**Table 12.3-8 Regulatory Guide 4.21 Design Objectives and Applicable DCD Subsection Information for Minimizing Contamination and Generation of Radioactive Waste (Sheet 10 of 62)**

| Objective | | System Features | DCD Reference |
|---|---|---|---|
| 3 | Use leak detection methods (e.g., instrumentation, automated samplers) capable of early detection of leaks in areas where it is difficult or impossible to conduct regular inspections (such as for spent fuel pools, tanks that are in contact with the ground, and buried, embedded, or subterranean piping) to avoid release of contamination of the environment. | The leak detection instrumentation is described in the above rows, and is included on all four trains of the ESWS. | ~~9.2.1.2.1~~ |
| 4 | Reduce the need to decontaminate equipment and structures by decreasing the probability of any release, reducing any amounts released, and decreasing the spread of the contaminant from the source. | The ESWS draws water from the UHS [[basin]] and returns water to the UHS after passing through the CCW HXs and the essential chiller units. The UHS is the source of water to the UHS [[basin]]. The essential chiller units do not include the radioactive fluid, and CCWS is the intermediate loop between the reactor auxiliaries and the ESWS. This arrangement minimizes direct leakage of the radioactive fluid from the ESWS to the environment. In addition, radiation monitors are provided in each discharge line of CCW HX essential service water (ESW) side. The monitors alert the operator if the leaking CCW contains radioactivity so that the operator can isolate the leaking train. | 9.2.1.2 |

DCD_09.02.05-8

**Table 12.3-8 Regulatory Guide 4.21 Design Objectives and Applicable DCD Subsection Information for Minimizing Contamination and Generation of Radioactive Waste (Sheet 11 of 62)**

| Objective | | System Features | DCD Reference |
|---|---|---|---|
| 5 | Facilitate decommissioning by (1) minimizing embedded and buried piping, and (2) designing the facility to facilitate the removal of any equipment and/or components that may require removal and/or replacement during facility operation or decommissioning. | a. ~~Underground piping is lined and placed in trenches, with manholes provided for periodic piping inspection.~~<br><br>Process equipment items are accessible for maintenance and replacement. These items are small in volume and may be removed and replaced with minimum cutting into small pieces. | ~~9.2.1.2.2.5~~ |
| 6 | Minimize the generation and volume of radioactive waste both during operation and during decommissioning (by minimizing the volume of components and structures that become contaminated during plant operation). | All of the features listed above minimize the possibility of contamination of components and structures, and therefore minimize the volume of radioactive waste generated during operation and decommissioning. | — |

DCD_09.02.05-8

**Table 12.3-8 Regulatory Guide 4.21 Design Objectives and Applicable DCD Subsection Information for Minimizing Contamination and Generation of Radioactive Waste (Sheet 13 of 62)**

| Objective | | System Features | DCD Reference |
|---|---|---|---|
| | | **Design features to provide containment**<br><br>Radiation monitors are located downstream of the supply headers and the signal is indicated in the MCR. When the signal exceeds the setpoint, an alarm is transmitted and the CCW surge tank vent valve is closed and interlocked not to open automatically. | 9.2.2.5.2 |
| 2 | Provide for adequate leak detection capability to provide prompt detection of leakage for any structure, system, or component which has the potential for leakage. | The radiation monitors are installed to detect the leakage of radioactive materials into the CCWS.<br><br>In the event of in-leakage through a RCP thermal barrier heat exchanger, the isolation valves on the RCP thermal barrier heat exchanger CCW return lines are automatically closed by the high flow rate signal, thereby preventing CCWS contamination. In addition, isolation boundary valves between the Reactor Building and Turbine and Auxiliary Buildings can be closed if contamination is detected by radiation monitors.<br><br>If leakage from a higher pressure component to the CCWS should occur, the water level of the CCW surge tank increases and an alarm is transmitted to the MCR. If the in-leakage is radioactive, the radiation monitors of the CCWS also indicate in the MCR the increased radiation level and transmit an alarm when the radiation level reaches its set point. After the leak source is identified, the leak is isolated from the CCWS. | 1.2.1.5.4.4<br><br>9.2.2.2.1.5<br><br>9.2.2.3.1 |

DCD_09.02.02-69

**Table 12.3-8 Regulatory Guide 4.21 Design Objectives and Applicable DCD Subsection Information for Minimizing Contamination and Generation of Radioactive Waste (Sheet 14 of 62)**

| Objective | | System Features | DCD Reference |
|---|---|---|---|
| 3 | Use leak detection methods (e.g., instrumentation, automated samplers) capable of early detection of leaks in areas where it is difficult or impossible to conduct regular inspections (such as for spent fuel pools, tanks that are in contact with the ground, and buried, embedded, or subterranean piping) to avoid release of contamination of the environment. | The leak detection instrumentation is described above. | — |
| 4 | Reduce the need to decontaminate equipment and structures by decreasing the probability of any release, reducing any amounts released, and decreasing the spread of the contaminant from the source. | The detection and mitigation features discussed above decrease the probability of releases.<br><br>In addition, CCWS makeup sources use only radiologically "clean" water as potential CCWS makeup sources. | —<br><br>9.2.2.2.1.3 |

DCD_09.02.02-69

### 14.2.12.1.34 Essential Service Water System (ESWS) Preoperational Test

A. Objective

1. To demonstrate the operation of the ESWS.

B. Prerequisites

1. Required construction testing is completed.
2. Component testing and instrument calibration is completed.
3. Test instrumentation is available and calibrated.
4. Required support systems are available.

C. Test Method

1. Verify manual and automatic system controls, including interlocks. | DCD_09.02.02-68
2. Verify system flowrates and performance of ESWS pumps.
3. Verify alarms and status indications are functional.
4. Verify the absence of indications of water hammer by re-activating the ESW pump after a simulated LOOP as specified in Subsection 14.2.12.1.45, Class 1E Bus Load Sequence Preoperational Test.

D. Acceptance Criterion

1. The ESWS operates within design limits, as described in Subsection 9.2.1.

### 14.2.12.1.35 Main and Unit Auxiliary Transformers Preoperational Test

A. Objectives

1. To demonstrate operation of protective relaying, alarms, and control devices of the main and unit auxiliary transformers.
2. To demonstrate the energization of the unit auxiliary transformers.

B. Prerequisites

1. Required construction testing is completed.
2. Component testing and instrument calibration is completed.
3. Test instrumentation is available and calibrated.

2. To demonstrate the capability of the CCW system to provide cooling water during normal operation, normal cooldown, and postulated loss-of-coolant accident (LOCA) modes of operation.

3. To verify operation of system valves and control circuitry.

4. To demonstrate the operation and verify the operating characteristics of the CCW pumps.

5. To verify the lineup of the cooling water supply line from alternative sources (non-ECWS and FSS) to the charging pumps. DCD_09.02.02-80

6. To verify the lineup of the cooling water supply line from CCWS as an alternative source of cooling water to the containment fan coolers.

B. Prerequisites

1. Required construction testing is completed.

2. Component testing and instrument calibration is completed.

3. Test instrumentation is available and calibrated.

4. Required support systems are available.

5. Demineralized water is available for system makeup.

6. The CCW is aligned to cool the CCW motors.

7. The ESWS is available to CCW heat exchangers.

8. CCWS is filled and vented. DCD_09.02.02-55

9. Temporary test instrumentation is installed.

C. Test Method

1. The control circuitry of the CCW pumps, surge tanks, and valves is verified.

2. The CCW system pumps are operated, and performance characteristics verified.

3. System flows are balanced, as required, and then verified in each mode of operation. Cavitation is not present in the area of butterfly throttle valves. Testing includes verification of coolant flow to the thermal barrier via cross-tie.

4. The cooling ability of the CCW system is verified during RCS heatup and cooldown in conjunction with the RHRS during the hot functional test.

5. CCW surge tank vent valve closure logic is verified using a simulated high CCW radiation monitor condition.

6. The thermal barrier heat exchanger cooling water return line isolation valve logic is verified using a simulated reactor coolant pump thermal barrier heat exchanger cooling water high flow condition.

7. ~~The CCW header tie line isolation valves' closure logic is verified to be consistent with Subsection 9.2.2.2.1.5 using simulated signals. Valve response to ESF actuation signals may be verified via other tests (e.g., Subsection 14.2.12.1.55, ECCS Actuation and Containment Isolation Logic Preoperational Test).~~Not used. DCD_09.02.02-55

8. The CCW header tie line isolation valves' closure time is verified to be consistent with Subsection 9.2.2.2.1.5.

9. When a CCW header tie line isolation valve is manually closed from the MCR, monitor for the occurrence of water hammer, vibration and noise. DCD_09.02.02-55

10. Demonstrate the ability to provide makeup water and verify flow to each pressurized CCW surge tank using DWS, PMWS and ~~RWS~~FSS supplies. DCD_09.02.02-55

11. Operate the valves as needed to verify the lineup of the alternative cooling water supply. DCD_09.02.02-80

12. The CCWS SSCs design pressure is verified against unacceptable water hammer and pressure waves. The CCWS is potentially subject to water hammer and/or system pressure waves under plant conditions that will open/close the CCWS pump discharge check valve, for example, during CCWS pump swaps. The CCWS is verified to be adequately designed for these potential conditions when CCWS pumps are started and stopped. DCD_09.02.02-50

D. Acceptance Criteria

1. The tank alarms and interlocks operate as designed.

2. The performance characteristics of the CCW pumps are within design specifications (Subsection 9.2.2)

3. Components that are supplied with CCW receive flows that are within the design specifications in each of the operating modes including the supply of coolant flow to the thermal barrier via cross-tie.

4. The pump control and interlocks operate as designed.

5. CCW system performance characteristics are within design specifications.

6. CCW surge tank vent valve high radiation logic operates as described in Subsection 9.2.2.5.2.

7. The thermal barrier heat exchanger cooling water return line isolation valve logic operates as described in Subsection 9.2.2.5.5.

8. The CCW header tie line isolation valves' ~~closure logic and~~ closure times are consistent with Subsection 9.2.2.2.1.5. DCD_09.02.02-55

9. Water hammer does not affect CCW piping when a CCW header tie line isolation valve is closed. DCD_09.02.02-55

10. The ability to provide makeup water to each pressurized CCW surge tank using DWS, PMWS and ~~RWS~~FSS supplies is demonstrated. DCD_09.02.02-55

11. The lineup of the cooling water supply line from either non-ECWS or FSS to the charging pumps is consistent with the design in Subsection 9.2.2.2. DCD_09.02.02-80

12. The lineup of the cooling water supply line from CCWS to the containment fan coolers is consistent with the design in Subsection 9.2.2.2.

13. Verify that there is no evidence of unacceptable water hammer, excessive vibration, excessive noise, or unacceptable system pressure waves associated with pump discharge check valve functioning and that the CCWS SSCs (including the plate type heat exchanger gaskets) design values are not exceeded. The CCWS is verified to be adequately designed for these potential conditions during CCWS pump start and stop. DCD_09.02.02-50

### 14.2.12.1.88 Turbine Component Cooling Water System Preoperational Test

A. Objective

1. To verify that the system components perform their function of supplying adequate cooling water to the designated turbine building components, as described in Subsection 9.2.8.

B. Prerequisites

1. Required construction testing is completed.
2. Component testing and instrument calibration is completed.
3. Test instrumentation is available and calibrated.
4. Required support systems are available.
5. Electrical power supplies and control circuits are operational.
6. Components cooled by the system are operational and operating for verifying the heat exchanger capability.

C. Test Method

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY | |
|---|---|---|---|
| SR 3.7.7.1 | ----------NOTE----------<br>Isolation of CCW flow to individual components does not render the CCW System inoperable.<br>----------<br>Verify each CCW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days<br>OR<br>In accordance with the Surveillance Frequency Control Program] | |
| SR 3.7.7.2 | Verify train leakage for each CCW train is less than 3 gallons per hour. | [92 days<br>OR<br>In accordance with the Surveillance Frequency Control Program] | DCD_09.02.02-49 |
| SR 3.7.7.3 | Verify total subsystem leakage for CCW valving used to isolate non-safety piping is less than 25 gallons per 7 days. | [24 months<br>OR<br>In accordance with the Surveillance Frequency Control Program] | DCD_09.02.02-49 |
| SR 3.7.7.~~2~~4 | Verify each CCW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal. | [24 months<br>OR<br>In accordance with the Surveillance Frequency Control Program] | DCD_09.02.02-49 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY | |
|---|---|---|---|
| SR 3.7.7.~~3~~5 | Verify each CCW pump starts automatically on an actual or simulated actuation signal. | [24 months<br><br>OR<br><br>In accordance with the Surveillance Frequency Control Program] | DCD_09.02.02-49 |

[none]

SURVEILLANCE REQUIREMENTS (continued)

[The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions. OR The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.]

SR 3.7.7.2

DCD_09.02.02-49

This SR verifies that CCW train leakage is within the limits necessary to assure that an adequate water volume is maintained in each CCW surge tank compartment for cooling required loads for 7 days after a postulated seismic event with no makeup water source. Successful completion of this test provides assurance that CCWS component leakage during the operating cycle would not prevent CCWS function without surge tank makeup for at least 7 days. [The 92 day Frequency is based on engineering judgment and was chosen to provide added assurance that a potential existing leak during power operation would not be so large as to prevent CCWS operation for 7 days if makeup were unavailable. OR The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.]

The leak rate of 3 gallons per hour is based on the water volume in each tank compartment between the low-low level setpoint and instrument zero; this volume is greater than 800 gallons. A train leak rate of 3 gallons per hour would require more than 7 days to deplete the compartment of this water volume. (The leak rate value is conservatively selected to account for measurement uncertainty and margin.) The low-low level setpoint is below the normal operating level of each compartment. The zero level is above the pump suction nozzle elevation used for CCWS pump NPSH calculations. Thus, surveillance of this leak rate assures that surge tank compartment water volume is adequate to support CCWS operation for a minimum of 7 days without makeup. During the surveillance, it is necessary to minimize fluctuations in CCWS heat load and potential temperature fluctuations that could affect level indication. If the surveillance result is not within allowable limits for a CCW train, that train will be declared inoperable and additional testing may be necessary to determine if the header tie line isolation valves (NCS-MOV-007A/B/C/D, NCS-MOV-020A/B/C/D) are degraded. If it is determined that train separation cannot be achieved due to abnormal leakage through a pair of the redundant header tie line isolation valves (e.g., NCS-MOV-007A and NCS-MOV-007B), then both of the affected trains will be declared inoperable.

The duration of SR 3.7.7.2 testing should be long enough for the installed instrumentation to accurately measure the system losses with considerations of environmental changes in temperatures affecting thermal contraction and expansion of water within the CCWS surge tanks.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.7.3

DCD_09.02.02-49

This SR verifies isolation valves between safety and non-safety portions of the CCWS that cannot be tested during power operation. Such valves, notably NCS-AOV-57A/B and NCS-AOV-58A/B, cannot be tested during power operation because closure of these valves would isolate important components associated with normal operation. However, these valves are not normally cycled during power operation; thus, their leak rate is not likely to significantly change after the test is performed and the valves are restored to the position required for power operation. The valves are tested using a local leak rate test method. The total calculated leakage from isolation valves for each subsystem shall not exceed 25 gallons per 7 days. Successful completion of this test provides assurance that leakage from these valves isolating will not prevent CCWS function without surge tank makeup for at least 7 days. [The 24 month Frequency is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle length. This equipment is not at risk of imminent damage as it is designed to remain functional and in good condition while in operation. OR The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.]

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.7.~~2~~4

DCD_09.02.02-49

This SR verifies proper automatic operation of the CCW valves on an actual or simulated actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. [The 24 month Frequency is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle length. This equipment is not at risk of imminent damage as it is designed to remain functional and in good condition while in operation, thus significant degradation due to a longer surveillance interval should not be of major concern. The design reliability is, therefore, maintained by taking these considerations based on sound engineering judgment. OR The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.]

SR 3.7.7.~~3~~5

DCD_09.02.02-49

This SR verifies proper automatic operation of the CCW pumps on an actual or simulated actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. [The 24 month Frequency is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle length. This equipment is not at risk of imminent damage as it is designed to remain functional and in good condition while in operation, thus significant degradation due to a longer surveillance interval should not be of major concern. The design reliability is, therefore, maintained by taking these considerations based on sound engineering judgment. OR The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.]

REFERENCES 1. Subsection 9.2.2.

