# U. S. NUCLEAR REGULATORY COMMISSION REGION I
# OPERATOR LICENSING EXAMINATION REPORT

EXAMINATION REPORT NO.: 50-289/92-03 (OL)

FACILITY DOCKET NO.: 50-289

FACILITY LICENSE NO.: DPR-50

LICENSEE: GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

FACILITY: TMI-1

EXAMINATION DATES: February 11 - 13, 1992

CHIEF EXAMINER: Paul Bissett 3/3/92
Paul Bissett, Sr. Operations Engineer Date

APPROVED BY: Larry E. Briggs 3/4/92
for Peter Eselgroth, Chief Date
PWR Section
Operations Branch, DRS

SUMMARY: Written and operating examinations were administered to two Senior Reactor Operator candidates. Both candidates passed their examination and were issued licenses. No safety significant deficiencies were identified during this examination.

DETAILS

1.0 Persons Contacted:

GPU Nuclear Corporation

| | |
|---|---|
| R. Boltz, Manager, Simulator Management | (3) |
| T. Broughton, Director, TMI-1 | (3) |
| P. Fiedler, Director, NAD | (3) |
| D. Hassler, Licensing Engineer | (3) |
| R. Hess, Instructor, Operator Training | (1) |
| C. Husted, Analyst, Simulator Management | (3) |
| R. Parnell, Supervisor, Operator Training | (2,3) |
| M. Ross, Director, Operations & Maintenance | (3) |
| O. Shalikashvili, Manager, Plant Training | (3) |
| H. Shipman, Plant Operations Director | (1,3) |
| D. Smith, Shift Supervisor, Operations | (1,3) |
| M. Trump, Manager, Operator Training | (1,2,3) |

NRC

| | |
|---|---|
| P. Bissett, Senior Operations Engineer | (1,2,3) |
| J. Prell, Senior Operations Engineer | (1,2,3) |

LEGEND:

(1) Participated in examination development and/or preexam review.
(2) Participated in examination administration.
(3) Attended exit meeting on February 13, 1992 at the TMI Training facility.

2.0 Examination Results:

TYPE OF EXAMINATIONS: Initial Examinations

| | SRO Pass/Fail | TOTAL Pass/Fail |
|---|---|---|
| Written | 2/0 | 2/0 |
| Simulator | 2/0 | 2/0 |
| Walk-through | 2/0 | 2/0 |
| Overall | 2/0 | 2/0 |

3.0 Generic Strengths/Weaknesses

The following generic strengths were noted:

Both candidates appeared to be quite familiar with the plant as noted during the walk-through portion of the operating examination. Also noted by the examiners was the cleanliness of the plant in those areas in which job performance measures were conducted.

The following generic weakness was noted:

During the conduct of the simulator examination, it was noted that both general plant announcements made from the simulator and communications with various plant auxiliary personnel were transmitted over a simulator loudspeaker. Communications is one of eight competencies in which rating factors are used to evaluate a candidates performance during the conduct of simulator scenarios. Evaluation of the correctness and other attributes related to communications during these announcements was extremely difficult to assess due to the poor transmission quality of the simulator loudspeaker. During these evaluations, examiners routinely try to maintain a certain distance between themselves and the candidates so as not to interfere with the their freedom of movement within the vicinity of the control boards. However, because of the poor quality of the loudspeaker transmission, it was necessary for the examiners to position themselves as closely as possible to the candidates in order to hear what was being said in regard to plant announcements and directions to plant personnel. The examiners stated to the licensee that it would have been easier to hear the candidates had the simulator loudspeaker not been utilized. The licensee subsequently informed the examination team that communications are not transmitted over a loudspeaker in the control room. The examiners then questioned the appropriateness of the loudspeaker in the simulator. The licensee agreed to evaluate the need for the loudspeaker in the simulator. There were no further questions in this area.

4.0 Summary of Comments Made at Exit Meeting on February 13, 1992

A summary of the examination's activities that occurred during the week were presented and discussed during the exit meeting. The NRC expressed appreciation for the level of effort expended by the training department representatives in accommodating the NRC examination team. This level of effort, which included providing an adequate working area, appropriate reference materials, locked storage capabilities, etc., helped in expediting the review process and the conduct of the exam.

Also discussed were those items as noted above in paragraph 3.

The reference material supplied by the licensee to the NRC for examination preparation was, for the most part, excellent. Most material was well indexed and tabbed which allowed rapid access to specific topics and component information.

Nuclear Regulatory Commission
Operator Licensing
Examination

This document is removed from
Official Use Only category on
date of examination.

U. S. NUCLEAR REGULATORY COMMISSION
SITE SPECIFIC EXAMINATION
SENIOR OPERATOR LICENSE
REGION 1

| | |
|---|---|
| CANDIDATE'S NAME: | |
| FACILITY: | Three Mile Island 1 |
| REACTOR TYPE: | PWR-B&W177 |
| DATE ADMINISTERED: | 92/02/11 |

INSTRUCTIONS TO CANDIDATE:

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires a final grade of at least 80%. Examination papers will be picked up four (4) hours after the examination starts.

| TEST VALUE | CANDIDATE'S SCORE | % | |
|---|---|---|---|
| 100.00 | | % | TOTALS |
| | FINAL GRADE | | |

All work done on this examination is my own. I have neither given nor received aid.

Candidate's Signature

A N S W E R   S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

MULTIPLE CHOICE

001 a b c d ____

002 a b c d ____

003 a b c d ____

004 MATCHING

a ____

b ____

c ____

d ____

MULTIPLE CHOICE

005 a b c d ____

006 a b c d ____

007 a b c d ____

008 a b c d ____

009 MATCHING

a ____

b ____

c ____

d ____

MULTIPLE CHOICE

010 a b c d ____

011 a b c d ____

012 a b c d ____

013 a b c d ____

014 a b c d ____

015 MATCHING

a ____

b ____

c ____

d ____

MULTIPLE CHOICE

016 a b c d ____

017 MATCHING

a ____

b ____

c ____

d ____

MULTIPLE CHOICE

018 a b c d ____

019 a b c d ____

020 a b c d ____

021 a b c d ____

022 a b c d ____

# ANSWER SHEET

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

023 MATCHING

a ____

b ____

c ____

d ____

MULTIPLE CHOICE

024 a b c d ____

025 a b c d ____

026 a b c d ____

027 MATCHING

a ____

b ____

c ____

d ____

028 MATCHING

a ____

b ____

c ____

d ____

MULTIPLE CHOICE

029 a b c d ____

030 a b c d ____

031 a b c d ____

032 a b c d ____

033 a b c d ____

034 a b c d ____

035 a b c d ____

036 a b c d ____

037 a b c d ____

038 a b c d ____

039 a b c d ____

040 a b c d ____

041 a b c d ____

042 a b c d ____

043 a b c d ____

044 a b c d ____

045 a b c d ____

046 MATCHING

a ____

b ____

c ____

d ____

MULTIPLE CHOICE

047 a b c d ____

048 a b c d ____

049 a b c d ____

# A N S W E R  S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 050 | a | b | c | d | ____ | 073 | a | b | c | d | ____ |
| 051 | a | b | c | d | ____ | 074 | a | b | c | d | ____ |
| 052 | a | b | c | d | ____ | 075 | a | b | c | d | ____ |
| 053 | a | b | c | d | ____ | 076 | a | b | c | d | ____ |
| 054 | a | b | c | d | ____ | 077 | a | b | c | d | ____ |
| 055 | a | b | c | d | ____ | 078 | a | b | c | d | ____ |
| 056 | a | b | c | d | ____ | 079 | a | b | c | d | ____ |
| 057 | a | b | c | d | ____ | 080 | a | b | c | d | ____ |
| 058 | a | b | c | d | ____ | 081 | a | b | c | d | ____ |
| 059 | a | b | c | d | ____ | 082 | a | b | c | d | ____ |
| 060 | a | b | c | d | ____ | 083 | a | b | c | d | ____ |
| 061 | a | b | c | d | ____ | 084 | a | b | c | d | ____ |
| 062 | a | b | c | d | ____ | 085 | a | b | c | d | ____ |
| 063 | a | b | c | d | ____ | 086 | a | b | c | d | ____ |
| 064 | a | b | c | d | ____ | 087 | a | b | c | d | ____ |
| 065 | a | b | c | d | ____ | 088 | a | b | c | d | ____ |
| 066 | a | b | c | d | ____ | 089 | a | b | c | d | ____ |
| 067 | a | b | c | d | ____ | 090 | a | b | c | d | ____ |
| 068 | a | b | c | d | ____ | 091 | a | b | c | d | ____ |
| 069 | a | b | c | d | ____ | 092 | a | b | c | d | ____ |
| 070 | a | b | c | d | ____ | | | | | | |
| 071 | a | b | c | d | ____ | | | | | | |
| 072 | a | b | c | d | ____ | | | | | | |

(********** END OF EXAMINATION **********)

# NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.

2. After the examination has been completed, you must sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination. This must be done after you complete the examination.

3. Restroom trips are to be limited and only one applicant at a time may leave. You must avoid all contacts with anyone outside the examination room to avoid even the appearance or possibility of cheating.

4. Use black ink or dark pencil ONLY to facilitate legible reproductions.

5. Print your name in the blank provided in the upper right-hand corner of the examination cover sheet and each answer sheet.

6. Mark your answers on the answer sheet provided. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.

7. Before you turn in your examination, consecutively number each answer sheet, including any additional pages inserted when writing your answers on the examination question page.

8. Use abbreviations only if they are commonly used in facility literature. Avoid using symbols such as < or > signs to avoid a simple transposition error resulting in an incorrect answer. Write it out.

9. The point value for each question is indicated in parentheses after the question.

10. Show all calculations, methods, or assumptions used to obtain an answer to any short answer questions.

11. Partial credit may be given except on multiple choice questions. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK.

12. Proportional grading will be applied. Any additional wrong information that is provided may count against you. For example, if a question is worth one point and asks for four responses, each of which is worth 0.25 points, and you give five responses, each of your responses will be worth 0.20 points. If one of your five responses is incorrect, 0.20 will be deducted and your total credit for that question will be 0.80 instead of 1.00 even though you got the four correct answers.

13. If the intent of a question is unclear, ask questions of the examiner only.

14. When turning in your examination, assemble the completed examination with examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.

15. Ensure all information you wish to have evaluated as part of your answer is on your answer sheet. Scrap paper will be disposed of immediately following the examination.

16. To pass the examination, you must achieve a grade of 80% or greater.

17. There is a time limit of four (4) hours for completion of the examination.

18. When you are done and have turned in your examination, leave the examination area (EXAMINER WILL DEFINE THE AREA). If you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION: 001 (1.00)

An operator is performing a system line-up on the Makeup and Purification System per the normal operating procedure.

Which ONE of the following constitutes a discrepancy that MUST be logged on a DISCREPANCY SHEET per AP 1001G, Procedure Utilization?

a. A valve was found OUT OF POSITION and repositioned with the permission of the Control Room.

b. A valve was located in the plant that is NOT identified on the PRINTS or in any PROCEDURE.

c. A valve was found to have a PACKING leak AFTER repositioning per the lineup.

d. A LOCKED valve was found that required REPOSITIONING by the system lineup.

QUESTION: 002 (1.00)

Which ONE of the following identifies the BACKUP/ALTERNATE power source for Reactor Coolant Pump (RCP) RC-P-1C?

a. The 1A Auxiliary transformer through the 1A 6900V bus

b. The 1B Auxiliary transformer through the 1B 6900V bus

c. The 1B Auxiliary transformer through the 1A 6900V bus

d. The 1A Auxiliary transformer through the 1B 6900V bus

QUESTION: 003 (1.00)

Which ONE of the following describes the response of the Reactor Building Emergency Cooling System if the Reactor Coolant System (RCS) pressure suddenly decreases to 1500 psig during a Loss of Offsite Power?

NOTE:

| | |
|---|---|
| ESAS: | Engineered Safeguards Actuation System |
| RR-P-1A/B: | River Water Pumps |
| RR-V1-A/B: | Reactor Building Emergency Cooling Water pump discharge valves |
| RR-V-3A/B/C: | Reactor Building Emergency Cooler inlet valves |
| RR-V-4A/B/C/D: | Reactor Building Emergency Cooler outlet valves |

| | ESAS BLOCK 1 | ESAS BLOCK 2 |
|---|---|---|
| a. | Close signal: RR-V1-A/B<br>RR-V-3A/B/C<br>RR-V-4A/B/C/D | Start signal: RR-P-1A/B |
| b. | Open signal: RR-V1-A/B<br>RR-V-3A/B/C<br>RR-V-4A/B/C/D | Start signal: RR-P-1A/B |
| c. | Start signal: RR-P-1A/B | Open signal: RR-V1-A/B<br>RR-V-3A/B/C<br>RR-V-4A/B/C/D |
| d. | Start signal: RR-P-1A/B | Close signal RR-V1-A/B<br>RR-V-3A/B/C<br>RR-V-4A/B/C/D |

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| RR-V-4A/B/C/D: | Reactor Building Emergency Cooler outlet valves |

| | ESAS BLOCK 1 | ESAS BLOCK 2 |
|---|---|---|
| a. | Close signal: RR-V1-A/B<br>RR-V-3A/B/C<br>RR-V-4A/B/C/D | Start signal: RR-P-1A/B |
| b. | Open signal: RR-V1-A/B<br>RR-V-3A/B/C<br>RR-V-4A/B/C/D | Start signal: RR-P-1A/B |
| c. | Start signal: RR-P-1A/B | Open signal: RR-V1-A/B<br>RR-V-3A/B/C<br>RR-V-4A/B/C/D |
| d. | Start signal: RR-P-1A/B | Close signal RR-V1-A/B<br>RR-V-3A/B/C<br>RR-V-4A/B/C/D |

QUESTION: 004 (2.00)

MATCH each automatic emergency feedwater pump start condition in column A (CONDITION) with its actuation logic from column B (LOGIC). [0.5 each]

(NOTE: the items in Column B may be used once, more than once, or not at all, and only a single answer may occupy one answer space.)

| Column A CONDITION | Column B LOGIC |
|---|---|
| ______a. Low-Low OTSG level (channels) | 1. 1 of 2 |
| ______b. Loss of Main Feed Pump(s) | 2. 2 of 2 |
| ______c. High Containment press. (channels) | 3. 1 of 3 |
| ______d. Loss of Reactor Coolant Pump(s) | 4. 2 of 3 |
| | 5. 1 of 4 |
| | 6. 2 of 4 |
| | 7. 3 of 4 |
| | 8. 4 of 4 |

QUESTION: 005 (1.00)

With the normal instrumentation lineup per Operations Surveillance S319, which ONE of the following will be affected if pressurizer temperature input (TE-2/2) is lost?

a. Console recorder (LR/1).

b. Charging control valve (MU-V-17).

c. Pressurizer heater cutoff interlock.

d. Remote Shutdown Panel pressurizer level indication.

QUESTION: 006 (1.00)

Plant conditions:

- Reactor power is 5%
- Group 5 rods are at 75%
- Group 6 rods are at 10%
- All safety rods are full out

Which ONE of the following describes how the rod control system responds?

a. Sequence fault initiated by Actual Position Indication (API); sequence inhibit is actuated.

b. Sequence fault initiated by Relative Position Indication (RPI); sequence inhibit is actuated.

c. Group 7 can be withdrawn; Group 7 sequence enabled by Actual Position Indication (API).

d. Group 7 can be withdrawn; Group 7 sequence enabled by Relative Position Indication (RPI).

QUESTION: 007 (1.00)

With the plant in hot shutdown, which ONE of the following automatic actions occur upon an under frequency condition on the #4 and #8 buses of the 230KV substation?

a. All on-site AC power will be supplied by Auxiliary Transformers 1A and 1B.

b. All 230KV line breakers trip on the under frequency condition.

c. Only the tie breakers 1B-02 and 1B-12 to the 500KV substation trip.

d. Only the tie breakers to the Middletown and Jackson substations trip.

QUESTION: 008 (1.00)

Which ONE of the following is the function of the Hydrogen Recombiner System?

a. To maintain post-LOCA containment hydrogen below the flammable 4.0% by volume concentration.

b. To insure that post-LOCA containment hydrogen concentration does not exceed 0.5% by volume.

c. To back up the containment Hydrogen Purge system during post-LOCA conditions.

d. To prevent post-LOCA radiolytic decomposition of water and aluminum-hydrogen reactions.

QUESTION: 009 (2.00)

MATCH the situation in column A (CONDITION) for the turbine bypass valves to the correct bias value in column B (BIAS). [0.5 each]

(NOTE: The items in Column B may be used once, more than once, or not at all, and only a single answer may occupy one answer space.)

| Column A CONDITION | Column B BIAS |
| --- | --- |
| ______a. The reactor and turbine are operating at 20 % power, the turbine bypass valves are closed, and header pressure is 15 psig less than setpoint. | 1. 0 psig<br>2. 10 psig<br>3. 20 psig |
| ______b. The reactor is tripped as indicated by a TRIP CONF light on the Diamond Panel. | 4. 25 psig<br>5. 50 psig |
| ______c. The reactor and turbine are operating, turbine bypass valves are open and the ULD is controlling at 25% | 6. 75 psig<br>7. 100 psig<br>8. 125 psig |
| ______d. The reactor is operating at 20% power, and the main turbine is tripped. | |

QUESTION: 010 (1.00)

A REACTOR startup is in progress when a COMPLETE LOSS of the Secondary Services Closed Cooling Water System (SSCCW) occurs.

Plant Conditions:

- Reactor power is 25%
- Main Turbine load is at 200 MWe
- SSCCW cannot be restored

Which ONE of the following component losses will require a REACTOR shutdown because "long-term" reactor operation cannot be supported?

a. Main turbine generator exciter air cooler.

b. Isolated phase bus duct cooler.

c. Condensate pump oil coolers.

d. House service air compressor coolers.

QUESTION: 011 (1.00)

The Control Room has been evacuated and a cooldown is being performed from the Remote Shutdown Panels (RSPs). All of the Remote Shutdown Transfer Switch Panels (RSTSPs) have been transferred to EMERGENCY.

Which ONE of the following describes the proper operation of plant equipment from the RSP?

a. PZR heaters will TRIP at 80 inches PZR level.

b. ESAS signal will ISOLATE the Intermediate Cooling Water Reactor Building isolation valves (ICV-3 and 4).

c. ESAS signal will CONTINUE to control HPI and LPI equipment.

d. EFW flow control valves (EF-V-30 A-D) will NOT be controlled by the Heat Sink Protection System (HSPS).

QUESTION: 012 (1.00)

Which ONE of the following is the reason that quick operator response to an ATWS is critical?

a. To prevent the loss of Primary to Secondary heat transfer.

b. To prevent exceeding 17% Fuel Cladding Oxidation.

c. To prevent challenges to the pressurizer code safeties.

d. To prevent continued operation if a Safety Limit is violated.

QUESTION: 013 (1.00)

Plant Conditions:

- Plant cooldown in progress per ATP-1210-5 (OTSG Tube Leak / Rupture)
- RCS Temperature = 532°F
- RCS pressure = 950 psig
- BWST level ≈ 21 feet and decreasing
- HPI = injecting

Which ONE of the following is the reason for isolating the ruptured OTSG?

a. To ensure a sufficient inventory to fill the Reactor Building Emergency sump in the event of a LOCA.

b. To ensure adequate time exists for the operator to take action to keep the core covered should an intersystem LOCA occur.

c. To ensure an adequate supply of borated water to maintain the reactor shutdown during the cooldown following a LOCA event.

d. To ensure sufficient makeup to maintain a basic pH in the primary coolant during the cooldown following a small break LOCA.

