCR, along with the supply air subsystem and the supervised area exhaust air subsystem. During operation, only one of the two fans located in the NAB is running; the other is in standby. The exhaust air of the controlled area of the Access Building is filtered continuously through prefilters and HEPA filters and released to the atmosphere via the vent stack. Potential radioactivity in the controlled area exhaust air is monitored by the SAMS that takes samples upstream of the filter banks.

The areas within the Access Building adjacent to the controlled areas are clean areas. During normal operation, these clean areas are maintained at ambient pressure, while the controlled areas are maintained at a negative pressure relative to the outside ambient pressure. The ABVS is designed with a pressure control damper located in the supply ducting. This damper modulates between open and close to adjust the supply of air flow, as required, to maintain a negative pressure in the controlled areas, while the ABVS exhaust fan continuously operates to exhaust air from the controlled areas. Since the controlled areas are maintained at a negative pressure relative to the adjacent clean areas, air from clean areas flows towards the controlled areas.

There are three filter trains. Transferring operation from one filter train to another can be performed for maintenance and is possible during operation without changing the exhaust air flow capacity. The air-tight dampers of the standby train can be opened and those of the train to be maintained can be closed manually.

Air filter loading is monitored by regular inspection of the local differential pressure instrumentation at the filters.

Supervised Area Exhaust Air Subsystem

The supervised area exhaust air subsystem operates continuously. The subsystem is operated from the MCR, along with the supply air subsystem and the controlled area exhaust air subsystem. The control functions work automatically, and the air flow is maintained constant.

During normal operation, only one of the two fans is running; the other is in standby. The exhaust air of the supervised area of the Access Building is released continuously via a concrete air shaft to the atmosphere.

The exhaust air fan of the prestressing gallery operates in conjunction with its manual supply air damper. The ventilation of the prestressing gallery operates continuously.

9.4.14.3.2 Shutdown

When the plant is shut down, the operation of the supply air subsystem and exhaust air subsystems is the same as described in Section 9.4.14.3.1.

9.4.14.3.3 Abnormal Operation

Fan Failures

In case of failure of one supply air fan, one supervised area exhaust air fan or one controlled area exhaust air failure, the unaffected standby fan switches on automatically. Since redundant fans are provided, failure of one fan does not result in the loss of the system function. A failure of the prestressing gallery exhaust air fan leads to the loss of the ventilation of the prestressing gallery.

Failure of an Intake Line

Two supply air intake lines are provided so that the failure of one component in one air intake line does not affect the other intake line. The loss of one air intake train due to a component failure or the securing of one air intake for maintenance does not create a significant heating or cooling concern in the Access Building. This situation allows one air intake line to provide approximately 70 percent of the design air flow rate during normal plant operation. Considering the low likelihood of this situation and the fact that the ABVS heating and cooling functions are not safety functions, two 50 percent intakes are provided.

Loss of Offsite Power (LOOP)

A LOOP results in a loss of power to the ABVS electrical components, such as fans, dampers, cooling units, and heaters. The ABVS system is not provided with emergency power.

9.4.14.4 Safety Evaluation

The operation of the ABVS is not required for the safe shutdown of the plant or for mitigating the consequences of a DBA. Therefore, the system has no safety-related function and requires no nuclear safety evaluation.

To meet the requirements of GDC-60, the ABVS is designed, installed, and tested in accordance with RG 1.143, RG 1.140 and ANSI/ASME N509 (Reference 2), ANSI/ASME N510 (Reference 3), and ASME AG-1 (Reference 4).

9.4.14.5 Testing and Inspection Requirements

The ABVS major components, such as dampers, motors, fans, filters, coils, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Initial in-place acceptance testing of the ABVS is performed as described in Section 14.2 (test abstracts #224), Initial Plant Test Program, to verify the system is built in accordance with applicable programs and specifications.

The ABVS is designed with adequate instrumentation for differential pressure, temperature, and flow indicating devices to enable testing and verification of equipment function, heat transfer capability and air flow monitoring.

During normal plant operation, periodic testing of ABVS is performed to demonstrate system and component operability and integrity.

Isolation dampers are periodically inspected and damper seats replaced as required.

Fans are tested by the manufacturer in accordance with Air Movement and Control Association (AMCA) standards (References 5, 6, and 7). Air filters are tested in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards (Reference 8). Cooling coils are hydrostatically tested and their performance is rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) standards (Reference 9).

Housings and ductwork are leak-tested in accordance with ANSI/ASME N510 (Reference 3), RG 1.140 (Reference 11), and the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) technical manual "HVAC Air Duct Leakage Test Manual" (Reference 10), American Society of Mechanical Engineers.

Periodic testing and inspections identify systems and components requiring corrective maintenance, and plant maintenance programs correct deficiencies.

9.4.14.6 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the MCR. Fans, motor-operated dampers, heaters and cooling units are operable from the MCR. Local instruments are provided to measure differential pressure across filters, flow, temperature and pressure. The fire detection and sensors information is delivered to the fire detection system.

The radiation instrumentation requirements for controlling airborne radioactivity releases via the ~~plant~~vent stack are addressed in Section 11.5.3.1.12 and Table 11.5-1, measurement point R-31.

9.4.14.7 References

1. NFPA 80, “Standard for Fire Doors and Other Opening Protectives,” National Fire Protection Association Standards, 2007.~~UL 555, “Standard for Fire Dampers,” Underwriter’s Laboratories, Sixth Edition, June 1999.~~

2. ANSI/ASME N509-1989, “Nuclear Power Plant Air-Cleaning Units and Components,” American National Standards Institute/The American Society of Mechanical Engineers, 1989.

3. ANSI/ASME N510-1989 (R1995), "Testing of Nuclear Air-Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

4. ASME AG-1, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 2003 (including the AG-1a-2000, "Housings," Addenda).

5. ANSI/AMCA- Standard 210-1999, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/Air Movement and Control Association International, December 1999.

6. ANSI/AMCA Publication -211-1987, "Certified Ratings Program – Air Performance," American National Standards Institute/Air Movement and Control Association International, December 1987.

7. ANSI/AMCA Standard -300-1985, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/Air Movement and Control Association International, December 19857.

8. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," ANSIAmerican National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

9. ANSI/ARI Standard 410-2001, "Forced-Circulation Air-Cooling and Air-Heating Coils," Air Conditioning and Refrigeration Institute, 2001.

10. "HVAC Air Duct Leakage Test Manual," Sheet Metal and Air Conditioning Contractors' National Association, 1985.

11. NRC Regulatory Guide 1.140, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Normal Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," 2001.

12. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilation Systems," National Fire Protection Association Standards, 2002.

Table 9.4.14-1—ABVS Environmental Conditions

Areas	Minimum Temperature	Maximum Temperature	Relative Humidity
Outdoor	-10°F	100°F Dry Bulb 77°F Wet Bulb	N/A
Changing Rooms, Showers	~~70~~68°F	77°F	~~30 – 70~~10 – 70%
Permanent Work Areas, Offices	68°F	77°F	~~30 – 95~~10 – 70%
Toilets	68°F	77°F	~~30 – 70~~10 – 70%
Rooms for I&C and Electrical Equipment, Stores	59°F	95°F	~~15 – 95~~10 – 95%
Staircases, Corridors	~~61~~59°F	95°F	~~15 – 95~~10 – 95%
Supply Air Chambers	~~50~~59°F	95°F	~~15 – 95~~10 – 95%
Prestressing Gallery	Not Controlled	Not Controlled	Not Controlled

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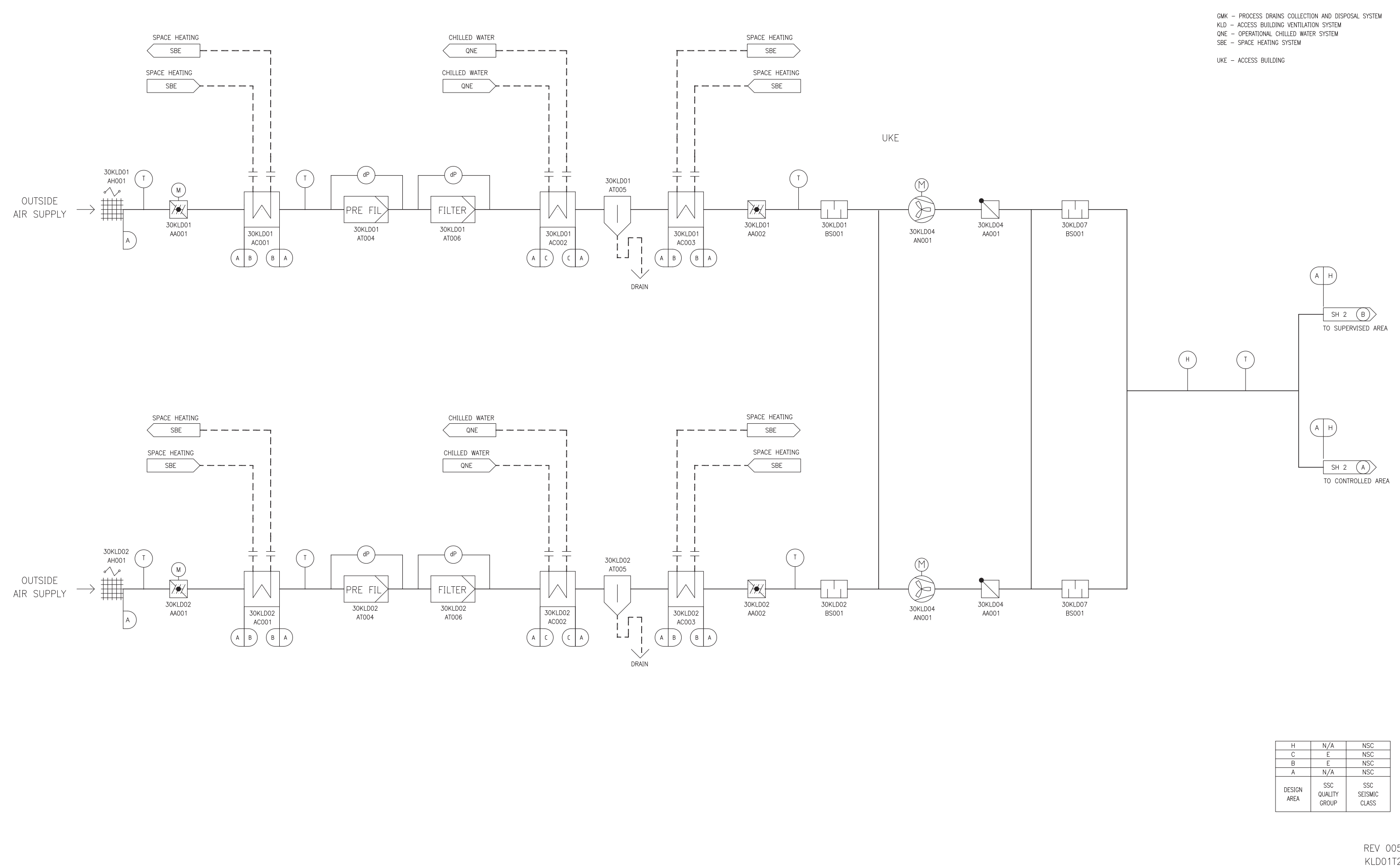
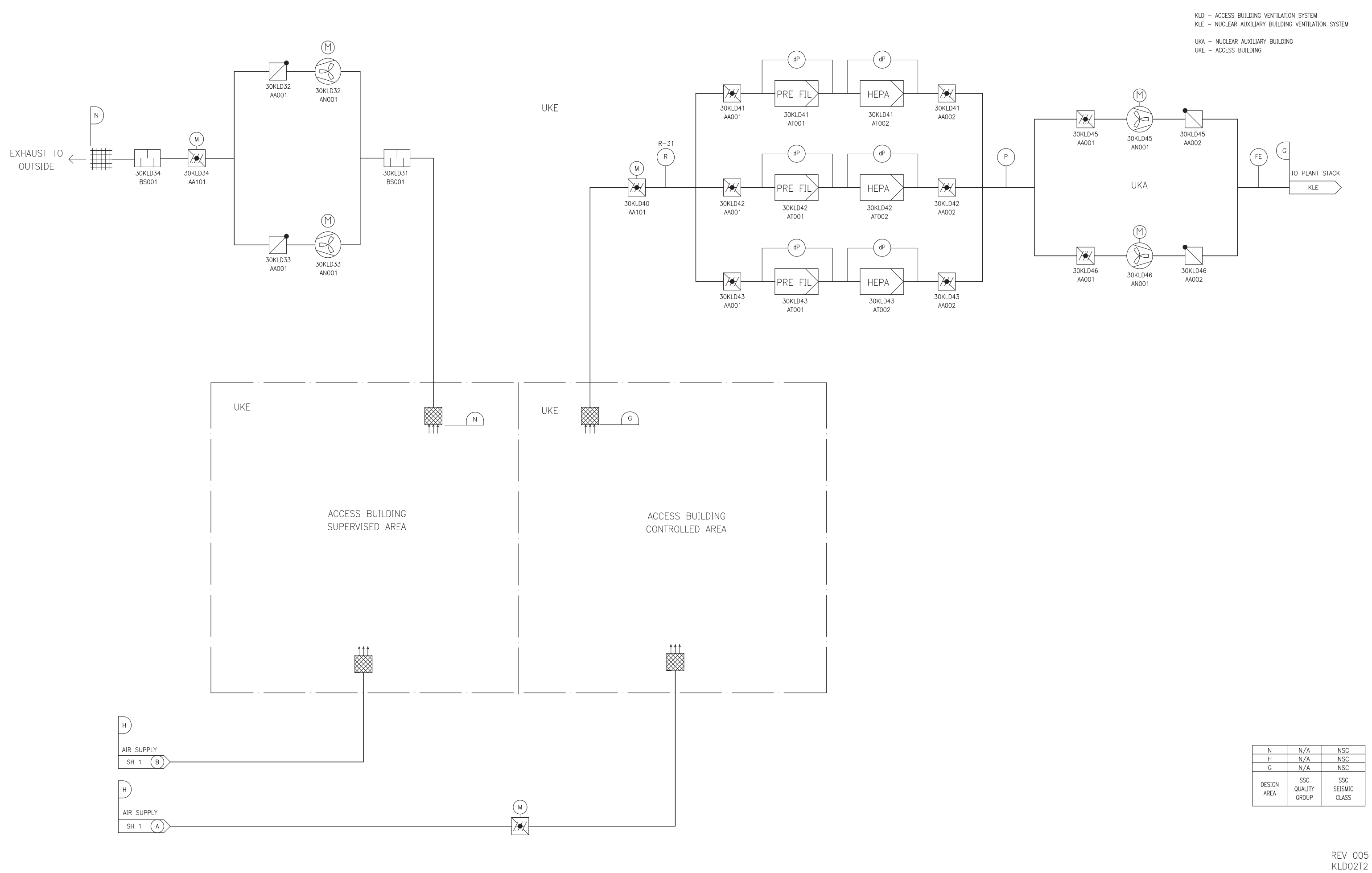
Figure 9.4.14-1—Access Building Ventilation System – Supply Air Subsystem



DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS
H	N/A	NSC
C	E	NSC
B	E	NSC
A	N/A	NSC

Figure 9.4.14-2—Access Building Ventilation System – Supply and Exhaust Air Subsystem



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the release of fission products. These instruments provide information that permits the MCR operator to assess the magnitude of the release in the event of an accident and to assess the release while in progress.

Emergency power is supplied to installed accident monitoring systems via the 1E power supply (refer to Section 8.3.1), which has diesel generators as the auxiliary power to provide power in the event of loss of normal power.

Table 12.3-4 includes airborne radioactivity monitoring instrumentation.

Refer to Section 7.5 for information regarding post-accident monitoring instrumentation.

12.3.4.2.3 Control Room Airborne Radioactivity Monitoring System

The MCR envelope (MCR, technical support center, and MCR HVAC room) is normally supplied with fresh unfiltered air. Airborne radioactivity monitoring instrumentation is provided for the MCR to:

- Monitor for airborne radioactivity so that the control room envelope remains habitable following a radioactive release.
- Provide a signal to initiate the supplemental air filtration system, isolate the MCR complex air intake and exhaust ducts, and activate the emergency habitability system when predetermined setpoints are exceeded.

The control room airborne radioactivity monitoring system is an ESF system (refer to Section 7.3). This instrumentation is powered by the EUPS (refer to Section 8.3.1), which is served by a two-hour battery backup with diesel generators as the auxiliary power to provide continuous indication. The system is illustrated in Figure 9.4.1-1—Control Room Air Intake and CREF (Iodine Filtration) Train Subsystem, Figure 9.4.1-2—Control Room Air Conditioning and Recirculation Air Handling Subsystem, and Figure 9.4.1-3—Control Room Envelope Air Supply and Recirculation Subsystem.~~Figure 12.3-72—Main Control Room Airborne Monitoring.~~

12.3.4.3 Portable Airborne Monitoring Instrumentation

The use and location of portable instruments, associated training and procedures, the methods to determine airborne concentration, and surveys and procedures for locating suspected high-activity areas are part of the Radiation Protection Program (see Section 12.5).

12.3.4.4 Criticality Accident Monitoring

In lieu of the installation of a criticality monitoring system, design and analysis requirements specified in 10 CFR 50.68(b) are followed to prevent criticality. Refer to

Figure 12.3-72—Deleted~~Main Control Room Airborne Monitoring~~

Figure 12.3-73—Reactor and Fuel Buildings Airborne Monitoring

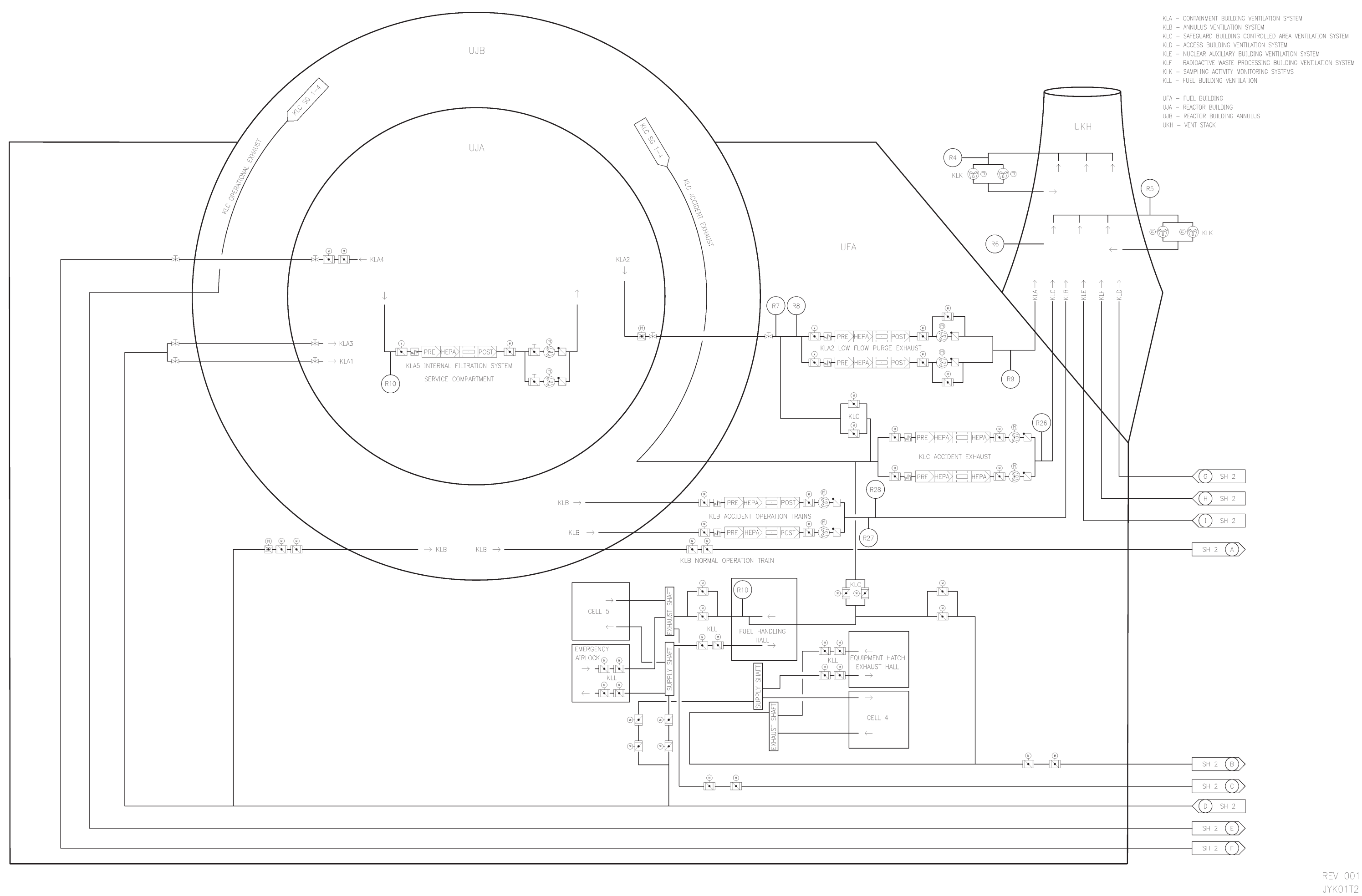
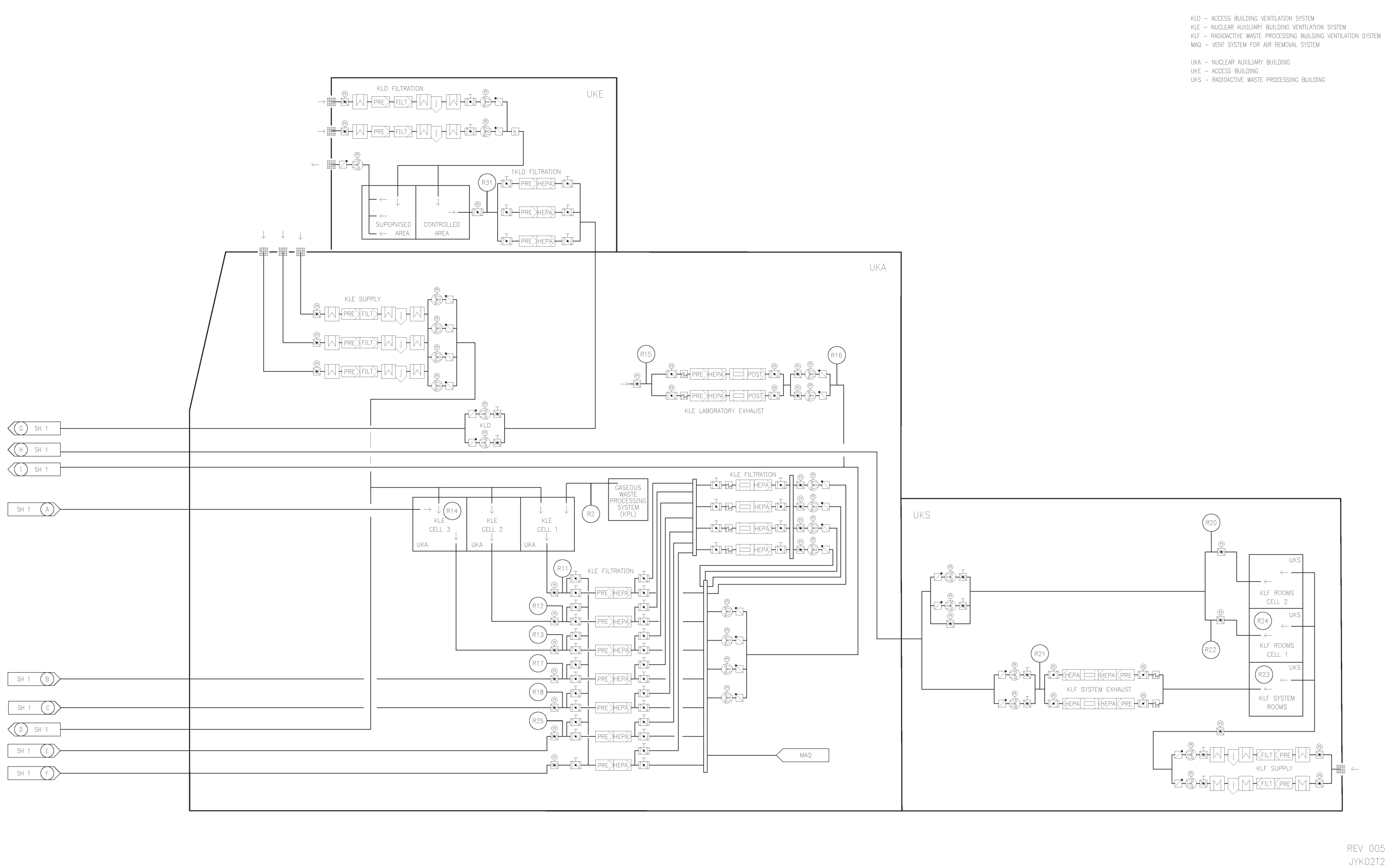