## Table 17.4-1 Risk-significant SSCs (Sheet 11 of 51)

| # | Systems, Structures and Components (SSCs) | Rationale[1] | Failure Mode[2] | Insights and Assumptions |
|---|---|---|---|---|
| 52 | CCWS - Non-essential chilled water system boundary motor operated valves<br>[NCS-MOV-241]<br>[NCS-MOV-242] | FV(L2)<br>RAW(L2)/LP | CM, EL, OD, PR | The valves are installed at the boundary between non-essential chilled water system and CCWS. In the case of the loss of containment cooling, the valves are opened to perform alternative containment cooling, utilizing the containment fan cooler system. |
| **4** | **Containment system** | | | |
| 1 | Containment vessel(PCCV) | EJ<br>SM | SS | The containment vessel is designed to completely enclose the reactor and reactor coolant system and to ensure that essentially no leakage of radioactive materials to the environment would result even if a major failure of the reactor coolant system were to occur.<br>Hydrogen ignition system are provided for protection against possible detonation following a core damage accident to meet the requirement of 10 CFR 50.34(f) and 10 CFR 50.44(c). |
| 2 | Hydrogen igniters | EJ | SR | |
| 3 | Interior containment structure | SM | SS | |
| 4 | Equipment hatches | SM | SS | |
| **5** | **Containment isolation system** | | | |
| 1 | Instrument air system motor operated and check valves [IAS-MOV-002], [IAS-VLV-003] | RAW(L2,FR2),<br>SM | CD, IL, FS | In the case of core damage accident, the containment isolation valve is important to prevent radionuclide releases to the environment. |
| 2 | RCP seal water return line : C/V isolation valves<br>[CVS-MOV-203], [CVS-MOV-204] | RAW(L2-CC, FL2-CC, FR2-CC)<br>SM | CD, FS | |
| 3 | RCP seal water return line C/V isolation system piping | SM | SS | |
| 4 | C/V sump pump outlet pipe line C/V isolation system piping | SM | SS | |
| 5 | Instrument air pipe C/V isolation system piping | SM | SS | |
| 6 | C/V clean up pipe line C/V isolation system piping | SM | SS | |

DCD_09.02.02-80

**Table 17.4-1 Risk-significant SSCs (Sheet 23 of 51)**

| # | Systems, Structures and Components (SSCs) | Rationale[1] | Failure Mode[2] | Insights and Assumptions |
|---|---|---|---|---|
| 9 | **Non-essential chilled water system** | | | |
| ~~1~~ | ~~Non-essential chilled water system CCWS boundary motor operated valves [VWS-MOV-424] [VWS-MOV-425]~~ | ~~FV(L2) RAW(L2) LP~~ | ~~CM, EL, OD, PR~~ | In the case of loss of component cooling water events, non-essential chilled water system or fire protection water supply system provides alternative component cooling water to charging pumps in order maintain RCP seal water injection. These SSCs are risk significant because large external leak from these valves result in loss of alternative component cooling water from both non-essential chilled water system and fire protection water supply system. On the other hand, failure of other SSCs of this system affects only the non-essential chilled water system itself. |
| ~~2~~1 | Containment fan cooler unit supply line changeover valve [VWS-MOV-401] [VWS-MOV-409] | RAW(L2) | EL | |
| ~~3~~2 | Containment fan cooler unit containment isolation valves [VWS-MOV-403] [VWS-MOV-407] [VWS-MOV-422] | FV(L2) RAW(L2) | CM,EL,OD,PR | |
| ~~4~~3 | Containment fan cooler unit cooling coil inlet valve [VWS-MOV-411A (B,C,D)] | FV(L2) RAW(L2, L2-CC) | CM, EL, OD, PR | |
| ~~5~~4 | CRDM cooling unit cooling coil inlet valve [VWS-MOV-414] | FV(L2) RAW(L2) | CD, EL, IL, OM | |
| ~~6~~5 | Containment fan cooler unit line piping | RAW(L2) | EL | |
| ~~7~~6 | Containment fan cooler unit outlet air operated valves [VWS-TCV-041A (B), 042A (B)] | RAW(L2) | CM, EL, PR | |
| ~~8~~7 | Containment fan cooler unit outlet manual valves [VWS-VLV-412A (B,C,D)] | RAW(L2) | EL, PR | |

DCD_09.02.02-80

**Table 17.4-1 Risk-significant SSCs (Sheet 24 of 51)**

| # | Systems, Structures and Components (SSCs) | Rationale[1] | Failure Mode[2] | Insights and Assumptions |
|---|---|---|---|---|
| ~~9~~8 | Containment fan cooler unit bypass line valves [VWS-VLV-413A (B,C,D)] | RAW(L2) | EL | The "Insights and Assumptions" for these SSCs are described on the previous page. |
| ~~10~~ 9 | CRDM cooling unit outlet valve [VWS-VLV-415] | RAW(L2) | EL | |
| ~~11~~ 10 | Containment fan cooler unit supply line check valve [VWS-VLV-421] | RAW(L2) | EL, OD, PR | |
| ~~12~~ 11 | Containment fan cooler unit return line check valve [VWS-VLV-423] | RAW(L2) | EL | |

DCD_09.02.02-80

**Table 19.1-44 Basic Events (Hardware Failure, Human Error) FV Importance for LRF (Sheet 7 of 7)**

| Rank | Basic Event ID | Basic Event Description | Basic Event Probability | FV Importance | RAW | |
|---|---|---|---|---|---|---|
| 85 | RSSCF4RHPR001-ALL | RHS-MHX-001A,B,C,D (CS/RHR HX) PLUG / FOUL (CCF) | 4.8E-06 | 5.6E-03 | 1.2E+03 | |
| 86 | EPSCF4SEFFGTG-ALL | CLASS-1E GTG A,B,C,D SEQUENCER FAIL TO OPERATE (CCF) | 3.8E-05 | 5.4E-03 | 1.5E+02 | |
| 87 | CWSTMRC001D | NCS-MHX-001D (D-CCW HX) TEST & MAINTENANCE | 7.0E-03 | 5.4E-03 | 1.8E+00 | |
| 88 | NCCMVOD403 | VWS-MOV-403 FAIL TO OPEN | 1.0E-03 | 5.1E-03 | 6.1E+00 | |
| 89 | NCCMVOD422 | VWS-MOV-422 FAIL TO OPEN | 1.0E-03 | 5.1E-03 | 6.1E+00 | |
| 90 | NCCMVCD414 | VWS-MOV-414 FAIL TO CLOSE | 1.0E-03 | 5.1E-03 | 6.1E+00 | |
| 91 | ~~NCCMVOD425~~<br>NCCMVOD242 | ~~VWS-MOV-425 FAIL TO OPEN~~<br>NCS-MOV-242 FAIL TO OPEN | 1.0E-03 | 5.1E-03 | 6.1E+00 | DCD_09.02.02-80 |
| 92 | NCCMVOD407 | VWS-MOV-407 FAIL TO OPEN | 1.0E-03 | 5.1E-03 | 6.1E+00 | |
| 93 | ~~NCCMVOD424~~<br>NCCMVOD241 | ~~VWS-MOV-424 FAIL TO OPEN~~<br>NCS-MOV-241 FAIL TO OPEN | 1.0E-03 | 5.1E-03 | 6.1E+00 | DCD_09.02.02-80 |
| 94 | EPSTMDGEGTGD | D-CLASS 1E GTG TEST & MAINTENANCE | 1.2E-02 | 5.1E-03 | 1.4E+00 | |

**Table 19.1-45 Basic Events (Hardware Failure, Human Error) RAW for LRF (Sheet 41 of 60)**

| Rank | Basic Event ID | Basic Event Description | Basic Event Probability | FV Importance | RAW | |
|---|---|---|---|---|---|---|
| 702 | CWSRIEL001C | NCS-MHX-001C (C-CCW HX) TUBE EXTERNAL LEAK LARGE | 7.2E-07 | 3.9E-06 | 6.4E+00 | |
| 703 | CWSPMEL001C | NCS-MPP-001C (C-CCW PUMP) EXTERNAL LEAK LARGE | 1.9E-07 | 1.0E-06 | 6.4E+00 | |
| 704 | CWSXVEL104C | NCS-VLV-104C EXTERNAL LEAK LARGE | 7.2E-08 | 3.9E-07 | 6.4E+00 | |
| 705 | HPIXVEL114C | NCS-VLV-114C EXTERNAL LEAK LARGE | 7.2E-08 | 3.9E-07 | 6.4E+00 | |
| 706 | HPIXVEL119C | NCS-VLV-119C EXTERNAL LEAK LARGE | 7.2E-08 | 3.9E-07 | 6.4E+00 | |
| 707 | CWSXVEL008C | NCS-VLV-008C EXTERNAL LEAK LARGE | 7.2E-08 | 3.9E-07 | 6.4E+00 | |
| 708 | CWSXVEL018C | NCS-VLV-018C EXTERNAL LEAK LARGE | 7.2E-08 | 3.9E-07 | 6.4E+00 | |
| 709 | CWSXVEL101C | NCS-VLV-101C EXTERNAL LEAK LARGE | 7.2E-08 | 3.9E-07 | 6.4E+00 | |
| 710 | HPIXVEL115C | NCS-VLV-115C EXTERNAL LEAK LARGE | 7.2E-08 | 3.9E-07 | 6.4E+00 | |
| 711 | HPIXVEL111C | NCS-VLV-111C EXTERNAL LEAK LARGE | 7.2E-08 | 3.9E-07 | 6.4E+00 | |
| 712 | HPIXVEL116C | NCS-VLV-116C EXTERNAL LEAK LARGE | 7.2E-08 | 3.9E-07 | 6.4E+00 | |
| 713 | CWSCVEL016C | NCS-VLV-016C EXTERNAL LEAK LARGE | 4.8E-08 | 2.6E-07 | 6.4E+00 | |
| 714 | CWSPNELCWC | NCS CWS TRAIN C PIPING EXTERNAL LEAK LARGE | 6.0E-10 | 3.2E-09 | 6.4E+00 | |
| 715 | NCCMVCD414 | VWS-MOV-414 FAIL TO CLOSE | 1.0E-03 | 5.1E-03 | 6.1E+00 | |
| 716 | NCCMVOD~~425~~242 | ~~VWS-MOV-425~~NCS-MOV-242 FAIL TO OPEN | 1.0E-03 | 5.1E-03 | 6.1E+00 | DCD_09.02.02-80 |
| 717 | NCCMVOD407 | VWS-MOV-407 FAIL TO OPEN | 1.0E-03 | 5.1E-03 | 6.1E+00 | |
| 718 | NCCMVOD~~424~~241 | ~~VWS-MOV-424~~ NCS-MOV-241 FAIL TO OPEN | 1.0E-03 | 5.1E-03 | 6.1E+00 | DCD_09.02.02-80 |
| 719 | NCCMVPR407 | VWS-MOV-407 PLUG | 2.4E-06 | 1.2E-05 | 6.1E+00 | |
| 720 | NCCMVPR~~424~~241 | ~~VWS-MOV-424~~NCS-MOV-241 PLUG | 2.4E-06 | 1.2E-05 | 6.1E+00 | DCD_09.02.02-80 |
| 721 | NCCMVPR~~425~~242 | ~~VWS-MOV-425~~ NCS-MOV-242 PLUG | 2.4E-06 | 1.2E-05 | 6.1E+00 | |
| 722 | NCCMVOM414 | VWS-MOV-414 SPURIOUS OPEN | 9.6E-07 | 4.9E-06 | 6.1E+00 | |
| 723 | NCCMVCM407 | VWS-MOV-407 SPURIOUS CLOSE | 9.6E-07 | 4.9E-06 | 6.1E+00 | |
| 724 | NCCMVCM~~424~~241 | ~~VWS-MOV-424~~ NCS-MOV-241 SPURIOUS CLOSE | 9.6E-07 | 4.9E-06 | 6.1E+00 | DCD_09.02.02-80 |

**Table 19.1-45 Basic Events (Hardware Failure, Human Error) RAW for LRF (Sheet 42 of 60)**

| Rank | Basic Event ID | Basic Event Description | Basic Event Probability | FV Importance | RAW |
|---|---|---|---|---|---|
| 725 | NCCMVCM~~425~~242 | ~~VWS-MOV-425~~ NCS-MOV-242 SPURIOUS CLOSE | 9.6E-07 | 4.9E-06 | 6.1E+00 |
| 726 | NCCMVIL414 | VWS-MOV-414 INTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 |
| 727 | NCCAVOD022 | NCS-PCV-022 FAIL TO OPEN | 1.2E-03 | 6.2E-03 | 6.1E+00 |
| 728 | NCCOO04022 | (HE) NCC MISCALIBRATION OF NCS-PCA-022 | 8.0E-04 | 4.1E-03 | 6.1E+00 |
| 729 | NCCIPFF022 | NCS-PCA-022 FAIL TO OPERATE | 2.7E-05 | 1.4E-04 | 6.1E+00 |
| 730 | NCCAVCM022 | NCS-PCV-022 SPURIOUS CLOSE | 4.8E-06 | 2.5E-05 | 6.1E+00 |
| 731 | NCCAVOM056B | NCS-RCV-056B SPURIOUS OPEN | 4.8E-06 | 2.5E-05 | 6.1E+00 |
| 732 | NCCSVOM003B | NCS-SRV-003B SPURIOUS OPEN | 4.8E-06 | 2.5E-05 | 6.1E+00 |
| 733 | NCCAVPR022 | NCS-PCV-022 PLUG | 2.4E-06 | 1.2E-05 | 6.1E+00 |
| 734 | NCCAVIL056B | NCS-RCV-056B INTERNAL LEAK LARGE | 1.2E-07 | 6.2E-07 | 6.1E+00 |
| 735 | NCCTKEL001B | NCS-MTK-001B (B-CCW SURGE TANK) EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 |
| 736 | NCCXVEL045B | NCS-VLV-045B EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 |
| 737 | NCCAVEL056B | NCS-RCV-056B EXTERNAL LEAK LARGE | 2.2E-08 | 1.1E-07 | 6.1E+00 |
| 738 | NCCAVEL022 | NCS-PCV-022 EXTERNAL LEAK LARGE | 2.2E-08 | 1.1E-07 | 6.1E+00 |
| 739 | NCCPNELPIPE1 | NCS B-CCW SURGE TANK PRESSURIZING LINE PIPING EXTERNAL LEAK LARGE | 6.0E-10 | 3.1E-09 | 6.1E+00 |
| 740 | NCCMVOD403 | VWS-MOV-403 FAIL TO OPEN | 1.0E-03 | 5.1E-03 | 6.1E+00 |
| 741 | NCCMVOD422 | VWS-MOV-422 FAIL TO OPEN | 1.0E-03 | 5.1E-03 | 6.1E+00 |
| 742 | NCCCVOD421 | VWS-VLV-421 FAIL TO OPEN | 1.2E-05 | 6.2E-05 | 6.1E+00 |
| 743 | NCCCVPR421 | VWS-VLV-421 PLUG | 2.4E-06 | 1.2E-05 | 6.1E+00 |
| 744 | NCCMVPR403 | VWS-MOV-403 PLUG | 2.4E-06 | 1.2E-05 | 6.1E+00 |
| 745 | NCCMVPR422 | VWS-MOV-422 PLUG | 2.4E-06 | 1.2E-05 | 6.1E+00 |
| 746 | NCCMVCM403 | VWS-MOV-403 SPURIOUS CLOSE | 9.6E-07 | 4.9E-06 | 6.1E+00 |

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**Table 19.1-45 Basic Events (Hardware Failure, Human Error) RAW for LRF (Sheet 43 of 60)**

| Rank | Basic Event ID | Basic Event Description | Basic Event Probability | FV Importance | RAW | |
|---|---|---|---|---|---|---|
| 747 | NCCMVCM422 | VWS-MOV-422 SPURIOUS CLOSE | 9.6E-07 | 4.9E-06 | 6.1E+00 | |
| 748 | NCCRIEL001C | VCS-MAH-001C (C-CONTAINMENT FAN COOLER UNIT) EXTERNAL LEAK LARGE | 7.2E-07 | 3.7E-06 | 6.1E+00 | |
| 749 | NCCRIEL001B | VCS-MAH-001B (B-CONTAINMENT FAN COOLER UNIT) EXTERNAL LEAK LARGE | 7.2E-07 | 3.7E-06 | 6.1E+00 | |
| 750 | NCCRIEL001A | VCS-MAH-001A (A-CONTAINMENT FAN COOLER UNIT) EXTERNAL LEAK LARGE | 7.2E-07 | 3.7E-06 | 6.1E+00 | |
| 751 | NCCRIEL001D | VCS-MAH-001D (D-CONTAINMENT FAN COOLER UNIT) EXTERNAL LEAK LARGE | 7.2E-07 | 3.7E-06 | 6.1E+00 | |
| 752 | NCCXVEL413A | VWS-VLV-413A EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 | |
| 753 | NCCXVEL412D | VWS-VLV-412D EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 | |
| 754 | NCCXVEL412C | VWS-VLV-412C EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 | |
| 755 | NCCXVEL415 | VWS-VLV-415 EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 | |
| 756 | NCCXVEL413D | VWS-VLV-413D EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 | |
| 757 | NCCXVEL413C | VWS-VLV-413C EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 | |
| 758 | NCCXVEL413B | VWS-VLV-413B EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 | |
| 759 | NCCXVEL412A | VWS-VLV-412A EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 | |
| 760 | NCCXVEL412B | VWS-VLV-412B EXTERNAL LEAK LARGE | 7.2E-08 | 3.7E-07 | 6.1E+00 | |
| 761 | NCCCVEL423 | VWS-VLV-423 EXTERNAL LEAK LARGE | 4.8E-08 | 2.5E-07 | 6.1E+00 | |
| 762 | NCCCVEL421 | VWS-VLV-421 EXTERNAL LEAK LARGE | 4.8E-08 | 2.5E-07 | 6.1E+00 | |
| 763 | NCCMVEL~~425~~242 | ~~VWS-MOV-425~~ NCS-MOV-242 EXTERNAL LEAK LARGE | 2.4E-08 | 1.2E-07 | 6.1E+00 | DCD_09.02.02-80 |
| 764 | NCCMVEL401 | VWS-MOV-401 EXTERNAL LEAK LARGE | 2.4E-08 | 1.2E-07 | 6.1E+00 | |
| 765 | NCCMVEL409 | VWS-MOV-409 EXTERNAL LEAK LARGE | 2.4E-08 | 1.2E-07 | 6.1E+00 | |
| 766 | NCCMVEL403 | VWS-MOV-403 EXTERNAL LEAK LARGE | 2.4E-08 | 1.2E-07 | 6.1E+00 | |
| 767 | NCCMVEL407 | VWS-MOV-407 EXTERNAL LEAK LARGE | 2.4E-08 | 1.2E-07 | 6.1E+00 | |
| 768 | NCCMVEL~~424~~241 | ~~VWS-MOV-424~~ NCS-MOV-241 EXTERNAL LEAK LARGE | 2.4E-08 | 1.2E-07 | 6.1E+00 | DCD_09.02.02-80 |