QUESTION: 014 (1.00)

The Main Feedwater (MFW) line to OTSG B has ruptured.

Plant conditions:

- Reactor Building pressure 5 psig, increasing.
- OTSG B pressure is 575 psig, decreasing rapidly.
- OTSG A pressure is 1010 psig, decreasing slowly.
- OTSG B level is 5 inches on startup range, decreasing rapidly.
- OTSG A level is 50% on operating range, decreasing slowly.

Which ONE of the following describes the operation of the Heat Sink Protection System (HSPS)?

a. Isolates MFW to OTSG B and trips both MFW pumps.

b. Isolates MFW and Emergency FW to OTSG B.

c. Isolates MFW to OTSG B, initiates Emergency FW and actuates level control for OTSG A and B with EF-V-30 A, B, C & D (Emergency FW FCVs).

d. Isolates MFW to OTSG B, initiates Emergency FW and actuates level control for OTSG B with EF-V-30 B&C (Emergency FW FCVs).

QUESTION: 015 (2.00)

Using the attached drawing of the Control Rod Drive Mechanism, MATCH the unidentified components indicated on the drawing with the correct component identified in LIST OF COMPONENTS column below. [0.5 points each]

(NOTE: There is only one correct answer for each unidentified component.)

| UNIDENTIFIED COMPONENT | LIST OF COMPONENTS |
|---|---|
| a.________ | 1. Leadscrew support |
| | 2. Leadscrew nut |
| b.________ | 3. Position indicator assembly |
| | 4. Torque tube |
| c.________ | 5. Thermal barrier assembly |
| | 6. Stator-water jacket assembly |
| d.________ | 7. Leadscrew |
| | 8. Roller nut |

QUESTION: 016 (1.00)

A 40 gpm leak has been discovered on OTSG B. Abnormal Transient Procedure 1210-5 directs the operator to cooldown the plant using both OTSGs.

Plant conditions:

- All RCPs are running
- RCS temperature is 535° F
- RCS pressure is 950 psig

Which ONE of the following is the reason that the plant cooldown would take longer if OTSG B were isolated?

a. Steaming only one OTSG can remove approximately half the decay heat from the primary compared to that which can be removed by steaming two OTSGs.

b. The isolated OTSG becomes a heat source that must be cooled down by heat removal through the steaming OTSG.

c. Voids formed in RCS loop B causes gas binding of RCPs in RCS loop A and would interfere with primary to secondary heat transfer.

d. The tube to shell stresses in the steaming OTSG will become excessive, thereby limiting cooldown because the steaming rate is high.

QUESTION: 017 (2.00)

Plant condition: A total loss of ICS/NNI power has just occurred.

MATCH the Makeup and Purification system valves listed in column A with their fail position listed in column B for this event. [0.5 each]

(NOTE: Answers in column B may be used once, more than once or not at all.)

| | COLUMN A | | COLUMN B |
|---|---|---|---|
| ______ | a. MU-V-3 (Letdown isolation) | 1. | As is |
| ______ | b. MU-V-20 (Seal injection isolation) | 2. | Open |
| ______ | c. MU-V-5 (Letdown isolation) | 3. | Mid position |
| ______ | d. MU-V-4 (Orifice block valve) | 4. | Closed |

QUESTION: 018 (1.00)

CHOOSE ONE of the statement below that describe the condition(s) that have to be met for the BUILDING SPRAY PUMP to automatically start on a large break LOCA.

a. 30 psig pressure in RB (2/3 logic) and start permissive from block 1.

b. 4 psig pressure in RB (2/3 logic) and start permissive from block 1.

c. 30 psig pressure in RB (2/3 logic) and start permissive from block 4.

d. 4 psig pressure in RB (2/3 logic) and start permissive from block 4.

QUESTION: 019 (1.00)

CHOOSE from the functions listed below, the one which CORRECTLY identifies the functions provided by the POWER RANGE Nuclear Instrumentation.

a. High flux trip; Feedwater Pump control; Source range high voltage cutoff; High start up rate rod stop.

b. High flux trip; Feedwater Pump control; Source range high voltage cutoff; Loss of all RCPs in one loop.

c. Loss of all FWPs Trip Bypass; High start up rate rod stop; Loss of all RCPs in one loop; Post accident wide range indication.

d. Loss of all FWPs Trip Bypass; High start up rate rod stop bypass; High flux trip; Source range high voltage cutoff.

QUESTION: 020 (1.00)

Plant Conditions:

- LOCA has occurred
- Loss of Subcooling Margin
- RCPs have been tripped

The operators have been ordered to verify that natural circulation has taken place. IDENTIFY which of the following indications is the BEST indication that natural circulation is taking place.

a. Thot is 557°F, Tcold is 532°F and stable.

b. OTSG levels are leveling out at approximately 75%.

c. OTSGs are steaming, OTSG pressure is 885 psig and stable, Tcold is 532°F and stable.

d. OTSG pressure is 775 psig and decreasing, Tcold is 532°F and stable.

QUESTION: 021 (1.00)

Which of the following is NOT a source of water to the Reactor Building Spray Pumps?

a. Condensate storage tank

b. Borated water storage tank

c. Sodium hydroxide tank

d. Reactor building sump

QUESTION: 022 (1.00)

The TWO sources which can be used for make-up to the hotwell are _______________ and _______________.

CHOOSE the ONE correct answer.

a. Cycle Makeup Pretreatment and Million Gallon Tank

b. Condensate Storage Tank and Reactor River

c. Illinois Water Treatment and Reactor River

d. Illinois Water Treatment and Million Gallon Tank

QUESTION: 023 (2.00)

MATCH the components listed in Column A with their correct response or function listed in Column B.

(NOTE: Answers in Column B may be used once, more than once or not at all.)

| COLUMN A | COLUMN B |
|---|---|
| a._____ Auxiliary boilers | 1. Locally control FW pump speed from 0 - 2600 rpm. |
| b._____ FW-V-1B (discharge valve) | 2. A closure will cause a FW-P-1B trip. |
| c._____ CO-V-9B (FWP suction valve) | 3. Supplies steam during startup/shutdown to the FWPs |
| d._____ MFW pump AIR motor speed changer | 4. Supplies auxiliary steam to the feedwater 10th stage low pressure heaters. |
| | 5. Controls the FW pump turbine speed under ICS control. |
| | 6. Closes following a trip of FW pump 1B |

QUESTION: 024 (1.00)

IDENTIFY which ONE of the following will automatically terminate a radioactive gaseous release.

a. Waste gas compressor trip

b. Low pressure in the waste gas decay tank

c. A trip signal from the Auxiliary and Fuel Handling exhaust fans

d. Low vent header pressure

QUESTION: 025 (1.00)

Using the attached RCS Letdown drawing, IDENTIFY which valve(s) will shut in response to a HIGH radiation (cpm) alarm on RM-L1 (RCS Letdown)

a. MU-V1A/B

b. MU-V2A/B

c. MU-V3

d. MU-V4 & MU-V5

QUESTION: 026 (1.00)

Initial conditions:
- Loss of Offsite Power
- ESAS Actuation signal present

CHOOSE from below the statement that best completes the following sentence. After the diesels load and assuming NO operator action, the battery chargers will ______________________________.

a. supply DC loads as usual

b. be locked out by E.S. 27/86 relays

c. be the only power source available for the inverters

d. have tripped on the AC undervoltage, but may be restarted

QUESTION: 027 (2.00)

MATCH the following Atmospheric Radiation Monitors in Column A with their associated Technical Specification Requirement in Column B.

NOTE: The answers in Column B may be used once, more than once, or not at all.

| COLUMN A | COLUMN B |
| --- | --- |
| a._____ RM-A-6(Aux. Bldg.) | 1. Must be operable whenever there is a vacuum in the main condenser. |
| b._____ RM-A-5(Condenser off gas) | 2. Must be operable during fuel handling operations. |
| c._____ RM-A-14(Aux. Bldg. roof) | 3. Must be operable whenever the ESF system is in operation. |
| d._____ RM-A-9 (RB purge) | 4. Must be operable during gaseous releases via their associated pathways. |

QUESTION: 028 (2.00)

MATCH the components/functions in Column A with their Reactor Coolant System location listed in Column B.

NOTE: Answers in Column B may be used once, more than once, or not at all.

| COLUMN A | COLUMN B |
|---|---|
| a._____ Source of Pressurizer spray flow. | 1. RC-P-1A discharge |
| b._____ Pressurizer Surge line penetration to RCS. | 2. RC-P-1B suction |
| c._____ Normal Letdown line connection to RCS | 3. RC-P-1C suction |
| d._____ Drained down level transmitter tap to the RCS | 4. RC-P-1D discharge |
| | 5. "A" RCS Hot Leg |
| | 6. "B" RCS Hot Leg |

QUESTION: 029 (1.00)

CHOOSE the answer from below which correctly identifies ALL the emergency boration source(s) to the RCS via the Makeup System.

a. BWST (borated water storage tank) and BAMT (boric acid mix tank)

b. BWST and RBAT (reclaimed boric acid tank)

c. BWST

d. BWST and BAMT and RBAT

QUESTION: 030 (1.00)

IDENTIFY which of the following statements is correct regarding the Smart Automatic Signal Selector (SASS) system.

a. If SASS senses one of the parallel instruments changing at 15% per second, it will announce a MISMATCH and an AUTOMATIC transfer will NOT occur.

b. If SASS senses one of the parallel instruments changing at 5% per second, it will announce a MISMATCH and WILL AUTOMATICALLY select the other instrument.

c. If SASS senses one of the parallel instruments SLOWLY changing by more than 3% of full scale away from the other, it WILL AUTOMATICALLY transfer to the most conservative reading instrument and provide an alarm.

d. If SASS senses one of the parallel instruments SLOWLY changing by more than 3% of full scale away from the other, it will announce a MISMATCH and an AUTOMATIC transfer will NOT occur.

QUESTION: 031 (1.00)

The following plant conditions exist:

RPS "D" DC CRD Breakers are open for maintenance
"E" electronic trip is tripped
"F" electronic trip is NOT tripped
VBA has just lost power

CHOOSE from below the rod group(s) that will be dropped into the core

a. None will drop

b. Safety groups 1-4 will drop

c. Regulating groups 5-7 will drop

d. All Safety and Regulating groups will drop

QUESTION: 032 (1.00)

IDENTIFY from below how the readings of the Saturation Margin Meter may be affected by a plant transient, such as a reactor trip caused by a loss of load, and the action the operators should take based on these readings.

a. The Saturation Margin Meter may give an erroneous LOW SCM reading and the operators are cautioned not to take any actions based on these readings until they are sure the instrument is reading properly.

b. The Saturation Margin Meter may give an erroneous HIGH SCM reading and the operators are cautioned not to take any actions based on these readings until they are sure the instrument is reading properly.

c. The Saturation Margin Meter now responds properly due to modifications made during the last outage and the operators may now take all required actions based on its reading.

d. The Saturation Margin Meter may receive an erroneous LOW Th reading from the Safety Grade Wide Range Th RTD and the operators are cautioned not to take any actions based on these readings until they are sure the instrument is reading properly.

QUESTION: 033 (1.00)

The supply fans (AH-E-6A/6B) for the Reactor Building Purge System will automatically shutdown under which of the following conditions.

a. The high temperature setpoint of the high limit thermostat in their supply duct is exceeded.

b. The high temperature setpoint of the high limit thermostat in their discharge duct is exceeded.

c. The high radiation monitor setpoint of the radiation monitor located in the Reactor Building Purge exhaust is exceeded.

d. None of the above.

QUESTION: 034 (1.00)

In the event both Spent Fuel Cooling chains were out of service simultaneously, under design basis conditions, the heat capacity of the water contained in both spent fuel pools is such that approximately ____A____ would elapse before the water in them would ____B____.

CHOOSE from below the answer which most correctly completes the statement above.

| | A | | B |
|---|---|---|---|
| a. | three days | - | begin to boil. |
| b. | 25 hours | - | heat up to approximately 135°F. |
| c. | three days | - | heat up to an excessive temperature (>180°F). |
| d. | 25 hours | - | heat up to an excessive temperature (>180°F) |

QUESTION: 035 (1.00)

During refueling operations, the Fuel Hoist Pendant on the refueling bridge is ____________________.

CHOOSE from below the phrase which correctly completes the above statement.

a. energized only when the grapple is NOT in a slow zone.

b. not operable whenever there is an indication of the grapple being disengaged.

c. capable of controlling the hoist anytime, whether the grapple is in the slow zone or not.

d. used to variably control the speed of the grapple as it approaches the fuel assembly.

QUESTION: 036 (1.00)

A power increase has just occurred in which megawatt power has increased from 60% to 80%. IDENTIFY from below the transient that occurs within the OTSGs in response to this load increase. Assume the ICS is in auto and all automatic actions occurred properly.

a. Nucleate boiling region decreases; film boiling region constant; superheat region increases

b. Nucleate boiling region decreases; film boiling region increases; superheat region increases

c. Nucleate boiling region increases; film boiling region decreases; superheat region decreases

d. Nucleate boiling region increases; film boiling region constant; superheat region decreases

QUESTION: 037 (1.00)

A reactor trip has just occurred. The following plant conditions exist.

- Atmospheric Dump Valves (ADVs) (MS-V-4A/B) are open
- Condenser vacuum 22 inches Hg
- Circulating water pumps, CW-P1A/C, running

SELECT from below the statement which describes why MS-V-4A/B opened.

a. The ADVs opened due to the initial steam pressure transient spike caused by the reactor trip.

b. The ADVs receive automatic control signals on loss of adequate condenser vacuum.

c. The ADVs open on a NORMAL trip to control OTSG pressure at 1010 psig

d. The ADVs open on a NORMAL trip when the OTSG pressure reaches 1026 psig.

QUESTION: 038 (1.00)

The following conditions have just occurred at Unit-1:

- 1D ES Bus = 3700 Vac
- 1E ES Bus = 4160 Vac

CHOOSE from below the expected plant response.

a. No actions occur.

b. EG-Y-1A starts after a 10 second delay; G1-02 feeder breaker closes.

c. EG-Y-1A starts after a 10 second delay; G1-02 feeder breaker remains open.

d. EG-Y-1A starts after a 1.5 second delay; G1-02 feeder breaker remains open.

QUESTION: 039 (1.00)

Plant Conditions:

- LOCA
- Reactor trip and turbine trip
- All ESAS equipment operating normally
- Assume below listed conditions are stable for 30 min.

Which one of the below conditions require piggy back alignment of the Decay Heat and Makeup System?

| | BWST Level | RCS Press. | RB Press. |
|---|---|---|---|
| a. | 8 feet | 275 psig | 6 psig |
| b. | 6 feet | 275 psig | 4 psig |
| c. | 4 feet | 200 psig | 6 psig |
| d. | 3 feet | 200 psig | 4 psig |

QUESTION: 040 (1.00)

The Nuclear Service Closed Cooling Water (NSCCW) system surge tank is pressurized to ________________.

SELECT from below the statement which correctly completes the above sentence.

a. provide NPSH to NS-P-1A/B/C

b. fill portions of the system at elevations higher than the surge tank

c. prevent cross-connecting the Decay Closed Cooling Water systems with NSCCW

d. ensure any system leakage is into the Reactor Building and not from the Reactor Building into the NSCCW during any phase of a maximum LOCA.

QUESTION: 041 (1.00)

The plant is at 98% power and you notice control rod group 7 is withdrawing.

- neutron error is +0.5
- Main Annunciator Panel Alarm G-2-2, CRD Sequence Fault, is lit
- A fault lamp is lit on the CRD operator's panel

CHOOSE from below what these symptoms are indicative of.

a. Tave error with Tave being low

b. Feedwater to reactor crosslimit

c. Motor fault

d. Sequence fault

QUESTION: 042 (1.00)

The following plant conditions exist:

- The reactor is at 100% power
- The full-length control rod at the core center (H-8) was discovered to be at only 5% withdrawn
- The rest of the group is fully withdrawn
- No asymmetric rod alarm was received for this rod
- It is not known how long the rod was inserted
- Attempts to move the rod +/- 1 percent are successful as evidenced by incore flux measurements

CHOOSE the proper method to recover the rod:

a. Immediately withdraw the rod in a continuous pull to match its group average while maintaining power constant.

b. Reduce power to 60%, realign the rod, and return to 100% power at 10% power per hour.

c. Reduce power to 60%, and withdraw the rod in steps of 3% each hour until it is realigned with its group.

d. Reduce power to 60%, realign the rod, and return to 100% power at 3% power per hour.

QUESTION: 043 (1.00)

Plant conditions:

- The plant has just tripped on Low RCS pressure
- Subcooling Margin is 0° F
- RCS pressure is 500 psig and continuing to drop rapidly
- Core Flood Tank pressure is 525 psig and decreasing
- The following ESAS signals have automatically initiated
    - 1600 psi (RCS pressure)
    - RB 4 psi
    - RB 30 psi
    - 500 psi (RCS pressure)

ATOG actions up through ATP 1210-2, Loss of Subcooling Margin, have been completed. IDENTIFY the next ATOG procedure to be entered:

a. ATP 1210-4, Lack of Primary to Secondary Heat Transfer

b. ATP 1210-6, Small Break LOCA Cooldown

c. ATP 1210-7, Large Break LOCA Cooldown

d. ATP 1210-8, RCS Superheated

QUESTION: 044 (1.00)

ATP 1210-7, Large Break LOCA Cooldown, requires that the Main Steam Isolation Valves (MS-V-1A,B,C,D) be closed

CHOOSE from below the reason for shutting these valves:

a. Minimize OTSG tensile tube stress

b. Prevent steam line water hammer

c. Provide containment integrity

d. Help maintain RCS inventory by minimizing the cooldown rate

QUESTION: 045 (1.00)

The following data is observed on Reactor Coolant Pump 1A (RC-P-1A):

- Number one Seal Leak-off flow = 1.8 gpm
- Periodic motor stand vibration alarms occurring - however the alarm can be reset without immediately alarming again
- Bently-Nevada vibration reading range between 14 and 18 mils
- Number one Seal leak-off temperature = 168°F
- Radial Bearing temperature = 170°F
- High Standpipe level alarm present

IDENTIFY the situation below which could cause the above indications:

a. Number One Seal abnormally open

b. Number Two Seal abnormally open

c. Number Three Seal abnormally open

d. High Seal injection flow

QUESTION: 046 (2.00)

MATCH the following RCP failures in Column A with their required Immediate Manual Action in Column B: [0.5 each]

(NOTE: The Answers in Column B may be used once, more than once, or not at all)

| A | | B |
|---|---|---|
| ______a. No. 2 Seal Failure | 1. | Start oil lift system on affected pump; Commence a normal plant shutdown; Stop all RCPs as soon as possible; Determine cause and repair |
| ______b. Loss of RCP NSCCW | 2. | Commence plant shutdown; Secure affected pump |
| ______c. Reverse rotation | 3. | Verify auto start of D.C. oil lift pump or manually start; If radial bearing > 185°F or thrust bearing > 195°F, reduce Rx. power to 50-75 % and trip affected RCP |
| ______d. Dropped impeller | 4. | If motor stator > 302°F OR motor radial bearing > 185°F OR motor thrust bearings > 195°F, reduce Rx. power to 50-70 % and trip affected pump. |
| | 5. | Reduce Rx. power to 50-70 % and secure the affected pump within 24 hours |

QUESTION: 047 (1.00)

The plant is in cold shutdown with the "A" loop of the Decay Heat Removal System in operation.