Figure 12.3-74—Access, Nuclear Auxiliary, and Radioactive Waste Buildings Airborne Monitoring



14.2.12.8.3 Containment Building Ventilation System (Test #075)

1.0 OBJECTIVE

1.1 To demonstrate the proper operation of the reactor containment building ventilation system (CBVS) to maintain design temperature conditions.

1.2 To verify that radiation monitors respond as designed to check sources.

1.3 To verify that the radiation sample point provides a representative sample of the CBVS.

2.0 PREREQUISITES

2.1 Construction activities on the CBVS have been completed.

2.2 CBVS instrumentation, including radiation monitors, has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems are complete and functional for operation of the CBVS.

2.4 Test Instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify that operation, stroking speed and position indication of dampers meet design requirements.

3.3 Verify the system maintains the Reactor Containment at a negative pressures relative to outside air pressure (only when purge system is operating).

3.4 Verify the system maintains the differential pressure between the equipment compartment and the service compartments (only when exhaust is operating).

3.5 Verify that operation of the ventilation supply units and fans meets design requirements.

3.6 Verify that operation of the ventilation exhaust units and fans meet design requirements.

3.7 Verify that operation of the equipment compartment cooling units meets design requirements.

3.8 Verify that operation of the equipment compartment ventilation units meets design requirements.

3.9 Verify HEPA filter efficiency, carbon adsorber efficiency, and air flow capacity.

3.10 Verify the system rated air flow and air balance.

3.11 Verify that operation of protective devices, controls, interlocks instrumentation, and alarms using actual or simulated inputs meet design requirements.

3.12 ~~Verify that operation of the CBVS radiation monitors meets design requirements (refer to Table 11.5-1, Monitors R-7 through R-10).~~

3.13 Verify operation of radiation monitors using check sources (refer to Table 11.5-1, Radiation Measuring Point R-10) and external test equipment, as necessary:

3.13.1 Check the self-testing features of radiation monitors.

3.13.2 Record the response of radiation monitors to check sources.

3.13.3 Initiate a high radiation signal to each radiation monitor to verify monitor response (alarm actuations) meets design requirements.

3.13.4 Record alarm actuations at local and remote locations, as appropriate.

3.14 Verify that sample point (refer to Table 11.5-1, Radiation Measuring Point R-10) is capable of collecting representative samples.

4.0 DATA REQUIRED

4.1 Air balancing verification.

4.2 Fan and damper operating data.

4.3 Temperature data of building areas.

4.4 Setpoints of alarms, interlocks, and controls

4.5 Reactor Containment Building negative pressurization data.

4.6 HEPA filter and carbon adsorber data.

4.7 CBVS performance data in response to radiation monitors.

4.8 Radiation monitor response to check source.

4.9 Technical data associated with check source.

4.10 Signal levels necessary to initiate alarm actuation.

5.0 ACCEPTANCE CRITERIA

5.1 The CBVS operate as designed (refer to Section 9.4.7):

5.1.1 CBVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 CBVS fan performance meets design requirements.

5.1.3 CBVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.2 ~~The CBVS meets design requirements to monitor radiation (refer to Table 11.5-1, Monitors R-7 through R-10).~~

5.3 Radiation monitoring instrumentation meets design requirements to monitor radiation and respond as designed to radiation sources (refer to Table 11.5-1, Radiation Measuring Point R-10). This includes, but is not limited to, the following that could adversely impact the ability to measure the parameters described in Table 11.5-1:

5.3.1 Range.

5.3.2 Response time.

5.3.3 Sensitivity.

5.4 Radiation sample point (refer to Table 11.5-1, Radiation Measuring Point R-10) is capable of collecting the required samples.

5.5 The radiation monitoring system (containment building ventilation system - internal filtration subsystem) meets design requirements for RCS leak detection required to demonstrate compliance with Technical Specification Chapter 16, LCO 3.4.14 (refer to Section 11.5.4.8, Section 11.5.3.1.4, and Table 11.5-1, Footnote 16 for Radiation Measuring Point R-10).

14.2.12.8.4 Containment Purge (Test #076)

1.0 OBJECTIVE

1.1 To demonstrate the capability of the containment purge systems, both low-flow and full-flow, to maintain the containment air quality and cleanliness at the required value during normal operation (low-flow), inspection, testing, maintenance, and refueling operations.

1.2 To demonstrate electrical independence and redundancy of power supplies.

1.3 Demonstrate containment purge system response to protection system (PS) signals.

1.4 To verify that radiation monitors respond as designed to check sources.

1.5 To verify that radiation monitors initiate automatic control functions upon detecting high activity levels.

1.6 To verify that the response time from when radiation monitors detect a high radiation condition until each actuated component travels to the required position meets design requirements.

1.7 Verify that the containment purge path can be realigned to the required ELAP event containment exhaust alignment during a simulated compressed air failure.

2.0 PREREQUISITES

2.1 Construction activities in the containment have been completed and acceptable levels of cleanliness established.

2.2 Construction activities on the containment purge systems have been completed.

2.3 Containment purge system instrumentation, including radiation monitors, has been calibrated and is operating satisfactorily prior to performing the following test.

2.4 Support systems required for operation of the containment purge systems are complete and functional.

2.5 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Demonstrate manual and automatic system controls.

3.2 Verify alarms, indicating instruments and status lights are functional.

3.3 Verify design air flows for high purge, low purge.

3.4 Perform HEPA filters and carbon adsorber efficiency tests.

3.5 ~~Demonstrate system responses to a high radiation signal to perform automatic control functions (refer to Section 11.5.3.1.4 and Table 11.5-1, Monitor R-9) and high relative humidity signal.~~

3.6 Operate control valves remotely while:

a. Observing each valve operation and position indication.

b. Measuring valve performance data (e.g., thrust, opening and closing times).

3.7 Verify power-operated valves fail upon loss of motive power as designed (refer to Section 9.4.7).

3.8 Simulate the following and observe isolation valve response:

3.8.1 CIAS.

3.8.2 ~~High humidity actuation signal.~~

3.8.3 High radiation actuation signal.

3.9 Verify that operation of containment purge system radiation monitors meets design requirements (refer to Table 11.5-1, Monitor R-7 through R-9).

3.10 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

3.11 Verify that the containment purge system functions as designed.

3.12 ~~Verify containment purge isolation signal from PS upon detection of containment high activity at radiation monitor (refer to Table 11.5-1, Monitor R-9).~~

Note: Response time of actuated components is to be determined from a single test.

3.13 Verify operation of radiation monitors using check sources (refer to Table 11.5-1, Radiation Measuring Points R-7 through R-9) and external test equipment, as necessary:

3.13.1 Check the self-testing features of radiation monitors.

3.13.2 Record the response of radiation monitors to check sources.

3.13.3 Initiate a high radiation signal to each radiation monitor to verify monitor response (alarm actuations) meets design requirements.

3.13.4 Record alarm actuations at local and remote locations, as appropriate.

3.13.5 Initiate a high radiation signal to emergency push button to measure the response time for each actuated component from the time until the actuated component has traveled to the designated position.

3.14 Confirm that Automatic Control Function (refer to Table 11.5-1, Radiation Measuring Point R-9) initiate upon actuation of emergency push button.

3.15 Verify that sample points (refer to Table 11.5-1, Radiation Measuring Points R-7 through R-8) are capable of collecting representative samples.

3.16 Verify that the normal filtered purge path can be isolated and the ELAP containment exhaust bypass path can be aligned to the plant vent stack.

3.17 Verify that the ELAP containment purge can be aligned during a simulated failure of the compressed air system.

3.17.1 Verify that the normal compressed air source has been isolated from the containment purge valves.

3.17.2 Align the ELAP compressed air source to the containment low flow purge valves.

3.17.3 Verify that the ELAP compressed air source can realign the normal containment purge valves, as applicable.

3.17.4 Verify that the ELAP power supply can realign the ELAP containment bypass path valves, as applicable.

4.0 DATA REQUIRED

4.1 Air balancing report, including fan operating data for low purge and high purge fans.

4.2 HEPA filter and carbon ~~adsorber~~absorber data for exhaust filter trains.

4.3 Valve performance data, where required.

4.4 Valve position indication.

4.5 Position response of valves to loss of motive power.

4.6 Setpoints at which alarms and interlocks occur.

4.7 Temperature of air supply (outside) to high purge supply and discharge into containment.

4.8 Valves respond to the following simulated signals:

4.8.1 CIS.

4.8.2 ~~High humidity actuation signal.~~

4.8.3 High radiation actuation signal.

4.9 Containment purge system radiation monitors performance data.

4.10 Radiation monitor response to check source.

4.11 Technical data associated with check source.

4.12 Signal levels necessary to initiate alarm actuation.

4.13 Response time of each actuated component.

5.0 ACCEPTANCE CRITERIA

5.1 The containment purge system meets design requirements (refer to Section 9.4.7):

5.1.1 The containment purge alarms, remote indications, interlocks, and controls (manual and automatic) respond as designed.

5.1.2 The containment purge valves meet the design requirements (i.e., thrust opening speed, closing speed, failure mode upon loss of motive power).

- Table 14.3-2 Item 2-10.