**Table 19.1-119 Key Insights and Assumptions (Sheet 22 of 46)**

| Key Insights and Assumptions | Dispositions |
|---|---|
| 12. In the case of loss of secondary side cooling function by emergency feedwater system in transient events including turbine trip, load loss event etc., with emergency feedwater pump flow rate, operators start to recover main feedwater system in order to maintain secondary side cooling. | 19.2.5<br>COL 19.3(6)<br>COL 13.5(6) |
| 13. In the case of loss of SI injection function entirely in LOCA event, with SI flow rate and RCS temperature indication, operators provide secondary side cooling to reduce RCS pressure and temperature by opening the main steam depressurization valves manually and supplying water from the emergency feedwater system in order to enable low pressure injection with containment spray system / residual heat removal system. | 19.2.5<br>COL 19.3(6)<br>COL 13.5(6) |
| 14. In the case of loss of containment spray system function, alternate containment cooling operation is implemented utilizing CV natural recirculation in order to remove heat from CV. This preparation contains CCW pressurization with N2 gas, disconnection heat load of non-safety chiller and CRDM etc. and connection to containment fan cooler units. This operation is implemented when the containment pressure reaches the design pressure. | 19.2.5<br>COL 19.3(6)<br>COL 13.5(6) |
| 15. In the case of leakage of the RWSP water from HHIS piping, CSS/RHRS piping or refueling water storage system piping, with drain sump water level – abnormally high, operators close the RWSP suction isolation valves respectively in order to prevent leakage of RWSP water from failed piping. | 19.2.5<br>COL 19.3(6)<br>COL 13.5(6) |
| 16. When the containment isolation signal fail to automatically actuate, with CV pressure abnormally high signal, operators manually actuate the containment isolation signal in order to remove heat from the containment vessel. | 19.2.5<br>COL 19.3(6)<br>COL 13.5(6) |
| 17. ~~When the CCW header tie line isolation valves fail to automatically close with specific signals which contain ECCS actuation signal plus under voltage signal, containment spray signal, and surge tank level low signal, operators manually close these valves in order to separate CCW header.~~ | ~~19.2.5~~<br>~~COL 19.3(6)~~<br>~~COL 13.5(5)~~ |
| 18. RCS is depressurized through operating the depressurization valve after onset of core damage and before reactor vessel breach. This operation prevents events due to high pressure melt ejection. | 19.2.5<br>COL 19.3(6)<br>COL 13.5(5) |
| 19. Operation of firewater injection to reactor cavity is implemented to flood reactor cavity in case of containment spray system failure, after onset of core damage and before reactor vessel breach. | 19.2.5<br>COL 19.3(6)<br>COL 13.5(6) |

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02-48

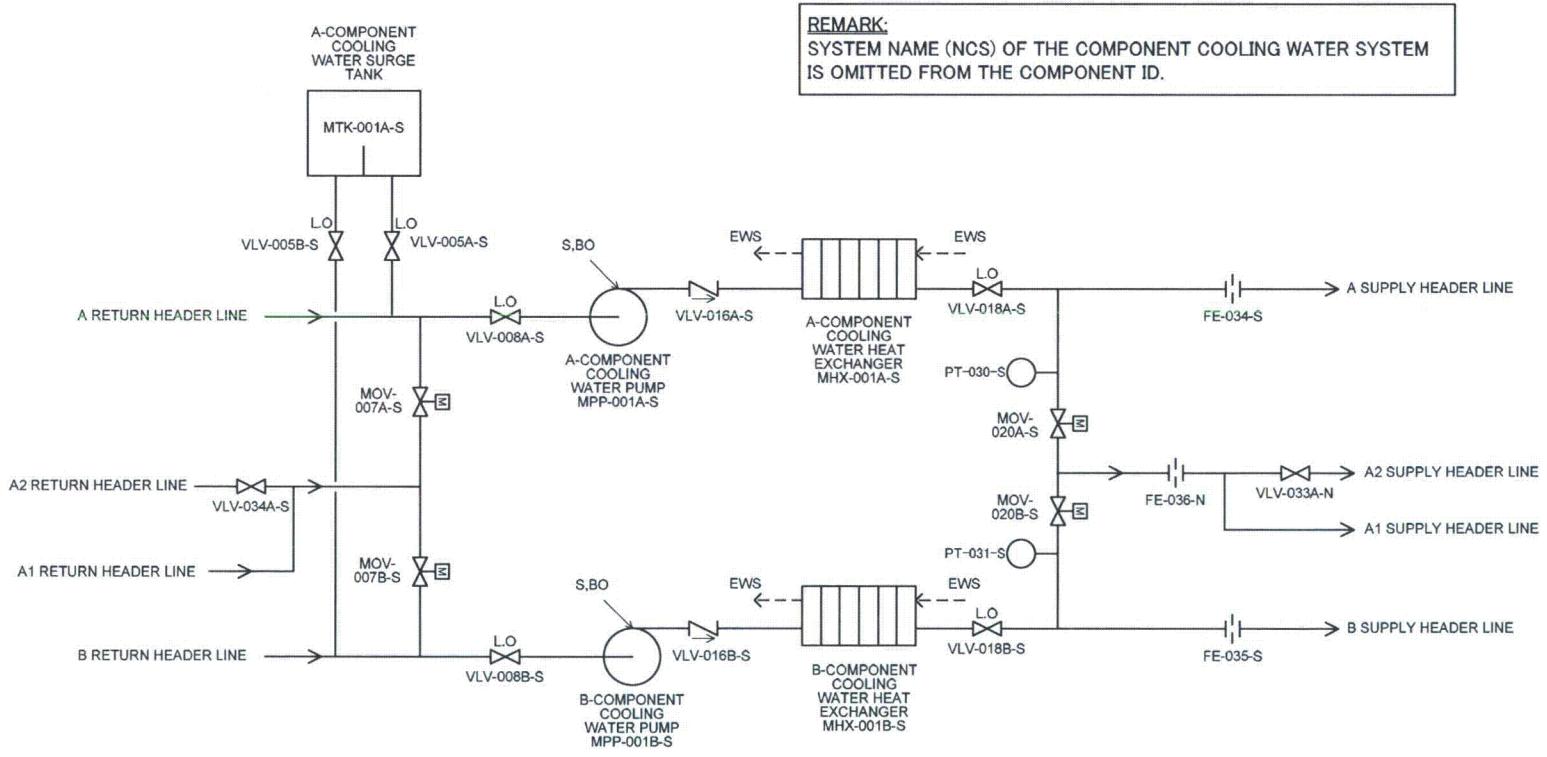


**Figure 19.1-2 Simplified System Diagram (Sheet 14 of 42) (Component Cooling Water System [1 of 5])**

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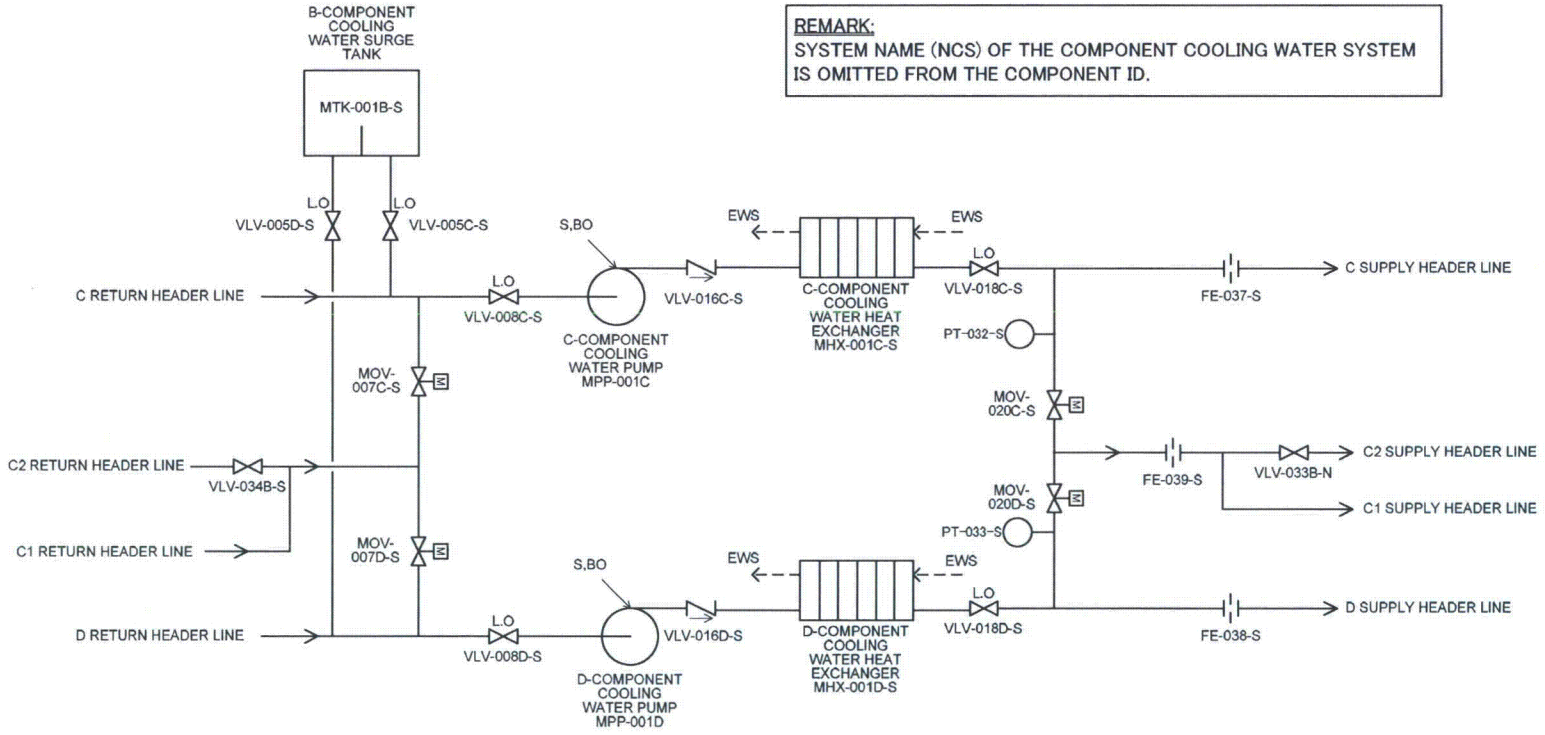


**Figure 19.1-2 Simplified System Diagram (Sheet 15 of 42) (Component Cooling Water System [2 of 5])**

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02-80

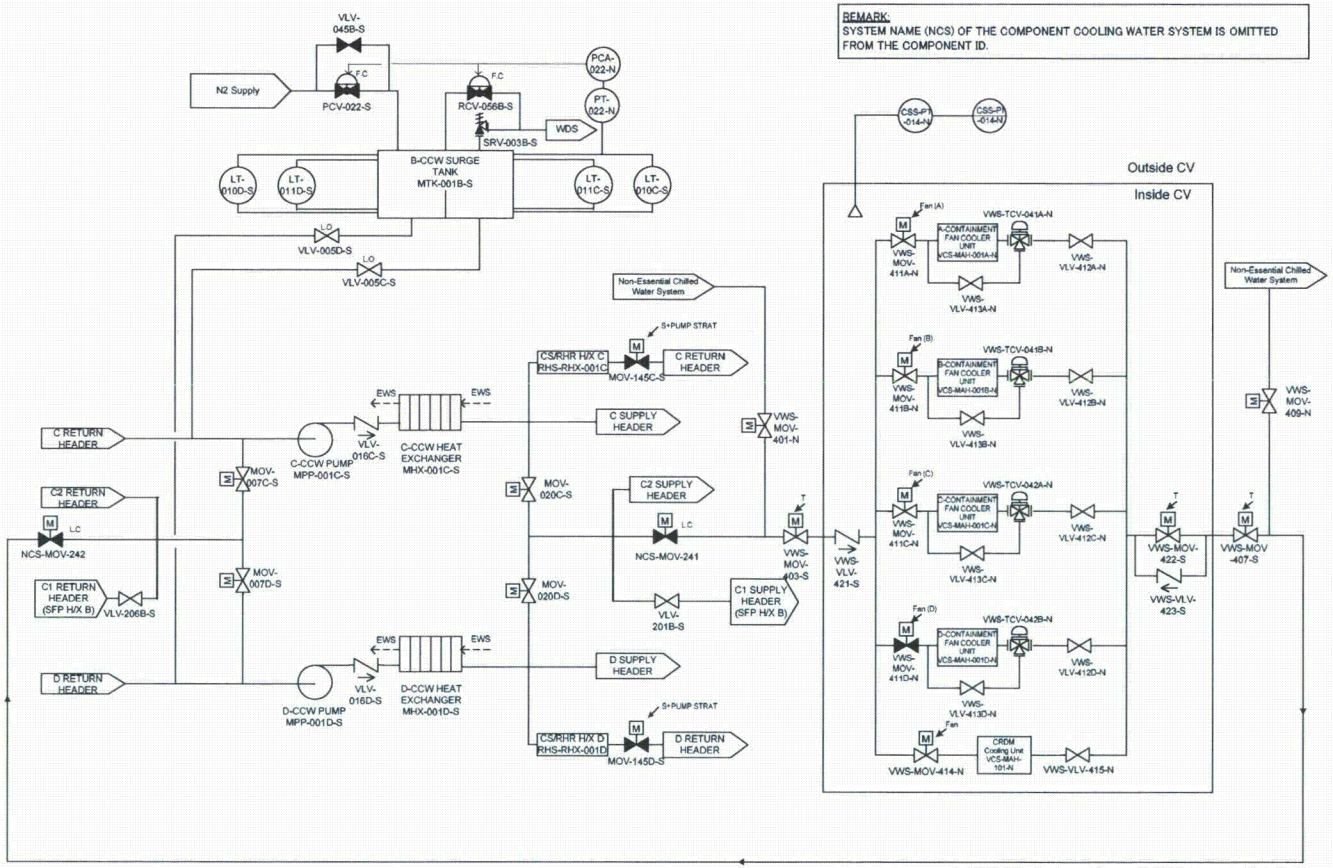


**Figure 19.1-2 Simplified System Diagram (Sheet 28 of 42)**
**(Alternate Containment Cooling by Containment Fan Cooler System - Normal Operation)**

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02-80

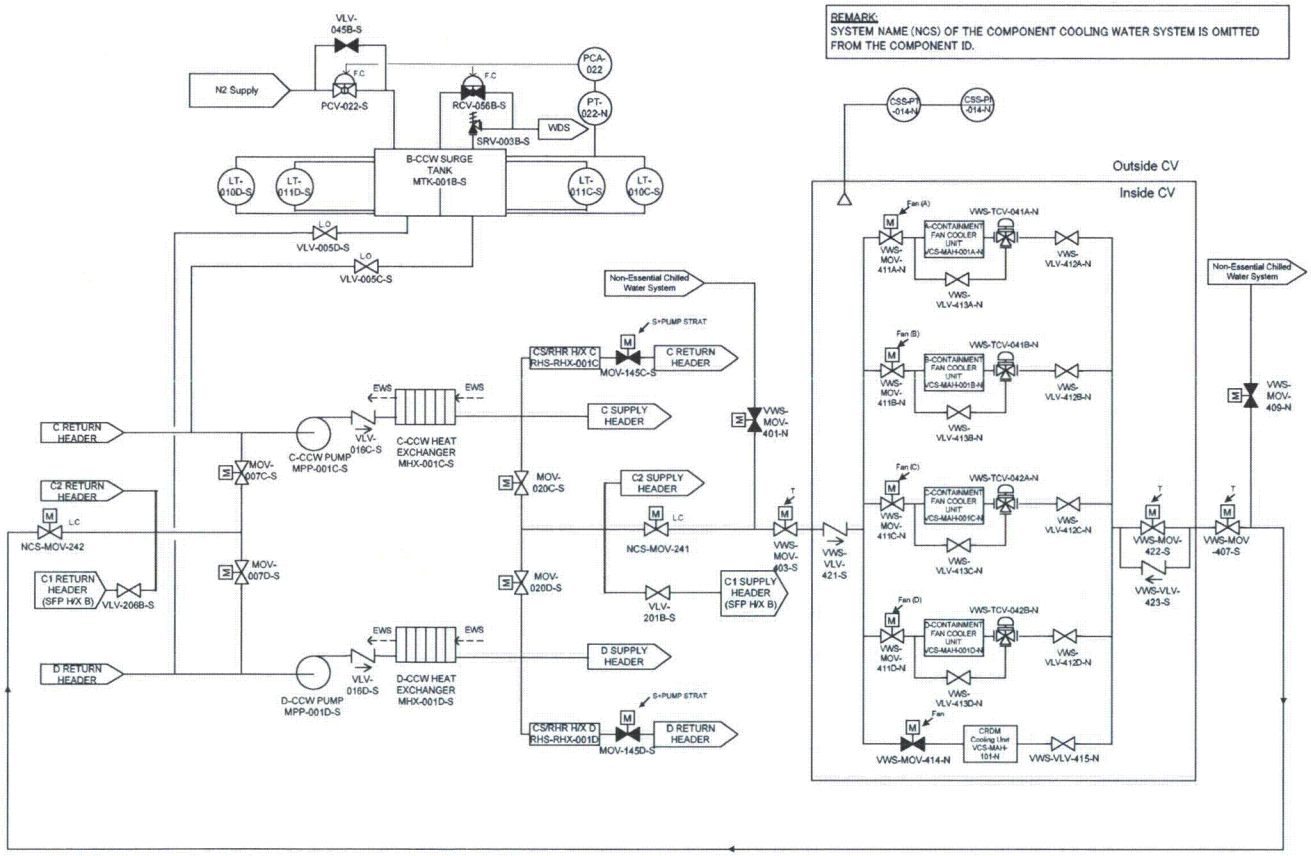


**Figure 19.1-2 Simplified System Diagram (Sheet 29 of 42)**
**(Alternate Containment Cooling by Containment Fan Cooler System - Alternate Containment Cooling Mode)**

14. Penetrations in the external walls of the R/B and each PS/B, as shown in Figures 2.2-14 through 2.2-25, that are at or below design basis flood level, are fitted with water-tight seals to protect against external flooding.