Plant conditions are as follows:

- DH-P-1B out of service for maintenance
- RCS temperature increasing
- RCS level decreasing
- RB Sump alarm cycling on more frequently
- High Decay Heat injection flow alarm (3300 gpm)

Based upon the above indications which of the following IMMEDIATE manual actions would be appropriate?

a. Isolate RCS letdown DH-V-12A and open DH-V-5A (BWST suction).

b. Stop DH-P-1A and investigate the cause of the above indications.

c. Decrease Decay Heat Removal injection flow by throttling down DH-V-19A and increase DHCCW flow to DH-C-1A (Decay Heat Removal Cooler).

d. Open DH-V-5A (BWST suction) and establish flow through the discharge cross connect valves and the "B" loop injection nozzle

QUESTION: 048 (1.00)

Following a reactor trip it is noted that Rod 5-3 is stuck at 100% withdrawn.

IDENTIFY which of the following actions is required for this situation.

a. Initiate High Pressure Injection

b. Emergency borate

c. Initiate the immediate actions of EP 1202-08, CRD Equipment Failures-CRD Malfunction Action, for a stuck rod.

d. Take Hand control of the FW regulating valves and control to the proper OTSG level.

QUESTION: 049 (1.00)

IDENTIFY from below the event which could possibly lead to a Pressurized Thermal Shock (PTS) accident of the reactor vessel if the operator fails to respond properly.

a. Loss of RCS subcooling margin

b. Excessive RCS cooling

c. Lack of primary to secondary heat transfer

d. RCS superheat

QUESTION: 050 (1.00)

The plant was escalating in power and was at 75 % power prior to an automatic reactor trip on low pressure. The following conditions and indications are present:

- RCS pressure 1690 psig
- RB pressure [illegible] psig and increasing
- RCS pressure decrease rate = 30 psig per minute
- Cooldown rate > 100° F
- MU-P-1A and MU-P-1C have been started
- HPI flow = 900 gpm total
- Pressurizer level = 91 inches
- All RCPs operating
- Thot "A" loop = 538°F
- Tcold "A" loop = 530°F
- Thot "B" loop = 537°F
- Tcold "B" loop = 501°F
- Time = + 8 minutes since event initiation
- "A" OTSG pressure = 900 psig and slowly decreasing
- "B" OTSG pressure = 670 psig and decreasing
- "A" and "B" OTSG levels = 30 inches (Startup Range)
- Main Feedwater flows - "A" side = 0.0 E6 lbm/hr
  "B" side = 0.0 E6 lbm/hr

CHOOSE from below the required Immediate Action which has to be taken based on the above indications.

a. Trip a RCP

b. Trip the Main Feedwater pumps

c. Isolate "A" OTSG

d. Isolate "B" OTSG

QUESTION: 051 (1.00)

The following are conditions at 90% reactor power:

| | | |
|---|---|---|
| CO-P-1A = ON | CO-P-2A = ON | FW-P-1A = ON |
| CO-P-1B = ON | CO-P-2B = ON | FW-P-1B = ON |
| CO-P-1C = PTL | CO-P-2C = OFF | |

Assume that CO-P-1B has tripped one second ago. IDENTIFY the plant/operator response by choosing the correct statement below.

a. CRO must start CO-P-1C

b. One booster pump will trip

c. One main feed pump will trip

d. One booster pump and one main feed pump will trip

QUESTION: 052 (1.00)

The plant experienced a reactor/turbine trip from 100 % power 2 minutes ago. Current plant conditions are:

- #4 and #8 230 KV Buses = 0 volts.
- The main generator breaker amber and green indicating lights illuminated and the red light is off.
- 1D and 1E 4160V buses = 0 volts.

IDENTIFY from below which event the unit has just experienced.

a. Load Rejection

b. Station Blackout

c. Loss of Offsite Power

d. Degraded Grid

QUESTION: 053 (1.00)

IDENTIFY which of the following vital 120 Vac feeds also serves as an alternate feed to Panel ATA (ICS/NNI power source).

a. Panel ATB through manual transfer switch

b. Regulated power panel, TRA, through static transfer switch

c. Regulated power panel, TRB, through manual transfer switch

d. Regulated power panel, TRB, through static transfer switch

QUESTION: 054 (1.00)

The following plant conditions exist:

- ESAS actuation SIMULTANEOUSLY with a station blackout
- No operator actions have been completed

Based upon the above conditions, the power input(s) to the Vital AC electrical system inverters will:

CHOOSE the best answer.

a. be isolated from the AC power source until manually reset.

b. switch to station batteries until manually reset.

c. switch to station batteries until the ES signal clears.

d. switch to station batteries until AC power is restored.

QUESTION: 055 (1.00)

IDENTIFY from below the ONE option which is available for disposing of the evaporator condensate in the Waste Evaporator Condensate Storage Tanks WITHOUT Plant Operations Director approval.

a. Transfer to the Reclaimed Water Storage Tank of the Chemical Addition System.

b. Transfer to the Reactor Coolant Bleed Tanks for re-use in the primary system or for storage.

c. Transfer to the Reactor Coolant Drain Tank for re-use in the primary system or for storage.

d. Discharge to the effluent of the Mechanical Draft Cooling Towers.

QUESTION: 056 (1.00)

Which one of the following will automatically terminate a radioactive liquid release by closing WDL-V-257 (Waste Evaporator Condensate Storage Tank release isolation valve)?

a. Waste Evaporator Condensate Storage Tank pumps (WDL-P-14A/B) trips.

b. High release rate as measured on FR-84 (Liquid Release Flow Recorder).

c. Mechanical Draft Cooling Tower effluent flow increases to > 5000 gpm.

d. RM-L-7 (station effluent radiation monitor) interlock switch taken to DEFEAT during the release.

QUESTION: 057 (1.00)

You are the Shift Foreman. It has just been reported to you that the Sprinkler System in the Air Intake Structure is inoperable. Per the enclosed AP 1038, Administrative Controls - Fire Protection Program, you are REQUIRED to ____________________.

CHOOSE from below the phrase which correctly completes the above statement.

a. establish a continuous fire watch, with backup fire suppression equipment, within one hour.

b. establish within one hour a once-per-hour fire watch patrol.

c. perform an immediate surveillance of the fire suppression system in the area to determine its' operability.

d. take no immediate action since a firewatch is not required in the air intake structure.

QUESTION: 058 (1.00)

As part of the Refueling Bridge interlock test surveillance procedure, the operators are required to move a fuel assembly in order to test the Fuel Hoist Fast and Slow Zones Over Core interlocks.

IDENTIFY which of the following statements CORRECTLY describe the requirements for Containment Integrity during this test.

a. Containment Integrity IS NOT required because Reactor Building Exhaust ventilation would be required to be running and would ensure that any contaminants resulting from an accident would be exhausted through the exhaust filtering system.

b. Containment Integrity IS NOT required because the fuel assembly is only removed from the core and then promptly reinserted in the same location. The movement of this fuel assembly therefore does not constitute a core alteration or geometry change.

c. Containment Integrity IS required because the refueling bridge interlock test surveillance procedure requires containment integrity to be established during all refueling bridge interlock testing.

d. Containment Integrity IS required because any movement of irradiated fuel is considered a core geometry change and a core alteration by the plant Technical Specifications.

QUESTION: 059 (1.00)

The Caution in the Reactor Coolant Pump Trip Criteria Rule states in part:

"If 25°F subcooling margin is lost and all operating RCPs are NOT tripped within ten (10) minutes, leave one RCP per loop on for at least two hours."

IDENTIFY the consequences of NOT running one RCP per loop for two hours as the Caution states:

a. When the RCPs are shutdown, phase separation will occur which could result in steam binding of the RCPs.

b. Heat provided by the RCP provides for a more controlled cooldown and thereby reduces a possible Pressurized Thermal Shock (PTS) violation.

c. Insufficient boron mixing will occur and as inventory is lost, a reactivity excursion could occur.

d. Circulation of the two phase mixture will cease, which could lead to core uncovery.

QUESTION: 060 (1.00)

Plant Conditions:

- The unit has just finished a power change from 15% to 40%
- RM-L-1 (RC Letdown) has increased to the alert setpoint.
- Chemistry analysis indicates 5.0 µci/ml Dose EQ. I-131.

IDENTIFY the Immediate Action(s), if required, for the above condition.

a. No action is required since Iodine spikes are not unusual for power increases.

b. No action is required since RM-L-1 has closed MU-V-2A & B and readings from RM-L-1 should only be monitored to determine if any Emergency Action Levels (EALs) have been exceeded.

c. Monitor RM-A5 channel for possible increase and resample to verify the results of the initial sample.

d. Make a page announcement to indicate there is high activity in letdown and to send all unnecessary personnel in the Aux. Building to the H.P. Checkpoint.

QUESTION: 061 (1.00)

An automatic reactor trip has occurred. Approximately two minutes after the trip the following indications are present in the Control Room.

- RCS pressure is 1675 psig and stable
- Subcooling Margin is 30°F in both loops
- Pressurizer level is at 25 inches
- OTSG steam pressure is 870 psig in both steam generators
- RB pressure is at 0.1 psig
- T hot is 539°F
- T cold is 532°F
- Second Makeup pump has been started and MU-V-217 is open
- Main Feedwater flow is 0.0 x E6 lbm/hr to each OTSG
- Both OTSG levels are approximately 90 inches on the startup range and stable

Based on the above conditions, IDENTIFY which one of the following actions MUST be taken.

a. Control Main Feedwater flow to the OTSGs

b. Manually initiate HPI

c. Secure Letdown

d. Take NO action at this time

QUESTION: 062 (1.00)

Following a reactor trip, ICS fails to control Main Feedwater. Operators have attempted to manually control Main Feedwater without success.

IDENTIFY, from below, the point where both Main Feedwater Pumps should be tripped:

a. Immediately upon discovering that the operator is unable to manually control Main Feedwater.

b. Not until at least one OTSG level is greater than 90% but less than 97.5%

c. Not until at least one OTSG level reaches 97.5%

d. Only if RCS temperature crosses [illegible] OV. COOLING line on the Pressure-Temperature plot.

QUESTION: 063 (1.00)

Plant conditions:

- RCS pressure is 2125 psig and slowly decreasing
- Acoustic monitor for RC-RV-2, G-1-7, is in alarm
- RC drain tank level is slowly increasing
- RC drain tank temperature is 120°F
- DPI-921 (discharge differential pressure indicator for RC-RV-2) is 20 psig
- DPI-922/923 (DPI for RC-RV-1A and 1B) is 0 psig
- Backup Pressurizer Heaters, BK1, BK2 and BK3, indicate full on

IDENTIFY from below which event is taking place based upon the above conditions.

a. Failure of all Backup Pressurizer Heaters to energize at setpoint.

b. Pressurizer Spray valve RC-V-1 has failed open.

c. The PORV is leaking.

d. Pressurizer Code Safety Valve(s) has(have) failed open.

QUESTION: 064 (1.00)

The plant is at 100 % power, when RC3A-PT1 (Narrow Range RC Pressure Transmitter for "A" loop) instantaneously fails high. Based on this failure, which of the following automatic actions will take place?

CHOOSE the correct answer from below.

a. The "C" RPS cabinet will trip on the high failure.

b. The "A" RPS cabinet will trip on the high failure.

c. The "A" RPS cabinet will trip on the high failure and the Spray Control Valve, RC-V-1, will open.

d. SASS will select the alternate instrument for "A" RPS cabinet and for monitoring and controlling RCS pressure.

QUESTION: 065 (1.00)

During a Small Break LOCA cooldown, it is preferable to make up to the BWST rather than shift suction to the Reactor Building Sump while the HPI pumps are on running.

CHOOSE from below the reason for preferring BWST make up rather than swapping suction to the RB sump.

a. May have to use "piggy back" operation with LPI/HPI

b. May not have adequate NPSH for HPI pump.

c. May not have adequate inventory in the RB sump.

d. May damage the HPI pumps with debris from the sump.

QUESTION: 066 (1.00)

Plant Conditions:

- Reactor power is 100%
- Normal Make up system alignment
- Make up tank level is INCREASING about 1 inch per minute
- Pressurizer level in DECREASING about 2 inches per minute
- Letdown flow has been constant at 45 gpm
- Tave has been constant at 579°F

Given the above conditions, IDENTIFY which one of the following problems exist.

a. MU-P-1B, normally aligned Make up pump, has tripped

b. MU-V-32, seal injection control valve, has failed closed

c. MU-V-17, RCS injection control valve, has failed closed

d. MU-V-4, Letdown control valve, has failed open

QUESTION: 067 (1.00)

The plant is in cold shutdown with the "A" loop of the Decay Heat Removal System in operation.

The following indications are present in the control room.

- RCS temperature increasing
- Low flow alarm on Decay Heat flow received
- Discharge pressure on DH-P-1A is oscillating
- Motor amps on DH-P-1A are unstable

Based on the above indications, IDENTIFY which of the following is the appropriate IMMEDIATE action to take.

a. Shift to the alternate Decay Heat Removal string

b. Open DH-V-5A (BWST suction)

c. Trip DH-P-1A and investigate the cause for unstable pump amps and pressure

d. Align Make up pump to provide cooling to the RCS

QUESTION: 068 (1.00)

During a reactor startup when the Intermediate Range (IR) instruments come on scale the overlap between the IR and the Source Range (SR) instrumentation ______________________________.

CHOOSE from below the phrase which correctly completes the above statement.

a. shall occur prior to going critical

b. shall occur prior to withdrawing Regulatory Group 6

c. shall be greater than or equal to one decade

d. is required in order to provide redundancy in monitoring capability when approaching the ECP.

QUESTION: 069 (1.00)

The Intermediate Range (IR) instrumentation provides a high voltage cutoff and reset signal to the Source Range (SR) detectors when certain conditions of the IR instrumentation are satisfied.

CHOOSE from below the answer which correctly identifies the conditions under which the IR (A) cuts off the high voltage to the SR detectors and (B) resets the high voltage to the SR detectors.

a. (A) High voltage to the Source Range detectors is cutoff when both IR instruments are E-9 amps. (B) IR instrumentation resets high voltage to the SR detectors when one IR instrument is 5 E-10 amps.

b. (A) High voltage to the Source Range detectors is cutoff when one IR instrument is E-9 amps. (B) IR instrumentation resets high voltage to the SR detectors when both IR instruments are 5 E-10 amps.

c. (A) High voltage to the Source Range detectors is cutoff when both IR instruments are 5 E-10 amps. (B) IR instrumentation resets high voltage to the SR detectors when one IR instrument is E-9 amps.

d. (A) High voltage to the Source Range detectors is cutoff when one IR instrument is 5 E-10 amps. (B) IR instrumentation resets high voltage to the SR detectors when both IR instruments are E-9 amps.

QUESTION: 070 (1.00)

The plant is at 100% power when the following alarms are received simultaneously:

- A-1-7 Battery 1A Discharging
- A-2-7 Batt Chgr 1A/1C/1E Trouble
- A-3-7 Invertor 1A/1C/1E Trouble
- PRF-1-1 CRDM Breaker Test / Trouble
- NN-3-1 230 KV Substation Trouble
- AA-3-2 7KV Bus Trouble
- AA-3-3 4KV Bus Trouble
- AA-3-5 480V BOP Bus Trouble

IDENTIFY which of the following is an action required to be IMMEDIATELY performed by an operator.

a. Close the DC tie switches to provide an alternate source of DC power.

b. Manually trip the generator exciter breaker.

c. Transfer the A, C and E Invertor loads to the regulating transformers.

d. Reduce power to within the reduced capability of the condensate system.

QUESTION: 071 (1.00)

From the list below, SELECT the detector which will start a MAP-5 iodine sampler.

a. RM-A-2 (REACTOR BUILDING)

b. RM-A-4 (FUEL HANDLING BUILDING EXHAUST)

c. RM-A-5 (CONDENSER OFFGAS)

d. RM-A-6 (AUXILIARY BUILDING VENT EXHAUST)

QUESTION: 072 (1.00)

Plant conditions:

- Instrument Air pumps 1A-P-1A and B and 1A-P-4 have failed.
- Both Service Air Compressors have failed.

SELECT from below the source of air, if any, for the Turbine Driven Emergency Feedwater Pump steam inlet valves, MS-V-13A (B).

a. 1A-P-2A

b. 1A-P-2B

c. 2 hour Bottle back up air supply

d. There is NO back up air supply for these valves.

QUESTION: 073 (1.00)

SELECT from below the one step which is NOT an Immediate Manual Action per EP 1202-36, Loss of Instrument Air, when responding to a Loss of Instrument Air (IA) event.

a. Verify locally that backup instrument air compressors (IA-P-2A/B) are operating and, if not, attempt to start them.

b. Open IA-Q-2 bypass valve IA-V-2131.

c. Trip reactor when instrument air pressure for Primary and/or Secondary Plant drops to < 60 psig.

d. As necessary, take local manual control of MU-V-20 in the open position to prevent loss of RCP seal injection.

QUESTION: 074 (1.00)

The various Pressurizer Level indications ALL disagree by more than 12 inches. The span between the highest indication and the lowest indication is 48 inches.

CHOOSE the instrumentation that should be used to control pressurizer level until the problem can be resolved.

a. Use the highest indication.

b. Use the lowest indication.

c. Use both the highest and lowest indications.

d. Use the average of the highest and lowest indications.

QUESTION: 075 (1.00)

The plant was initially at 100% power when a loss of offsite power occurred, which led to a reactor/turbine trip.

IDENTIFY which of the following describes the relationship between ATP 1210-1 (Reactor/Turbine Trip) and EP 1202-2 (Loss of Offsite Power)?

a. EP 1202-2 is the lead procedure.

b. EP 1202-2 is referred to in ATP 1210-1 and both are applicable.

c. After EP 1202-2 is referenced in ATP 1210-1, then EP 1202-2 becomes the controlling procedure.

d. ATP 1210-1 must be completed prior to using any other procedure.

QUESTION: 076 (1.00)

During refueling operations, while loading a new fuel assembly into the core, the fuel assembly stops at approximately TWO (2) inches above the full down ZZ tap reading with a "fulldown" load cell indication. This is an indication that ______________.

CHOOSE from below the statement which describes the event which has taken place.

a. the moving fuel assembly has hung up with the SIXTH grid of an adjacent previously seated fuel assembly

b. the moving fuel assembly has hung up with the FIRST grid of an adjacent previously seated fuel assembly

c. the moving fuel assembly is probably resting upon the reactor internals lower grid

d. the moving fuel assembly is fully seated since the ZZ tape readings can have as much as a ± 2 inch variance in reading

QUESTION: 077 (1.00)

CHOOSE from below the statement which CORRECTLY identifies the administrative controls applicable to equipment which has been tagged with a BLUE TAG.

a. Maintenance shall NOT, under any circumstances, be performed with the equipment energized or operated

b. Maintenance may be performed by ONE or MORE parties at one time, provided each party has received clearance from the Switching and Tagging CRO.

c. Equipment may have its operational condition/state (i.e., energized, de-energized / opened, closed) changed but ONLY after the employee in charge of the work party has NOTIFIED the Operations Department

d. Maintenance may be performed by only ONE party at a time

QUESTION: 078 (1.00)

An individual turned 20 years old on January 1, 1991, and that individual began working at TMI-1 the same day. This individual has an NRC Form-4 on file with no previous occupational exposure prior to January 1, 1991. The following is a

record of the individual's whole body dose history from January through October, 1991:

| Month | Dose |
|---|---|
| January | 900 mrem |
| February | 860 mrem |
| March | 1230 mrem |
| April | 810 mrem |
| May | 760 mrem |
| June | 800 mrem |
| July | 1000 mrem |
| August | 910 mrem |
| September | 830 mrem |
| October | 700 mrem |

CHOOSE from below the MAXIMUM whole body dose the individual could have received for the rest of 1991 without exceeding any 10CFR20 Federal limits?

a. 550 mrem

b. 1200 mrem

c. 1800 mrem

d. 2300 mrem

QUESTION: 079 (1.00)

The reactor is in Cooldown Mode. RCS pressure is 325 psig, Tave is 220°F and RB pressure is 2 psig. IDENTIFY which of the following valves is in a position which would require that the operators enter an ACTION statement for an applicable LCO for this mode of operation.

a. MU-V-217 (makeup bypass valve) and MU-V-16 A/B/C/D (HPI isolation valves) are closed.

b. RC-V-2 (PORV Block Valve) is closed.

c. DH-V-41 (Decay Heat isolation valve) is open.

d. AH-V-1A (Reactor Building purge valve) is 50% open.