5.1.3 The containment purge flow rate meets design requirements.

5.2 The containment purge system responds to the radiation monitors as designed (refer to Section 11.5.3.1.4 and Table 11.5-1, Monitor R-9):

5.2.1 The containment purge system isolates purge flow as designed upon detection of high activity

5.2.2 The radiation monitors perform as designed in response to high activity levels.

5.3 Verify that safety-related components meet electrical independence and redundancy requirements.

5.4 Radiation monitoring instrumentation meets design requirements to monitor radiation and respond as designed to radiation sources (refer to Table 11.5-1, Radiation Measuring Points R-7 through R-9). This includes, but is not limited to, the following that could adversely impact the ability to measure the parameters described in Table 11.5-1:

5.4.1 Range.

5.4.2 Response time.

5.4.3 Sensitivity.

5.5 Radiation monitoring instrumentation meets design requirements to monitor radiation (refer to Table 11.5-1, Radiation Measuring Point R-9).

5.5.1 The response time from actuation of the emergency push button until each actuated component has reached the required position meets the design requirement.

5.6 Radiation sample points (refer to Table 11.5-1, Radiation Measuring Points R-7 through R-8) are capable of collecting the required samples.

5.7 The normal purge path can be isolated and the ELAP bypass containment exhaust path can be aligned as designed.

14.2.12.8.5 Annulus Ventilation System (Test #077)

1.0 OBJECTIVE

1.1 To demonstrate the capability of the annulus ventilation system (AVS) to produce and maintain a negative pressure in the annulus following a loss of coolant accident (LOCA).

1.2 To minimize the release of radioisotopes following a LOCA by filtering annulus air prior to discharge to the vent stack.

1.3 To demonstrate electrical independence and redundancy of power supplies.

1.4 To verify that radiation monitors respond as designed to check sources.

1.5 To verify that the radiation sample point provides a representative sample of the AVS.

2.0 PREREQUISITES

2.1 Construction activities on the containment wall and shield wall are complete with penetrations sealed in place.

2.2 Construction activities on the AVS have been completed.

2.3 AVS instrumentation, including radiation monitors, has been calibrated and is operating satisfactorily prior to performing the following test.

2.4 Support systems required for operation of the AVS are complete and functional.

2.5 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic, including response to Protection signals.

3.2 Verify that operation, failure mode, stroke speed and position indication of control valves and dampers meets design requirements.

3.3 Demonstrate that the AVS shall achieve a negative pressure in the Annulus within the design requirements:

3.3.1 Greater than or equal to the required inches water gauge.

3.3.2 Within the required elapsed time since actuation.

3.4 Verify that operation of protective devices, controls, interlocks, instrumentation and alarms meet design requirements.

3.5 Verify design air flow for normal and emergency operation.

3.6 Perform HEPA filter and carbon adsorber efficiency tests on the accident filtration train.

3.7 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

3.8 Verify operation of radiation monitors using check sources (refer to Table 11.5-1, Radiation Measuring Point R-27) and external test equipment, as necessary:

3.8.1 Check the self-testing features of radiation monitors.

3.8.2 Record the response of radiation monitors to check sources.

3.8.3 Initiate a high radiation signal to each radiation monitor to verify monitor response (alarm actuations) meets design requirements.

3.8.4 Record alarm actuations at local and remote locations, as appropriate.

3.9 Verify that sample point (refer to Table 11.5-1, Radiation Measuring Point R-28) is capable of collecting representative samples.

4.0 DATA REQUIRED

4.1 Setpoints at which alarms, interlocks, and controls occur.

4.2 Valve and damper operating data.

4.3 Air balancing report, including fan operating data.

4.4 HEPA filter and carbon adsorber efficiency data.

4.5 Annulus negative pressurization data: Annulus pressure and drawdown time response curve.

4.6 Radiation monitor response to check source.

4.7 Technical data associated with check source.

4.8 Signal levels necessary to initiate alarm actuation.

5.0 ACCEPTANCE CRITERIA

5.1 The AVS operates as designed (refer to Section 6.2.3):

5.1.1 Verify that the response of alarms, interlocks, and control logic meets design requirements.

5.1.2 Verify that operation of valves and dampers meet design requirements.

5.1.3 Verify that system response to simulated accident signal meets design requirements.

- Table 14.3-2 Item 2-1.

5.2 Verify that safety-related components meet electrical independence and redundancy requirements.

5.3 ~~The AVS meet design requirements to monitor radiation (refer to Table 11.5-1, Monitor R-27).~~

5.4 Radiation monitoring instrumentation meets design requirements to monitor radiation and respond as designed to radiation sources (refer to Table 11.5-1, Radiation Measuring Point R-27). This includes, but is not limited to, the following that could adversely impact the ability to measure the parameters described in Table 11.5-1:

5.4.1 Range.

5.4.2 Response time.

5.4.3 Sensitivity.

5.5 Radiation sample point (refer to Table 11.5-1, Radiation Measuring Point R-28) is capable of collecting the required samples.

14.2.12.8.6 Electrical Division of Safeguard Building Ventilation System (Test #078)

1.0 OBJECTIVE

1.1 To demonstrate the operation of the electrical division of safeguard building ventilation system (SBVSE):

1.1.1 Vital instrument and equipment room ventilation subsystems.

1.1.2 Electrical and mechanical equipment room air handling units, recirculation fans, battery rooms/safety chilled water room exhaust fans.

1.1.3 Component cooling water/heat exchanger rooms fan coil units.

1.1.4 Emergency feedwater pump rooms fan coil units.

1.2 To demonstrate electrical independence and redundancy of power supplies.

2.0 PREREQUISITES

2.1 Construction activities in the Safeguard Building controlled area are complete with penetrations sealed.

2.2 Construction activities on the SBVSE have been completed.

2.3 SBVSE instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.4 Support systems required for operation of the SBVSE are functional.

2.5 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify the operation of the electrical and mechanical equipment room air handling units, recirculation fans, battery rooms/safety chilled water room exhaust fans.

3.3 Verify the operation of the component cooling water/heat exchanger rooms fan coil units.

3.4 Verify the operation of the emergency feedwater pump rooms fan coil units.

3.5 Verify alarms, indicating lights, and status lights are functional.

3.6 Perform air flow balancing of the SBVSE.

3.7 Verify that operation of dampers meet the requirements of ASME AG-1 (Reference 9).

3.8 Verify that operation of the vital instrument and equipment room HVAC units, fans, or both meet design requirements.

3.9 For separate HVAC units check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

3.10 Verify that duct/housing total leakage requirements are met.

4.0 DATA REQUIRED

4.1 Damper operating data.

4.2 Air flow and balancing verification.

4.3 Setpoints at which alarms, center backs and control occur.

4.4 Temperature data for each of the SBVSE.

5.0 ACCEPTANCE CRITERIA

5.1 The SBVSE operates as designed (refer to Section 9.4.6):

5.1.1 Safeguard Building cooling alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 Safeguard Building cooling fan performance meets design requirements.

5.1.3 Safeguard Building cooling dampers/valve performance (thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.1.4 Safeguard Building cooling air balance meets design requirements.

5.1.5 SBVSE meets duct/housing total leakage requirements.

5.2 Verify that safety-related components meet electrical independence and redundancy requirements.

14.2.12.8.7 Nuclear Auxiliary Building Ventilation System (Test #079)

1.0 OBJECTIVE

1.1 To demonstrate the operation of the nuclear auxiliary building ventilation system (NABVS).

1.2 To demonstrate electrical independence and redundancy of power supplies.

1.3 To verify that radiation monitors respond as designed to check sources.

1.4 To verify that radiation monitors initiate automatic control functions upon detecting high activity levels.

1.5 To verify that the response time from when radiation monitors detect a high radiation condition until each actuated component travels to the required position meets design requirements.

2.0 PREREQUISITES

2.1 Construction activities in the nuclear auxiliary building are complete with penetrations sealed.

2.2 Construction activities on the NABVS have been completed.

2.3 NABVS instrumentation, including radiation monitors, has been calibrated and is operating satisfactorily prior to performing the following test.

2.4 Support systems required for operation of the NABVS are functional.

2.5 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify the operation of the air handling units or fans or both.

3.3 Verify alarms, indicating lights and status lights are functional.

3.4 Perform air flow balancing of the NABVS.

3.5 Verify that operation of dampers meets design requirements.

3.6 Perform HEPA filter and carbon adsorber efficiency tests.

3.7 ~~Verify operation of the NABVS radioactivity monitors (refer to Table 11.5-1, Monitors R-11 through R-15).~~

3.8 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

3.9 Verify that duct/housing total leakage requirements are met.

3.10 Verify operation of radiation monitors using check sources (refer to Table 11.5-1, Radiation Measuring Points R-11 through R-15) and external test equipment, as necessary:

3.10.1 Check the self-testing features of radiation monitors.

3.10.2 Record the response of radiation monitors to check sources.

3.10.3 Initiate a high radiation signal to each radiation monitor to verify monitor response (alarm actuations) meets design requirements.

3.10.4 Record alarm actuations at local and remote locations, as appropriate.

3.10.5 Initiate a high radiation signal to each radiation monitor to measure the response time for each actuated component from the time that the radiation monitor reaches the control setpoint until the actuated component has traveled to the designated position.

Note: Response time of actuated components is to be determined from a single test using the check source specified in Table 11.5-1 that is specified for each radiation monitor until travel is completed for each actuated component impacted by the radiation monitor signal.

3.11 Confirm that Automatic Control Functions (refer to Table 11.5-1, Radiation Measuring Points R-11 through R-13) initiate upon detecting high activity levels.

3.12 Verify that sample points (refer to Table 11.5-1, Radiation Measuring Points R-11 through R-16) are capable of collecting representative samples.

4.0 DATA REQUIRED

4.1 Damper operating data.

4.2 Air flow and balancing verification.

4.3 Setpoints at which alarms and control occur.

4.4 Temperature data for each of the NABVS.

4.5 HEPA filter and carbon adsorber efficiency data.

4.6 Radiation monitor response to check source.

4.7 Technical data associated with check source.

4.8 Signal levels necessary to initiate alarm actuation.

4.9 Signal levels necessary to initiate Automatic Control Functions.

4.10 Response time of each actuated component.

5.0 ACCEPTANCE CRITERIA

5.1 The NABVS operates as designed (refer to Section 9.4.3):

5.1.1 NABVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 NABVS fan performance meets design requirements.

5.1.3 NABVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.1.4 NABVS air balance meets design requirements.

5.1.5 The NABVS meets design requirements to monitor radiation (refer to Table 11.5-1, Monitors R-11 through R-15).

5.1.6 NABVS meets duct/housing total leakage requirements.

5.2 Radiation monitoring instrumentation meets design requirements to monitor radiation and respond as designed to radiation sources (refer to Table 11.5-1, Radiation Measuring Points R-11 through R-15). This includes, but is not limited to, the following that could adversely impact the ability to measure the parameters described in Table 11.5-1:

5.2.1 Range.

5.2.2 Response time.

5.2.3 Sensitivity.

5.3 Radiation monitoring instrumentation meets design requirements to monitor radiation and initiate Automatic Control Functions (refer to Table 11.5-1, Radiation Measuring Points R-11 through R-13) upon detection of high activity levels.

5.3.1 For each applicable radiation monitor, the response time from the radiation monitor reaching the level to initiate the automated control function until each actuated component has reached the required position meets the design requirement.

5.4 Radiation sample points (refer to Table 11.5-1, Radiation Measuring Points R-11 through R-16) are capable of collecting the required samples.

14.2.12.8.8 Radioactive Waste Processing Building Ventilation System (Test #080)

1.0 OBJECTIVE

1.1 To demonstrate the proper operation of the radioactive waste processing building ventilation system (RWBVS) to maintain design condition.