15. Deleted.

16. Deleted.

17. Redundant safe shutdown components and associated electrical divisions outside the containment and the control room complex are separated by 3-hour rated fire barriers to preserve the capability to safely shutdown the plant following a fire.

18.a. Penetrations and openings, other than ventilation ducts, through fire barriers are protected against fire.

18.b. Ventilation ducts that penetrate fire barriers are protected by fire dampers.

19. Deleted.

20. Deleted.

21. Safety-related SSCs are protected from any credible internal missile sources inside and outside the containment.

22. Deleted.

23.a. The seismic Category II structures identified in Table 2.2-1 will not impair the ability of ~~safety-related~~seismic Category I SSC~~s~~ to perform ~~their safety-related~~ its design basis safety function~~s~~ during or following an SSE. DCD_09.02.02-48

23.b. Seismic Category II systems and components will not impair the ability of seismic Category I SSC to perform its design basis safety function during or following an SSE.

24. SSCs that require evaluation in the seismic fragilities task of a seismic margin analysis have high confidence of low probability of failure (HCLPF) values equal to or greater than the review level earthquake.

### 2.2.4 Inspection, Tests, Analyses, and Acceptance Criteria

Table 2.2-4 describes the ITAAC for structural and systems engineering.

**Table 2.2-4 Structural and Systems Engineering Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 4 of 4)**

| Design Commitment | Inspections, Tests, Analyses | Acceptance Criteria | |
|---|---|---|---|
| 21. Safety-related SSCs are protected from any credible internal missile sources inside and outside the containment. | 21. Inspections and analyses will be performed to verify that as-built safety-related SSCs are protected from credible internal missile sources by the methods described in Section 2.2.2.1. | 21. A report exists and concludes that as-built safety-related SSCs are protected from credible internal missile sources by the methods described in Section 2.2.2.1. | |
| 22. Deleted. | 22. Deleted. | 22. Deleted. | |
| 23.a The seismic Category II structures identified in Table 2.2-1 will not impair the ability of ~~safety-related~~seismic Category I SSC~~s~~ to perform its design basis safety~~their safety-related~~ function~~s~~ during or following an SSE. | 23.a Analyses and inspections ~~of the design and~~ will be performed to verify that the as-built configuration of seismic Category II structures identified in Table 2.2-1~~will be performed to verify that these structures~~ will not impair the ability of seismic Category I~~safety-related~~ SSC~~s~~ to perform its desgn basis safety ~~their safety-related~~ function~~s~~ during or following an SSE. | 23.aA report exists and concludes that the as-built seismic Category II structures identified in Table 2.2-1 will not impair the ability of ~~safety-related~~ seismic Category I SSC~~s~~ to perform its design basis safety ~~their safety-related~~ function~~s~~ during or following an SSE. | DCD_09.02.02-48 |
| 23.b Seismic Category II systems and components will not impair the ability of seismic Category I SSC to perform its design basis safety function during or following an SSE. | 23.b Analyses and inspections will be performed to verify that the as-built configuration of seismic Category II systems and components will not impair the ability of a seismic Category I SSC to perform its design basis safety function during or following an SSE. | 23.b A report exists and concludes that as-built seismic Category II systems and components will not impair the ability of a seismic Category I SSC to perform its design basis safety function during or following an SSE. | DCD_09.02.02-48 |
| 24. SSCs that require evaluation in the seismic fragilities task of a seismic margin analysis have high confidence of low probability of failure (HCLPF) values equal to or greater than the review level earthquake. | 24.i Analyses will be performed to verify that the SSCs requiring evaluation in the seismic fragilities task of a seismic margin assessment have HCLPF values equal to or greater than the review level earthquake. | 24.i Reports exist and conclude that the SSCs evaluated in the seismic fragilities task of the seismic margin assessment have HCLPF values equal to or greater than the review level earthquake. | |
| | 24.ii Inspection and analysis will be performed to verify that as-built SSCs requiring evaluation in the seismic fragilities task of a seismic margin assessment are bounded by conditions used in the assessment. | 24.ii A report exists and concludes that the as-built SSCs requiring evaluation in the seismic fragilities task of a seismic margin assessment are bounded by the conditions used in the assessment. | |

**Table 2.5.1-3 ESF Actuations and Monitored ~~Parameters~~Variables (Sheet 3 of 3)** MIC-03-07-0 0001

| ESF Function | Actuation Signal | Monitored Variables |
|---|---|---|
| CVCS Isolation | High Pressurizer Water Level | Pressurizer Water Level |
| | Manual Actuation | Manual Switch Position<br>(CVCS Isolation Switch) |

**Table 2.5.1-4 Interlocks Important to Safety**

| |
|---|
| Containment Spray/Residual Heat Removal Pump Hot Leg Isolation Valve Open Permissive Interlock |
| ~~Simultaneous-Open Block Interlock with Residual Heat Removal Discharge Line Containment Isolation Valve and Containment Spray Header Containment Isolation Valve~~ |
| Simultaneous-Open Block Interlock with Containment Spray/Residual Heat Removal Pump Hot Leg Isolation Valve and Containment Spray Header Containment Isolation Valve |
| Reactor Makeup Water Line Isolation Interlock |
| Accumulator Discharge Valve Open Interlock |
| ~~Component Cooling Water Supply and Return Header Tie Line Isolation Interlock~~ |
| RCP Thermal Barrier Heat Exchanger Component Cooling Water Return Line Isolation Interlock |
| Low-Pressure Letdown Line Isolation Interlock |

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**Table 2.7.3.1-2 Essential Service Water System Equipment Characteristics (Sheet 2 of 2)**

| Equipment Name | Tag No. | ASME Code Section III Class | Seismic Category I | Remotely Operated Valve | Class 1E/ Qual. For Harsh Envir. | PSMS Control | Active Safety Function | Loss of Motive Power Position |
|---|---|---|---|---|---|---|---|---|
| Essential service water pump discharge strainer backwash line isolation valves | EWS-MOV-573A, B, C, D<br>EWS-MOV-574A, B, C, D | 3 | Yes | Yes | Yes/ No | ESW pump stop | Transfer Closed | As Is |
| | | | | | | Remote Manual | Transfer Open/ Transfer Closed | |
| | | | | | | ECCS actuation, undervoltage signal | Transfer Open | |

DCD_09.02.01-52

NOTE:
Dash (-) indicates not applicable

### 2.7.3.3 Component Cooling Water System (CCWS)

#### 2.7.3.3.1 Design Description

The component cooling water system (CCWS) is a safety-related system that provides cooling water to various components including non safety-related components. The CCWS is the intermediate cooling system that transfers heat from the cooled components to the essential service water system.

The CCWS provides for containment isolation, as described in Section 2.11.2, of the CCWS lines penetrating the containment.

The CCWS consists of four divisions (Division A, B, C & D). Each division has one component cooling water (CCW) pump and one component cooling water heat exchanger and provides 50% of the cooling capacity required for its safety function. Each division provides cooling water for a safety injection pump, a core spray/residual heat removal (CS/RHR) pump and other safety-related components shown in Figure 2.7.3.3-1. Header tie lines between Division A and B, and between Division C and D are provided. A common line for supply header A1 and supply header A2 branches out from the tie line between Division A and B. Similarly, a common line for the supply header C1 and the supply header C2 branches out from the tie line between Division C and D. The supply headers A1 and C1 provide cooling water for charging pumps, SFP heat exchangers and other safety-related components shown in Figure 2.7.3.3-1. The supply headers A2 and C2 provide cooling water for the instrument air system and other non safety-related components shown in Figure 2.7.3.3-1. The CCWS line is connected to the non-essential chilled water system to provide alternate cooling water to the containment fan cooler units through the non-essential chilled water system.

1.a The functional arrangement of the CCWS is as described in the Design Description of Subsection 2.7.3.3 and in Table 2.7.3.3-1 and as shown in Figure 2.7.3.3-1.

1.b Each mechanical division of the CCWS ~~(Divisions A, B, C & D) with the exception of that portion of the system consisting of the supply headers A2 & C2~~as shown in Figure 2.7.3.3-1, is physically separated from the other divisions so as not to preclude accomplishment of the safety function. DCD_09.02.02-68

2.a.i The ASME Code Section III components of the CCWS, identified in Table 2.7.3.3-2, are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

2.a.ii The ASME Code Section III components of the CCWS identified in Table 2.7.3.3-2 are reconciled with the design requirements.

2.b.i The ASME Code Section III piping of the CCWS, including supports, identified in Table 2.7.3.3-3, is fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

2.b.ii The ASME Code Section III piping of the CCWS, including supports, identified in Table 2.7.3.3-3, is reconciled with the design requirements.

3.a Pressure boundary welds in ASME Code Section III components, identified in Table 2.7.3.3-2, meet ASME Code Section III requirements for non-destructive examination of welds.

3.b Pressure boundary welds in ASME Code Section III piping, identified in Table 2.7.3.3-3, meet ASME Code Section III requirements for non-destructive examination of welds.

4.a The ASME Code Section III components, identified in Table 2.7.3.3-2, retain their pressure boundary integrity at their design pressure.

4.b The ASME Code Section III piping, identified in Table 2.7.3.3-3, retains its pressure boundary integrity at its design pressure.

5.a The seismic Category I equipment identified in Table 2.7.3.3-2 can withstand seismic design basis loads without loss of safety function.

5.b The seismic Category I piping, including supports, identified in Table 2.7.3.3-3 can withstand seismic design basis loads without a loss of its safety function.

6.a The Class 1E equipment identified in Table 2.7.3.3-2 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

6.b Class 1E equipment identified in Table 2.7.3.3-2 is powered from its respective Class 1E division.

6.c Separation is provided between redundant divisions of CCWS Class 1E cables, and between Class 1E cables and non-Class 1E cables.

7. The CCWS removes heat from various components during all plant operating conditions, including normal plant operating, ~~abnormal and accident conditions~~abnormal, and accident conditions for at least 7 days without surge tank makeup. DCD_09.02.02-49

8.a Controls are provided in the MCR to open and close the remotely operated valves identified in Table 2.7.3.3-2.

8.b The valves identified in Table 2.7.3.3-2 as having PSMS control perform an active safety function after receiving a signal from PSMS.

9.a The remotely operated valves and check valves, identified in Table 2.7.3.3-2, perform an active safety function to change position as indicated in the table.

9.b After loss of motive power, the remotely operated valves, identified in Table 2.7.3.3-2, assume the indicated loss of motive power position.

**Table 2.7.3.3-1 Component Cooling Water System Location of Equipment and Piping (Sheet 1 of 2)**

| System and Components | Location | |
|---|---|---|
| Component cooling water heat exchangers | Reactor Building | |
| Component cooling water pumps | Reactor Building | |
| Component cooling water surge tank | Reactor Building | |
| Component cooling water supply, return lines piping and valves excluding the following;<br>Component cooling water system containment isolation valves and piping between the valves<br><br>Component cooling water supply, return lines piping and valves between and excluding the valves NCS-~~VLV-033~~AOV-058A and NCS-VLV-034A | Reactor Building | DCD_09.02.02-49 |
| Component cooling water supply, return lines piping and valves excluding the following;<br>Component cooling water system containment isolation valves and piping between the valves<br><br>Component cooling water supply, return lines piping and valves between and excluding the valves NCS-~~VLV-033~~AOV-058B and NCS-VLV-034B | Reactor Building | DCD_09.02.02-49 |
| Component cooling water supply, return lines piping and valves between and excluding the valves NCS-~~VLV-033~~AOV-058A and NCS-VLV-034A, excluding the following;<br>Component cooling water system containment isolation valves and piping between the valves<br><br>Component cooling water system piping and valves between and ~~including~~excluding the valve NCS-~~AOV~~VLV-661A and NCS-VLV-~~671~~669A<br><br>Component cooling water system piping and valves between and ~~including~~excluding the valve NCS-~~AOV~~VLV-601 and NCS-VLV-~~653~~651 | Reactor Building | DCD_09.02.02-49<br>DCD_09.02.02-49<br>DCD_09.02.02-49 |
| Component cooling water supply, return lines piping and valves between and excluding the valves NCS-~~VLV-033~~AOV-058B and NCS-VLV-034B, excluding the following;<br>Component cooling water system containment isolation valves and ~~piping~~ between the valves<br><br>Component cooling water system piping and valves between and ~~including~~excluding the valve NCS-~~AOV~~VLV-661B and NCS-VLV-~~671~~669B | Reactor Building | DCD_09.02.02-49<br>DCD_09.02.02-49<br>DCD_09.02.02-49 |
| Component cooling water system piping and valves related to the excess letdown heat exchanger inside containment between and including the valves NCS-MOV-511,517, SRV-513 | Containment Reactor Building | |
| Component cooling water system piping and valves related to the letdown heat exchanger inside containment between and including the valves NCS-MOV-531,537, SRV-533 | Containment Reactor Building | |

**Table 2.7.3.3-1 Component Cooling Water System Location of Equipment and Piping (Sheet 2 of 2)**

| System and Components | Location | |
|---|---|---|
| Component cooling water system piping and valves between and including the containment isolation valves NCS-MOV-402A,436A,438A~~,445A,447A,448A~~ and NCS-VLV-403A,437A | Containment Reactor Building | DCD_09.02.02-58 |
| Component cooling water piping and valves between and including the containment isolation valves NCS-MOV-402B,436B,438B~~,445B,447B,448B~~ and NCS-VLV-403B,437B | Containment Reactor Building | DCD_09.02.02-58 |
| Component cooling water system piping and valves related to components installed in A/B from and excluding ~~isolation~~stop valve NCS-~~AOV-602~~VLV-601 up to and excluding stop valve NCS-VLV-651 | Auxiliary Building Reactor Building | DCD_09.02.02-49 |
| Component cooling water system piping and valves related to components installed in T/B from and excluding ~~isolation~~stop valves NCS-~~AOV-662~~VLV-661A,B up to and excluding stop valves NCS-VLV-669A,B | Turbine Building Reactor Building | DCD_09.02.02-49 |
| Component cooling water system piping and valves related to reactor coolant pumps between the containment isolation valves NCS-MOV-436A,447A (excluding) and NCS-VLV-403A,437A (excluding) and the valves NCS-SRV-406A,B,435A (including) | Containment | |
| Component cooling water system piping and valves related to reactor coolant pumps between the containment isolation valves NCS-MOV-436B,447B (excluding) and NCS-VLV-403B,437B (excluding) and the valves NCS-SRV-406C,D,435B (including) | Containment | |
| ~~Component cooling water system piping and valves between and including the valves NCS-AOV-601 and 602~~ | ~~Reactor Building~~ | DCD_09.02.02-49 |
| ~~Component cooling water system piping and valves between and including the valves NCS-VLV-651 and 653~~ | ~~Reactor Building~~ | DCD_09.02.02-49 |
| ~~Component cooling water system piping and valves between and including the valves NCS-AOV-661A,B and 662A,B~~ | ~~Reactor Building~~ | DCD_09.02.02-49 |
| ~~Component cooling water system piping and valves between and including the valves NCS-VLV-669A,B and 671A,B~~ | ~~Reactor Building~~ | DCD_09.02.02-49 |
| Component cooling water surge tank surge line piping | Reactor Building | |

**Table 2.7.3.3-2 Component Cooling Water System Equipment Characteristics (Sheet 1 of 8)**

| Equipment Name | Tag No. | ASME Code Section III Class | Seismic Category I | Remotely Operated Valve | Class 1E/ Qual. For Harsh Envir. | PSMS Control | Active Safety Function | Loss of Motive Power Position |
|---|---|---|---|---|---|---|---|---|
| Component cooling water (CCW) heat exchangers | NCS-MHX-001 A, B, C, D | 3 | Yes | - | -/- | - | - | - |
| Component cooling water pumps | NCS-MPP-001 A, B, C, D | 3 | Yes | - | Yes/No | ECCS Actuation | Start | - |
| | | | | | | LOOP sequence | Start | |
| | | | | | | Low CCW header pressure | Start | |
| Component cooling water surge tanks | NCS-MTK-001 A, B | 3 | Yes | - | -/- | - | - | - |
| Component cooling water pump discharge check valves | NCS-VLV-016 A, B, C, D | 3 | Yes | - | -/- | - | Transfer Open/ Transfer Closed | - |
| CCW supply header tie line isolation valves | NCS-MOV-020 A, B, C, D | 3 | Yes | Yes | Yes/No | ~~ECCS Actuation and undervoltage signal~~ | ~~Transfer Closed~~ | As Is |
| | | | | | | ~~Containment Spray~~ | ~~Transfer Closed~~ | |
| | | | | | | ~~Low-low CCW surge tank water level~~ | ~~Transfer Closed~~ | |
| | | | | | | Remote Manual | Transfer Open/ Transfer Closed | |