QUESTION: 080 (1.00)

IDENTIFY from below the reason why during a plant startup, air is purged from the generator with $CO_2$ prior to adding hydrogen ($H_2$).

a. The $CO_2$ reduces the possibility that a potentially explosive mixture of air and hydrogen will occur.

b. Prevents moisture formation caused by mixing air with $H_2$ in the generator which would be potentially corrosive to the generator windings.

c. A combination of $CO_2$ and $H_2$ has better heat transfer characteristics than does a mixture of air and $H_2$.

d. The $CO_2$ absorbs any moisture which may be present in the generator prior to adding $H_2$.

QUESTION: 081 (1.00)

Control Room Operators (CROs) are permitted to take reasonable action that departs from a license condition or Technical Specifications when such actions are done to protect the public health and safety and no action consistent with license conditions and Technical Specifications are adequate PROVIDED that:

IDENTIFY from below the criteria under which a CRO may take actions contrary to Technical Specification or plant procedures.

a. if in the judgement of the CRO such action is necessary for the public health and safety.

b. the approval of the Shift Supervisor or Shift Foreman is obtained prior to taking the action.

c. the approval of the Director, TMI-1, is obtained prior to taking the action.

d. the NRC is notified that such action is going to be taken.

QUESTION: 082 (1.00)

Which one of the following methods is the CORRECT way to determine if the working copy of a procedure you are using is current?

a. Verify that the revision on the Cover Sheet of the working copy is the same revision as that listed on the cover sheet of the Control Room controlled copy of the procedure.

b. Verify that the date of the working copy of the procedure is within two years of today's date.

c. Verify that the date on the Cover Sheet of the working copy is the same date as that listed in the Procedure Index Report located in the Operations Office area files.

d. Verify that the revision on the Cover Sheet of the working copy is current by calling the TMI Information Management Center Manager, or someone on his staff, and requesting the most current revision number for that procedure.

QUESTION: 083 (1.00)

Repainting of the "A" Emergency Diesel Generator is in progress. Workmen have started bringing in cans of paint they will use and are stacking them in a corner of the "A" Diesel Generator Room. Which ONE of the following requirements MUST be met before the paint can be stored in the "A" Diesel Generator Room area?

a. A portable CO2 fire extinguisher must be pre-staged next to the location of the cans of paint or a one hour fire watch established.

b. A safety evaluation and approval by the Fire Protection Engineer is required prior to storing the paint in the "A" Diesel Generator Room.

c. A safety evaluation performed by the Fire Protection Engineer MUST be reviewed and approved by the Plant Operations Director prior to storing the paint in the "A" Diesel Generator Room.

d. A safety evaluation performed by the Fire Protection Engineer MUST be reviewed and approved by the Plant Materiel Manager prior to storing the paint in the "A" Diesel Generator Room.

QUESTION: 084 (1.00)

You are on a midnight shift plant tour and are walking through the Aux. Building near the Neutralizer Mix Tank. Suddenly a caustic addition line to the tank springs a leak and sprays liquid on your face and chest. Which ONE of the following actions should be performed FIRST?

a. Immediately report to the Control Room to report the spill.

b. Immediately report to the medical department to receive first aid.

c. Immediately try and isolate the leak.

d. Immediately go to the nearest eyewash station to flush your eyes with water.

QUESTION: 065 (1.00)

An inadvertent Safety Injection results in fluid discharge into the Reactor Building. The Shift Supervisor has determined that the NRC must be notified within one hour. Which ONE of the following communication systems is the PRIMARY method of notifying the NRC?

a. Notification Line (DLM-6)

b. Health Physics Network (HPN) Line

c. Emergency Notification System (ENS) Line

d. Commercial telephone lines

QUESTION: 086 (1.00)

For a 21 year old individual, with an NRC Form 4, who had no previous exposure to occupational radiation, IDENTIFY which of the following practices is an example of the principle of maintaining radiation exposures "as low as reasonably achievable" (ALARA) based on Federal exposure limits

a. Limiting the dose to the skin of the whole body to 7.5 Rem/qtr.

b. Limiting the dose to the feet and ankles to 18.75 Rem/qtr.

c. Limiting the dose to the whole body to 6 Rem/yr.

d. Limiting the cumulative dose to the whole body to 5(N-18), where N = the individual's age in full years.

QUESTION: 087 (1.00)

IDENTIFY which item below is required to be entered into the Shift Foreman's Log.

Assume the plant is operating at 10% power.

a. Personnel entry into the D-rings.

b. The manual stopping of SR-P-1C (Secondary Service Water Pump) for normal maintenance concurrent with the manual starting of SR-P-1B.

c. An Aux. operator who burned his hand slightly during his rounds.

d. The start and stop times of a planned radioactive liquid release.

QUESTION: 088 (1.00)

Shutdown Bypass has just been initiated by the CROs during a shutdown.

IDENTIFY from below which item best describes the logging requirements for this situation.

a. There are no logging requirements since this action was done per procedure.

b. It MUST be logged in BOTH the CRO's and Shift Foreman's log books.

c. It MUST be logged in the CRO's log book and MAY be logged in the Shift Foreman's log book.

d. It MUST be logged in the Shift Foreman's log book and MAY be logged in the CRO's log book.

QUESTION: 089 (1.00)

The plant is shutdown for a refueling outage. The RCS pH is LOW and out of specification which requires that corrective action be taken.

IDENTIFY from below the general steps that would be used to correct this condition.

a. Place the RCS on cleanup through the non-lithium saturated precoat filter.

b. Add boron to the RCS via the suction of the Decay Heat pump.

c. Add lithium to the RCS via the Decay Heat pump suction.

d. Add hydrazine to the RCS via the Decay Heat pump suction.

QUESTION: 090 (1.00)

The heat detector in the EG-Y-1A Diesel room is out of service.

IDENTIFY from below the response required, if any, to compensate for loss of this detector.

a. Station a CONTINUOUS fire watch in EG-Y-1A diesel room within one hour.

b. Establish a fire watch patrol to inspect the diesel room at least once per hour.

c. Declare EG-Y-1A out of service and follow the applicable Technical Specification time clock.

d. No action is required.

QUESTION: 091 (1.00)

An Unusual Event is declared per the Emergency Plan.

Using AP 1044, IDENTIFY the category under which this would be reportable.

a. ONE hour notification under Immediate Notifications

b. FOUR hour notification under Immediate Notifications

c. Licensee Event Report

d. TWENTY FOUR hour notification

QUESTION: 092 (1.00)

IDENTIFY which statement below gives the bases for the following step in ATP 1210-8, RCS Superheated.

"When Incore Thermocouple temperatures are beyond curve C (Tclad > 1800°F), all available RB cooling fans (AH-E-1s) should be run."

a. Provides adequate containment cooling.

b. Protects the containment from overpressure.

c. Used only when the Building Spray system is not available.

d. Promotes mixing of the RB atmosphere.

(********** END OF EXAMINATION **********)

ANSWER: 001 (1.00)

b.

REFERENCE:

TMI-1 Objective: V.A. 03.08
TMI: AP-100G, Rev. 26, Enclosure I, page E1-1
NRC RO exam administered 8/26/91, ques. 4

[3.6/3.7]

194001A101 ..(KA's)

ANSWER: 002 (1.00)

c.

REFERENCE:

TMI-1 Objective: IV.A.05.10
TMI-OPM: Primary Systems, Section B-2, Rev. 3, page 16
TMI-OPM: Electrical Systems, Section A-1, Rev. 4, page 88
NRC RO exam administered 8/26/91, ques. 17

[3.1/3.1]

003000K201 ..(KA's)

ANSWER: 003 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.A.17.08
TMI-OPM: Primary Support Systems, Rev. 5, page 7, Section V.C.b.
NRC RO exam administered 8/26/91, ques. 24

[4.1/4.3]

022000A301 ..(KA's)

ANSWER: 004 (2.00)

a. 6 [0.5]
b. 2 [0.5]
c. 6 [0.5]
d. 8 [0.5]

REFERENCE:

TMI-1 Objective: IV.C.05.11
TMI-OPM: Secondary Support Systems, I-1, Rev. 6, Page 4, Section V.A.2
NRC RO exam administered 8/26/91, ques. 29
[4.2/4.2]

061000A301 ..(KA's)

ANSWER: 005 (1.00)

d.

REFERENCE:

TMI-1 Objective: IV.E.09.07
TMI-OPM: Primary & Secondary Instrumentation & Control, F-5, Rev. 6, pages 5/6, Section V.Ah/1; page 11, F 10
OPS Surveillance S-319
NRC RO exam administered 8/26/91, ques. 39

[3.0/3.3]

011000K404 ..(KA's)

ANSWER: 006 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.E.13.16
TMI-OPM: Primary & /secondary Instrumentation & Control, F-1, Rev. 0, pages 50 & 64
NRC RO exam administered 8/26/91, ques. 42

[3.4/3.7]

014000K406 ..(KA's)

ANSWER: 007 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.G.01.04
TMI-OPM: Electrical Systems, A-1, Rev. 5, page 58
NRC RO exam administered 8/26/91, ques. 50

[3.1/3.4]

062000A204 ..(KA's)

ANSWER: 008 (1.00)

a.

REFERENCE:

TMI-1 Objective: IV.B. 2.01
TMI-OPM: Primary Support Systems, C-8, page 4, Section III.1 & III.2
NRC RO exam administered 8/26/91, ques. 54

[3.4/3.8]

028000A101 ..(KA's)

ANSWER: 009 (2.00)

a. 6 [0.5]
b. 8 [0.5]
c. 6 [0.5]
d. 2 [0.5]

REFERENCE:

I-1 Objective: IV.E.27-48, 49
TMI-OPM: Primary & Secondary I & C: Section F-3, page 29
NRC RO exam administered 8/26/91, ques. 55
[3.7/3.9]

041020K417 ..(KA's)

ANSWER: 010 (1.00)

c.

REFERENCE:

TMI-1 Objective; IV.D.23.08
TMI-OPM: SSCCW, Fig. 2
TMI-OPM: House Air
NRC RO exam administered 8/26/91, ques. 61

[3.2/3 3]

000026A102 ..(KA's)

ANSWER: 011 (1.00)

d.

REFERENCE:

TMI-1 Objective: None located
TMI-OPM: EFW, page 9
TMI-OPM: RSP, page 8
AP 1202-37, page 3
NRC RO exam administered 8/26/91, ques. 69

[4.1/4.2]

000068A113 ..(KA's)

ANSWER: 012 (1.00)

d.

REFERENCE:

TMI-1 Objective: V.E.01.05
TMI-LP 11.2.01.210
QR5E01-050Q01
NRC RO exam administered 8/26/91, ques. 82

[4.2/4.5]

000029K301 ..(KA's)

ANSWER: 013 (1.00)

a.

REFERENCE:

TMI-1 Objective: V.E.05.03
B&W Bases Document
NRC RO exam administered 8/26/91, ques. 85

[4.2/4.5]

000038K306 ..(KA's)

ANSWER: 014 (1.00)

c.

REFERENCE:

TMI-1 Objective: IV.E.05.01 to .05
TMI-OPM: HSPS, pages 2 & 3, Figs. 6 & 11
NRC RO exam administered 8/26/91, ques. 86

[4.2/4.3]

000054A204 ..(KA's)

ANSWER: 015 (2.00)

a. 5 [0.5]
b. 7 [0.5]
c. 8 [0.5]
d. 4 [0.5]

REFERENCE:

TMI-1 Objective: LP-11.2.01.013, obj. 13.5
TMI-OPM: Reactor Protection Instrumentation & Control, T-1, Fig. 6, page 17

[3.8/3.8]

001000K402 ..(KA's)

ANSWER: 016 (1.00)

b.

REFERENCE:

TMI-1 Objective: V.E.05.03
B&W Bases Document
NRC RO exam administered 8/26/91, ques. 84

[4.2/4.4]

000037K307 ..(KA's)

ANSWER: 017 (2.00)

a. 4 [0.5]
b. 1 [0.5]
c. 3 [0.5]
d. 1 [0.5]

REFERENCE:

TMI-1 Objective: LP-11.2.01.069, obj. 9.14
LP-11.2.01.069, page 29
EP-1202-40, page 2.0

[3.0/3.4]

004020K403 ..(KA's)

ANSWER: 018 (1.00)

c.

REFERENCE:

TMI-1 Objective: LP-11.2.01.029, obj. 24.07
TMI-OPM: Reactor Protection Instrumentation & Control, F-6, pages 11 & 12 and Fig. 7

[4.1/4.2]

013000A302 ..(KA's)

ANSWER: 019 (1.00)

d.

REFERENCE:

TMI-1 Objective: LP-11.2.01.082, obj. 11.07
TMI-OPM: Nuclear Instrumentation, F-4, pages 47-49

[4.3/4.5]

015000K405 ..(KA's)

ANSWER: 020 (1.00)

c.

REFERENCE:

TMI-1 Objective: V.E.04.05
AP 1210-2, page 2.0
LP 11.7.03.035, Rev. 1, page 13

[3.5/3.7]

017020K301 ..(KA's)

ANSWER: 021 (1.00)

a.

REFERENCE:

TMI-1 Objective: LP 11.2.01.127, obj. 15.06
TMI-OPM: Building Spray, B-9, Rev. 1, page 5

[4.2/4.3]

026000K401 ..(KA's)

ANSWER: 022 (1.00)

d.

REFERENCE:

TMI-1 Objective: IV.C.02.05
LP 11.2.01.010

[2.6/2.6]

056000K103 ..(KA's)

ANSWER: 023 (2.00)

a. 3 [0.5]
b. 6 [0.5]
c. 2 [0.5]
d 5 [0.5]

REFERENCE:

TMI-1 Objective: LP 11.2.01.032, objs. 4.1, 4.2, 4.6 & 4.7
LP 11.2.01.032: pages 11, 16, 17

[3.1/3.2]

059000G007 ..(KA's)

ANSWER: 024 (1.00)

c.

REFERENCE:

TMI-1 Objective: IV.B.08.08 [3.2/3.2]
OP 1104-27: page 21; step 7.d.
TMI Question Bank: modified question SR4B08-08-Q01
[2.9/3.4]

071000K404 ..(KA's)

ANSWER: 025 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.E.06.10 [3.6/3.6]
TMI-OPM: Radiation Monitoring System (F-7), page 47, Table 1
[3.3/3.9]

073000K402 ..(KA's)

ANSWER: 026 (1.00)

a.

REFERENCE:

TMI-1 Objective: IV.G.10.03 [2.6/2.6]
TMI Exam Question Bank: ques. 4G10-03-Q02

[2.7/3.2]

063000K102 ..(KA's)

ANSWER: 027 (2.00)

a. 4 [0.5]
b. 1 [0.5]
c. 3 [0.5]
d. 4 [0.5]

REFERENCE:

TMI-1 Objective: IV.E.06.07 [2.6/2.6]
TMI-OPM: Radiation Monitoring System (F-7), page 34, para. IX
Technical Specification 3.21.2

[3.0/3.6]

072000G005 ..(KA's)

ANSWER: 028 (2.00)

a. 1. [0.5]
b. 5 [0.5]
c. 3 [0.5]
d. 1 [0.5]

REFERENCE:

TMI-1 Objective: IV.A.01.02 [3.0/3.0]
P&ID C-302-650
Modification made during 9R outage
TMI-1 Question Bank 4.A.01, ques. AL4A01-02-Q01

[4.1/4.1]

002000K109 ..(KA's)

ANSWER: 029 (1.00)

d.

REFERENCE:

TMI-1 Objective: IV.A.09.25 [5.0/5.0]
IV.A.09.26 [4.6/4.6]
LP-11.2.01.065: page 60

[3.4/3.9]

006000K601 ..(KA's)

ANSWER: 030 (1.00)

d.

REFERENCE:

TMI-1 Objective: IV.E.09.07h. [3.4/3.4]
LP 11.2.01.080: page 7; paragraphs II.B. & D.

[2.9/2.9]

016000A302 ..(KA's)

ANSWER: 031 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.E.14.10 [3.4/3.4]
LP-11.2.01.132; page 26
TMI-1 Question bank QR4E14-10-Q04

[3.1/3.5]

012000K603 ..(KA's)

ANSWER: 032 (1.00)

a.

REFERENCE:

TMI-1 Objective: IV.E.09.05 [3.8/3.8]
LP-11.2.01.080: page 23

[2.9/2.9]

016000A302 ..(KA's)

ANSWER: 033 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.F.02.03 [1.8/1.8]
OPM: Heating and Ventilation Systems; L1; pages 13 & 34; Table 7
OPM: Rad Monitoring System, F-7; page 49, table 2

[3.2/3.5]

029000K403 ..(KA's)

ANSWER: 034 (1.00)

d.

REFERENCE:

TMI-1 Objective: IV.B.10.05 [2.4/2.4]
OPM: Primary Support Systems; C-1; page 11

[3.0/3.3]

033000K303 ..(KA's)

ANSWER: 035 (1.00)

c.

REFERENCE:

TMI-1 Objective: OPM-Miscellaneous Systems; page 2; objective B.12
OPM-Miscellaneous Systems; M-1; pages 9-10

[2.5/3.3]

034000K402 ..(KA's)

ANSWER: 036 (1.00)

d.

REFERENCE:

TMI-1 Objective: IV.A.08.06 [3.0/3.0]
OPM-Primary Systems: B-4; pages 10 and 36

[3.6/3.8]

035010A101 ..(KA's)

ANSWER: 037 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.C.01.05 [4.2/4.2]
OPM-Secondary Systems: G-3; page 10

[2.9/3.1]

039000K404 ..(KA's)

ANSWER: 038 (1.00)

~~a.~~ b.

REFERENCE: J. Pell 8/13/92

TMI-1 Objectives: IV.G.08.08 [3.4/3.4] AP 1203-41 pg. 2
OPM-Electrical Systems: A-4; pages 3 and 5

[3.4/3.7]

064000A302 ..(KA's)

ANSWER: 039 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.A.11.03 [3.8/3.9]
OPM-Primary Systems: B-6; page 8
Based on TMI Question Bank QR4A11-03-Q01

[3.1/3.5]

005000K408 ..(KA's)

ANSWER: 040 (1.00)

d.

REFERENCE:

TMI-1 Objective: IV.B.05.09 [3.4/3.4]
OPM-Primary Systems: B-11; page 3 and 4
TMI Question Bank: question SR405-09-Q01

[3.3/3.4]

008000G007 ..(KA's)

ANSWER: 041 (1.00)

c.