1.2 To verify that radiation monitors respond as designed to check sources.

1.3 To verify that radiation monitors initiate automatic control functions upon detecting high activity levels.

1.4 To verify that radiation sample points provide representative samples of the RWBVS.

1.5 To verify that the response time from when radiation monitors detect a high radiation condition until each actuated component travels to the required position meets design requirements.

2.0 PREREQUISITES

2.1 Construction activities on the RWBVS have been completed.

2.2 RWBVS instrumentation, including radiation monitors, has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the RWBVS are complete and functional.

2.4 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify that operation, stroking speed and position indication of dampers meets design requirements.

3.3 Verify the capacity of the HVAC system to maintain the area temperature.

3.4 Verify the system maintains the Radioactive Waste Processing Building at a negative pressure.

3.5 Verify that operation of the general ventilation supply units and fans meets design requirements.

3.6 Verify that operation of the general ventilation exhaust units and fans meets design requirements.

3.7 Perform HEPA filter and carbon adsorber efficiency tests.

3.8 Verify the systems rated air flow and air balance.

3.9 Verify that operation of protective devices, controls, interlocks instrumentation and alarms using actual or simulated inputs meets design requirements.

3.10 Verify that operation of the RWBVS response to high radiation monitor signal meets design requirements (refer to Table 11.5-1, Monitors R-20 and R-22).

3.11 Verify that duct/housing total leakage requirements are met.

Note: Response time of actuated components is to be determined from a single test using the check source specified in Table 11.5-1 that is specified for each radiation monitor until travel is completed for each actuated component impacted by the radiation monitor signal.

3.12 Verify operation of radiation monitors using check sources (refer to Table 11.5-1, Radiation Measuring Points R-20, R-22 through R-24) and external test equipment, as necessary:

3.12.1 Check the self-testing features of radiation monitors.

3.12.2 Record the response of radiation monitors to check sources.

3.12.3 Initiate a high radiation signal to each radiation monitor to verify monitor response (alarm actuations) meets design requirements.

3.12.4 Record alarm actuations at local and remote locations, as appropriate.

3.12.5 Initiate a high radiation signal to each radiation monitor to measure the response time for each actuated component from the time that the radiation monitor reaches the control setpoint until the actuated component has traveled to the designated position.

3.13 Confirm that Automatic Control Functions (refer to Table 11.5-1, Radiation Measuring Points R-20 and R-22) initiate upon detecting high activity levels.

3.14 Verify that sample points (refer to Table 11.5-1, Radiation Measuring Points R-20 through R-24) are capable of collecting representative samples.

4.0 DATA REQUIRED

4.1 Air balancing verification.

4.2 Fan and damper operating data.

4.3 Temperature data.

4.4 Setpoints of alarms interlocks and controls.

4.5 The Radioactive Waste Processing Building negative pressure readings.

4.6 RWBVS performance data in response to radiation monitor signals.

4.7 HEPA filter and carbon adsorber efficiency data.

4.8 Radiation monitor response to check source.

4.9 Technical data associated with check source.

4.10 Signal levels necessary to initiate alarm actuation.

4.11 Signal levels necessary to initiate Automatic Control Functions.

4.12 Response time of each actuated component.

5.0 ACCEPTANCE CRITERIA

5.1 The RWBVS operates as designed (refer to Section 9.4.8):

5.1.1 RWBVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 RWBVS fan performance meets design requirements.

5.1.3 RWBVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.1.4 RWBVS air balance meets design requirements.

5.1.5 RWBVS meets duct/housing total leakage requirements.

5.2 The RWBVS responds as designed to radiation monitor signals designed (refer to Table 11.5-1, Monitors R-20 through R-22).

5.3 Radiation monitoring instrumentation meets design requirements to monitor radiation and respond as designed to radiation sources (refer to Table 11.5-1, Radiation Measuring Points R-20, R-22 through R-24). This includes, but is not limited to, the following that could adversely impact the ability to measure the parameters described in Table 11.5-1:

5.3.1 Range.

5.3.2 Response time.

5.3.3 Sensitivity.

5.4 Radiation monitoring instrumentation meets design requirements to monitor radiation and initiate Automatic Control Functions (refer to Table 11.5-1, Radiation Measuring Points R-20 and R-22) upon detection of high activity levels.

5.4.1 For each applicable radiation monitor, the response time from the radiation monitor reaching the level to initiate the automated control function until each actuated component has reached the required position meets the design requirement.

5.5 Radiation sample points (refer to Table 11.5-1, Radiation Measuring Points R-20 through R-24) are capable of collecting the required samples.

14.2.12.8.9 Fuel Building Ventilation System (Test #081)

1.0 OBJECTIVE

1.1 To demonstrate the proper operation of the fuel building ventilation system (FBVS) to maintain design conditions.

1.2 To demonstrate electrical independence and redundancy of power supplies.

1.3 To verify that radiation monitors respond as designed to check sources.

1.4 To verify that radiation monitors initiate automatic control functions upon detecting high activity levels.

1.5 To verify that the response time from when radiation monitors detect a high radiation condition until each actuated component travels to the required position meets design requirements.

2.0 PREREQUISITES

2.1 Construction activities on the FBVS have been completed.

2.2 FBVS instrumentation, including radiation monitors, has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the FBVS are complete and functional.

2.4 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify that operation, stroke speed and position indication of dampers meet design requirements.

3.3 Verify the system maintains the Fuel Building at a negative pressure.

3.4 Verify the NABVS supplies and exhausts air to the Fuel Building.

3.5 Verify that the operation of the fuel handling area ventilation exhaust units and fans meet design requirements.

3.6 Verify that operation of the heating and cooling units meet design requirements.

3.7 Verify HEPA filter efficiency, carbon adsorber efficiency, and air flow capacity.

3.8 Verify the systems rated air flow and air balance.

3.9 Verify that operation of protective devices, controls, interlocks instrumentation, and alarms using actual or simulated inputs.

3.10 Verify system response to a high radiation signal (refer to Table 11.5-1, Monitors R-17, R-18, and R-19)).

3.11 Verify that operation of the FBVS radiation monitors meet design requirements (refer to Table 11.5-1, Monitors R-17, R-18, and R-19).

3.12 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

3.13 Verify that duct/housing total leakage requirements are met.

Note: Response time of actuated components is to be determined from a single test using the check source specified in Table 11.5-1 that is specified for each radiation monitor until travel is completed for each actuated component impacted by the radiation monitor signal.

3.14 Verify operation of radiation monitors using check sources (refer to Table 11.5-1, Radiation Measuring Points R-17 through R-19) and external test equipment, as necessary:

3.14.1 Check the self-testing features of radiation monitors.

3.14.2 Record the response of radiation monitors to check sources.

3.14.3 Initiate a high radiation signal to each radiation monitor to verify monitor response (alarm actuations) meets design requirements.

3.14.4 Record alarm actuations at local and remote locations, as appropriate.

3.14.5 Initiate a high radiation signal to each radiation monitor to measure the response time for each actuated component from the time that the radiation monitor reaches the control setpoint until the actuated component has traveled to the designated position.

3.15 Confirm that Automatic Control Functions (refer to Table 11.5-1, Radiation Measuring Points R-17 through R-19) initiate upon detecting high activity levels.

3.16 Verify that sample points (refer to Table 11.5-1, Radiation Measuring Points R-17 through R-18) are capable of collecting representative samples.

4.0 DATA REQUIRED

4.1 Air balancing verification.

4.2 Fan and damper operating data.

4.3 Temperature data in the Fuel Building.

4.4 Setpoints at which alarms, interlocks, and controls occur.

4.5 Fuel Building negative pressurization data during normal and postulated emergency conditions.

4.6 Filter and carbon adsorber data.

4.7 FBVS performance data in response to radiation monitor signals.

4.8 Radiation monitor response to check source.

4.9 Technical data associated with check source.

4.10 Signal levels necessary to initiate alarm actuation.

4.11 Signal levels necessary to initiate Automatic Control Functions.

4.12 Response time of each actuated component.

5.0 ACCEPTANCE CRITERIA

5.1 The FBVS operates as designed (refer to Section 9.4.2):

5.1.1 FBVS alarms, interlocks, and controls (manual and automatic) function as designed.

5.1.2 FBVS valves and dampers function as design.

5.1.3 FBVS maintains the Fuel Building at the required negative pressure.

- Table 14.3-2 Item 2-9.

5.1.4 FBVS recirculation rate (e.g., through the HEPA filters, carbon adsorber) meet design requirements.

5.1.5 FBVS normal operation heating and ventilation system performs as designed.

5.1.6 FBVS meets duct/housing total leakage requirements.

5.2 The FBVS responds to radiation monitor signals as designed (refer to Table 11.5-1, Monitors R-17, R-18, and R-19).

5.3 Verify that safety-related components meet electrical independence and redundancy requirements.

5.4 Radiation monitoring instrumentation meets design requirements to monitor radiation and respond as designed to radiation sources (refer to Table 11.5-1, Radiation Measuring Points R-17 through R-19). This includes, but is not limited to, the following that could adversely impact the ability to measure the parameters described in Table 11.5-1:

5.4.1 Range.

5.4.2 Response time.

5.4.3 Sensitivity.

5.5 Radiation monitoring instrumentation meets design requirements to monitor radiation and initiate Automatic Control Functions (refer to Table 11.5-1, Radiation Measuring Points R-17 through R-19) upon detection of high activity levels.

5.5.1 For each applicable radiation monitor, the response time from the radiation monitor reaching the level to initiate the automated control function until each actuated component has reached the required position meets the design requirement.

5.6 Radiation sample points (refer to Table 11.5-1, Radiation Measuring Points R-17 through R-18) are capable of collecting the required samples.

14.2.12.8.10 Main Control Room Air Conditioning System (Test #082)

1.0 OBJECTIVE

1.1 To verify that operation of the main control air conditioning system (CRACS) establishes that a proper environment for personnel and equipment under postulated conditions in the following areas:

1.1.1 MCR.

1.1.2 Technical Support Center.

1.1.3 Other offices and equipment areas of the control room envelope (CRE).

1.2 To demonstrate electrical independence and redundancy of power supplies.

1.3 To verify that radiation monitors respond as designed to check sources.

1.4 To verify that radiation monitors initiate automatic control functions upon detecting high activity levels.

1.5 To verify that the response time from when radiation monitors detect a high radiation condition until each actuated component travels to the required position meets design requirements

2.0 PREREQUISITES

2.1 Construction activities in the MCR complex have been completed and penetrations sealed.

2.2 Construction activities on the CRACS have been completed.

2.3 The CRACS system instrumentation, including radiation monitors, has been calibrated and is operating satisfactorily prior to performing the following test.

2.4 Support systems required for operation of the CRACS are complete and functional.

2.5 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify that operation, stroke speed and position indication of dampers meet design requirements.

3.3 Verify in manual operating mode that system rated air flow and air balance meet design requirements.

3.4 Demonstrate in automatic mode the transfer to emergency-operations as a result of the following:

3.4.1 Detection of radiation in one of the outside inlets places the CREF (iodine filtration) units in the filtered alignment.

3.4.2 Safety injection actuation/primary containment isolation signal.

3.5 Verify the HEPA filter efficiency, carbon adsorber efficiency, and filter bank air flow capacity.

3.6 Verify that operation of protective devices, controls, interlocks, instrumentation, and alarms using actual or simulated inputs meets design requirements.

3.7 Verify that the system maintains the CRE at the required positive pressure relative to external areas adjacent to the CRE boundary while operating in the design basis accident alignment~~the outside atmosphere during system operation~~.