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**Table 2.7.3.3-2 Component Cooling Water System Equipment Characteristics (Sheet 2 of 8)**

| Equipment Name | Tag No. | ASME Code Section III Class | Seismic Category I | Remotely Operated Valve | Class 1E/ Qual. For Harsh Envir | PSMS Control | Active Safety Function | Loss of Motive Power Position |
|---|---|---|---|---|---|---|---|---|
| CCW return header tie line isolation valves | NCS-MOV-007 A, B, C, D | 3 | Yes | Yes | Yes/No | ~~ECCS Actuation and undervoltage signal~~ | ~~Transfer Closed~~ | As Is |
| | | | | | | ~~Containment Spray~~ | ~~Transfer Closed~~ | |
| | | | | | | ~~Low-low CCW surge tank water level~~ | ~~Transfer Closed~~ | |
| | | | | | | Remote Manual | Transfer Open/ Transfer Closed | |
| CS/RHR heat exchanger CCW outlet valves | NCS-MOV-145 A, B, C, D | 3 | Yes | Yes | Yes/No | ECCS Actuation and CCW pump start | Transfer Open | As Is |
| | | | | | | Remote Manual | Transfer Open/ Transfer Closed | |
| RCP CCW supply line outside containment isolation valves | NCS-MOV-402 A, B | 2 | Yes | Yes | Yes/No | ~~Containment Isolation Phase B~~ | ~~Transfer Closed~~ | As Is |
| | | | | | | Remote Manual | Transfer Open/ Transfer Closed | |

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**Table 2.7.3.3-2 Component Cooling Water System Equipment Characteristics (Sheet 3 of 8)**

| Equipment Name | Tag No. | ASME Code Section III Class | Seismic Category I | Remotely Operated Valve | Class 1E/ Qual. For Harsh Envir. | PSMS Control | Active Safety Function | Loss of Motive Power Position | |
|---|---|---|---|---|---|---|---|---|---|
| RCP CCW supply line inside containment check valves | NCS-VLV-403 A, B | 2 | Yes | - | -/- | - | Transfer Open/ Transfer Closed | - | |
| Reactor coolant pump thermal barrier heat exchanger component cooling water supply check valves | NCS-VLV-405 A, B, C, D | 3 | Yes | - | -/- | - | Transfer Open/ Transfer Closed | - | |
| ~~RCP CCW supply line outside containment isolation valve bypass valves~~ | ~~NCS-MOV-445 A, B~~ | ~~2~~ | ~~Yes~~ | ~~Yes~~ | ~~Yes/No~~ | ~~Remote Manual~~ | ~~Transfer Open/ Transfer Closed~~ | ~~As Is~~ | DCD_09.02.02-58 |
| RCP CCW return line inside containment isolation valves | NCS-MOV-436 A, B | 2 | Yes | Yes | Yes/Yes | ~~Containment Isolation Phase B~~ | ~~Transfer Closed~~ | As Is | |
| | | | | | | Remote Manual | Transfer Open/ Transfer Closed | | |
| RCP CCW return line inside containment check valves | NCS-VLV-437 A, B | 2 | Yes | - | -/- | - | Transfer Closed | - | |
| Reactor coolant pump component cooling water return line check valves | NCS-VLV-439 A, B | 3 | Yes | - | -/- | - | Transfer Open/ Transfer Closed | - | |
| ~~RCP CCW return line inside containment isolation valve bypass valves~~ | ~~NCS-MOV-447 A, B~~ | ~~2~~ | ~~Yes~~ | ~~Yes~~ | ~~Yes/Yes~~ | ~~Remote Manual~~ | ~~Transfer Open/ Transfer Closed~~ | ~~As Is~~ | DCD_09.02.02-58 |

**Table 2.7.3.3-2 Component Cooling Water System Equipment Characteristics (Sheet 4 of 8)**

| Equipment Name | Tag No. | ASME Code Section III Class | Seismic Category I | Remotely Operated Valve | Class 1E/ Qual. For Harsh Envir. | PSMS Control | Active Safety Function | Loss of Motive Power Position | |
|---|---|---|---|---|---|---|---|---|---|
| RCP CCW return line outside containment isolation valves | NCS-MOV-438 A, B | 2 | Yes | Yes | Yes/No | ~~Containment Isolation Phase B~~ | ~~Transfer Closed~~ | As Is | DCD_09.02.02-58 |
| | | | | | | Remote Manual | Transfer Open/ Transfer Closed | | |
| ~~RCP CCW return line outside containment isolation valve bypass valves~~ | ~~NCS-MOV-448 A, B~~ | ~~2~~ | ~~Yes~~ | ~~Yes~~ | ~~Yes/No~~ | ~~Remote Manual~~ | ~~Transfer Open/ Transfer Closed~~ | ~~As Is~~ | DCD_09.02.02-58 |
| RCP motor CCW supply line isolation valves | NCS-MOV-446 A, B,C,D | 3 | Yes | Yes | Yes/Yes | Remote Manual | Transfer Closed | As Is | |
| RCP CCW supply line tie line isolation valves | NCS-MOV-232 A, B | 3 | Yes | Yes | Yes/No | Remote Manual | Transfer Open | As Is | |
| RCP CCW return line tie line isolation valves | NCS-MOV-233 A, B | 3 | Yes | Yes | Yes/No | Remote Manual | Transfer Open | As Is | |
| RCP CCW return line isolation valve | NCS-MOV-234 A, B | 3 | Yes | Yes | Yes/No | Remote Manual | Transfer Closed | As Is | |
| RCP CCW supply line isolation valves | NCS-MOV-401 A, B | 3 | Yes | Yes | Yes/No | ~~Containment Isolation Phase B~~ | ~~Transfer Closed~~ | As Is | DCD_09.02.02-58 |
| | | | | | | Remote Manual | Transfer Open/ Transfer Closed | | |
| Letdown heat exchanger CCW supply line outside containment isolation valve | NCS-MOV-531 | 2 | Yes | Yes | Yes/No | Containment Isolation Phase A | Transfer Closed | As Is | |
| Letdown heat exchanger CCW return line outside containment isolation valve | NCS-MOV-537 | 2 | Yes | Yes | Yes/No | Containment Isolation Phase A | Transfer Closed | As Is | |

**Table 2.7.3.3-2 Component Cooling Water System Equipment Characteristics (Sheet 8 of 8)**

| Equipment Name | Tag No. | ASME Code Section III Class | Seismic Category I | Remotely Operated Valve | Class 1E/ Qual. For Harsh Envir. | PSMS Control | Active Safety Function | Loss of Motive Power Position |
|---|---|---|---|---|---|---|---|---|
| Charging pump non-essential chilled water return isolation valve | NCS-MOV-326 A, B | 3 | Yes | Yes | Yes/ No | - | - | As Is |
| Component cooling water Header Flow | NCS-FT-034, 035, 037, 038 | - | Yes | - | Yes/ No | - | - | - |
| Component cooling water Surge Tank Water Level | NCS-LT-010, 011, 020, 021 | - | Yes | - | Yes/ No | - | - | - |
| Component cooling water Header Pressure | NCS-PT-030, 031, 032, 033 | - | Yes | - | Yes/ No | - | - | - |
| Component cooling water Supply Temperature | NCS-TE-025, 026, 027, 028, | - | Yes | - | Yes/ No | - | - | - |
| RCP thermal barrier component cooling water flow 1 | NCS-FT-129 A<br>130 A<br>131 A<br>132 A | - | Yes | - | Yes/No | - | - | - |
| RCP thermal barrier component cooling water flow 2 | NCS-FT-129 B<br>130 B<br>131 B<br>132 B | - | Yes | - | Yes/No | - | - | - |
| Containment fan cooler alternative cooling water supply isolation valve | NCS-MOV-241 | 3 | Yes | Yes | Yes/No | - | - | As Is |
| Containment fan cooler alternative cooling water return isolation valve | NCS-MOV-242 | 3 | Yes | Yes | Yes/No | - | - | As Is |

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NOTE:
Dash (-) indicates not applicable.

**Table 2.7.3.3-3 Component Cooling Water System Piping Characteristics (Sheet 1 of 2)**

| Pipe Line Name | ASME Code Section III Class | Seismic Category I | |
|---|---|---|---|
| Component cooling water supply, return lines piping and valves excluding the following;<br>Component cooling water system containment isolation valves and piping between the valves<br><br>Component cooling water supply, return lines piping and valves between and excluding the valves NCS-~~VLV-033~~AOV-058A and NCS-VLV-034A | 3 | Yes | DCD_09.02.02-49 |
| Component cooling water supply, return lines piping and valves excluding the following;<br>Component cooling water system containment isolation valves and piping between the valves<br><br>Component cooling water supply, return lines piping and valves between and excluding the valves NCS-~~VLV-033~~AOV-058B and NCS-VLV-034B | 3 | Yes | DCD_09.02.02-49 |
| Component cooling water supply, return lines piping and valves between and excluding the valves NCS-~~VLV-033~~AOV-058A and NCS-VLV-034A, excluding the following;<br>Component cooling water system containment isolation valves and piping between the valves<br><br>~~Component cooling water system piping and valves between and including the valve NCS-AOV-661A and NCS-VLV-671A~~<br><br>~~Component cooling water system piping and valves between and including the valve NCS-AOV-601 and NCS-VLV-653~~ | - | No | DCD_09.02.02-49<br>DCD_09.02.02-49 |
| Component cooling water supply, return lines piping and valves between and excluding the valves NCS-~~VLV-033~~AOV-058B and NCS-VLV-034B, excluding the following;<br>Component cooling water system containment isolation valves and piping between the valves<br><br>~~Component cooling water system piping and valves between and including the valve NCS-AOV-661B and NCS-VLV-671B~~ | - | No | DCD_09.02.02-49<br>DCD_09.02.02-49 |
| Component cooling water system piping and valves related to the excess letdown heat exchanger inside containment between and including the valves NCS-MOV-511,517, SRV-513 | 2 | Yes | |
| Component cooling water system piping and valves related to the letdown heat exchanger inside containment between and including the valves NCS-MOV-531,537, SRV-533 | 2 | Yes | |
| Component cooling water system piping and valves between and including the containment isolation valves NCS-MOV-402A,436A,438A~~,445A,447A,448A~~ and NCS-VLV-403A,437A | 2 | Yes | DCD_09.02.02-58 |

**Table 2.7.3.3-3 Component Cooling Water System Piping Characteristics (Sheet 2 of 2)**

| Pipe Line Name | ASME Code Section III Class | Seismic Category I | |
|---|---|---|---|
| Component cooling water piping and valves between and including the containment isolation valves NCS-MOV-402B,436B,438B~~,445B,447B,448B~~ and NCS-VLV-403B,437B | 2 | Yes | DCD_09.02.02-58 |
| ~~Component cooling water system piping and valves related to components installed in A/B from and excluding isolation valve NCS-AOV-602 up to and excluding stop valve NCS-VLV-651~~ | ~~-~~ | ~~No~~ | DCD_09.02.02-49 |
| ~~Component cooling water system piping and valves related to components installed in T/B from and excluding isolation valves NCS-AOV-662A,B up to and excluding stop valves NCS-VLV-669A,B~~ | ~~-~~ | ~~No~~ | DCD_09.02.02-49 |
| Component cooling water system piping and valves related to reactor coolant pumps between the containment isolation valves NCS-MOV-436A,447A (excluding) and NCS-VLV-403A,437A (excluding) and the valves NCS-SRV-406A,B,435A (including) | 3 | Yes | |
| Component cooling water system piping and valves related to reactor coolant pumps between the containment isolation valves NCS-MOV-436B,447B (excluding) and NCS-VLV-403B,437B (excluding) and the valves NCS-SRV-406C,D,435B (including) | 3 | Yes | |
| ~~Component cooling water system piping and valves between and including the valves NCS-AOV-601 and 602~~ | ~~3~~ | ~~Yes~~ | DCD_09.02.02-49 |
| ~~Component cooling water system piping and valves between and including the valves NCS-VLV-651 and 653~~ | ~~3~~ | ~~Yes~~ | DCD_09.02.02-49 |
| ~~Component cooling water system piping and valves between and including the valves NCS-AOV-661A,B and 662A,B~~ | ~~3~~ | ~~Yes~~ | DCD_09.02.02-49 |
| ~~Component cooling water system piping and valves between and including the valves NCS-VLV-669A,B and 671A,B~~ | ~~3~~ | ~~Yes~~ | DCD_09.02.02-49 |
| Component cooling water surge tank surge line piping | 3 | Yes | |

NOTE:
Dash (-) indicates not applicable

**Table 2.7.3.3-4 Component Cooling Water System Equipment Alarms, Displays, and Control Functions (Sheet 1 of 3)**

| Equipment/Instrument Name | MCR/RSC Alarm | MCR Display | MCR/RSC Control Function | RSC Display | |
|---|---|---|---|---|---|
| Component cooling water pumps (NCS-MPP-001 A,B,C,D) | No | Yes | Yes | Yes | |
| CCW supply header tie line isolation valves (NCS-MOV-020A,B) | No | Yes | Yes | Yes | |
| CCW return header tie line isolation valves (NCS-MOV-007A,B) | No | Yes | Yes | Yes | |
| CS/RHR heat exchanger CCW outlet valves (NCS-MOV-145A,B,C,D) | No | Yes | Yes | Yes | |
| RCP CCW supply line outside containment isolation valves (NCS-MOV-402A,B) | No | Yes | Yes | Yes | |
| ~~RCP CCW supply line outside containment isolation valve bypass valves (NCS-MOV-445A,B)~~ | ~~No~~ | ~~Yes~~ | ~~Yes~~ | ~~Yes~~ | DCD_09.02.02-58 |
| RCP CCW return line inside containment isolation valves (NCS-MOV-436A,B) | No | Yes | Yes | Yes | |
| ~~RCP CCW return line inside containment isolation valve bypass valves (NCS-MOV-447A,B)~~ | ~~No~~ | ~~Yes~~ | ~~Yes~~ | ~~Yes~~ | DCD_09.02.02-58 |
| RCP CCW return line outside containment isolation valves (NCS-MOV-438A,B) | No | Yes | Yes | Yes | |
| ~~RCP CCW return line outside containment isolation valve bypass valves (NCS-MOV-448A,B)~~ | ~~No~~ | ~~Yes~~ | ~~Yes~~ | ~~Yes~~ | DCD_09.02.02-58 |
| RCP motor CCW supply line isolation valves (NCS-MOV-446A,B,C,D) | No | Yes | Yes | Yes | |
| RCP CCW supply line tie line isolation valves (NCS-MOV-232A,B) | No | Yes | Yes | Yes | |
| RCP CCW return line tie line isolation valves (NCS-MOV-233A,B) | No | Yes | Yes | Yes | |
| RCP CCW return line isolation valve (NCS-MOV-234A,B) | No | Yes | Yes | Yes | |
| RCP CCW supply line isolation valves (NCS-MOV-401A,B) | No | Yes | Yes | Yes | |
| Charging pump CCW return isolation valve (NCS-MOV-316A,B) | No | Yes | Yes | Yes | |
| Charging pump fire fighting water supply isolation valve (NCS-MOV-321A, B) | No | Yes | Yes | Yes | |
| Charging pump alternative cooling water supply isolation valve (NCS-MOV-322A,B) | No | Yes | Yes | Yes | |
| Charging pump non-essential chilled water supply isolation valve (NCS-MOV-323A,B) | No | Yes | Yes | Yes | |
| Charging pump alternative cooling water return isolation valve (NCS-MOV-324A,B) | No | Yes | Yes | Yes | |

**Table 2.7.3.3-4 Component Cooling Water System Equipment Alarms, Displays, and Control Functions(Sheet 3 of 3)**

| Equipment/Instrument Name | MCR/RSC Alarm | MCR Display | MCR/RSC Control Function | RSC Display |
|---|---|---|---|---|
| Containment fan cooler alternative cooling water supply isolation valve (NCS-MOV-241) | No | Yes | Yes | Yes |
| Containment fan cooler alternative cooling water return isolation valve (NCS-MOV-242) | No | Yes | Yes | Yes |

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**Table 2.7.3.3-5 Component Cooling Water System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 5 of 8)**

| Design Commitment | Inspections, Tests, Analyses | Acceptance Criteria |
|---|---|---|
| | 6.a.ii Inspection will be performed of the as-built Class 1E equipment identified in Table 2.7.3.3-2 as being qualified for a harsh environment and the associated wiring, cables, and terminations located in a harsh environment. | 6.a.ii The as-built Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.7.3.3-2 as being qualified for a harsh environment are bounded by type tests or a combination of type tests and analyses. |
| 6.b Class 1E equipment, identified in Table 2.7.3.3-2, is powered from its respective Class 1E division. | 6.b A test will be performed on each division of the as-built Class 1E equipment identified in Table 2.7.3.3-2 by providing a simulated test signal only in the Class 1E division under test. | 6.b The simulated test signal exists at the as-built Class 1E equipment identified in Table 2.7.3.3-2 under test. |
| 6.c Separation is provided between redundant divisions of CCWS Class 1E cables, and between Class 1E cables and non-Class 1E cables. | 6.c Inspections of the as-built Class 1E divisional cables will be performed. | 6.c Physical separation or electrical isolation is provided in accordance with RG 1.75, between the as-built cables of redundant Class 1E divisions and between Class 1E cables and non-Class 1E cables. |
| 7. The CCWS removes heat from various components during all plant operating conditions, including normal plant operating, ~~abnormal and accident conditions~~abnormal, and accident conditions for at least 7 days without surge tank makeup. | 7.i An analysis will be performed that determines the heat removal capability of the CCW heat exchangers. | 7.i A report exists and concludes that the product of the overall heat transfer coefficient and the effective heat exchange area, UA, of each CCW heat exchanger identified in Table 2.7.3.3-2 is greater than or equal to 10.0 x $10^6$ Btu/hr-°F. DCD_09.02.02-49 |
| | 7.ii Tests will be performed to confirm that the as-built CCW pumps can provide flow to the CCW heat exchangers. | 7.ii Each as-built CCW pump identified in Table 2.7.3.3-2 is capable of achieving its design flow rate of 11,000 gpm to each CCW heat exchanger in the same division. |
| | 7.iii Inspections will be performed to confirm the as-built CCW surge tank volume. | 7.iii The as-built CCW surge tank volume is greater than or equal to the design volume of ~~283~~420 $ft^3$. DCD_09.02.02-68 |