REFERENCE:

TMI-1 Objective: V.D.03.03 [3.6/3.6]
EP 1202-08; page 13
ARP: Main Annunciator Panel G-2-2
Based on TMI Question Bank; question QR5D03-03-Q01

[4.0/4.1]

000001G011 ..(KA's)

ANSWER: 042 (1.00)

d.

REFERENCE:

TMI-1 Objective: V.D.03.04 [3.4/3.4]
EP 1202-8, page 7.0
TMI Question Bank: question QR5D03-04-Q01

[3.8/4.1]

000003K304 ..(KA's)

ANSWER: 043 (1.00)

c.

REFERENCE:

TMI-1 Objective: V.E.07.06 [4.0/4.0]
ATP 1210-2, page 2.0
TMI-1 Question Bank; question QR5E07-06-Q01

[4.3/4.5]

000011C011 ..(KA's)

ANSWER: 044 (1.00)

c.

REFERENCE:

TMI-1 Objective: V.E.07.03 [3.2/3.2]
ATP 1210-7, page 2.0, step 2.9
LP-11.2.01.215: page 11

[3.4/3.5]

000011K301 ..(KA's)

ANSWER: 045 (1.00)

b.

REFERENCE:

TMI-1 Objective: V.C.06.01 [3.6/3.6]
AP 1203-16: pages 2 and 3
Based on TMI Question Bank: question QR5C06-01-Q01

[4.0/4.2]

000015A122 ..(KA's)

ANSWER: 046 (2.00)

a. 5 [0.5]
b. 4 [0.5]
c. 1 [0.5]
d. 2 [0.5]

REFERENCE:

TMI-1 Objective: V.C.04.04 [3.2/3.2]
AP 1203-16: pages 3.0, 5.0, 6.0, 7.0 and 8.0
[3.4/3.4]

000015G010 ..(KA's)

ANSWER: 047 (1.00)

b.

REFERENCE:

TMI-1 Objective: V.D.16.02 [3.8/3.8]
EP 1202-35: page 10.0; paragraph H.

[4.1/4.4]

000024K301 ..(KA's)

ANSWER: 048 (1.00)

b.

REFERENCE:

TMI-1 Objective: V.E.01.03 [4.4/4.4]
ATP 1210-1: page 1

[4.1/4.4]

000024K301 ..(KA's)

ANSWER: 049 (1.00)

b.

REFERENCE:

TMI-1 Objective: V.E.03.02 [4.6/4.6]
LP 11.2.01.212: page 11
[4.1/4.4]

000040K101 ..(KA's)

ANSWER: 050 (1.00)

d.

REFERENCE:

TMI-1 Objective: V.E.03.06 [4.2/4.2]
ATP 1210-3: page 2
Based on TMI Question Bank: question QR5E03-06-Q01

[4.2/4.7]

000040A201 ..(KA's)

ANSWER: 051 (1.00)

d.

REFERENCE:

TMI-1 Objective: IV.C.2.10 [3.6/3.6]
CPM-Secondary Systems: G-1; page ; paragraph 2.

[2.4/2.7]

000051G009 .(KA's)

ANSWER: 052 (1.00)

b.

REFERENCE:

TMI-1 Objective: V.D.01.02 [3.4/3.4]
EP 1202-2A: page 7.0

[4.1/4.1]

000055G011 ..(KA's)

ANSWER: 053 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.G.10.02 [2.4/2.4]
OPM-Electrical Systems: pages 4 and 5 (Figure 1 and Table 1)

[4.0/4.3]

000057A219 ..(KA's)

ANSWER: 054 (1.00)

d.

REFERENCE:

TMI-1 Objective: IV.G.10.03 [2.6/2.[illegible]]
OPM-Electrical Systems: page 10

[3.2/3.6]

000057A214 ..(KA's)

ANSWER: 055 (1.00)

d.

REFERENCE:

TMI-1 Objective: None Identified
OP 1104-29: pages 11 and 12

[3.2/3.5]

000059A204 ..(KA's)

ANSWER: 056 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.B.09.04 [2.8/2.8]
Based on TMI Question Bank: question AL4B09-04-Q02

[3.5/3.9]

000059K301 ..(KA's)

ANSWER: 057 (1.00)

d.

REFERENCE:

TMI-1 Objective: OPM-Fire Systems; K-1; page 6; objective 24
OPM-Fire Systems: K-1; page 28; paragraph VIII c.
AP 1038: page E2-11

[3.1/3.6]

000067G003 ..(KA's)

ANSWER: 058 (1.00)

d.

REFERENCE:

TMI-1 Objective: Could not identify
Technical Specification 3.8
LER 91-004-00 (Docket No. 50-289)
[3.3/3.9]

000069G003 ..(KA's)

ANSWER: 059 (1.00)

d.

REFERENCE:

TMI-1 Objective: V.E.C2.03 [4.6/4.6]
LP-2.11.2.C1.211: pages 4 and 5
TMI-Question Bank: question QR5E02-03-Q01
[3.9/4.2]

000074K304 ..(KA's)

ANSWER: 060 (1.00)

d.

REFERENCE:

TMI-1 Objective: V.D.06.02 [3.6/3.6]
EP 1202-11: page 2.0
TMI-1 Question Bank: question QR5D06-02-Q02
[3.2/3.6]

000076K306 ..(KA's)

ANSWER: 061 (1.00)

d.

REFERENCE:

TMI-1 Objective: V.E.01.08 [4.2/4.2]
ATP 1210-1: page 3.0; step 2.6

[4.0/4.0]

000007G005 ..(KA's)

ANSWER: 062 (1.00)

a.

REFERENCE:

TMI-1 Objective: V.E.01.03 [4.4/4.4]
LP-11.2.01.210, page 9.0
TMI Question Bank: question QR5E01-03-Q06

[3.7/4.1]

000007K106 ..(KA's)

ANSWER: 063 (1.00)

c.

REFERENCE:

TMI-1 Objective: V.D.11.03 [3.2/3.2]
EP 1202-29: page 3.0

[3.9/3.9]

000008A203 ..(KA's)

ANSWER: 064 (1.00)

b.

REFERENCE:

TMI-1 Objective: IV.E.09.02 [2.4/2.4]
LP-11.2.01.080: pages 20 and 21
[3.7/4.0]

000027A215 ..(KA's)

ANSWER: 065 (1.00)

d.

REFERENCE:

TMI-1 Objective: V.E.06.06 [3.4/3.4]
EOP Tech Bases
TMI Question Bank: question QR5E06-06-Q01

[3.6/3.8]

000009K327 ..(KA's)

ANSWER: 066 (1.00)

c.

REFERENCE:

TMI-1 Objective: V.C.05.01 [4.2/4.2]
AP 1203-15: page 2.0
Based on TMI Question Bank: question QR5C05-01-Q01

[3.1/3.6]

000022A203 ..(KA's)

ANSWER: 067 (1.00)

c.

REFERENCE:

TMI-1 Objective: V.D. 16.02 [3.8/3.8]
EP 1202-35: page 3.0
Based on TMI Question Bank: question SR5D16-02-Q02

[3.9/4.1]

000025K303 ..(KA's)

ANSWER: 068 (1.00)

c.

REFERENCE:

TMI-1 Objective: V.B.09.05 [3.4/3.4]
OP 1103-8: page 3.0; paragraph 2.1.6

[3.1/3.5]

000032A204 ..(KA's)

ANSWER: 069 (1.00)

a.

REFERENCE:

TMI-1 Objective: IV.E.11.11 [2.0/2.0]
LP-11.2.01.082: page 17

[3.2/3.6]

000033A204 ..(KA's)

ANSWER: 070 (1.00)

b.

REFERENCE:

TMI-1 Objective: V.D.04.02 [3.8/3.8] & V.D.04.04 [3.2/3.2]
EP 1202-9A: pages 2.0 and 4.0
Based on TMI Question Bank: questions SR5D04-02-Q02 & QR5D04-04-Q01
[4.0/4.2]

000058K302 ..(KA's)

ANSWER: 071 (1.00)

c.

REFERENCE:

TMI-1 Objective: IV.E.06.04 [2.8/2.8]
ARP-MAP C-C-1-1: pages 4, 6, 11, and 12

[3.6/3.6]

000061A101 ..(KA's)

ANSWER: 072 (1.00)

d.

REFERENCE:

TMI-1 Objective: V.D.17.01 [3.2/3.2]
EP 1202-36: page 3.0; step A.4.

[2.9/3.3]

000065A208 ..(KA's)

ANSWER: 073 (1.00)

a.

REFERENCE:

TMI-1 Objective: V.D.17.02 [4.0/4.0]
EP 1202-36: page 4.0

[3.7/3.9]

000065K308 ..(KA's)

ANSWER: 074 (1.00)

c.

REFERENCE:

TMI-1 Objective: V.D.11.02 [3.4/3.4]
EP 1202-29: page 16
TMI Question Bank: question QR5D11-02-Q05

[3.4/3.6]

000028A201 ..(KA's)

ANSWER: 075 (1.00)

b.

REFERENCE:

TMI-1 Objective: V.D.01.04 [3.8/3.8]
EP 1202-2
TMI Question Bank: question SR5D01-04-Q01

[3.4/3.6]

000056G012 ..(KA's)

ANSWER: 076 (1.00)

c.

REFERENCE:

TMI-1 Objective: Could not identify
RP 1505-3: page ,.0; section 7.4

[3.5/3.9]

000036G011 ..(KA's)

ANSWER: 077 (1.00)

d.

REFERENCE:

TMI-1 Objective: Could not identify
AP 1002: page 4.0; section 4.1.3.b.

[3.6/3.7]

194001K107 ..(KA's)

ANSWER: 078 (1.00)

b.

REFERENCE:

TMI-1 Objective: Could not identify
10 CFR Part 20, Section 20.101, paragraph (b)
[2.8/3.4]

194001K103 ..(KA's)

ANSWER: 079 (1.00)

d.

REFERENCE:

TMI-1 Objective: IV.B.18.05 [2.6/2.6]
Technical Specifications 3.1.12.4; 3.4.2.1; 3.6.1; 3.6.8; 3.6.9

[4.3/4.1]

194001A113 ..(KA's)

ANSWER: 080 (1.00)

a.

REFERENCE:

TMI-1 Objective: IV.D.16.04 [3.6/3.6]
OP 1106-8: age 5 and 10

[3.4/3.8]

194001K115 ..(KA's)

ANSWER: 081 (1.00)

b.

REFERENCE:

TMI-1 Objective: Could not identify
AP 1029: page 8.0; paragraph 4.2.16

[2.8/4.1]

194001A111 ..(KA's)

ANSWER: 082 (1.00)

a.

REFERENCE:

TMI-1 Objective: Could not identify
AP 1001G: page 7; section 4.2

[3.3/3.4]

194001A101 ..(KA's)

ANSWER: 083 (1.00)

b.

REFERENCE:

TMI-1 Objective: Could not identify
AP 1035: page 3.0; paragraphs 4.5 and 4.6

[3.5/4.2]

194001K116 ..(KA's)

ANSWER: 084 (1.00)

d.

REFERENCE:

CAF

[3.0/3.3]

194001K110 ..(KA's)

ANSWER: 085 (1.00)

c.

REFERENCE:

TMI-1 Objective: Could not identify
EPIP-TMI-.03: page E1-1

[3.0/3.2]

194001A104 ..(KA's)

ANSWER: 086 (1.00)

c.

REFERENCE:

TMI-1 Objective: Could not identify
10CFR20.101 (a) and (b)

[3.3/3.5]

194001K104 ..(KA's)

ANSWER: 087 (1.00)

a.

REFERENCE:

TMI-1 Objective: V.A.06.05 [2.2/2.2]
AP 1012: page 7.0; section 4.5.3

[3.4/3.4]

194001A106 ..(KA's)

ANSWER: 088 (1.00)

c.

REFERENCE:

TMI-1 Objective: V.A.07.01 [3.8/3.8]
AP 1013: pages 3.0 and 4.0
AP 1012: pages 5.0 and 7.0; sections 4.3.3.2 and 4.5.2
Based on TMI Question Bank: question QS5A07-01-Q01
[4.1/3.9]

194001A102 ..(KA's)

ANSWER: 089 (1.00)

c.

REFERENCE:

TMI-1 Objective: III.G.30.02 [2.8/2.8]
TMI Question Bank: question SO3G30-02-Q01

[2.5/2.9]

194001A114 ..(KA's)

ANSWER: 090 (1.00)

b.

REFERENCE:

TMI-1 Objective: V.A.15.05 [2.7/2.7]
AP 1038: page E2-1; section 1.3.2.1.
TMI Question Bank: question SO5A15-05-Q01

[3.5/4.2]

194001K116 ..(KA's)

ANSWER: 091 (1.00)

a.

REFERENCE:

TMI Objective: V.A.18.05[4.2/4.2]
AP 1044: page E3-1
Based on TMI Question Bank: question QS5A18-05-Q11

[3.1/4.4]

194001A116 ..(KA's)

ANSWER: 092 (1.00)

d.

REFERENCE:

TMI-1 Objective: V.E.08.06[3.4/3.4]
ATP 1210-08: page 4.0; step 2.7.6
Based on TMI Question Bank: question QS5E08-06-Q01

[3.3/3.6]

194001K114 ..(KA's)

( ******** END OF EXAMINATION **********)

# A N S W E R K E Y

MULTIPLE CHOICE

001 b

002 c

003 b

004 MATCHING

a 6

b 2

c 6

d 8

MULTIPLE CHOICE

005 d

006 b

007 b

008 a

009 MATCHING

a 6

b 8

c 6

d 2

MULTIPLE CHOICE

010 c

011 d

012 d

013 a

014 c

015 MATCHING

a 5

b 7

c 8

d 4

MULTIPLE CHOICE

016 b

017 MATCHING

a 4

b 1

c 3

d 1

MULTIPLE CHOICE

018 c

019 d

020 c

021 a

022 d

ANSWER KEY

023 MATCHING

a 3

b 6

c 2

d 5

MULTIPLE CHOICE

024 c

025 b

026 a

027 MATCHING

a 4

b 1

c 3

d 4

028 MATCHING

a 1

b 5

c 3

d 1

MULTIPLE CHOICE

029 d

030 d

031 b

032 a

033 b

034 d

035 c

036 d

037 b

038 ~~c~~ b. JP 2/13/92

039 b

040 d

041 c

042 d

043 c

044 c

045 b

046 MATCHING

a 5

b 4

c 1

d 2

MULTIPLE CHOICE

047 b

048 b

049 b

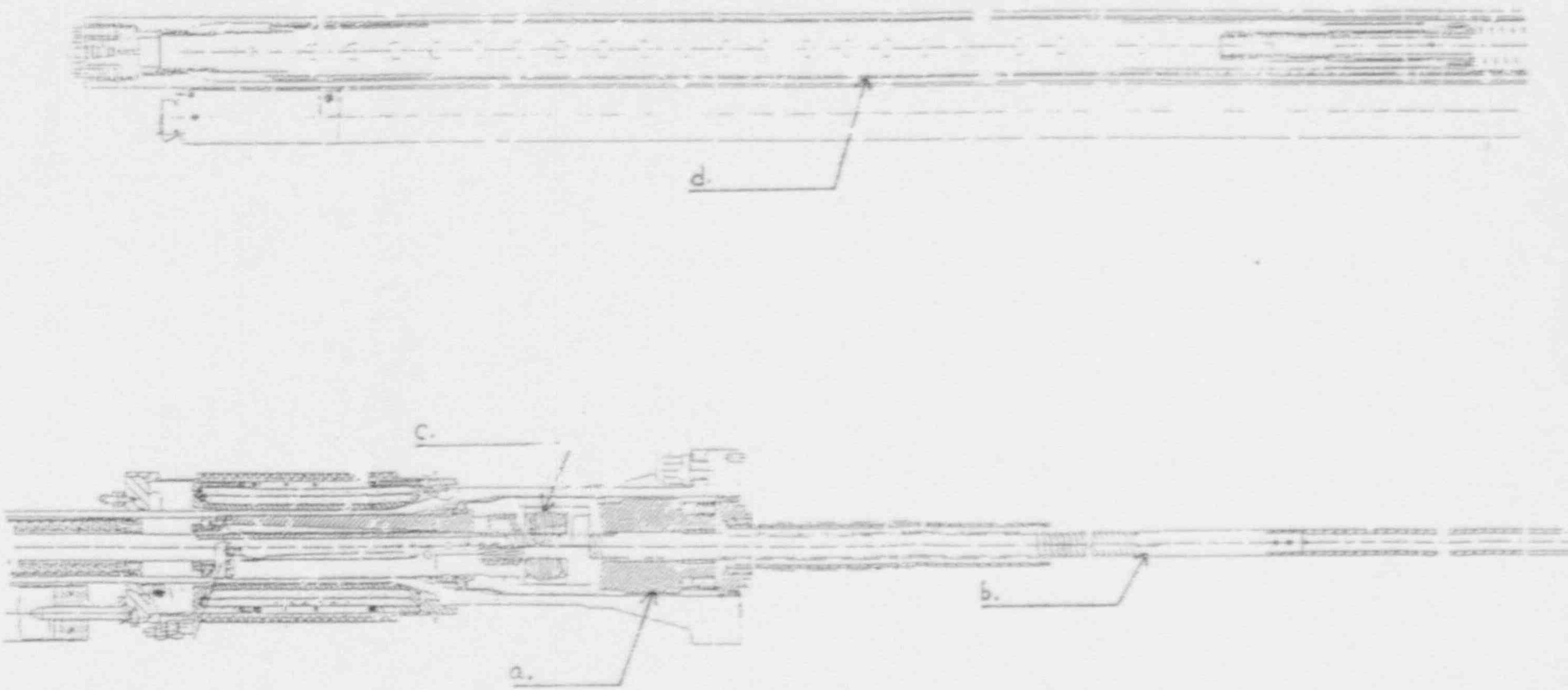
# ANSWER KEY

050 d
051 d
052 b
053 b
054 d
055 d
056 b
057 d
058 d
059 d
060 d
061 d
062 a
063 c
064 b
065 d
066 c
067 c
068 c
069 a
070 b
071 c
072 d

073 a
074 c
075 b
076 c
077 d
078 b
079 d
080 a
081 b
082 a
083 b
084 d
085 c
086 c
087 a
088 c
089 c
090 b
091 a
092 d

(********** END OF EXAMINATION **********)

FIGURE-6 CONTROL ROD DRIVE (COMPONENT IDENTIFICATION)



RCS LETDOWN

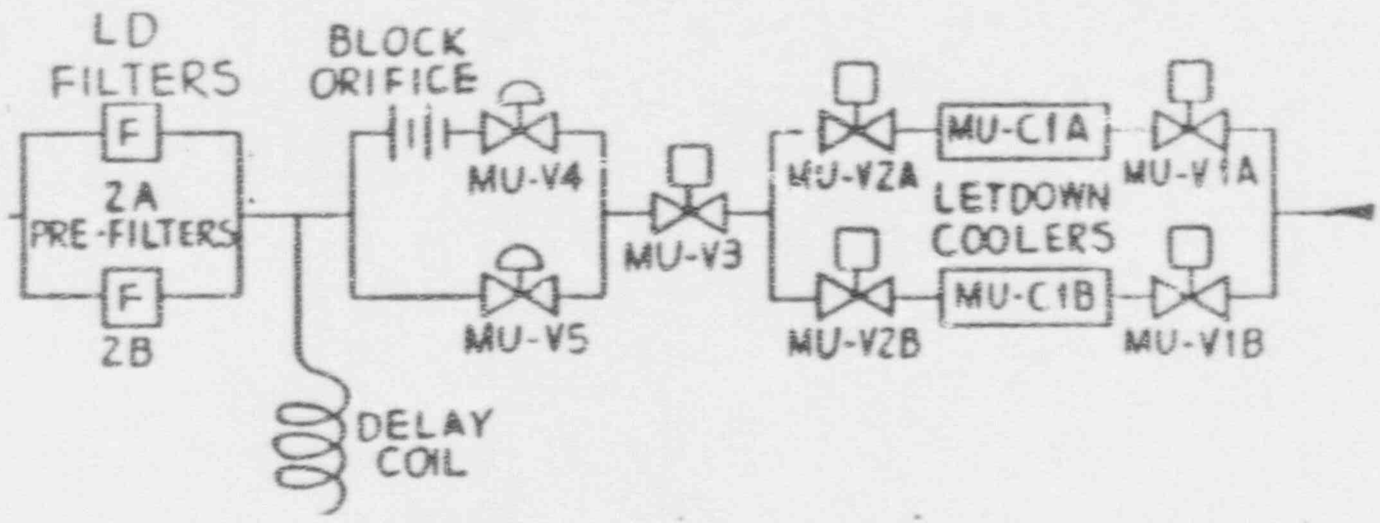

LD
FILTERS
F
2A
PRE-FILTERS
F
2B
DELAY
COIL
BLOCK
ORIFICE
MU-V4
MU-V5
MU-V3
MU-V2A
MU-V2B
MU-C1A
LETDOWN
COOLERS
MU-C1B
MU-V1A
MU-V1B

EXHIBIT 2

SAFETY RELATED FIRE PROTECTION SYSTEM SPECIFICATIONS

| NOTE: Exhibit 7 lists Implementing Test and Inspection Procedures. |

1.0 FIRE DETECTION

1.1 Applicability

At all times when equipment in that fire detection zone is required to be operable. Fire detection instruments located within the Reactor Building are not required to be operable during the performance of Type A Containment Leakage Rate Test.