3.8 Verify that the system maintains the CRE at the required positive pressure while in the normal operation alignment.

3.9 Demonstrate the operation of the battery room exhaust fans.

3.10 Verify the CRE air in-leakage rate when aligned in the emergency mode.

3.11 Verify that operation of CRACS in response to radiation monitors meets design requirements (refer to Table 11.5-1, Monitors R-29 and R-30).

3.12 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

Note: Response time of actuated components is to be determined from a single test using the check source specified in Table 11.5-1 that is specified for each radiation monitor until travel is completed for each actuated component impacted by the radiation monitor signal.

3.13 Verify operation of radiation monitors using check sources (refer to Table 11.5-1, Radiation Measuring Points R-29 and R-30) and external test equipment, as necessary:

3.13.1 Check the self-testing features of radiation monitors.

3.13.2 Record the response of radiation monitors to check sources.

3.13.3 Initiate a high radiation signal to each radiation monitor to verify monitor response (alarm actuations) meets design requirements.

3.13.4 Record alarm actuations at local and remote locations, as appropriate.

3.14 Confirm that Automatic Control Functions (refer to Table 11.5-1, Radiation Measuring Points R-29 and R-30) initiate upon detecting high activity levels.

3.15 Verify that duct/housing leakage requirements are met.

4.0 DATA REQUIRED

4.1 Air balancing verification.

4.2 Fan and damper operating data.

4.3 Temperature data in the CRE.

4.4 Response to radioactivity and smoke.

4.5 Setpoints of alarms, interlocks, and controls.

4.6 Pressurization data for the CRE.

4.7 Filter and carbon adsorber data.

4.8 CRE in-leakage rate when aligned in the emergency mode.

4.9 The CRACS response to radiation monitors.

4.10 Radiation monitor response to check source.

4.11 Technical data associated with check source.

4.12 Signal levels necessary to initiate alarm actuation.

4.13 Signal levels necessary to initiate Automatic Control Functions.

4.14 Response time of each actuated component.

5.0 ACCEPTANCE CRITERIA

5.1 The CRACS operates as designed (refer to Section 9.4.1).

5.1.1 CRACS alarms, interlocks, and controls (manual and automatic) function as designed.

5.1.2 CRACS valves and dampers function as design.

5.1.3 CRACS responds as designed to a simulated smoke signal.

5.1.4 CRACS recirculation flow rate meets design requirements.

- Table 14.3-2 Item 2-7.

5.1.5 CRACS unfiltered air in-leakage rate while in recirculation mode meets design requirements.

- Table 14.3-2 Item 2-8.

5.1.6 CRACS is capable of generating a positive MCR pressure relative to adjacent areas, as designed.

- Table 14.3-2 Item 2-6.

5.1.7 CRACS responds as designed to a simulated SIS signal.

- Table 14.3-2 Item 2-5.

5.1.8 CRACS meets duct/housing total leakage requirements.

5.2 The CRACS radiation monitors perform as designed (refer to Table 11.5-1, Monitors R-29 and R-30):

5.2.1 CRACS responds as designed to a simulated high radiation signal.

- Table 11.5-1, Monitors R-29 and R-30.
- Table 14.3-2 Item 2-5.

5.3 Verify that safety-related components meet electrical independence and redundancy requirements.

5.4 Radiation monitoring instrumentation meets design requirements to monitor radiation and respond as designed to radiation sources (refer to Table 11.5-1, Radiation Measuring Points R-29 and R-30). This includes, but is not limited to, the following that could adversely impact the ability to measure the parameters described in Table 11.5-1:

5.4.1 Range.

5.4.2 Response time.

5.4.3 Sensitivity.

5.5 Radiation monitoring instrumentation meets design requirements to monitor radiation and initiate Automatic Control Functions (refer to Table 11.5-1, Radiation Measuring Points R-29 and R-30) upon detection of high activity levels.

5.5.1 For each applicable radiation monitor, the response time from the radiation monitor reaching the level to initiate the automated control function until each actuated component has reached the required position meets the design requirement.

5.6 The radiation monitoring system (MCR air intake duct activity) generates a Main Control Room air intake activity measurement signal as an input to the protection system (refer to Table 12.3-3).

14.2.12.8.11 Safeguard Building Controlled Area Ventilation System (Test #083)

1.0 OBJECTIVE

1.1 To demonstrate the operation of the safeguard building controlled area ventilation system (SBVS):

1.1.1 Hot mechanical area serviced by the SBVS.

1.1.2 SBVS air supply subsystem.

1.1.3 SBVS air exhaust subsystem.

1.1.4 Electric air heating convectors (area heaters).

1.2 To demonstrate electrical independence and redundancy of power supplies.

1.3 To verify that radiation monitors respond as designed to check sources.

1.4 To verify that radiation monitors initiate automatic control functions upon detecting high activity levels.

1.5 To verify that the response time from when radiation monitors detect a high radiation condition until each actuated component travels to the required position meets design requirements.

2.0 PREREQUISITES

2.1 Construction activities in the safeguard building mechanical area are complete with penetrations sealed.

2.2 Construction activities on the SBVS have been completed.

2.3 Safeguard building mechanical area ventilation subsystem instrumentation, including radiation monitors, has been calibrated and is operating satisfactorily prior to performing the following test.

2.4 Support systems required for operation of the SBVS are functional.

2.5 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify the operation of air handling units or fans or both.

3.3 Verify operation of the operational air exhaust mode in the mechanical area.

3.4 Verify operation of the accident air exhaust mode in the mechanical area.

3.5 Verify operation of the electric air convectors (area heaters).

3.6 Verify operation of the filter air heaters, prefilters, HEPA filters, and adsorbers.

3.7 Verify operation of the recirculation cooling units.

3.8 Verify alarms, indicating lights and status lights are functional.

3.9 Perform air flow balancing of the SBVS.

3.10 Verify that operation of dampers meet design requirements.

3.11 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

3.12 ~~Verify that operation of the SBVS radiation monitors meet design requirements (refer to Table 11.5-1, Monitors R-25 and R-26).~~

3.13 Verify that duct/housing leakage requirements are met.

Note: Response time of actuated components is to be determined from a single test using the check source specified in Table 11.5-1 that is specified for each radiation monitor until travel is completed for each actuated component impacted by the radiation monitor signal.

3.14 Verify operation of radiation monitors using check sources (refer to Table 11.5-1, Radiation Measuring Points R-25 and R-26) and external test equipment, as necessary:

3.14.1 Check the self-testing features of radiation monitors.

3.14.2 Record the response of radiation monitors to check sources.

3.14.3 Initiate a high radiation signal to each radiation monitor to verify monitor response (alarm actuations) meets design requirements.

3.14.4 Record alarm actuations at local and remote locations, as appropriate.

3.14.5 Initiate a high radiation signal to each radiation monitor to measure the response time for each actuated component from the time that the radiation monitor reaches the control setpoint until the actuated component has traveled to the designated position.

3.15 Confirm that Automatic Control Functions (refer to Table 11.5-1, Radiation Measuring Point R-25) initiate upon detecting high activity levels.

3.16 Verify that sample points (refer to Table 11.5-1, Radiation Measuring Points R-25 and R-26) are capable of collecting representative samples.

4.0 DATA REQUIRED

4.1 Damper operating data.

4.2 Air flow and balancing verification.

4.3 Setpoints at which alarms, center backs and control occur.

4.4 Temperature data for each of the SBVS.

4.5 Radiation monitor response to check source.

4.6 Technical data associated with check source.

4.7 Signal levels necessary to initiate alarm actuation.

4.8 Signal levels necessary to initiate Automatic Control Functions.

4.9 Response time of each actuated component.

5.0 ACCEPTANCE CRITERIA

5.1 The SBVS operates as designed (refer to Section 9.4.5):

5.1.1 SBVS air handlers/fans perform as designed.

5.1.2 The operation of the SBVS operational air exhaust mode in the mechanical area meets design requirements.

5.1.3 The operation of the SBVS accident air exhaust mode in the mechanical area meets design requirements.

5.1.4 The operation of the SBVS electric air convectors (area heaters) meets design requirements.

5.1.5 The operation of the SBVS filter air heaters, prefilters, HEPA filters, and adsorber meets design requirements.

5.1.6 The operation of the SBVS recirculation cooling units meets design requirements.

5.1.7 SBVS alarms, indicating lights and status lights meet design requirements.

5.1.8 SBVS meets duct/housing total leakage requirements.

5.2 Verify that safety-related components meet electrical independence and redundancy requirements.

5.3 ~~The SBVS meets design requirements to monitor radiation (refer to Table 11.5-1, Monitors R-25 and R-26).~~

5.4 Radiation monitoring instrumentation meets design requirements to monitor radiation and respond as designed to radiation sources (refer to Table 11.5-1, Radiation Measuring Points R-25 and R-26). This includes, but is not limited to, the following that could adversely impact the ability to measure the parameters described in Table 11.5-1:

5.4.1 Range.

5.4.2 Response time.

5.4.3 Sensitivity.

5.5 Radiation monitoring instrumentation meets design requirements to monitor radiation and initiate Automatic Control Functions (refer to Table 11.5-1, Radiation Measuring Point R-25) upon detection of high activity levels.

5.5.1 For each applicable radiation monitor, the response time from the radiation monitor reaching the level to initiate the automated control function until each actuated component has reached the required position meets the design requirement.

5.6 Radiation sample points (refer to Table 11.5-1, Radiation Measuring Points R-25 and R-26) are capable of collecting the required samples.

14.2.12.8.12 Emergency Power Generating Building Ventilation System (Test #084)

1.0 OBJECTIVE

1.1 To demonstrate proper operation of the emergency power generating building ventilation system (EPGBVS).

1.2 To demonstrate proper operation of the EPGBVS.

1.3 To demonstrate electrical independence and redundancy of power supplies.

2.0 PREREQUISITES

2.1 Construction activities on the EPGBVS have been completed.

2.2 EPGBVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the EPGBVS are complete and functional.

2.4 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify design air flow with each EPGBVS in operation.

3.3 Verify design temperature can be maintained in each Emergency Power Generating Building.

3.4 Verify alarms, indicating instruments, and status lights are functional.

3.5 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

3.6 Verify that operation of dampers meet the requirements of ASME AG-1.

3.7 Verify that duct/housing leakage requirements are met.

4.0 DATA REQUIRED

4.1 Fan and damper operating data.

4.2 Air flow verification

4.3 Setpoint at which alarms, interlocks, and controls occur.

4.4 Temperature data of each Emergency Power Generating Building.

5.0 ACCEPTANCE CRITERIA

5.1 The EPGBVS operates as designed (refer to Section 9.4.9):

5.1.1 EPGBVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 EPGBVS fan performance meets design requirements.

5.1.3 EPGBVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.1.4 EPGBVS air balance meets design requirements.

5.1.5 EPGBVS meets duct/housing total leakage requirements.

5.2 Verify that safety-related components meet electrical independence and redundancy requirements.

14.2.12.8.13 Smoke Confinement System (Test #085)

1.0 OBJECTIVE

1.1 To demonstrate the operation of the smoke confinement system (SCS) for Nuclear Island.

2.0 PREREQUISITES

2.1 Construction activities in the SCS are complete with penetrations sealed.

2.2 SCS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the SCS.

2.4 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify the operation of the supply air fans.