**Table 2.7.3.3-5 Component Cooling Water System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 6 of 8)**

| Design Commitment | Inspections, Tests, Analyses | Acceptance Criteria | |
|---|---|---|---|
| | 7.iv Tests will be performed to verify that the as-built CCWS can provide flow to each CS/RHR heat exchanger. | 7.iv Each CCW pump deliver at least 4400 gpm of component cooling water to each CS/RHR heat exchanger. | DCD_09.02.02-68 |
| | 7.v Tests will be performed to verify that the as-built CCWS can provide flow to each RCP thermal barrier with any two CCW pumps operating. | 7.v Any two CCW pumps deliver at least 40.0 gpm of component cooling water to each RCP thermal barrier. | DCD_09.02.02-68 |
| | 7.vi Tests will be performed to verify that the as-built CCWS can provide flow to each SFP heat exchanger with any two CCW pumps operating. | 7.vi Any two CCW pumps deliver at least 3,600 gpm of component cooling water to each spent fuel pit heat exchanger. | DCD_09.02.02-68 |
| 8.a Controls are provided in the MCR to open and close the remotely operated valves identified in Table 2.7.3.3-2. | 8.a Tests will be performed on the as-built remotely operated valves identified in Table 2.7.3.3-2 using controls in the as-built MCR. | 8.a Controls in the as-built MCR open and close the as-built remotely operated valves identified in Table 2.7.3.3-2. | |
| 8.b The valves identified in Table 2.7.3.3-2 as having PSMS control perform an active safety function after receiving a signal from PSMS. | 8.b Test will be performed on the as-built remotely operated valves identified in Table 2.7.3.3-2 using simulated signals. | 8.b The as-built remotely operated valves identified in Table 2.7.3.3-2 as having PSMS control perform the active safety function identified in the table after receiving a simulated signal. | |
| 9.a The remotely operated valves and check valves, identified in Table 2.7.3.3-2, perform an active safety function to change position as indicated in the table. | 9.a.i Type tests or a combination of type tests and analyses of the remotely operated valves identified in Table 2.7.3.3-2 will be performed that demonstrate the capability of the valve to operate under its design conditions. | 9.a.i A report exists and concludes that each remotely operated valve changes position as identified in Table 2.7.3.3-2 under design conditions. | |
| | 9.a.ii Tests of the as-built remotely operated valves identified in Table 2.7.3.3-2 will be performed under preoperational flow, differential pressure, and temperature conditions. | 9.a.ii Each as-built remotely operated valve changes position as indicated in Table 2.7.3.3-2 under preoperational test conditions. | |

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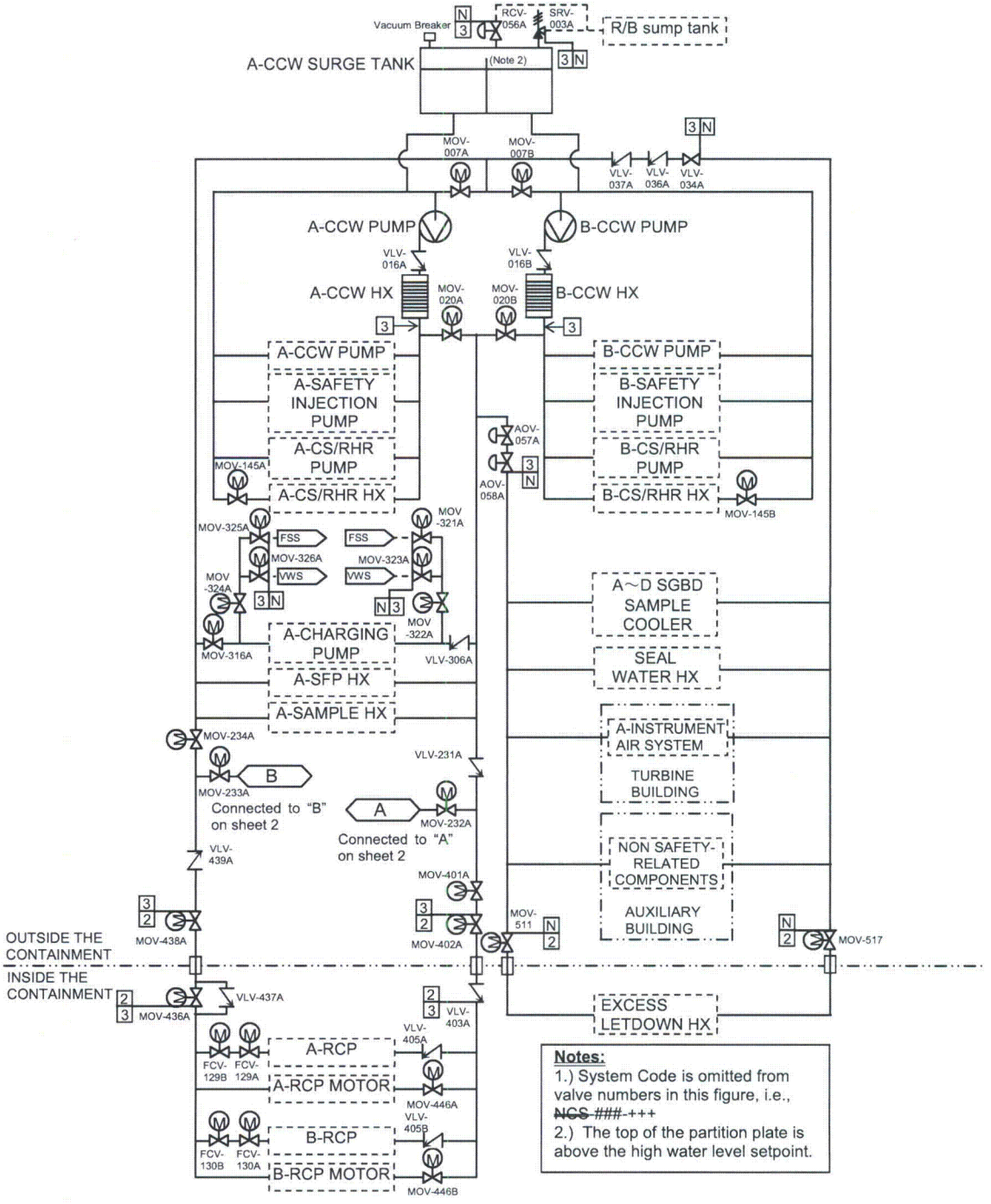


**Figure 2.7.3.3-1 Component Cooling Water System (Sheet 1 of 2)**

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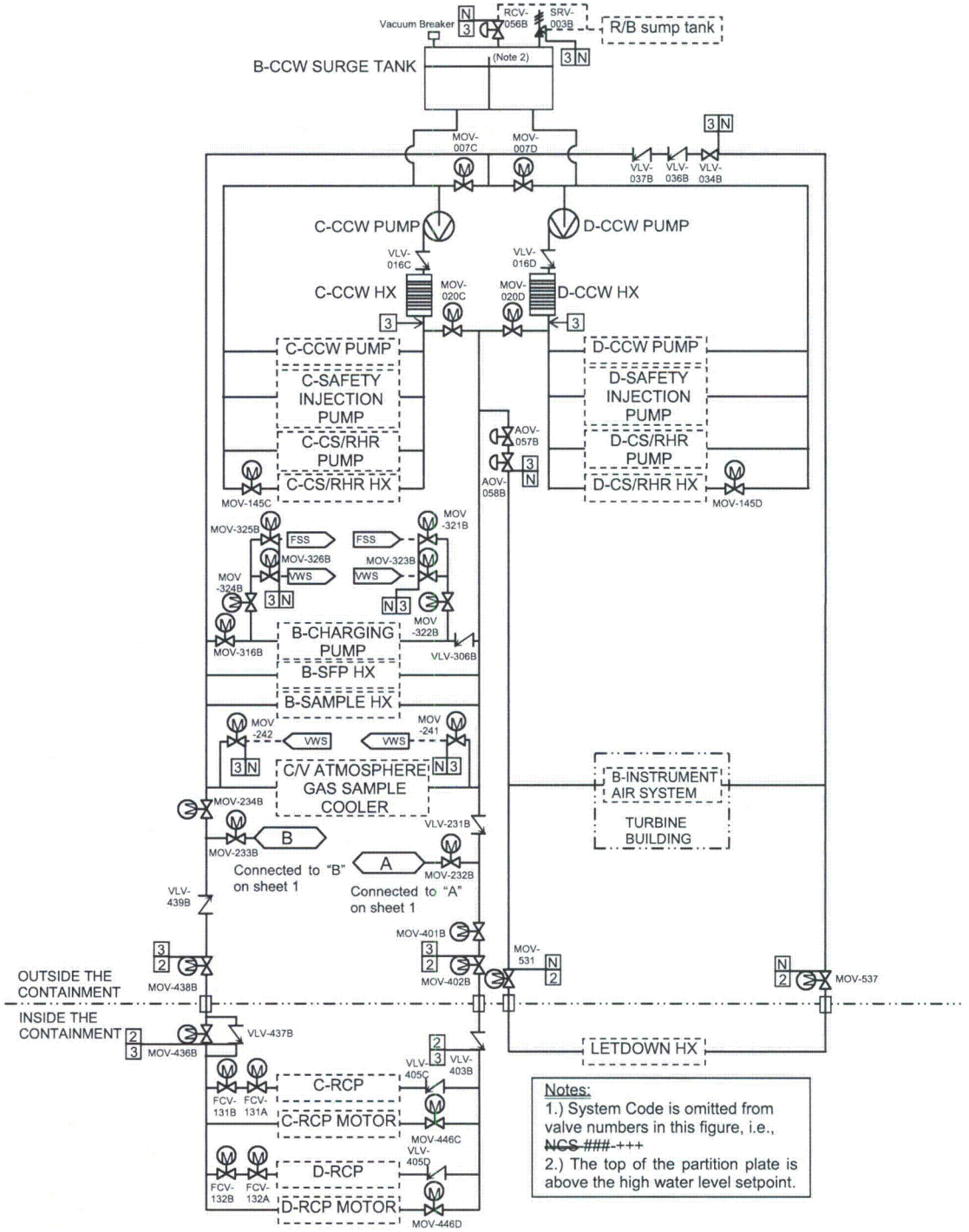


**Figure 2.7.3.3-1 Component Cooling Water System (Sheet 2 of 2)**

### Table 2.7.3.6-1 ~~Non-Essential Chilled Water System Location of Equipment and Piping~~Deleted

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| ~~System and Components~~ | ~~Location~~ |
|---|---|
| ~~Non-Essential chilled water system piping and valves between and including the containment isolation valves, VWS-MOV-403, 407, 422 and VWS-VLV-421, 423.~~ | ~~Containment Reactor Building~~ |
| ~~CCW supply and return line isolation valves, VWS-MOV-424, 425~~ | ~~Reactor Building~~ |

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### Table 2.7.3.6-2 ~~Non-Essential Chilled Water System Piping Characteristics~~Deleted

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| ~~Pipe Line Name~~ | ~~ASME Code Section III Class~~ | ~~Seismic Category I~~ |
|---|---|---|
| ~~Non-Essential chilled water system piping and valves between and including the containment isolation valves, VWS-MOV-403, 407, 422 and VWS-VLV-421, 423.~~ | ~~2~~ | ~~Yes~~ |
| ~~CCW supply and return line isolation valves, VWS-MOV-424 and 425~~ | ~~3~~ | ~~Yes~~ |

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~~NOTE:~~
~~Dash ( ) indicates not applicable~~

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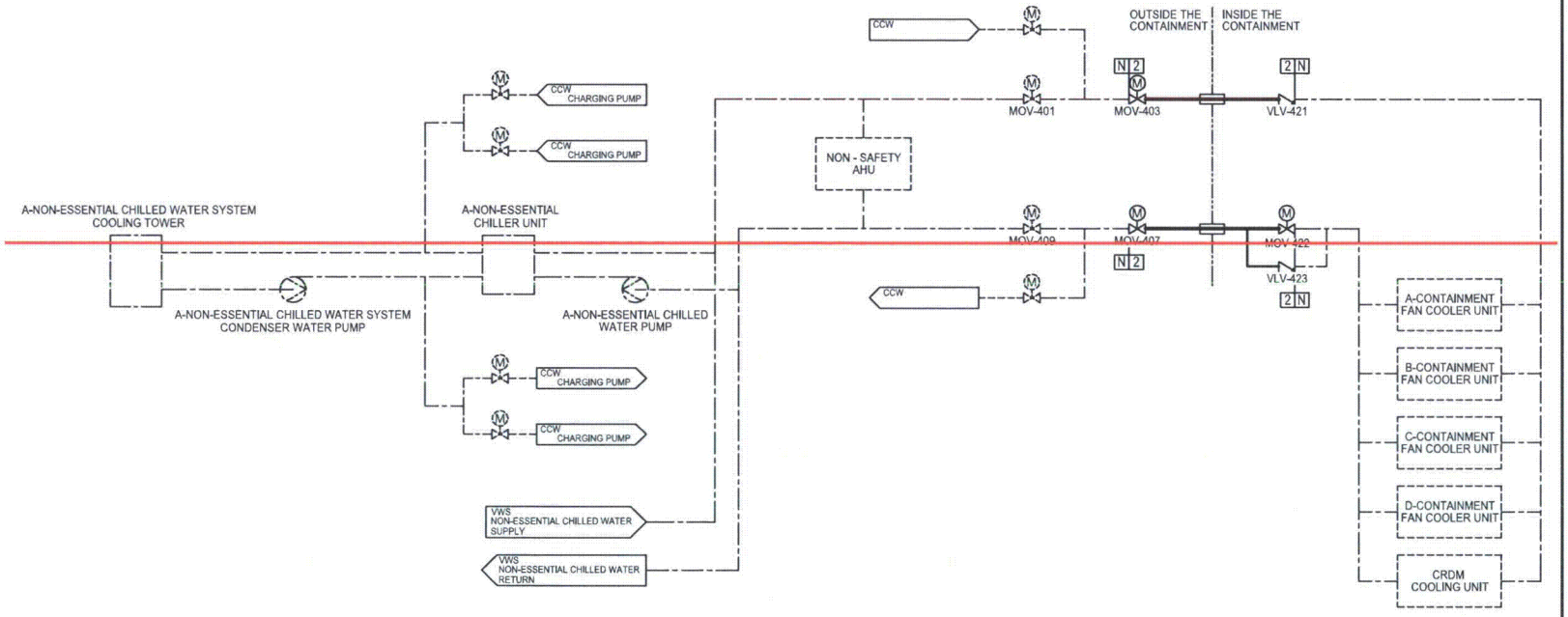


**Figure 2.7.3.6-1 ~~Non-Essential Chilled Water System~~Deleted**

**Table 2.11.2-1 Containment Isolation System Equipment Characteristics (Sheet 9 of 10)**

| System Name | Tag No. | ASME Code Section III Class | Seismic Category I | Remotely Operated Valve | Class 1E/ Qual. For Harsh Envir. | Safety-Related Display | PSMS Control | Active Safety Function | Loss of Motive Power Position | |
|---|---|---|---|---|---|---|---|---|---|---|
| CCWS | NCS-MOV-402 A, B | Refer to Tables 2.7.3.3-2 and 2.7.3.3-4 | | | | | | | | |
| CCWS | NCS-VLV-403 A, B | | | | | | | | | |
| ~~CCWS~~ | ~~NCS-MOV-445 A, B~~ | | | | | | | | | DCD_09.02.02-58 |
| CCWS | NCS-MOV-436 A, B | | | | | | | | | |
| CCWS | NCS-VLV-437 A, B | | | | | | | | | |
| ~~CCWS~~ | ~~NCS-MOV-447 A, B~~ | | | | | | | | | DCD_09.02.02-58 |
| CCWS | NCS-MOV-438 A, B | | | | | | | | | |
| ~~CCWS~~ | ~~NCS-MOV-448 A, B~~ | | | | | | | | | DCD_09.02.02-58 |
| CCWS | NCS-MOV-531 | | | | | | | | | |
| CCWS | NCS-MOV-537 | | | | | | | | | |
| CCWS | NCS-MOV-511 | | | | | | | | | |
| CCWS | NCS-MOV-517 | | | | | | | | | |

**Table 2.11.2-2 Containment Isolation System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 10 of 10)**

<table>
<tr><th>Design Commitment</th><th>Inspections, Tests, Analyses</th><th>Acceptance Criteria</th></tr>
<tr>
<td>15. Remotely operated CIVs located inside and outside the containment in series on the same penetration are powered from different Class 1E divisions.</td>
<td>15. Inspection of the remotely operated CIVs located inside and outside the containment in series on the same penetration will be performed.</td>
<td>15. The following CIVs located inside and outside the containment in series on the same penetration are powered from different Class 1E divisions.
<table>
<tr><th>Inside containment</th><th>Outside containment</th></tr>
<tr><td>RCS-AOV-147</td><td>RCS-AOV-148</td></tr>
<tr><td>CVS-AOV-005</td><td>CVS-AOV-006</td></tr>
<tr><td>CVS-MOV-203</td><td>CVS-MOV-204</td></tr>
<tr><td>NCS-MOV-436A<br>~~NCS-MOV-447A~~</td><td>NCS-MOV-438A<br>~~NCS-MOV-448A~~</td></tr>
<tr><td>NCS-MOV-436B<br>~~NCS-MOV-447B~~</td><td>NCS-MOV-438B<br>~~NCS-MOV-448B~~</td></tr>
<tr><td>LMS-AOV-052</td><td>LMS-AOV-053</td></tr>
<tr><td>LMS-AOV-055</td><td>LMS-AOV-056<br>LMS-AOV-060</td></tr>
<tr><td>LMS-LCV-010A</td><td>LMS-LCV-010B</td></tr>
<tr><td>LMS-AOV-104</td><td>LMS-AOV-105</td></tr>
<tr><td>PSS-AOV-003<br>PSS-MOV-006<br>PSS-MOV-013</td><td>PSS-MOV-031A</td></tr>
<tr><td>PSS-MOV-023</td><td>PSS-MOV-031B</td></tr>
<tr><td>PSS-AOV-062A<br>PSS-AOV-062B<br>PSS-AOV-062C<br>PSS-AOV-062D</td><td>PSS-AOV-063</td></tr>
<tr><td>RWS-MOV-002</td><td>RWS-MOV-004</td></tr>
<tr><td>VCS-AOV-306</td><td>VCS-AOV-307</td></tr>
<tr><td>VCS-AOV-305</td><td>VCS-AOV-304</td></tr>
<tr><td>VCS-AOV-356</td><td>VCS-AOV-357</td></tr>
<tr><td>VCS-AOV-355</td><td>VCS-AOV-354</td></tr>
<tr><td>VWS-MOV-422</td><td>VWS-MOV-407</td></tr>
<tr><td>RMS-MOV-001</td><td>RMS-MOV-002</td></tr>
<tr><td>IGS-AOV-002</td><td>IGS-AOV-001</td></tr>
</table>
</td>
</tr>
</table>

DCD_09.02.02-58

# Section 9.2 Change List

Note : This is excerpt from Tier 2 Ch.9 Change List as of 7/29/2011 and will be finalized in the 1st Tracking Report of DCD Rev.3.