1.2 Objective

To insure adequate fire detection capability.

1.3 Operability

1.3.1 The minimum fire detection instrumentation for each fire detection zone shown in Table 1 shall be operable or action shall be taken as described in Section 1.3.2.

1.3.2 With the number of OPERABLE fire detection instruments less than required by Table 1.

1. Within 1 hour, establish a firewatch patrol to inspect the zone with the inoperable instrument(s) at least once per hour unless the instrument(s) is located inside the containment, then inspect the containment at least once per 8 hours or monitor containment air temperature at least once per hour at the locations listed in T.S. 3.17.3.

2. Restore the inoperable instrument(s) to OPERABLE status within 14 days or prepare a potentially reportable event form per AP 1044 and determine reportability using the criteria of 10 CFR 50.72 and 10 CFR 50.73.

EXHIBIT 2 (Cont'd)

1.4 Test/Inspection

1.4.1 Each of the fire detection instruments listed in Table 1 which are accessible during plant operation shall be demonstrated operable at least once per 6 months by performance of a Channel Functional Test. Instruments listed on Table 1 which are not accessible during plant operation shall be demonstrated operable by the performance of a Channel Functional Test during each cold shutdown exceeding 24 hours unless performed in the previous 6 months.

1.4.2 The non-supervised circuits between the instrument and the control room and between local panels and the control room shall be demonstrated operable at least once per month for the instruments listed in Table 1.

1.4.3 The NFPA Standard 72 D supervised circuits associated with the detector alarms for Table 1 instruments shall be demonstrated operable at least once per 6 months.

1.5 Basis

OPERABILITY of the fire detection instrumentation ensures that adequate warning capability is available for the prompt detection of fires. This capability is required in order to detect and locate fires in their early stages. Prompt detection of fires will reduce the potential for damage to safety related equipment and is an integral element in the overall facility fire protection program.

In the event that a portion of the fire detection instrumentation is inoperable, the establishment of frequent fire patrols in the affected areas is required to provide detection capability until the inoperable instrumentation is restored to operability.

EXHIBIT 2 (Cont'd)

TABLE 1

FIRE DETECTION INSTRUMENTS

| Instrument Location | Total Number of Detectors | | Minimum Instruments Operable | |
|---|---|---|---|---|
| | Heat | Smoke | Heat | Smoke |
| 1. Control Building Elev. 355' | | | | |
| Control Room Cabinets | 0 | 12 | 0 | 12 |
| Control Room Area | 0 | 8 | 0 | 4 |
| I&C (Mod Comp Computer Halon) | 0 | 5 | 0 | 3 |
| I&C (Mod Comp Area) | 0 | 4 | 0 | 2 |
| 2. Control Building Elev. 338' | | | | |
| 1D 4160V SWGR | 0 | 1 | NA | 1 |
| 1E 4160V SWGR | 0 | 1 | NA | 1 |
| ESAS Cabinets (CB-3C) | 0 | 3 | NA | 2 |
| Relay Room | 4 | 1 | 2 | 1 |
| 3. Control Building Elev. 322' | | | | |
| 1P 480V SWGR | 0 | 1 | NA | 1 |
| 1S 480V SWGR | 0 | 1 | NA | 1 |
| Battery Room A | 0 | 1 | NA | 1 |
| Battery Room B | 0 | 1 | NA | 1 |
| Inverter Room A | 0 | 1 | NA | 1 |
| Inverter Room B | 0 | 1 | NA | 1 |
| Remote Shutdown Panel | 0 | 1 | NA | 1 |
| 4. Control Building Elev. 306' | | | | |
| Above False Ceiling | 0 | 10 | NA | 5 |
| Fuel Handling Bldg. Elev. 285' | | | | |
| Chiller Room | 0 | 2 | NA | 1 |
| 5. Diesel Generators | | | | |
| Diesel A | 1 | 0 | 1 | NA |
| Diesel B | 1 | 0 | 1 | NA |
| 6. Screen House | | | | |
| General Area (HVAC) | 2 | 0 | 1 | NA |
| Zone 1 | 0 | 6 | NA | 3 |
| Zone 2 | 0 | 6 | NA | 3 |
| 7. Fuel Handling Bldg. Elev. 281' | | | | |
| General Cable Area (Zone 8) | 0 | 9 | NA | 5 |
| Lubricant & Storage Area (Zone 9) | 0 | 3 | NA | 2 |

EXHIBIT 2 (Cont'd)

| Instrument Location | Total Number of Detectors | | Minimum Instruments Operable | |
|---|---|---|---|---|
| | Heat | Smoke | Heat | Smoke |
| 8. Auxiliary Bldg. Elev. 261' | | | | |
| Decay Heat Removal Pump A (Zone 6) | 0 | 3 | NA | 2 |
| Decay Heat Removal Pump B (Zone 7) | 0 | 4 | NA | 2 |
| 9. Auxiliary Bldg. Elev. 271' | | | | |
| Heat Exchanger Vault (Zone 11) | 0 | 10 | NA | 5 |
| 10. Auxiliary Bldg. Elev. 281' | | | | |
| Pipe Penetration Area (Zone 1A) | 0 | 3 | NA | 2 |
| Pipe Penetration Area (Zone 1B) | 0 | 2 | NA | 1 |
| Makeup & Purification Pumps (Zone 2) | 0 | 3 | NA | 2 |
| Valve Gallery (Zone 3) | 0 | 1 | NA | 1 |
| Cable Gallery (Zone 4) | 0 | 3 | NA | 2 |
| Hallway (Zone 10) | 0 | 9 | NA | 5 |
| 11. Auxiliary Bldg. Elev. 305' | | | | |
| Decay Heat & Nucl. Service | | | | |
| Pumps & MCC 1A (Zone 1A) | 0 | 2 | NA | 1 |
| Pumps & MCC 1A (Zone 1B) | 0 | 2 | NA | 1 |
| Pumps & MCC 1A, 1B (Zone 5) | 0 | 7 | NA | 4 |
| Ventilation Room | 1 | 1 | 1 | 1 |
| 12. Intermediate Bldg. Elev. 295' | | | | |
| EF-P-2 A&B Rooms (Zone 1) | 0 | 6 | NA | 3 |
| Cable Area (Zone 2) | 0 | 2 | NA | 1 |
| EF-P-1 Room (Zone 3) | 0 | 2 | NA | 1 |
| Valve Gallery (Zone 4) | 0 | 2 | NA | 1 |
| Hallway Elev. 295' (Zone 6) | 0 | 3 | NA | 2 |
| 13. Intermediate Bldg. Elev. 305' | | | | |
| Tank Room (Zone 5) | 0 | 1 | NA | 1 |
| 14. Reactor Bldg. Elev. 281' | | | | |
| Exhaust Ducts (Zone 1) | 0 | 3 | NA | 2 |
| Decay Heat Valve 1 (Zone 2) | 1 | 0 | 1 | NA |
| Decay Heat Valve 2 (Zone 2) | 0 | 1 | NA | 1 |
| Cable Tray at Let Down Cooler (Zone 3) | 0 | 1 | NA | 1 |

EXHIBIT 2 (Cont'd)

| | Instrument Location | Total Number of Detectors | | Minimum Instruments Operable | |
|---|---|---|---|---|---|
| | | Heat | Smoke | Heat | Smoke |
| 15. | Reactor Bldg. Elev. 308' | | | | |
| | Exhaust Ducts (Zone 4) | 0 | 5 | NA | 3 |
| | Purge Exhaust (Zone 5) | 0 | 1 | NA | 1 |
| | Cable Tray at Personnel Hatch (Zone 6) | 0 | 2 | NA | 1 |
| 16. | Reactor Bldg. Elev. 346' | | | | |
| | D-Ring 1d (Zone 7) | 6 | 0 | 4 | NA |
| | D-Ring 1e (Zone 8) | 6 | 0 | 4 | NA |
| 17. | Reactor Bldg. Elev. 382' | | | | |
| | Cable Tray (Zone 9) | 0 | 2 | NA | 1 |
| 18. | Reactor Bldg. Elev. 382' | | | | |
| | Elevator Room (Zone 10) | 0 | 1 | NA | 1 |

EXHIBIT 2 (Cont'd)

2.0 FIRE SUPPRESSION WATER SYSTEM

2.1 Applicability

All plant operating conditions.

2.1.1 A FIRE SUPPRESSION WATER SYSTEM shall consist of: a water source, gravity tank or pump and distribution piping with associated sectionalizing control or isolation valves. Such valves include yard hydrant curb valves, and the first valve upstream of the water flow alarm device on each sprinkler, hose standpipe or spray system riser (T S. 1.8 definition).

2.2 Objective

To insure adequate fire suppression capability.

2.3 Operability

NOTE: FS-P-1 (TMI-2) is available for emergency use. Testing requirements of Section 2.4 do not appl, unless FS-P-1 (TMI-2) is relied upon to meet the requirements of Section 2.3. An inspection and test program has been established to use the pump as a backup, emergency unit. There is no automatic start on this pump.

2.3.1 The Fire Suppression Water System shall be operable with:

1. Two (2) high pressure pumps of the following three, shall be operable with their discharge aligned to the fire suppression header and automatic initiation logic operable. Any two of the pumps provide combined capacity greater than 3575 gal/min:

    1. Circulating Water Flume Diesel Fire Pump
    2. River Water Diesel Fire Pump, Unit 1
    3. River Water Motor Fire Pump, Unit 1

2. Two (2) separate water supplies of the following three each containing a minimum of 90,000 gallons:

    1. Altitude Tank
    2. Circulating Water Flume
    3. Unit 1 River Water Intake

EXHIBIT 2 (Cont'd)

3. An operable flow path capable of taking suction from two of the operable sources listed in 2, above, and transferring the water through distribution piping with operable sectionalizing control or isolation valves to the yard hydrant curb valves and the front valve ahead of the water flow alarm device on each sprinkler, hose standpipe or spray system riser.

| NOTE: | The TMI-2 River Water Intake is considered an acceptable water supply when FS-P-1 (U-2) is utilized as an emergency service pump. |
|---|---|

2.3.2 With the FIRE SUPPRESSION WATER SYSTEM INOPERABLE:

| NOTE: | FS-P-1 (U-2) may be utilized to meet this requirement. |
|---|---|

1. Establish a backup FIRE SUPPRESSION WATER SYSTEM within 24 hours or

2. Be in hot shutdown within 1 hour and cold shutdown within the next 30 hours.

2.3.3 Restore inoperable equipment to operable status within 7 days (restore "system" to operable within 24 hours) or prepare a potentially reportable event form per AP 1044 and determine reportability using the criteria of 10 CFR 50.72 and 10 CFR 50.73. (This review also required with "system" inoperable.)

2.4 Test/Inspection

| NOTE: | FS-P-1/U-2 is tested under the Operations Surveillance and Preventive Maintenance Program. |
|---|---|

2.4.1 The system shall be demonstrated operable:

1. Once per 7 days by verifying 90,000 gallons of water in the altitude tank, equivalent level in the circulating water flume, and/or equivalent level in the river.

EXHIBIT 2 (Cont'd)

2. Once per month by starting each pump and operating it for 15 minutes on recirculation flow.

---

NOTE: TMI-2 Recovery Operations Plan Section 4.7.10.1.1.b requires 20 minute pump runs. This more restrictive time is covered by the surveillance procedure.

---

3. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path is in its correct position.

4. At least once per 12 months by performance of a system flush.

5. At least once per 12 months by cycling each testable valve in the flow path through at least one complete cycle of full travel.

6. At least once per 18 months by performing a system functional test which includes simulated automatic actuation of the system throughout its operating sequence, and:

    1. Verifying that each automatic valve in the flow path actuates to its correct position on a test signal.

    2. Verifying that each pump develops at least 2500 gpm at a system head of 260 feet for FS-P-1 and 294 feet for FS-P-2 and FS-P-3.

    3. Cycling each valve in the flow path that is not testable during plant operation through at least one complete cycle of full travel, and

    4. Verifying that each high pressure pump starts to maintain the fire suppression water system pressure $\geq$ 125 psig.

7. At least once per 3 years by performing a flow test of the system in accordance with Chapter 5, Section 11 of the Fire Protection Handbook, 14th Edition, published by the National Fire Protection Association.

2.4.2 The fire pump diesel engines shall be demonstrated OPERABLE:

EXHIBIT 2 (Cont'd)

2.4.2.1 At least once per 31 days by verifying;

1. The fuel storage tanks contain at least 250 gallons of fuel, and

2. The diesels start from ambient conditions and operate for at least 20 minutes.

2.4.2.2 At least once per 92 days by verifying that a sample of diesel fuel from each fuel storage tank, obtained in accordance with ASTM-D270-65, is within the acceptable limits specified in Table 1 of ASTM-D975-74 with respect to viscosity, water content and sediment for the type of fuel specified for the diesels.

2.4.2.3 At least once per 18 months by:

1. Subjecting each diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for the class of service, and

2. Verifying each diesel starts from ambient conditions on the auto-start signal and operates for $\geq$ 20 minutes while loaded with the fire pump.

2.4.3 Each fire pump diesel starting 24-volt battery bank and charger shall be demonstrated OPERABLE:

2.4.3.1 At least once per 7 days by verifying that:

1. The electrolyte level of each battery is above the plates, and

2. The overall battery voltage is $\geq$ 24 volts.

2.4.3.2 At least once per 92 days by verifying that the specific gravity is appropriate for continued service of the battery.

2.4.3.3 At least once per 18 months by verifying that:

1. The batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration, and

2. The battery-to-battery and terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material.

EXHIBIT 2 (Cont'd)

2.5 Basis

2.5.1 The OPERABILITY of the fire suppression systems ensures that adequate fire suppression capability is available to confine and extinguish fires occurring in any portion of the facility where safety related equipment is located. The fire suppression system consists of the water system, spray and/or sprinklers, $CO_2$, Halon and fire hose stations. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety related equipment and is a major element in the facility fire protection program.

2.5.2 In the event that portions of the fire suppression systems are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the inoperable equipment is restored to service.

2.5.3 In the event the fire suppression water system becomes inoperable, immediate corrective measures must be taken since this system provides the major fire suppression capability of the plant.

3.0 DELUGE/SPRINKLER SYSTEMS

3.1 Applicability

At all times when equipment in the area is required to be operable.

3.2 Objective

To assure adequate fire suppression capability.

3.3 Operability

3.3.1 The Deluge and/or Sprinkler Systems located in the following areas shall be operable or action shall be taken as described in Section 3.3.2.

Diesel Generator and Radiator Rooms
Diesel Generator Combustion Air Intakes
Diesel Generator Cooling Air Intake
Control Building Filter (AH-F3A, AH-F3B) Rooms
Air Intake Tunnel (3 zones)
Charcoal Filter (AH-F10, AH-F11)

EXHIBIT 2 (Cont'd)

Intake Screen Pump House
Diesel Driven Fire Pump Areas
Control Building at Elevation 305'
Control Building ESAS Relay Room at Elevation 338'6" (Manual System)
Fuel Handling Building at Elevation 281'0"
Auxiliary Building Containment Penetration Area at Elevation 281'0' (Automatic Pre-action Sprinkler System) and Water Curtain at Elevation 305'0"

3.3.2 With any of the above deluge and/or sprinkler systems in any room or zone inoperable:

1. Establish a continuous firewatch with backup fire suppression equipment for the unprotected area(s), within one hour except that no firewatch is required in the air intake tunnel.

2. Restore the inoperable system to operable status within 14 days or prepare a potentially reportable event form per AP 1044 and determine reportability using the criteria of 10 CFR 50.72 and 10 CFR 50.73.

3.4 Test/Inspection

3.4.1 The deluge and/or sprinkler systems listed in Section 3.3.1 shall be demonstrated to be operable:

1. Once per month by a flush through the drain/test valves at the inlet to each deluge valve.

2. Once per month by flowing water through the inspectors test connection on each wet sprinkler header to verify absence of header blockage.

3. At least once per 12 months by cycling each testable valve in the flow path through at least one complete cycle of full travel.

4. Once per 18 months by performing a system functional test which includes tripping detectors and: (a) verifying actuation of trip devices on associated deluge valves, and (b) cycling each valve through at least one complete cycle of full travel. This functional test will not normally involve flowing water through the sprinkler/deluge header.

EXHIBIT 2 (Cont'd)

Deluge sprinkler valves will be inspected internally to verify operability in all instances where header flooding during the test is undesirable.

5. Once per 18 months by visual inspection of deluge headers to verify their integrity.

6. Once per 18 months by visual inspection (from floor level) of each nozzle to verify absence of spray pattern blockage.

7. Once per 3 years by a gas or water flow test of any open type deluge head to verify absence of blockage.

3.5 Basis

See Section 2.5.

4.0 $CO_2$ SYSTEM

4.1 Applicability

At all items when the equipment in the area is required to be operable.

4.2 Objective

To insure adequate fire suppression capability.

4.3 Operability

4.3.1 The $CO_2$ system for the Cable Spreading Room shall be operable with a minimum level corresponding to 8500 lbm at a minimum pressure of 285 psig in the storage tank. Actual plant $CO_2$ discharge tests have verified that there is an ample system design margin at a minimum 285 psig in the $CO_2$ storage tank (i.e., 100%).

4.3.2 With the $CO_2$ system for the Cable Spreading Room inoperable:

1. Establish a continuous firewatch with backup fire suppression equipment for the unprotected area within one hour.

2. Restore the system to operable status within 14 days or prepare a potentially reportable event form per AP 1044 and determine reportability using the criteria of 10 CFR 50.72 and 10 CFR 50.73.