3.3 Verify operation of the smoke purge fans.

3.4 Verify alarms, indicating lights and status lights are functional.

3.5 Perform air flow balancing of the SCS.

3.6 Verify that operation of dampers meets design requirements.

4.0 DATA REQUIRED

4.1 Air balancing reports, including fan operating data for each of the air handling units and the smoke purge fans.

4.2 Damper operating data.

4.3 Air flow and balancing verification.

4.4 Setpoints at which alarms and control occur.

5.0 ACCEPTANCE CRITERIA

5.1 The SCS operates as designed (refer to Section 9.4.13):

5.1.1 SCS alarms, status lights, interlocks, and control logic meets design requirements.

5.1.2 The operation of the SCS smoke purge fans meet the design requirements.

5.1.3 The air balance of the SCS meets design requirements.

5.1.4 SCS dampers meet the design requirements.

14.2.12.8.14 Station Blackout Room Ventilation System (Test #086)

1.0 OBJECTIVE

1.1 To demonstrate proper operation of the ventilation to the station diesel generator divisions located inside the Switchgear Building.

1.2 To demonstrate electrical independence and redundancy of power supplies.

2.0 PREREQUISITES

2.1 Construction activities on the station blackout room ventilation system (SBORVS) have been completed.

2.2 SBORVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the SBORVS are complete and functional.

2.4 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify design air flow with each SBORVS in operation.

3.3 Verify design temperature can be maintained in each station blackout diesel ventilation area.

3.4 Verify alarms, indicating instruments, and status lights are functional.

3.5 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

4.0 DATA REQUIRED

4.1 Fan and damper operating data.

4.2 Air flow verification.

4.3 Setpoint at which alarms, interlocks, and controls, occur.

4.4 Temperature data of each station blackout diesel area with and without diesel operating.

5.0 ACCEPTANCE CRITERIA

5.1 The SBORVS operates as designed (refer to Section 9.4.10):

5.1.1 SBORVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 SBORVS fan performance meets design requirements.

5.1.3 SBORVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.1.4 SBORVS air balance meets design requirements.

14.2.12.8.15 Turbine Island Ventilation Systems (Test #087)

A COL applicant that references the U.S. EPR design certification will provide site-specific test abstract information for the turbine island ventilation systems. The following is a typical COLA test; if a site-specific test will be used, the COL applicant will provide the test.

1.0 OBJECTIVE

1.1 To demonstrate that the turbine building ventilation system (TBVS) provides a suitable operating environment for equipment and personnel during normal operations.

1.2 To demonstrate that the switchgear building ventilation system, turbine island (SWBVS) provides a suitable operating environment for equipment and personnel during normal operations.

2.0 PREREQUISITES

2.1 Construction activities on the TBVS have been completed.

2.2 Construction activities on the SWBVS have been completed.

2.3 TBVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.4 SWBVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.5 Support systems required for operation of the TBVS are complete and functional.

2.6 Support systems required for operation of the SWBVS are complete and functional.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify that operation of inlet air dampers and damper controls meets design requirements.

3.3 Verify that operation of the exhaust fan units and dampers meets design requirements.

3.4 Verify that operation of protective devices, controls, interlocks, instrumentation, and alarms meets design requirements.

4.0 DATA REQUIRED

4.1 Fan and damper operating data.

4.2 Setpoints at which alarms and interlocks occur.

5.0 ACCEPTANCE CRITERIA

5.1 The SWBVS operates as designed (refer to Section 9.4.4):

5.1.1 SWBVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 SWBVS fan performance meets design requirements.

5.1.3 SWBVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.1.4 SWBVS air balance meets design requirements.

5.2 The TBVS operates as designed (refer to Section 9.4.4):

5.2.1 TBVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.2.2 TBVS fan performance meets design requirements.

5.2.3 TBVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.2.4 TBVS air balance meets design requirements.

14.2.12.8.16 Essential Service Water Pump Building Ventilation System (Test #088)

1.0 OBJECTIVE

1.1 To verify the essential service water pump building ventilation system (ESWPBVS) can maintain the space temperature as required.

1.2 To demonstrate electrical independence and redundancy of power supplies.

2.0 PREREQUISITES

2.1 Construction activities on the ESWPBVS have been completed.

2.2 ESWPBVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the ESWPBVS are complete and functional.

2.4 Test Instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic and interlock.

3.2 Verify design air flow of each fan.

3.3 Verify alarms, indicating instruments and status lights are functional.

3.4 Verify design temperatures can be maintained in the structure.

3.5 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

3.6 Verify that operation of isolation dampers meet the requirements of ASME AG-1.

3.7 Verify operation of the electric air convectors (area heaters).

4.0 DATA REQUIRED

4.1 Temperature data for the structure from each fan unit.

4.2 Air balancing report, including fan operating data.

4.3 Setpoints at which alarms and interlocks occur.

5.0 ACCEPTANCE CRITERIA

5.1 The ESWPBVS operates as designed (refer to Section 9.4.11):

5.1.1 ESWPBVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 ESWPBVS fan performance meets design requirements.

5.1.3 ESWPBVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.1.4 ESWPBVS air balance meets design requirements.

5.1.5 ESWPBVS electric air heaters meet design requirements.

5.2 Verify that safety-related components meet electrical independence and redundancy requirements.

14.2.12.8.17 Main Steam and Feedwater Valve Room System (Test #089)

1.0 OBJECTIVE

1.1 To demonstrate that the main steam and feedwater valve room ventilation system (VRVS) provides a suitable operating environment for equipment and personnel during normal operations.

2.0 PREREQUISITES

2.1 Construction activities on the VRVS have been completed.

2.2 VRVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the VRVS are complete and functional.

2.4 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify design air flow with each VRVS in operation.

3.3 Verify design temperature can be maintained in each main steam and feedwater valve room.

3.4 Verify alarms, indicating instruments, and status lights are functional.

4.0 DATA REQUIRED

4.1 Fan and damper operating data.

4.2 Air flow verification.

4.3 Setpoint at which alarms, interlocks, and controls, occur.

4.4 Temperature data for each main steam and feedwater valve room train.

5.0 ACCEPTANCE CRITERIA

5.1 The VRVS operates as described in Section 9.4.12.

14.2.12.8.18 Plant Laboratory Equipment (Test #090)

A COL applicant that references the U.S. EPR design certification will provide site-specific test abstract information for the plant laboratory equipment. The following is a typical COL test; if a site-specific test will be used, the COL applicant will provide the test.

1.0 OBJECTIVE

1.1 To demonstrate proper operation of laboratory equipment used to analyze or measure radiation levels.

1.2 To demonstrate proper operation of laboratory equipment used to analyze or measure isotopic concentrations (such as a mass spectrometer) of radioactive samples.

2.0 PREREQUISITES

2.1 Construction activities on laboratory equipment support systems used to analyze or measure radiation levels are complete.

2.2 Construction activities on laboratory equipment support systems used to analyze or measure isotopic concentrations of radioactive samples are complete.

2.3 Construction activities related to the installation of vendor supplied laboratory equipment used to analyze or measure radiation levels are complete. The laboratory equipment has been installed per manufacture's recommendations.

2.4 Construction activities related to the installation of vendor supplied laboratory equipment used to analyze or measure isotopic concentrations of radioactive samples are complete. The laboratory equipment has been installed per manufacture's recommendations.

2.5 The laboratory equipment area radiological controls (such as postings, shielding, radioactive work permits, operation of ventilated hoods, interim storage of incoming and archived radioactive samples, and the availability of radwaste containers as interim means to store/hold laboratory radioactive wastes) have been implemented or are capable of being implemented.

2.6 Verify the availability of proper radioactive standards and check sources as well as non-radioactive standards.

2.7 Airborne and liquid radioactivity monitoring and sampling equipment, portable radiation survey equipment and radio-analytical equipment installed in the laboratory are calibrated in accordance with RG 1.21 and RG 4.15.

3.0 TEST METHOD

3.1 Confirm that all drains from laboratory equipment that analyze or measure radiation levels are routed correctly and verifying that drains discharge as designed. This could be performed by pouring a liquid down the drain colored with food dye or by some other suitable means and confirm the presence of the food dye in the receiving tank.

3.2 Confirm that all drains from laboratory equipment that analyze or measure isotopic concentrations of radioactive samples are routed correctly and verifying that drains discharge as designed. This could be performed by pouring a liquid down the drain colored with food dye or by some other suitable means, and confirm the presence of the food dye in the receiving tank.

3.3 Confirm that ventilation hoods and other engineered radioactive containment devices are vented as designed. This could be accomplished by tracer gas or some other suitable means.

3.4 Measure the ventilation hood discharge flow rates for engineered devices.

3.5 Perform vendor supplied startup checks and calibrations for all laboratory equipment that analyze or measure radiation levels.

3.6 Perform vendor supplied startup checks and calibrations for all laboratory equipment that analyze or measure isotopic concentrations of radioactive samples.

4.0 DATA REQUIRED

4.1 Inspection report from verification of laboratory equipment drains.

4.2 Inspection report from verification of ventilation hood flow and routing.

4.3 Completed vendor specified laboratory equipment startup procedures.

5.0 ACCEPTANCE CRITERIA

5.1 The laboratory equipment drain interface with the plant systems performs as designed.

5.2 The laboratory equipment ventilation hood interface with the plant systems performs as designed.

5.3 The laboratory equipment checkout and calibration procedures meet design requirements as described in Sections 11.5 and 13.4.

14.2.12.8.19 Access Building Ventilation System (Test #224)

1.0 OBJECTIVE

1.1 To verify the access building ventilation system (ABVS) can maintain the space temperature as required.

1.2 ~~To verify that radiological alarms are provided in the control room for the operator to manually isolate the building exhaust to the vent stack (refer to Section 11.5.3.1.2 and Table 11.5-1, Monitor R-31.~~

1.3 To verify that the radiation sample point provides a representative sample of the ABVS.

2.0 PREREQUISITES

2.1 Construction activities on the ABVS have been completed.

2.2 ABVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the ABVS are complete and functional.

2.4 Test Instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic and interlock.

3.2 Verify design air flow of each fan.

3.3 Verify alarms, indicating instruments and status lights are functional.

3.4 Verify design temperatures can be maintained in the structure.

3.5 Verify that duct/housing leakage requirements are met.

3.6 Verify that sample point (refer to Table 11.5-1, Radiation Measuring Point R-31) is capable of collecting representative samples.

4.0 DATA REQUIRED

4.1 Temperature data for the structure from each HVAC unit.

4.2 HVAC unit operating data.

4.3 Setpoints at which alarms and interlocks occur.

5.0 ACCEPTANCE CRITERIA

5.1 The ABVS operates as designed (refer to Section 9.4.14~~, Section 11.5.3.1.10 and Table 11.5-1, Monitor R-31~~):

5.1.1 ABVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 ABVS fan performance meets design requirements.

5.1.3 ABVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.1.4 ABVS air balance meets design requirements.

5.1.5 ABVS meets duct/housing total leakage requirements.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.7 Annulus Ventilation System (AVS)

BASES

BACKGROUND

The AVS is required by 10 CFR 50, Appendix A, GDC 41, "Containment Atmosphere Cleanup" (Ref. 1), to ensure that radioactive materials that leak from the Containment Building into the shield building (secondary containment) following a Design Basis Accident (DBA) are filtered and adsorbed prior to exhausting to the environment.

The Containment Building is surrounded by a secondary containment called the shield building, which is a concrete structure. Between the Containment Building and the shield building inner wall is an annular space that collects any containment leakage that may occur following a loss of coolant accident (LOCA). This space also allows for periodic inspection of the outer surface of the Containment Building.

The AVS maintains a negative pressure in the annulus between the shield building and the Containment Building during operation. Filters in the system control the release of radioactive contaminants to the environment. Shield building OPERABILITY is required to ensure retention of primary containment leakage and proper operation of the AVS. The AVS is designed to permit appropriate periodic pressure and functional testing to assure component integrity, OPERABILITY of active components, and operational performance of the system as required by GDC-43 "Testing of Containment Atmosphere Cleanup Systems" (Ref. 2).