Chapter 9 Change List

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| DCD_06.04-14 | 9.2.7.2.1<br><br>9.2.7.2.2 | 9.2-45<br>9.2-46<br>9.2-48 | Response to RAI No. 691 MHI Letter No. UAP-HF-11061 Date 03/09/2011 | Revised the 6th paragraph of Subsection 9.2.7.2.1 for RAI response.<br><br>Revised the 2nd paragraph of Subsection 9.2.7.2.2 for RAI response. | - |
| RCOL2_12.03-12.04-11 S02 | 9.2.6.2.4<br>Figure 9.2.6-1 | 9.2-40<br>9.2-109 | MHI Letter No. UAP-HF-11091 Date 04/6/2011 | AAdded description about CST overflow in the last of the first paragraph of Subsection 9.2.6.2.4.<br><br>Added CST overflow line in Figure 9.2.6-1 | - |
| DCD_09.02.02-80 | 9.2.2.2<br>9.2.7.2.1<br>9.3.4.2.6.1 | 9.2-18<br>9.2-46<br>9.3-30 | Response to RAI No. 697 MHI Letter No. UAP-HF-11133 | Added description about alternative cooling of the charging pumps and the containment fan | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | Date 5/12/2011 | coolers. | |
| DCD_09.02.02-81 | 9.1.3.2.1.3<br>9.1.3.2.1.4<br>9.2.1.2.2.3<br>9.2.2.2.1.3 | 9.1-17<br>9.2-7<br>9.2-19 | Response to RAI No. 699 MHI Letter No. UAP-HF-11172 Date 06/06/2011 | Added description about reference to EPRI TR 1013470 for industry lessons learned on potential blockage.<br><br>Added description about filter capability with respect to heat exchanger flow passages.<br><br>Added description about reference to EPRI TR 1013470 for industry lessons learned on potential blockage and leakage. | - |
| DCD_09.02.02-70 | 9.2.7.1.2.1 | 9.2-44<br>[9.2-59] | Response to RAI No. 584 MHI Letter No. UAP-HF-11217 Date 07/15/2011 | Revised the first sentence of first paragaraph as follows;<br><br>"The non-essential chilled water system, with the exception of piping and valves between and including the safety-related and seismic category I containment isolation valves, is classified as non-safety related | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| DCD_09.02.02-71 | 9.2.7.3.1<br><br>9.2.7.5.1 | 9.2-48<br>[9.2-66]<br>9.2-50<br>[9.2-67] | Response to RAI No. 584<br>MHI Letter No. UAP-HF-11217<br>Date 07/15/2011 | Revised the description of the fifth paragraph as follows;<br>generatedThe safety-related portions of the ECWS are protected against natural phenomena and internal missiles"<br><br>Deleted the description about safety related instrumentation and control associated with essential chilled water system. | - |
| DCD_09.02.02-72 | 9.2.7.2.1<br>9.2.7.2.1.1<br>9.2.7.2.1.1<br>9.2.7.2.1.2<br>9.2.7.2.1.2.1<br>9.2.7.2.1.2.2<br>9.2.7.2.1.2.3<br><br>9.2.7.2.2<br><br>9.2.7.2.2.1<br>9.2.7.2.2.1.1<br>9.2.7.2.2.1.2<br>9.2.7.2.2.1.3<br>9.2.7.2.2.1.4<br><br>9.2.7.3.1<br><br>Table 9.2.7-3 | 9.2-45, 46, 48[9.2-59, 60, 61, 62, 63, 64, 65]<br><br>9.2-91[9.2-119]<br><br>9.4-49 | Response to RAI No. 584<br>MHI Letter No. UAP-HF-11217<br>Date 07/15/2011 | Added the following sentence in the first paragraph.<br><br>"The operating data in Table 9.2.7-1 are determined at the system operating point, which is based on the abnormal operation condition, and are considered bounding values."<br><br>Added the following in the forth paragraph.<br><br>"The essential chiller | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | 9.4.7 | | | units stop for one hour after a SBO occurs until alternate ac gas turbine generator restores power (Chapter 8, Section 8.4)."<br><br>Added the ninth paragraph.<br><br>Revised the tenth paragraph as follows;<br><br>"WaterThe ECWS is a closed-loop system and water chemistry control of ECWS is performed by adding chemicals to the chemical feed tanks to prevent long-term corrosion that may degrade system performance."<br><br>Added the description about system operation of essential chilled water system.<br><br>Added the description about alternate cooling in severe accident. | |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | | Added the description about system operation of non-essential chilled water system.<br><br>Revised second sentence of first paragraph to clarify Table No.<br><br>Added the description about the essential chilled water compression tank.<br><br>Added Table 9.2.7-3.<br><br>Revised the description of COL item 9.4(4). | |
| DCD_09.02.02-73 | 9.2.7.2.1.1 | 9.2-46[9.2-62] | Response to RAI No. 584 MHI Letter No. UAP-HF-11217 Date 07/15/2011 | Revised the description about the essential chilled water pump and the essential chilled water compression tank. | - |
| DCD_09.02.02-74 | 9.2.7.2.1.1<br>Figure 9.2.7-1<br>Figure 9.2.7-2 (sheet 1 and 2 of 3) | 9.2-47[9.2-62]<br>9.2-112 to 117[9.2-146 to | Response to RAI No. 584 MHI Letter No. UAP-HF-11217 Date 07/15/2011 | Revised the description about the essential chilled water compression tank.<br><br>Revised Figure | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | 151] | | 9.2.7-1 and sheet 1 and 2 of Figure 9.2.7-2. | |
| DCD_09.02.02-78 | 9.2.7.5.1<br><br>9.2.7.5.2<br>Table 9.2.7-1<br>Table 9.2.7-2 | 9.2-50[9.2-67] 9.2-50[9.2-68]<br><br>9.2-89[9.2-116]<br>9.2-90, 91[9.2-117, 118] | Response to RAI No. 584 MHI Letter No. UAP-HF-11217 Date 07/15/2011 | Corrected the editorial error in second paragraph.<br><br>Revised the description about chiller units entering and leaving chilled water temperature, compression tank pressure, compression tank level, chilled water flowrate and chiller unit malfunction.<br><br>Added "High and low level indication with an alarm of the compression tanks" as the instrumentation and controls serving the non-essential chilled system and provided in the MCR.<br><br>Revised Table 9.2.7-1 and 9.2.7-2 | - |
| DCD_09.02.02-79 | 9.2.7.2.1.1 | 9.2-47[9.2-62] | Response to RAI No. 584 MHI Letter No. UAP-HF-11217 | Revised the description about the essential chilled water compression | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | Date 07/15/2011 | tank. | |
| DCD_09.02.02-48 | 9.2.2.2<br>9.2.2.2.1.5<br>9.2.2.5.4 | 9.2-17[9.2-25]<br>9.2-18[9.2-26]<br>9.2-19[9.2-30]<br>9.2-20[9.2-31]<br>9.2-26[9.2-40] | Amended Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 07/29/2011 | Revised Subsection 9.2.2.2 to add additional description of isolation of non-safety piping.<br><br>Revised Subsection 9.2.2.2.1.5 to remove automatic closure of header tie line isolation valves and the necessity to reopen the valves to provide RCP thermal barrier and spent fuel pool heat exchanger cooling.<br><br>Added statement that the valves are operated from the MCR when an operator determines that train separation is required to Subsection 9.2.2.2.1.5.<br><br>Add statement that closure time will not be so rapid as to cause a water hammer concern Subsection 9.2.2.2.1.5. | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | | Revised Subsection 9.2.2.5.4 to remove reference to automatic header tie line isolation on low-low surge tank water level. | |
| DCD_09.02.02-49 | 9.2.2.2.1.3<br>9.2.2.3.2 | 9.2-18[9.2-29]<br>9.2-24[9.2-37, 38] | Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 7/29/2011 | Revised Subsection 9.2.2.3.2 to reflect elimination of header tie line isolation valve on low-low surge tank level.<br><br>Revised Subsection 9.2.2.3.2 to reflect that makeup capacity exceeds potential leak rate from all valves used to isolate nonsafety piping.<br><br>Revised Subsection 9.2.2.3.2 to reflect that makeup capacity exceeds potential leak rate from CCWS seal failure.<br><br>Revised Subsection 9.2.2.3.2 to reflect that surge tank makeup is not required for at least 7-days. | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | | Revised Subsection 9.2.2.3.2 to add statement regarding potential pump seal leakage.<br><br>Revised Subsection 9.2.2.3.2 to add statement that the CCWS surge tanks have adequate capacity to accommodate potential leakage after a seismic event without degradation of system function.<br><br>Revised Subsection 9.2.2.3.2 to delete reference to RWSP as potential source for surge tank makeup.<br><br>Revised Subsection 9.2.2.3.2 to add reference to FSS as potential source for surge tank makeup.<br><br>Revised Subsection 9.2.2.3.2 to add discussion supporting Technical Specification leak rate.<br><br>Revised Subsection | |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | | 9.2.2.2.1.3•to address CCWS tank capacity with respect to 7-day leakage.<br><br>Revised Subsection 9.2.2.2.1.3•to modify description for consistency with surge tank design change. | |
| DCD_09.02.02-50 | 9.2.2.2.2.6 | 9.2-23[9.2-36] | Amended Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 7/29/2011 | Revised Subsection 9.2.2.2.2.6 to add explanation that voiding in piping will not occur even in the event. | - |
| DCD_09.02.02-51 | 9.2.2.1.1<br>9.2.2.2.1.5<br>9.2.2.2.2<br>9.2.2-7 (New Table)<br>Figure 9.2.2-2 | 9.2-16[9.2-23]<br>9.2-19[9.2-30]<br>9.2-22[9.2-34] | Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 7/29/2011 | Revised Subsection 9.2.2.1.1 to•correct maximum CCWS heat exchanger outlet temperature during design basis accident from 110 °F to 125 °F.<br><br>Revised Subsection 9.2.2.2.1.5 to add reference to new Table 9.2.2-7 which provides the electrical power division for CCWS motor and air operated valves.<br><br>Revised Subsection | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | | 9.2.2.2.2•to add the following to the end of the paragraph: "Figure 9.2.2-2 provides system operating parameters for various locations and operating modes."<br><br>Revised Subsection 9.2.2.2.2•to add Figure 9.2.2-2 which provides pressure, temperature and flow rates for various CCWS configurations.<br><br>Revised Subsection 9.2.2-1 to delete the RWSP as source for surge tank makeup and replace with FSS. | |
| DCD_09.02.02-52 | 9.2.2.1.2.1<br>9.2.2.1.2.2<br>9.2.2.1.2.3<br>9.2.2.1.2.4(New Subsection)<br>9.2.2.1.2.5(New Subsection)<br>9.2.2.1.2.6(New Subsection)<br>9.2.2.2.1.1<br>Table 9.2.2-2 | 9.2-16[9.2-24]<br>9.2-17[9.2-24]<br>9.2-18[9.2-27, 28]<br>9.2-73[9.2- | Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 7/29/2011 | Changed title of Subsection 9.2.2.1.2.1 from "Normal Operation" to "Power Operation"<br><br>Changed title of Subsection 9.2.2.1.2.2 from "Normal Plant | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | Table 9.2.2-4<br>Table 9.2.2-5 | 91]<br>9.2-78[9.2-96]<br>9.2-79[9.2-98] | | Cooldown" to "Cooldown by<br><br>CS/RHRS"<br><br>Added Subsection 9.2.2.1.2.4, "Startup"<br><br>Added Subsection 9.2.2.1.2.5, "Accident"<br><br>Added Subsection 9.2.2.1.2.6, "Safe Shutdown"<br><br>Editorial changes in subsection 9.2.2.1.2.<br><br>Added description of CCWS heat exchanger "design" condition in subsection 9.2.2.2.1.1.<br><br>,<br><br>Added allowable CCWS heat exchanger supply temperatures to loads for all | |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | | operating modes in subsection 9.2.2.2.1.1.<br><br>Add margin and the bases for margin determination in subsection 9.2.2.2.1.1.<br><br>Added "UA" value for design condition in table 9.2.2-2.<br><br>Editorial changes in table 9.2.2-2.<br><br>Added heat loads for Startup and refueling operating conditions in table 9.2.2-4<br><br>Added note addressing effect of opening RCP cross-tie valves in table 9.2.2-4<br><br>Editorial changes in table 9.2.2-4<br><br>Added flow rates for Startup and | |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | | Refueling operating conditions in table 9.2.2-5.<br><br>Added note addressing effect of opening RCP cross-tie valves in table 9.2.2-5.<br><br>Editorial changes in table 9.2.2-5. | |
| DCD_09.02.02-53 | 9.2.2.2.1.2 | 9.2-18[9.2-28] | Amended Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 7/29/2011 | Added summary description of CCWS head, flow margin in subsection 9.2.2.2.1.2. | - |
| DCD_09.02.02-54 | 9.2.2.2.2<br>9.2.2-6 (New Table) | 9.2-22[9.2-34] | Amended Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 7/29/2011 | Added description in subsection 9.2.2.2.2 that Tables 9.2.2-4 and 9.2.2-5 provide header information.<br><br>Added reference in subsection 9.2.2.2.2 to new Table 9.2.2-6 for specific CCWS loads.<br><br>Added new Table | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | | 9.2.2-6 | |
| DCD_09.02.02-56 | 9.2.2.2.1.5<br>9.2.2.2.2.1 | 9.2-21[9.2-33]<br>9.2-22[9.2-34] | Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 7/29/2011 | Revised Subsection 9.2.2.2.1.5 to add RCP CCW tie line isolation valve numbers to heading.<br><br>Revised Subsection 9.2.2.2.1.5 to add additional description regarding supply and return path.<br><br>Revised Subsection 9.2.2.2.1.5 to add RCP CCW supply and return line isolation valve numbers to heading.<br><br>Revised Subsection 9.2.2.2.1.5 to modify description regarding effect of opening RCP CCW tie line isolation valves.<br><br>Revised Subsection 9.2.2.2.1.5 to modify description of "RCP CCW supply line isolation valve" to delete "P" signal isolation.<br><br>Revised Subsection 9.2.2.2.1.5 to modify | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | | description of "RCP CCW return line isolation valve" to clarify use in conjunction with RCP CCW tie line isolation valves for RCP cooling from alternate subsystem.<br><br>Revised Subsection 9.2.2.2.1.5 to add RCP motor CCW supply line isolation valve numbers to heading.<br><br>Revised Subsection 9.2.2.2.1.5 to modify description of "RCP motor CCW supply line isolation valve" to clarify valve usage.<br><br>Revised Subsection 9.2.2.2.2.1 to add discussion of the use of the cross-tie valves.<br><br>Revised Subsection 9.2.2.2.2.1 to add reference to DCD Subsection 13.5.2 for development of Operating and Maintenance procedures | |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | | applicable to use of cross-tie valves. | |
| DCD_09.02.02-57 | 9.2.2.2.1.2<br>9.2.2.2.1.3<br>9.2.2.5.4<br>Table 9.2.2-2 | 9.2-18[9.2-28, 29]<br>9.2-19[9.2-30]<br>9.2-26[9.2-40]<br>9.2-73[9.2-91] | Response to RAI No. 571<br>MHI Letter No. UAP-HF-11237<br>Date 7/29/2011 | Revised Subsection 9.2.2.2.1.2 to add description of design approach used to assure adequate NPSH and avoidance of potential vortexing.<br><br>Revised Subsection 9.2.2.2.1.3 to add statement regarding physical location of the CCWS surge tanks<br><br>Revised Subsection 9.2.2.2.1.3 to add statement regarding surge tank elevation and piping arrangement for avoidance of gas accumulation.<br><br>Revised Subsection 9.2.2.2.1.3 to address inspection accessibility.<br><br>Revised Subsection 9.2.2.2.1.3 to clarify free volume capacity<br><br>Revised Subsection 9.2.2.2.1.3 to add | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
|---|---|---|---|---|---|
| | | | | surge tank capability to accommodate inleakage<br><br>Revised Subsection 9.2.2.2.1.3 to add effect of surge tank water volume change due to system temperature change<br><br>Revised Subsection 9.2.2.5.4 to add description of level indication and level control function<br><br>Revised Subsection 9.2.2.5.4 to add basis for normal level setpoint and variation of level with temperature.<br><br>Revised Subsection 9.2.2.5.4 to add discussion regarding surge tank leakage monitoring.<br><br>Revised surge tank volume consistent with design change in Subsection 9.2.2.5.4 and Table 9.2.2-2. | |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| DCD_09.02.02-58 | 9.2.2.2.2.4<br>9.2.2.3.2<br>9.2.2.3.5<br>Table 9.2.2-3 (Sheets 1,3,4) | 9.2-22[9.2-35]<br>9.2-24[9.2.2-37, 38]<br>9.2-25[9.2-38]<br>9.2-74[9.2-92]<br>9.2-76[9.2-94]<br>9.2-77[9.2-95] | Response to RAI No. 571<br>MHI Letter No. UAP-HF-11237<br>Date 7/29/2011 | Deleted automatic closure discussion for header tie line isolation valves in Subsection 9.2.2.2.2.4.<br><br>Added header tie line isolation valve closure time discussion in Subsection 9.2.2.2.2.4.<br><br>Reference COL item for closure header tie line isolation valve closure in Subsection 9.2.2.2.2.4.<br><br>Revised discussion of closure of header tie line isolation valves to eliminate reference to automatic closure in Subsection 9.2.2.3.2.<br><br>Added discussion provided in the response to RAI Question 09.02.02-34, Item 2 in Subsection 9.2.2.3.2. | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | | Revised discussion to reflect that thermal barrier cooling will not be automatically isolated and that 4-inch bypass valves have been removed from the design in Subsection 9.2.2.3.5.<br><br>Deleted reference to NCS-MOV-445A/B, 447A/B, 448A/B and update the FMEA in Table 9.2.2-3.<br><br>Updated to reflect that automatic closure of NCS-MOV-020A/B and 007A/B has been deleted in Table 9.2.2-3.<br><br>Reflect RCP cross tie operation in Item 1 in Table 9.2.2-3.<br><br>Added a note to provide additional information for "Effect on System Safety Function" with regard to header tie line isolation valves in Table 9.2.2-3. | |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| DCD_09.02.02-59 | 9.2.2.2.1.4 | 9.2-19[9.2-30] | Amended Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 7/29/2011 | Added the description about regulatory compliance of the CCW supply line. | - |
| DCD_09.02.02-60 | 9.2.2.2.1.4<br>9.2.2.2.1.5<br>9.2.2.2.2.4<br>9.2.2.5.1 | 9.2-19[9.2-30]<br>9.2-20, 21[31, 32, 33]<br>9.2-22[9.2-35]<br>9.2-26[9.2-39 | Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 7/29/2011 | Add statement in subsection 9.2.2.2.1.4 that piping related to RCP thermal barrier between check valves and motor-operated valves is designed for RCS rated conditions.<br><br>Revise the description of Containment Spray/Residual Heat Removal Heat Exchanger (CS/RHRS HX) CCW Outlet Valve in subsection 9.2.2.2.1.5.<br><br>Revise the description of RCP Thermal Barrier HX CCW Return Line Isolation valve in subsection 9.2.2.2.1.5.<br><br>Revise the description of | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | | Containment Isolation Valve in subsection 9.2.2.2.1.5.<br><br>Revise the description of Isolation valve between seismic category I portion and non-seismic category I portion in subsection 9.2.2.2.1.5.<br><br>Add the description of the 10-second CCW pump start time delay in Subsection 9.2.2.2.2.4.<br><br>Add basis for starting standby CCWS pump on low-pressure indication in Subsection 9.2.2.5.1. | |
| DCD_09.02.02-67 | 9.2.2.2.1.2<br>9.2.2.2.1.5<br>9.2.2.2.2.4<br>9.2.2.2.2.5<br>9.2.2.4.2 | 9.2-18[9.2-28, 29]<br>9.2-20[9.2-31]<br>9.2-21[9.2-33]<br>9.2- | Amended Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 7/29/2011 | Revised Subsection 9.2.2.2.1.2 to add description of CCWS flow rate control.<br><br>Revised Subsection 9.2.2.2.1.5 to add description of CCWS flow rate control to "Containment | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | 23[9.2-35]<br>9.2-25[9.2-39] | | Spray/Residual Heat Removal Heat Exchanger (CS/RHRS HX) CCW Outlet Valve".<br><br>Revised Subsection 9.2.2.2.1.5 to add additional bullet and control function description for "Letdown Heat Exchanger Outlet Valve"<br><br>Revised Subsection 9.2.2.2.2.4 and 9.2.2.2.2.5 to add statement that operator must manually open the CV atmosphere gas sample cooler outlet valve during accident conditions.<br><br>Revised Subsection 9.2.2.4.2 to correct spelling of "individual". | |
| DCD_09.02.02-68 | 9.2.2.2.1.2 | 9.2-18[9.2-29] | Response to RAI No. 571 MHI Letter No. UAP-HF-11237 Date 07/29/2011 | Added the reference in subsection 9.2.2.2.1.2 interlock with ESWS discussed in Subsection 9.2.1.2.3.1. | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| DCD_09.02.02-69 | 9.2.2.2.1.3<br>Figure 9.2.2-1<br>9.5.1.2.2 | 9.2-19[9.2-29, 30]<br>9.2-97 through 9.2-105[9.2-125 through 133]<br>9.5-9 | Response to RAI No. 576<br>MHI Letter No. UAP-HF-11238<br>Date 07/29/2011 | Revised Subsection 9.2.2.2.1.3 to delete the PMWS (primary water) and RWSP as sources of CCWS makeup.<br><br>Revised Subsection 9.2.2.2.1.3 and 9.5.1.2.2 to add FSS as a CCWS makeup source.<br><br>Revised Figure 9.2.2-1•to change valve position of NCS-VLV-063A/B from "normally closed" to "locked closed" (LC).<br><br>Revised Figure 9.2.2-1•to delete PWMS (primary water makeup) line and associated valving to the CCWS. (PWMS deareated water supply path remains.)<br><br>Revised Figure 9.2.2-1•to delete RWSP (makeup) line and associated valving to the CCWS. | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | | Revised Figure 9.2.2-1•to Add FSS line and associated isolation connection.<br><br>Revised Figure 9.2.2-1•to delete locked closed "LC" designation from RCP cross-tie valves.<br><br>Revised Figure 9.2.2-1•to add "LC" designation to boundary valves with FSS and VWS (NCS-VLV-321A/B, -322A/B, -323A/B, -324A/B, -325A/B, -326A/B) | |
| DCD_09.02.05-2 | 9.2.5.2.1 | 9.2-34[9.2-48] | Response to RAI No. 286 MHI Letter No. UAP-HF-11232 Date 7/25/2011 | Added that makeup source is non-safety and ensures keeping the 30-day capacity volume during normal operation to Subsection 9.2.5.2.1. | - |
| DCD_09.02.05-8 | 9.2.5.2.1 | 9.2-34[9.2-48] | Response to RAI No. 286 MHI Letter No. UAP-HF-11232 Date 07/25/2011 | Added the description to Subsection 9.2.5.2.1 to identify that any leak from the CCWS heat exchanger which is interface between CCWS and | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | | ESWS does not allow mixing of the potentially radioactive CCW and the nonradioactive ESW because of the CCW heat exchangers structure. | |
| DCD_09.02.01-32 | 9.2.1<br>9.2.1.1.1<br>9.2.1.1.3<br>9.2.1.2.2.1<br>9.2.1.2.3.1<br>9.2.10 | 9.2-1<br>9.2-2[9.2-3]<br>9.2-6[9.2-7]<br>9.2-11[9.2-16, 17]<br>9.2-58[9.2-76] | Response to RAI No. 585 MHI Letter No. UAP-HF-11235 Date 7/27/2011 | Added a short summary which describes that ESWS functional requirements are standard plant design regardless of location although some structures (e.g. ESWPT and UHSRS) where some of ESWS components are located are site specific to the beginning of Subsection 9.2.1.<br><br>Clarified the safety-related heat loads in Subsection 9.2.1.1.1.<br><br>Added description regarding backwashing of the CCW heat exchanger to clarify | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | | the heat exchanger backwashing is nonsafety-related design bases to Subsection 9.2.1.1.3.<br><br>Clarified that the non-safety design basis is only for conceptual design in Subsection 9.2.1.1.3.<br><br>Added the description regarding non-safety loads to Subsection 9.2.1.1.3.<br><br>Revised Subsection 9.2.1.2.2.1 to refer to Subsection 9.4.5 which describes the design detail of the ESW pump house ventilation.<br><br>Added the description regarding backwash operating of the CCW heat exchanger including the case with out of service train to Subsection 9.2.1.2.3.1.<br><br>Revised Subsection | |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | | 9.2.10, COL 9.2(6) to delete the requirement for selecting the mode of cooling of the ESWP motor. | |
| DCD_09.02.01-33 | 9.2.1.1.3<br>9.2.1.2.2.3<br>9.2.1.3<br>9.2.10 | 9.2-2[9.2-3]<br>9.2-7[9.2-11, 12]<br>9.2-12[9.2-20]<br>9.2-58[9.2-76] | Response to RAI No. 585 MHI Letter No. UAP-HF-11235 Date 07/27/2011 | Revised Subsection 9.2.1.1.3 to add the description regarding the CCW heat exchanger backwashing operation.<br><br>Added the description regarding the potential CCW heat exchanger fouling prevention, periodic inspection, monitoring, maintenance, performance and functional testing.<br><br>Revised Subsection 9.2.1.3 and DCD Subsection 9.2.10 COL 9.2(7) to clarify what the COL 9.2(7) refers to and to what extent it applies to that part of the ESWS that is within scope for standard plant design. | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| DCD_09.02.01-35 | 9.2.1.3<br>9.2.10 | 9.2-12[9.2-19]<br>9.2-58[9.2-75] | Response to RAI No. 585 MHI Letter No. UAP-HF-11235 Date 07/27/2011 | Revised Subsection 9.2.1 to identify which parts within SPDI that may be arranged in the outside of standard design scope building could be stagnant.<br><br>Revised Subsection 9.2.10 COL 9.2(2) to describe that the COL applicant will handle heat tracing measures as safety related. | - |
| DCD_09.02.01-38 | 9.2.1.2.2.1<br>9.2.10 | 9.2-6<br>9.2-58[9.2-76] | Response to RAI No. 585 MHI Letter No. UAP-HF-11235 Date 07/27/2011 | Revised Subsection 9.2.1.2.2.1 and Subsection 9.2.10 COL 9.2(6) will be revised to clarify testing requirement of the potential for vortex formation based on the most limiting assumptions for COL applicant. | - |
| DCD_09.02.01-40 | 9.2.1.2.3.1<br>9.2.1.5.7<br>Table 9.2.1-3<br>Table 9.2.1-4<br>Figure 9.2.1-1 (Sheet 1) | 9.2-8 through 10 [9.2-13 through 16]<br>9.2-14, 15[9.2- | Response to RAI No. 585 MHI Letter No. UAP-HF-11235 Date 07/27/2011 | Revised Subsection 9.2.1.2.3.1, Table 9.2.1-3 and 4 to add the supplemental explanation for the detail of each operating modes.<br><br>Revised Subsection | - |