EXHIBIT 2 (Cont'd)

4.4 Test/Inspection

4.4.1 The $CO_2$ system shall be demonstrated operable:

1. At least once per week by verifying the $CO_2$ storage tank level and pressure.

2. At least once per 18 months by verifying the system valves and associated ventilation dampers actuate manually and automatically in response to a simulated actuation signal. A brief flow test shall be made to verify flow from each nozzle. (Puff Test)

4.5 Basis

See Section 2.5.

5.0 HALON SYSTEMS

5.1 Applicability

The Air Intake Tunnel Halon System shall be functional at all times except when the Control Building ventilation is on recirculation. The Computer Room Halon System shall be functional at all times except when the halon-protected computer equipment in the Control Room is not energized.

5.2 Objective

To assure adequate fire suppression capability.

5.3 Operability

5.3.1 The Halon System shall be operable having at least 90% of full charge pressure and 95% full charge weight or action shall be taken as described in Section 5.3.2.

5.3.2 If the Halon System in any zone is inoperable:

a. Restore the inoperable system to operable status within 14 days or prepare a potentially reportable event form per AP 1044 and determine reportability using the criteria of 10 CFR 50.72 and 10 CFR 50.73.

NOTE: 1. The Air Intake Tunnel Halon System may be removed from service for periods up to 48 hours when the air tunnel must be occupied for testing or maintenance.

EXHIBIT 2 (Cont'd)

5.4 Test/Inspection

The Halon Systems shall be verified operable.

5.4.1 At least once per 6 months by verifying each Halon storage tank weight and pressure.

5.4.2 At least once per 18 months by:

1. Verifying that the system, including associated ventilation dampers, actuates automatically to a simulated test signal.

2. Functional test of the ultraviolet detectors, test of the pressure wave detectors, and replacement of the explosive actuators for the Air Intake Tunnel Halon System.

5.5 Basis

See Section 2.5.

6.0 <u>FIRE HOSE STATIONS</u>

6.1 Applicability

At all times when the equipment in the area is required to be operable.

6.2 Objective

To insure adequate fire suppression capability.

6.3 Operability

6.3.1 The fire hose stations listed in Table 2 shall be operable or an additional hose must be routed to the unprotected area from an operable hose station within one (1) hour.

6.3.2 Non-compliance or inability to comply with Section 6.3.1 requires preparation of a potentially reportable event form per AP 1044 and a reportability review per the criteria of 10 CFR 50.72 and 10 CFR 50.73.

EXHIBIT 2 (Cont'd)

6.4 Test/Inspection

6.4.1 The hose stations listed in Table 2 shall be verified operable:

1. At least once per month by visual inspection of the station to assure all equipment is at the station.

2. At least once per 18 months by removing the hose for inspection and re-racking, and replacing all gaskets in the couplings that are degraded.

3. At least once per 3 years, partially open hose station valves to verify valve operability and no blockage.

4. At least once per 3 years by conducting a hose hydrostatic test at a pressure at least 50 psi greater than the maximum pressure available at the hose stations.

NOTE: For hose stations in the Reactor Building, inspections 6.4.1.1 and 6.4.1.2 may be deferred, if purging is not permitted per T.S. 3.6, until the first shutdown greater than 48 hours following the interval which permits purging.

6.5 Basis

See Section 2.5.

EXHIBIT 2 (Cont'd)

TABLE 2

FIRE HOSE STATIONS

Intermediate Building

1. Fire hose near northeast piping chamber stairway at elev. 309' (2 stations).

Auxiliary Building

1. Fire hose near stairway at northeast end of building near valve room at elev. 285'.
2. Fire hose near waste evaporator condensate tank and auxiliary steam condensate return unit elev. 285'.
3. Fire hose near stairway at northeast end of auxiliary building and engineered safeguards control center, elev. 309'.
4. Fire hose near radioactive waste control center, elev. 309'.
5. Fire hose in heat exchanger vault, elev. 286'.

Turbine Building

1. Fire hose along west side of building near 12th stage extraction feedwater heaters, elev. 326'.
2. Fire hose along west side of building near 10th stage extraction feedwater heaters, elev. 359'.

Fuel Handling Building

1. Fire hose along west wall north end, elev. 326'.
2. Fire hose along west wall south end, elev. 326'.
3. Fire hose along west wall north end, elev. 342'.
4. Fire hose along west wall south end, elev. 342'.
5. Fire hose along east wall north end, elev. 359'.
6. Fire hose along east wall south end, elev. 359'.
7. Fire hose middle west wall, elev. 384'.

EXHIBIT 2 (Cont'd)

Reactor Building (Note 1)

1. Fire hose near personnel access hatch, elev. 312'.
2. Fire hose near southeast stairway, elev. 385'.
3. Fire hose near southeast stairway, elev. 350'.
4. Fire hose at top east D-Ring, elev. 369'.
5. Fire hose at door to D-Ring, elev. 285'.
6. Fire hose near west stairway, elev. 285'.
7. Fire hose near equipment access hatch, elev. 312'.
8. Fire hose near west stairway, elev. 350'.
9. Fire hose at top west D-Ring, elev. 369'.

NOTE 1: Only required to be operable during plant shutdown conditions that do not require establishing containment integrity per T.S. 3.6.

EXHIBIT 2 (Cont'd)

7.0 FIRE BARRIER COMPONENTS

7.1 Applicability

All fire barrier components (penetration seals, fire doors, fire dampers and envelope systems) in rated fire boundaries protecting safety related areas shall be functional at all times when equipment on either side of the barrier is required to be operable.

7.2 Objective

To assure the effectiveness of barriers.

7.3 Operability

7.3.1 All fire barrier components protecting safety related areas shall be functional or action shall be taken as described below.

7.3.2 With one or more of the above required fire barrier components non-functional, establish a continuous firewatch on at least one side of the affected barrier within one hour. Other compensatory measures may be taken for defective envelope systems with PRG review of the measures and loss of protection.

7.3.3 Restore the inoperable component to operable status within 14 days or prepare a potentially reportable event form per AP 1044 and determine reportability using the criteria of 10 CFR 50.72 and 10 CFR 50.73.

7.4 Test/Inspection

7.4.1 Fire barrier penetration seals, envelope systems and fire dampers shall be verified to be functional by a visual inspection:

1. At least once each refueling interval; and

2. Prior to declaring a fire barrier penetration seal, envelope or fire damper functional following repairs, maintenance or initial installation.

EXHIBIT 2 (Cont'd)

7.4.2 Fire doors shall be verified to be functional by a visual inspection:

1. At least weekly for doors that are locked closed to verify that they are locked closed and free of obstructions.
2. At least daily for doors held open by automatic release mechanisms to verify that the doorway is free of obstructions.
3. At least daily for doors neither locked nor supervised to verify that they are in a closed position.
4. Prior to declaring a fire door functional following repairs, maintenance or initial installation.

7.5 Basis

7.5.1 The functional integrity of the fire barrier components ensures that fires will be confined or adequately retarded from spreading to adjacent portions of the facility. This design feature minimizes the possibility of a single fire rapidly involving several areas of the facility prior to detection and extinguishment. The fire barrier components are a passive element in the facility fire protection program and are subject to periodic inspections.

7.5.2 During periods of time when a component is not functional, a continuous firewatch is required to be maintained in the vicinity of the affected component until the component is restored to functional status. Compensatory measures may be taken for defective envelope systems with PRG review of the measures taken and loss of protection vs. function. An example is use of manual calculations per EP 1202-29 for temperature compensated pressurizer level with loss of radiant energy heat shield ICF-REHS-01.

8.0 <u>REMOTE SHUTDOWN INSTRUMENTATION AND CONTROLS</u>

8.1 Applicability

Applies to remote shutdown instrumentation and controls.

8.2 Objective

To assure operability of monitoring instrumentation and controls needed to perform a safe shutdown of the plant from outside the Control Room.

EXHIBIT 2 (Cont'd)

8.3 Operability

8.3.1 Remote shutdown instrumentation and controls are required to be operable during all reactor operating conditions except cold shutdown or refueling.

8.3.2 When inoperable, restore to operable status within 7 days or provide compensatory measures.

NOTE: Compensatory measures either ensure the availability of an alternate component or monitoring function as a substitute for what is inoperable to ensure safe shutdown capability OR an hourly roving firewatch may be used in the areas where fire may require reliance on the inoperable remote shutdown function.

8.3.3 If not restored to operable status within 7 days, prepare a potentially reportable event form per AP 1044 report and determine reportability using the criteria of 10 CFR 50.72 and 10 CFR 50.73. This review shall also determine and ensure the adequacy of any compensatory measures.

8.4 Test/Inspection

8.4.1 Remote shutdown instrumentation that continuously displays shall be verified OPERABLE by the performance of a weekly check.

8.4.2 Circuit isolation transfer switches, control functions and status indicators shall be demonstrated OPERABLE by verifying the capability to perform intended functions once each refueling.

NOTE: Portions of this testing which require de-energizing ES Motor Control Centers or 480 volt and 4160 volt buses shall only be performed every other refueling. This testing shall be performed in conjunction with normal preventive maintenance cleaning of the 480 volt and 4160 volt breakers.

8.4.3 Calibration of instrumentation shall be performed once each refueling.

EXHIBIT 2 (Cont'd)

8.5 Basis

8.5.1 The remote shutdown system exists to meet the requirement of 10 CFR 50 Appendix R.

8.5.2 Instrumentation and controls may be inoperable for up to 7 days. This is based on the low probability of an undetected fire severe enough to require the use of any portion of the remote shutdown system that may be inoperable. If an alternate means of achieving the function of the inoperable feature is available or if acceptable compensatory measures are implemented the feature may remain inoperable for more than 7 days.

8.5.3 Instrumentation that continuously displays will be checked weekly. This will assure prompt detection and repair of inoperable instrumentation.

8.5.4 Circuit isolation transfer switches and status indicators will be verified to be operable and control functions tested once each refueling. This will assure operability with minimal risk in the event of a malfunction.

9.0 <u>MISC. FIRE PROTECTION</u>

9.1 Applicability

Applies to miscellaneous fire protection components:

1. Fire Hydrants
2. Rockbestos Fire Rated Cable
3. Three Train Safe Shutdown Systems (Make-up, Nuc. River and Nuclear Service Closed Cooling)
4. Cold Shutdown Repair Capability

EXHIBIT 2 (Cont'd)

9.2 Objective

1. To ensure hydrants remain operable to support exterior fire fighting efforts.

2. To ensure Rockbestos fire rated cable remains intact to function as a fire barrier to support safe shutdown.

3. To ensure 3 train systems not covered by Technical Specification LCO's remain operable to ensure a safe shutdown path in the event of fire.

4. To ensure material is maintained available to accomplish cold shutdown repairs per the Fire Hazards Analysis Report.

9.3 Operability

9.3.1 Hydrants are required to remain operable at all times.

9.3.2 Rockbestos fire rated cable is required to maintain its integrity as a fire barrier (and functional circuit) at all times except during cold shutdown and reactor refueling operating conditions.

9.3.3 For three train systems (MU, NR and NSCC), one train should remain operable beyond the restrictions of Technical Specification limiting conditions for operation (LCO) which allow one of the three trains to be out of service with no time limit. The Fire Hazards Analysis Report relies on different trains for certain fires (example: only MU-P-1A survives a fire in fire area CB-2B and therefore is the single path for safe shutdown in the event of the fire accident).

9.3.4 With hydrants inoperable, reliance may be placed on a nearby, operable hydrant. A job ticket should be issued to accomplish a priority repair.

9.3.5 If Rockbestos fire rated cable is damaged (non-functional fire barrier) follow Exhibit 2, Section 8.0 compensatory measures and reportability review. If the circuit or component is unavailable/non-functional, follow the T.S. LCO for that component.

EXHIBIT 2 (Cont'd)

9.3.6 If one of the three trains in the MU, NR or NSCC system is inoperable for 30 days, prepare an evaluation and determine compensatory measures per the systems operating procedure:

OP 1104-2 (MU)
OP 1104-30 (NR)
OP 1104-11 (NSCC)

9.3.7 If material required to accomplish cold shutdown repairs is missing or damaged, replace it within 30 days

9.3.8 Prepare a potentially reportable event form per AP 1044 and determine reportability using the criteria of 10 CFR 50.72 and 10 CFR 50.73. The AP 1044 form should be prepared if operability is not restored within 7 days for Rockbestos and 30 days for the three train systems listed.

9.4 Test/Inspection

9.4.1 Fire hydrants shall be tested for proper operation of the drain valve function:

1. In October of each year (prior to freezing weather).
2. In April of each year (following freezing weather).
3. Immediately following each use during freezing weather.

9.4.2 Rockbestos fire rated cable shall be inspected in the vicinity of the work area as part of the post-maintenance acceptance criteria for the specific work in progress. This inspection is covered in maintenance procedures which could result in work around cable and is a substitute for an 18 month hand-over-hand inspection of cable to verify the integrity of the fire barrier jacket.

9.4.3 No specific testing on three train systems beyond those required by existing Technical Specifications is required.

9.4.4 Cold shutdown repair materials shall be inventoried once per refueling.

EXHIBIT 2 (Cont'd)

9.5 Basis

9.5.1 Operable hydrants ensure the availability of water for exterior fire fighting efforts on the advancement of hose lines from outside to interior plant areas.

9.5.2 Functional fire rated Rockbestos cable, the availability of cold shutdown repair materials and three train operability ensures the plant's ability to achieve safe shutdown per the Fire Hazards Analysis Report.

GPU Nuclear

TMI-1
Administrative Procedure

Number: 1044

Title: Event Review and Reporting Requirements

Revision No.: 26

Applicability/Scope: TMI-1 Division

Responsible Office: Director, O & M

This document is within QA plan scope X Yes ___ No

Safety Reviews Required X Yes ___ No

Effective Date: 07/10/91

List of Effective Pages

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| | Signature | Concurring Organizational Element | Date |
|---|---|---|---|
| Originator | [signature] | Originator | 6/28/91 |
| Concurred By | | | |
| | [signature] | Procedure Owner | 6/28/91 |
| | | | |
| | [signature] | PRG | 6/28/91 |
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| Approved By | [signature] | Approver | 7/2/91 |
| | [signature] | Approver | 7/3/91 |



0109c

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1.0 PURPOSE

The purpose of this procedure is to specify the evaluation and reporting requirements when an event has occurred which may require notification of NRC representatives and/or company management.

2.0 APPLICABILITY/SCOPE

This procedure applies to personnel at the TMI-1 site.

3.0 DEFINITIONS

None

4.0 PROCEDURE

4.1 Potentially Reportable Events

4.1.1 10 CFR 50.72, Immediate Notification

a. Evaluate the event under consideration against the criteria specified in Enclosure 1.

b. If the event is considered reportable under 50.72, then make notifications using the ENS (red phone) as described in 4.3.1.

4.1.2 10 CFR 50.73, Licensee Event Reports

a. Evaluate the event under consideration against the criteria specified in Enclosure 2.

b. If the event is considered reportable under 50.73, then make notification as described in 4.3.2.

4.1.3 10 CFR 20, Radiological

a. Evaluate the event under consideration against the criteria specified in Enclosure 3.

b. If the event is considered reportable under Part 20, then make notifications as described in 4.3.1 and/or 4.3.2, as applicable.

4.1.4 10 CFR 50.36, Technical Specifications, Section 2.0

a. Evaluate the event under consideration against the criteria specified in Enclosure 4.

b. If the event is considered reportable under 50.36, then make notifications as described in 4.3.1 and/or 4.3.2, as applicable.

4.1.5 10 CFR 73.71, Reporting of Safeguards Events

a. With direction from Security personnel, evaluate the event under consideration against the criteria specified in Enclosure 5.

b. If the event is considered reportable under 73.71, then make notifications as described in 4.3.1. Senior Security personnel should make these notifications.

4.1.6 10 CFR 21, Defects and Noncompliance

a. 10 CFR 21 requires notification of the NRC upon discovery of substantial safety defects. Individuals generating reports in accordance with 10 CFR 21 shall provide a copy to the PRG Chairman and the Director, Operations and Maintenance.

4.1.7 Emergency Plan

**NOTE:** Initiation of the Emergency Plan is in itself reportable within one hour under 10 CFR 50.72.

a. The Emergency Plan requires special NRC notification for specific events. The Emergency Plan shall be used for guidance in making those notifications.

b. Events reportable under the Emergency Plan may also be reportable under 10 CFR 20 or other requirements.

4.1.8 Events of Potential Public Interest

**NOTE:** The declaration of an Event of Potential Public Interest shall not be made in lieu of the declaration of a formal emergency classification (i.e., Unusual Event).

a. These are events that may or may not be considered reportable under other sections of this procedure. Refer to Enclosure 6 for a list of these events.

b. The Shift Supervisor is responsible for declaring Events of Potential Public Interest and notifying the Director, Operations and Maintenance, or his designee, and the below listed personnel:

1. The Public Information Representative (see Initial Response Emergency Organization Duty Roster)

2. Site NRC Duty Representative (see current "Weekly Schedule - NRC on Call Representative" in the Shift Supervisor's office)

3. TMI-1 Duty Superintendent

4. Unit 2 Control Room

5. Events of Potential Public Interest may result in a GPUN press release and may cause public concern. Consider notifying the NRC per Step 4.3.1.b.3 in accordance with 50.72(b)(2)(vi) in Enclosure 1, coincident with or shortly following issuance of a press release by the Communications Department.

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NOTE: The ENS network shall not be used for routine communications with the NRC.

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c. Additionally, an entry should be made in the Shift Foreman's Log Book (left-hand section) describing the event.

d. In the event a call is received by Control Room personnel by members of the public concerning plant status or a perceived plant problem, refer to the guidelines provided in Enclosure 8.

e. Upon termination of the event notify the personnel listed in 4.1.8b.

4.2 Initial Review Process

4.2.1 The Duty Shift Supervisor is typically in the best position to become aware, first hand, of a potentially reportable event. Sources of information available to him include:

a. Results of Tech. Spec. surveillance.

b. Operations or maintenance activities that may reveal improper methods or malfunctioning equipment.

4.2.2 For events brought to his attention, the Shift Supervisor shall make the initial determination regarding reportability of an event. He shall review the event for reportability in any of the categories described in Section 4.1 of this procedure.

4.2.3 If the Shift Supervisor determines that the event is clearly not reportable, he shall inform the Plant Operations Director.

4.2.4 If the Shift Supervisor determines that the event is potentially reportable, additional action is required as specified in Section 4.3.

4.3 Follow-up Review and Reporting

4.3.1 Emergency Notification System (ENS)

a. 1. For events potentially reportable via the ENS, the Shift Supervisor shall immediately notify the Director Operations and Maintenance or Duty Superintendent.

2. The Director, Operations and Maintenance or Duty Superintendent will make the final determination regarding reportability (If unable to contact the Duty Superintendent or Director, Operations and Maintenance, the Shift Supervisor will make the determination).

b. If he determines the event is reportable, he or his designee shall notify:

1. The Public Information Representative (see Initial Response Emergency Organization Duty Roster)

2. Site NRC Duty Representative (see current "Weekly Schedule - NRC on Call Representative" in the Shift Supervisor's office)

3. NRC Operations Center via ENS (red phone). Notification to the NRC Operations Center shall be made within the required time frame and the applicable CFR or other reporting requirement shall be identified.

c. If the ENS is inoperative, then make the required notifications via commercial telephone service, other dedicated telephone system, or any other method which will ensure that a report is made as soon as practical to the NRC Operations Center.