The AVS consists of one normal operation filtration train (non-safety related), and two independent and redundant accident filtration trains (safety related). The normal filtration train operates during normal plant operation, including cold shutdown and outages. The normal operations filtration train maintains a pressure of ≤ -0.8~~0.25~~ inches wg in the annulus during normal operation. During normal plant operation, the accident filtration trains are not required to be in operation, however they are both available for back-up if the normal filtration train is not able to maintain sufficient negative pressure in the annulus.

BACKGROUND (continued)

During normal operation, the conditioned air is drawn from the Nuclear Auxiliary Building Ventilation supply shaft to the bottom of annulus through a fire damper, manual regulated control damper, and two motor operated isolation dampers. The exhaust air is drawn through a vent at the top of annulus through two motor operated isolation dampers and fire dampers to the Nuclear Auxiliary Building Ventilation System exhaust fans via air shaft cell 3. See FSAR Section 9.4.3 (Ref. 3). The exhaust air from cell 3 is monitored for radiation. If clean, the air is filtered by the pre-filter and HEPA filter and then discharged through the vent stack. If in alarm, the air is filtered by a prefilter, HEPA filter, carbon adsorber and a post-filter, and discharged through the vent stack. The annulus air inlet and exhaust motor operated isolation dampers of the normal filtration train are the only components which are safety related. The four safety-related class motor operated air tight dampers will isolate the annulus from the non-safety normal operation train in case of a design basis accident. The two isolation dampers in both the supply and exhaust train are powered by separate divisions and are supplied by the emergency diesel generators. Each isolation damper can be operated either automatically or manually from the Main Control Room.

In normal operation mode, if there is a loss of negative pressure in the annulus, failure of the Nuclear Auxiliary Ventilation System, or Loss of Offsite Power, the normal operation filtration train is considered lost and one of the accident filtration trains is switched on. The two isolation dampers on both the normal supply and exhaust trains are closed and one of the two accident filtration trains is switched on. The other accident filtration train is available for backup.

The AVS accident filtration trains are used during a design basis event to contain leaks from the primary containment by maintaining a negative pressure in the annulus. During a design basis event, the annulus air is filtered before releasing to the environment. There are two independent 100% accident trains. Each train consists of an upstream air-tight motor controlled damper, moisture separator electrical heater, pre-filter, ~~upstream HEPA filter~~, an activated carbon adsorber for removal of radioiodines, ~~downstream HEPA~~ post-filter, downstream air-tight motor controlled damper, fan, and backdraft damper. The ~~upstream~~ HEPA filter removes the fine discrete particulate matter from the air stream. The ~~downstream HEPA~~ post-filter following the carbon adsorber collects carbon particles ~~and provides backup in case of failure of the upstream HEPA filter~~. Only the ~~upstream~~ HEPA filter and the carbon adsorber section are credited in the analysis.

BASES

BACKGROUND (continued)

The system initiates and maintains a negative air pressure in the annulus by means of filtered exhaust ventilation of the Shield Building following receipt of a containment isolation signal. The system is described in Reference 4.

The prefilters remove large particles in the air to prevent excessive loading of the HEPA filters and carbon absorbers. ~~Heaters reduce the relative humidity of the airstream to 70 percent or less~~. Monthly operation of each train, for ≥ 15 minutes, with heaters on, reduces moisture buildup on the HEPA filter and adsorber~~filters and adsorbers~~. The heater operation time and monthly Frequency are consistent with Reference 6.

During normal operation, the AVS normal operation filtration train (non-safety related) maintains a negative pressure in the annulus~~ and processes the air through HEPA filters~~.

The isolation dampers on the normal operation filtration train and the accident filtration trains can be operated either automatically or manually from the Main Control Room.

The AVS accident filtration train reduces the radioactive content in the shield building atmosphere following a DBA. Loss of the AVS could cause site boundary doses, in the event of a DBA, to exceed the values given in the licensing basis.

APPLICABLE SAFETY ANALYSES

The AVS design basis is to mitigate the consequences of the limiting DBA, which is a LOCA. The accident analysis (Ref. 5) assumes that only one train of the AVS is OPERABLE due to a single failure that disables the other train. The accident analysis accounts for the reduction in airborne radioactive material provided by the remaining one train of this filtration system. The amount of fission products available for release from containment is determined for a LOCA. For all events analyzed, the AVS is assumed to be automatically initiated to reduce via filtration and adsorption, the radioactive material released to the environment.

The modeled AVS actuation in the safety analyses is based upon a worst case response time following a containment isolation initiated at the limiting setpoint. The total response time, from exceeding the signal setpoint to attaining a pressure of ≤ -0.25 inches wg in the annulus, is ≤ 305 seconds. This response time is composed of signal delay, diesel generator startup and sequencing time, system startup time, and time for the system to attain the required pressure after starting.

The AVS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

B 3.7 PLANT SYSTEMS

B 3.7.12 Safeguard Building Controlled Area Ventilation System (SBVS)

BASES

BACKGROUND

The SBVS provides a protected environment in the hot mechanical areas of Safeguards Building Divisions 1, 2, 3, and 4 and the fuel building. The SBVS also filters airborne radioactive particulates from the areas of the active Emergency Core Cooling System (ECCS) components during a Loss of Coolant Accident (LOCA).

The conditioned air supply to all four Safeguard Building Divisions is provided independently for each division by the Electrical Division of Safeguard Ventilation System (Ref. 1). The SBVS supplies the conditioned air for ventilation through a volume control damper and two isolation dampers for each division to the hot mechanical areas of the four Safeguard Building Divisions. The SBVS air supply and exhaust flows are designed to prevent spread of airborne contamination and to maintain a negative pressure in the safeguard building controlled areas and fuel building.

Under normal plant operation, the operational air exhaust from each hot area is drawn independently through a volume control damper and two isolation dampers located on the operational exhaust duct system for each safeguard building. The main exhaust duct of each division is connected to a common concrete duct which runs inside the annulus. The operational air exhaust is then drawn through a concrete duct cell for processing by the normal filtration train of the Nuclear Auxiliary Building Ventilation System prior to release through the vent stack (Ref. 2).

During conditions in which a release of airborne contamination from any of the four hot mechanical areas occurs, the SBVS will redirect the accident air exhaust independently via four separate exhaust lines which join into one common leak-tight exhaust duct inside the annulus. The exhaust duct then connects to an accident exhaust filtration train located in the fuel building. There are two 100% capacity accident iodine exhaust filtration trains in parallel configuration. Each train consists of inlet motor controlled damper, moisture separator, electric heater, ~~upstream~~ HEPA filter, iodine filter with activated carbon, ~~downstream HEPA~~ post-filter, outlet motor controlled damper, exhaust fan, and non-return damper. The accident air exhaust is processed through one or both independent iodine filtration trains prior to release through the vent stack. ~~The downstream~~

BACKGROUND (continued)

HEPA filter is not credited in the analysis, but serves to collect carbon particles and provides a backup in case the upstream HEPA filter bank fails. The prefilters and moisture separator removes any large particles in the air and any entrained water droplets present to prevent excessive loading of the HEPA filters and carbon adsorbers.

In case of a LOCA with assumed ECCS leakage, the accident air exhaust from the safeguard building controlled areas and fuel building is also directed through the accident iodine exhaust filtration trains prior to release through the vent stack.

The SBVS accident iodine filtration train is a standby system which may also be operated during normal plant operations. Upon receipt of an actuating signal, the normal air exhaust from the buildings is isolated and the accident air is redirected through the iodine filtration train.

The SBVS is discussed in FSAR Section 9.4.5 (Ref. 3).

As discussed in Reference 8, the shield building, portions of the safeguard buildings, and the fuel building are maintained at a negative pressure in order to process any post-accident containment leakage through filters in the Annulus Ventilation System (AVS) and the SBVS.

APPLICABLE SAFETY ANALYSES

The SBVS design basis is established by the consequences of the limiting postulated accident, which is a LOCA with assumed ECCS leakage. The analysis of a LOCA, given in Reference 4, assumes ECCS leakage to the safeguard building controlled areas and fuel building is a conservative four gallons a minute. The SBVS consists of two 100% capacity iodine filtration trains in parallel configuration. There are only two iodine filtration trains since only slow failure modes are assumed and filtration efficiency is checked periodically. Both sets of iodine filtration trains are required to be OPERABLE. One SBVS train is then assumed to be lost due to a single failure. The postulated accident analysis assumes that two trains of the SBVS are OPERABLE. The accident analysis accounts for the reduction in airborne radioactive material provided by the one train of this filtration system. The amount of fission products available for release from the safeguard building controlled areas and fuel building is determined for a LOCA. These assumptions and the analysis follow the guidance provided in Regulatory Guide 1.25 (Ref. 5).

The SBVS is not credited in the Fuel Handling Accident evaluation.

The SBVS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

Two independent and redundant trains of SBVS Accident Exhaust Filtration are required to be OPERABLE to ensure that at least one train is available, assuming a single failure that disables the other train, coincident with a loss of offsite power.

The failure of both trains could result in the atmospheric release from the safeguard building controlled areas and fuel building exceeding the 10 CFR 50.34 (Ref. 6) limits in the event of a LOCA.

The SBVS Accident Exhaust Filtration train is considered OPERABLE when it's associated:

a. Fan is OPERABLE;

b. Prefilter, HEPA filter ~~and~~ carbon adsorber, and post-filter are not excessively restricting flow, and are capable of performing their filtration function; and

c. Heater, ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

The LCO is modified by a Note allowing the safeguard building controlled areas and fuel building boundaries to be opened intermittently under administrative controls. For entry and exit through doors the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening when a need for safeguard building or fuel building isolation is indicated.

APPLICABILITY

In MODE 1, 2, 3, or 4, the SBVS Accident Exhaust Filtration train is required to be OPERABLE to provide fission product removal associated with the leakage inside the controlled areas of the safeguard buildings and fuel building.

In MODE 5 or 6, the SBVS Accident Exhaust Filtration train is not required to be OPERABLE since the ECCS is not required to be OPERABLE.

ACTIONS

A.1

With one SBVS Accident Exhaust Filtration train inoperable, action must be taken to restore OPERABLE status within 7 days. During this period, the remaining OPERABLE train is adequate to perform the SBVS function. The 7 day Completion Time is based on the risk from an event occurring requiring the inoperable SBVS train, and the remaining SBVS train providing the required protection.

B.1

----------------------------------REVIEWER'S NOTE----------------------------------
Adoption of Condition B is dependent on a commitment from the licensee to have guidance available describing compensatory measures to be taken in the event of an intentional and unintentional entry into Condition B.

----------------------------------REVIEWER'S NOTE----------------------------------
The need for toxic gas isolation state will be determined by the COL applicant.

If the safeguard building controlled areas or fuel building boundary is inoperable in MODE 1, 2, 3, or 4, the SBVS trains may not be able to perform their intended functions. Actions must be taken to restore an OPERABLE safeguard building controlled areas and fuel building boundaries within 24 hours. During the period that the safeguard building controlled areas or fuel building boundary is inoperable, appropriate compensatory measures consistent with the intent, as applicable, of GDC 19 and 10 CFR Part 100 should be utilized to protect plant personnel from potential hazards such as radioactive contamination, [toxic gases,] smoke, temperature ~~and relative humidity~~, and physical security. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a postulated accident occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan and possibly repair, and test most problems with the safeguard building controlled areas or fuel building boundary.