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| | | 22]<br>9.2-68[9.2-86]<br>9.2-69[9.2-87]<br>9.2-94[9.2-122] | | 9.2.1.2.3.1 to add the detail description of the interlocks between the ESWS and CCWS.<br><br>Revised Subsection 9.2.1.2.3.1 to clarify that not only the standby pump will be started but also the discharge MOV will be opened when the operating pump discharge header pressure becomes low.<br><br>Revised Subsection 9.2.1.5.7 to add the supplemental information regarding the ESWS backup actuation interlock.<br><br>Revised Figure 9.2.1-1 (Sheet 1 of 3) to make consistency with the description regarding the interlock between ESWS and CCWS in 9.2.1.2.3.1. | |
| DCD_09.02.01-41 | 9.2.1.5 | 9.2-13[9.2-20] | Response to RAI No. 585 MHI Letter No. | Revised Subsection 9.2.1.5 to clarify that all instrumentation | - |

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| | | | UAP-HF-11235 Date 07/27/2011 | available in MCR also has local read out. | |
| DCD_09.02.01-43 | 9.2.1.1.3<br>9.2.1.2.3.1<br>9.2.1.4<br>9.2.1.5.2<br>9.2.10<br>Table 9.2.1-2 | 9.2-2[9.2-3]<br>9.2-8[9.2-13]<br>9.2-10[9.2-16]<br>9.2-13[9.2-20]<br>9.2-14[9.2-21]<br>9.2-60[9.2-77]<br>9.2-63 through 67[9.2-81 through 85] | Response to RAI No. 585 MHI Letter No. UAP-HF-11235 Date 07/27/2011 | Corrected typographical error. | - |
| DCD_09.02.01-44 | 9.2.1.3 | 9.2-12[9.2-18, 19] | Response to RAI No. 585 MHI Letter No. UAP-HF-11235 Date 07/27/2011 | Revised Subsection 9.2.1.3 to refer to Subsection 3.4.1.5.2.2 which describes detail of the flood protection. | - |
| DCD_09.02.01-49 | 9.2.1.2.3.1 | 9.2-10[9.2-16] | Response to RAI No. 585 MHI Letter No. UAP-HF-11235Date | Revised Subsection 9.2.1.2.3.1 to add the CDI information which describes regarding the detail | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | 07/27/2011 | of the void detection system. | |
| DCD_09.02.01-52 | 9.2.1.2.2.2<br>9.2.1.2.2.3<br>9.2.1.5.3<br>Table 9.2.1-1<br>Table 9.2.1-2 (Sheets 3,4) | 9.2-6, 7[9.2-7 through 10]<br>9.2-7[9.2-12]<br>9.2-14[9.2-21]<br>9.2-62[9.2-80]<br>9.2-65[9.2-83]<br>9.2-66[9.2-84] | Response to RAI No. 585 MHI Letter No. UAP-HF-11235 Date 07/27/2011 | Revised Subsection 9.2.1.2.2.2 to state that Figure 9.2.1-1 has the valve ID markings to match the DCD description to make it clear which valves are being referred.<br><br>Clarified the definition and details of each operating mode of the strainer in Subsection 9.2.1.2.2.2.<br><br>Clarified that the actual fouling factor will not exceed the design fouling factor for at least the duration required for UHS capacity of 30 days or minimum of 36 days for a cooling pond in 9.2.1.2.2.3.<br><br>Revised Subsection 9.2.1.5.3 to clearly delineate that the differential pressure instrumentation of the strainer and/or alarm is credited | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | | post accident.<br><br>Revised Table 9.2.1-1 to clarify that the power supply to the strainers including their associated components are Class 1E.<br><br>Revised Table 9.2.1-2 item 3 and 4 to add the plant operating mode of "startup, normal shutdown, normal operation, refueling, cooldown" to safety function of "starts and opens to provide flow path to backwash flow before strainer clogging to maintain ESW supply to CCW HX." | |
| DCD_09.02.02-80 | 9.2.2.2<br>9.2.7.2.1<br>9.3.4.2.6.1 | 9.2-18[9.2-26, 27]<br>9.2-46[9.2-61]<br>9.3-30 | Amended Response to RAI No. 697 MHI Letter No. UAP-HF-11239 Date 07/29/2011 | Revised Subsection 9.2.2.2, 9.2.7.2.1 and 9.3.4.2.6.1 to add the description regarding operation during severe accident such as charging pump cooling by non-essential chilled water system or the | - |

| Change ID No. | Location<br><br>(e.g., subsection, table, or figure) | DCD Rev.3 Page * | Reason for Change | Change Summary | Rev. of T/R |
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| | | | | fire water supply system and the cooling of containment fan coolers by the CCWS. | |
| DCD_09.02.02-81 | 9.1.3.2.1.3<br>9.1.3.2.1.4<br>9.2.1.2.2.3<br>9.2.2.2.1.3 | 9.1-17<br>9.2-7[9.2-12]<br>9.2-19[9.2-30] | Amended Response to RAI No. 699 MHI Letter No. UAP-HF-11240 Date 7/29/2011 | Added description about reference to EPRI TR 1013470 for industry lessons learned on potential blockage. in Subsection 9.1.3.2.1.3<br><br>Added description about filter capability with respect to heat exchanger flow passages in subsection 9.1.3.2.1.4.<br><br>Added description about reference to EPRI TR 1013470 for industry lessons learned on potential blockage and leakage in Subsection 9.2.1.2.2.3.<br><br>Add discussion regarding strainers in piping from surge | - |

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| | | | | tank makeup sources in Subsection 9.2.2.2.1.3. | |

*Page numbers for the attached marked-up pages may differ from the revision 3 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.