NOTE: If the ENS is inoperative, 10 CFR 50.72(b)(1)(v) requires notification of the NRC Operations Center of this occurrence within one hour. Refer to EPIP-TMI-.06 for the commercial telephone number.

d. During the course of the event, immediately report:

1. Any worsening of conditions
2. Declaration of an emergency, if not already made
3. Change of emergency class, including termination
4. Results of evaluations of plant conditions
5. Effectiveness of response or protective measures taken
6. Information related to plant behavior that is not understood

e. Maintain an open, continuous communication channel with the NRC Operations Center upon request by the NRC.

f. The Shift Supervisor shall complete and distribute a Potentially Reportable Event Form provided as Enclosure 7 to this procedure.

4.3.2 Other Notification and Reporting

a. The Shift Supervisor shall notify the Director, Operations and Maintenance or the Duty Superintendent. The Shift Supervisor will then, as appropriate, make the following notifications:

1. The Public Information Representative (see Initial Response Emergency Organization Duty Roster)
2. Site NRC Duty Representative (see current "Weekly Schedule - NRC on Call Representative" in the Shift Supervisor's office)
3. Plant Operations Director
4. PRG Chairman

b. The Shift Supervisor shall complete and distribute a Potentially Reportable Event Form provided as Enclosure 7 to this procedure.

c. 1. PRG will review the potentially reportable event and make a recommendation concerning reportability to the Director, Operations and Maintenance. The PRG reportability recommendation will be documented.

2. A PRG recommendation concerning reportability is not required if the event has already been reported.

3. If the item requires further technical evaluation, a Potential Safety Concern Initiation form may be submitted in accordance with Reference 6.10.

4. Applicable procedures shall be reviewed following a reportable occurrence such as an accident, an unexpected transient, significant operator error, or equipment malfunction to determine whether procedure changes are required.

d. The Director, Operations and Maintenance or his designee shall make the final determination regarding reportability. He shall then take the following action as appropriate.

1. If the event is not reportable, the Director, Operations and Maintenance shall inform the PRG Chairman.

2. If the event is reportable, the Director, Operations and Maintenance or his designee shall:

a. Notify the NRC within the required time frame.

b. Notify Company Management

c. Notify the Public Information Representative

d. Notify the PRG Chairman

## 5.0 RESPONSIBILITIES

5.1 All employees are responsible for ensuring that items which could adversely affect nuclear safety are brought to the attention of the Shift Supervisor.

5.2 The Shift Supervisor is responsible for making the initial determination regarding reportability. He shall ensure notification is made to the Director, Operations and Maintenance, outside agencies, Public Information Representatives, Plant Operations Director, PRG Chairman and Lead Engineer as appropriate.

5.3 The Lead Engineer or Department head shall ensure that potentially reportable events brought to his attention are submitted to the PRG for evaluation.

5.4 The PRG Chairman shall ensure timely review by the PRG of potentially reportable events and recommend appropriate action to the Director, Operations and Maintenance.

5.5 The Director, Operations and Maintenance or his designee (in non-emergency situations) shall make the final determination regarding reportability and ensure that appropriate on-site and off-site organizations are notified.

6.0 **REFERENCES**

6.1 10 CFR 50.72, Immediate Notification Requirements for Operating Nuclear Power Reactors

6.2 10 CFR 50.73, Licensee Event Report System

6.3 10 CFR 20, Standards for Protection Against Radiation

6.4 10 CFR 50.36, Technical Specifications

6.5 10 CFR 73.71, Reporting of Safeguards Events

6.6 Memo from Director, TMI-1, dated June 1, 1981 concerning a ional desired notifications

6.7 GPU Nuclear Corporation Emergency Plan for Three Mile Isla and Oyster Creek Nuclear Stations, 1000-PLN-1300.01

6.8 10 CFR 21, Reporting of Defects and Noncompliance

6.9 NUREG 1022, Licensee Event Report System

6.10 1000-ADM-7330.01, Management of Potential Safety Concerns

6.11 EPIP-TMI-.06, Additional Assistance and Notification

7.0 **EXHIBITS**

7.1 Enclosure 1 - 10 CFR 50.72

7.2 Enclosure 2 - 10 CFR 50.73

7.3 Enclosure 3 - 10 CFR 20

7.4 Enclosure 4 - 10 CFR 50.36

7.5 Enclosure 5 - 10 CFR 73.71

7.6 Enclosure 6 - Events of Potential Public Interest

7.7 Enclosure 7 - Potentially Reportable Event Form

7.8 Enclosure 8 - Public Inquiry Policy

## 10 CFR 50.72 Notifications

I. One-Hour Notification Requirements

Notify the NRC as soon as practical and in all cases within one hour of the occurrence of any of the following:

(a)(1)(i) The declaration of any of the Emergency Classes specified in the licensee's approved Emergency Plan.

(b)(1)(i) (A) The initiation of any nuclear plant shutdown required by the plant's Technical Specifications.

(B) Any deviation from the plant's Technical Specifications authorized pursuant to subsection 50.54(x) of this part.

| NOTE: | 50.54(x) - A licensee may take reasonable action that departs from a license condition or a Technical Specification in an emergency when this action is immediately needed to protect the public health and safety and no action consistent with license conditions and Technical Specifications that can provide adequate or equivalent protection is immediately apparent. |
|---|---|

| NOTE: | Refer also to 50.73 (a)(2)(i)(A), (B), (C). |
|---|---|

(b)(1)(ii) Any event or condition during operation that results in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded; or results in the nuclear power plant being:

(A) In an unanalyzed condition that significantly compromises plant safety;

(B) In a condition that is outside the design basis of the plant; or

(C) In a condition not covered by the plant's operating and emergency procedures.

| NOTE: | Refer also to 50.73 (a)(2)(ii). |
|---|---|

(b)(1)(iii) Any natural phenomenon or other external condition that poses an actual threat to the safety of the nuclear power plant or significantly hampers site personnel in the performance of duties necessary for the safe operation of the plant.

| NOTE: Refer also to 50.73 (a)(2)(iii). |
|---|

(b)(1)(iv) Any event that results or should have resulted in Emergency Core Cooling System (ECCS) discharge into the reactor coolant system as a result of a valid signal.

| NOTE: Refer also to 50.73 (a)(2)(iv). |
|---|

(b)(1)(v) Any event that results in a major loss of emergency assessment capability, off-site response capability, or communications capability (e.g., significant portion of control room indication, Emergency Notification System, or off-site notification system).

(b)(1)(vi) Any event that poses an actual threat to the safety of the nuclear power plant or significantly hampers site personnel in the performance of duties necessary for the safe operation of the nuclear power plant including fires, toxic gas releases, or radioactive releases.

| NOTE: Refer also to 50.73 (a)(2)(x). |
|---|

## II. Four-Hour Notification Requirements

Notify the NRC as soon as practical and in all cases within four hours of the occurrence of any of the following:

(b)(2)(i) Any event, found while the reactor is shutdown, that, had it been found while the reactor was in operation, would have resulted in the nuclear power plant, including its principal safety barriers, being seriously degraded or being in an unanalyzed condition that significantly compromises plant safety.

| NOTE: Refer also to 50.73 (a)(2)(ii). |
|---|

Enclosure 1 (Cont'd) 

(b)(2)(ii) Any event or condition that results in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS). However, actuation of an ESF, including the RPS, that results from and is part of the preplanned sequence during testing or reactor operation need not be reported.

NOTE: At TMI-1, ESF includes RPS and ESAS. Additionally, TMI-1 has agreed to report HSPS actuations.

NOTE: Refer also to 50.73 (a)(2)(iv).

(b)(2)(iii) Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to:

(A) Shut down the reactor and maintain it in a safe shutdown condition.

(B) Remove residual heat.

(C) Control the release of radioactive material, or

(D) Mitigate the consequences of an accident.

NOTE: Refer also to 50.73 (a)(2)(v) and (a)(2)(vi).

(b)(2)(iv) (A) Any airborne radioactive release that exceeds 2 times the applicable concentrations of the limits specified in Appendix B, Table II of Part 20 of this chapter in unrestricted areas, when averaged over a time period of one hour.

(B) Any liquid effluent release that exceeds 2 times the limiting combined Maximum Permissible Concentration (MPC)(See Note 1 of Appendix B to Part 20 of this chapter) at the point of entry into the receiving water (i.e., unrestricted area) for all radionuclides except tritium and dissolved noble gases, when averaged over a time period of one hour. (Immediate notifications made under this paragraph also satisfy the requirements of paragraphs (a)(2) and (b)(2) of subsection 20.403 of Part 20 of this chapter).

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NOTE: Refer also to 50.73 (a)(2)(viii)(A)(B).

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(b)(2)(v) Any event requiring the transport of a radioactively contaminated person to an off-site medical facility for treatment.

(b)(2)(vi) Any event or situation, related to the health and safety of the public or onsite personnel, or protection of the environment, for which a news release is planned or notification to other government agencies has been or will be made. Such an event may include an onsite fatality or inadvertent release of radioactively contaminated materials.

## 10 CFR 50.73 Reports

> NOTE: Reports made in accordance with 10 CFR 50.73 must be submitted to NRC within 30 days.

(a)(2)(i) (A) The completion of any nuclear plant shutdown required by the plant's Technical Specifications; or

(B) Any operation or condition prohibited by the plant's Technical Specifications; or

(C) Any deviation from the plant's Technical Specifications authorized pursuant to subsection 50.54(x) of this part.

> NOTE: 50.54(x) - A licensee may take reasonable action that departs from a license condition or a Technical Specifications in an emergency when this action is immediately needed to protect the public health and safety and no action consistent with license conditions and Technical Specifications that can provide adequate or equivalent protection is immediately apparent.

> NOTE: Refer also to 50.72 (b)(1)(i)(A)(B).

(a)(2)(ii) Any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded; or that resulted in the nuclear power plant being:

(A) In an unanalyzed condition that significantly compromises plant safety;

(B) In a condition that was outside the design basis of the plant; or

(C) In a condition not covered by the plant's operating and emergency procedures.

> NOTE: Refer also to 50.72 (b)(1)(ii) and (b)(2)(i).

(a)(2)(iii) Any natural phenomenon or other external condition that posed an actual threat to the safety of the nuclear power plant or significantly hampered site personnel in the performance of duties necessary for the safe operation of the nuclear plant.

| NOTE: Refer also to 50.72 (b)(1)(iii). |
|---|

(a)(2)(iv) Any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS). However, actuation of an ESF, including the RPS, that resulted from and was part of the preplanned sequence during testing or reactor operation need not be reported.

| NOTE: At TMI-1, ESF includes RPS and ESAS. Additionally, TMI-1 has agreed to report HSPS actuations. |
|---|

| NOTE: Refer also to 50.72 (b)(1)(iv) and (b)(2)(ii). |
|---|

(a)(2)(v) Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to:

(A) Shut down the reactor and maintain it in a safe shutdown condition;

(B) Remove residual heat;

(C) Control the release of radioactive material; or

(D) Mitigate the consequences of an accident.

| NOTE: Refer also to 50.72 (b)(2)(iii). |
|---|

(a)(2)(vi) Events covered in paragraph (a)(2)(v) of this section may include one or more procedural errors, equipment failures, and/or discovery of design, analysis, fabrication, construction, and/or procedural inadequacies. However, individual component failures need not be reported pursuant to this paragraph if redundant equipment in the same system was operable and available to perform the required safety function.

Enclosure 2 (Cont'd) 

(a)(2)(vii) Any event where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to:

(A) Shut down the reactor and maintain it in a safe shutdown condition;

(B) Remove residual heat;

(C) Control the release of radioactive material; or

(D) Mitigate the consequences of an accident.

(a)(2)(viii) (A) Any airborne radioactive release that exceeded 2 times the applicable concentrations of the limits specified in Appendix B, Table II of Part 20 of this chapter in unrestricted areas, when averaged over a time period of one hour.

(B) Any liquid effluent release that exceeded 2 times the limiting combined Maximum Permissible Concentration (MPC) (See Note 1 of Appendix B to Part 20 of this chapter) at the point of entry into the receiving water (i.e., unrestricted area) for all radionuclides except tritium and dissolved noble gases, when averaged over a time period of one hour.

NOTE: Refer also to 50.72 (b)(2)(iv).

(a)(2)(ix) Reports submitted to the Commission in accordance with paragraph (a)(2)(viii) of this section also meet the effluent release reporting requirements of paragraph 20.405 (a)(5) of Part 20 of this chapter.

(a)(2)(x) Any event that posed an actual threat to the safety of the nuclear power plant or significantly hampered site personnel in the performance of duties necessary for the safe operation of the nuclear power plant including fires, toxic gas releases, or radioactive releases.

NOTE: Refer also to 50.72 (b)(1)(vi).

10 CFR 20

20.402(a)(1) Each licensee shall report to the Commission, by telephone, immediately after it determines that a loss or theft of licensed material has occurred in such quantities and under such circumstances that it appears to the licensee that a substantial hazard may result to persons in unrestricted areas.

> NOTE: Telephone notification shall be made via the ENS as in 10 CFR 50.72. Written reports are required within 30 days as in 10 CFR 50.73.

20.403 Notifications of Incidents

(a) Immediate notification

Each licensee shall immediately report any events involving by product, source, or special nuclear material possessed by the licensee that may have caused or threatens to cause:

(1)° Exposure of the whole body of any individual to 25 rems or more of radiation;

° exposure of the skin of the whole body of any individual of 150 rems or more of radiation;

° or exposure of the feet, ankles, hands or forearms of any individual to 375 rems or more of radiation; or

(2)° The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 5,000 times the limits specified for such materials in Appendix B, Table II of this part, or

(3)° A loss of one working week or more of the operation of any facilities affected; or

(4)° Damage to property in excess of $200,000.

(b) Twenty-four Hour Notification

Each licensee shall within 24 hours of discovery of the event, report any event involving licensed material possessed by the licensee that may have caused or threatens to cause:

(1) Exposure of the whole body of any individual to 5 rems or more of radiation; exposure of the skin of the whole body of any individual to 30 rems or more of radiation; or exposure of the feet, ankles, hands, or forearms to 75 rems or more of radiation; or

(2) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 500 times the limits specified for such materials in Appendix B, Table II of this part; or

(3) A loss of one day or more of the operation of any facilities affected; or

(4) Damage to property in excess of $2,000.

| NOTE: | Telephone notification shall be made via the ENS as in 10 CFR 50.72. |
|---|---|

20.405 Reports of overexposures and excessive levels and concentrations.

(a)(1) In addition to any notification required by subsection 20.403 of this part, each licensee shall make a report in writing concerning any one of the following types of incidents within 30 days of its occurrence:

(i) Each exposure of an individual to radiation in excess of the applicable limits in subsection 20.101 or 20.104(a) of this part, or the license;

(ii) Each exposure of an individual to radioactive material in excess of the applicable limits in subsection 20.103(a)(1), 20.103(a)(2), or 20.104(b) of this part, or in the license;

(iii) Levels of radiation or concentrations of radioactive material in a restricted area in excess of any other applicable limit in the license;

(iv) Any incident for which notification is required by subsection 20.403 of this part; or

(v) Levels of radiation or concentrations of radioactive material (whether or not involving excessive exposure of any individual) in an unrestricted area in excess of ten times any applicable limit set forth in this part or in the license.

(c)(1) In addition to any notification required by subsection 20.403 of this part, each licensee shall make a report in writing of levels of radiation or releases of radioactive material in excess of limits specified by 40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations," or in excess of license conditions related to compliance with 40 CFR Part 190.

| NOTE: | Written reports are required within 30 days as in 10 CFR 50.73. |
|---|---|

Enclosure 4

10 CFR 50.36 Requirements

(c)(1) Safety Limits, Limiting Safety System Settings, and Limiting Control Settings (Technical Specifications, Section 2.0)

(i)(A) Safety limits for nuclear reactors are limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity. If any safety limit is exceeded, the reactor must be shut down. The licensee shall notify the Commission, review the matter and record the results of the review, including the cause of the condition and the basis for corrective action taken to preclude recurrence. Operation must not be resumed until authorized by the Commission.

(ii)(A) Limiting Safety Systems Settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a Limiting Safety System Setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor. The licensee shall notify the Commission, review the matter and record the results of the review, including the cause of the condition and the basis for corrective action taken to preclude recurrence.

(c)(2) Limiting Conditions for Operation

(Technical Specifications, Section 3.0)

Limiting Conditions for Operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a Limiting Condition for Operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the Technical Specifications until the condition can be met. The licensee shall notify the Commission, review the matter, and record the results of the review, including the cause of the condition and the basis for corrective action taken to preclude recurrence.

Enclosure 5

10 CFR 73.71, Reporting of Safeguards Events

(A) Each licensee . . . shall notify the NRC Operations Center [via the ENS] within one hour after discovery of the loss of any shipment of SNM or spent fuel, and within one hour after recovery of or accounting for such lost shipment.

(B) Each licensee . . . shall notify the NRC Operations Center [via the ENS] within one hour of discovery of . . . the following events:

(a) Any event in which there is reason to believe that a person has committed or caused, or attempted to commit or cause, or has made a credible threat to commit or cause:

(1) A theft or unlawful diversion of special nuclear material; or

(2) Significant physical damage to a power reactor or any facility possessing SSNM or its equipment or carrier equipment transporting nuclear fuel or spent nuclear fuel, or to the nuclear fuel or spent nuclear fuel a facility or carrier possesses; or

(3) Interruption of normal operation of a licensed nuclear power reactor through the unauthorized use of or tampering with its machinery, components, or controls including the security system.

(b) An actual entry of an unauthorized person into a protected area, material access area, controlled access area, vital area, or transport.

(c) Any failure, degradation, or the discovered vulnerability in a safeguard system that could allow unauthorized or undetected access to a protected area, material access area, controlled access area, vital area, or transport for which compensatory measures have not been employed.

(d) The actual or attempted introduction of contraband into a protected area, material access area, vital area, or transport.

NOTE: The above requirements are taken from 10 CFR 73.71, subsections (a)(1) and (b)(1), and Appendix G, I.

Enclosure 6

Events of Potential Public Interest

Events of Potential Public Interest may result in a GPUN press release and may cause public concern. Consider notifying the NRC per Step 4.3.1.b.3. in accordance with 50.72(b)(2)(vi) in Enclosure 1, coincident with or shortly following issuance of a press release by the Communications Department.

1. Any plane crash in the immediate vicinity of TMI.

2. Any near or onsite toxic or flammable gas or liquid release.

3. Any ambulance leaving the site while transporting a patient to a hospital.

4. Any fire on TMI regardless of whether off-site assistance was needed (and which does not require declaration of an Unusual Event, Alert, Site Area Emergency or General Emergency). (A good rule of thumb is if the siren was activated, except for testing, then notifications should be made).

5. An unanticipated radioactive spill, leak or dropped cask or liner of radioactive material or a plant operational problem which results in an evacuation of a building due to confirmed high radiation or airborne radioactivity levels.

6. Personnel have received a radiation exposure in excess of the Federal limits for the whole body, skin, extremities and critical organs.

7. Failure of the makeup system which results in a loss of RCS pressure and/or level control (as applicable).

8. Environmental samples, directly affected from TMI operations, indicating greater than ten times the background levels of radioactivity.

9. An uncontrolled release which results in a valid liquid or gaseous effluent radiation monitor increase which is greater than ten times the normal radiation levels (other than controlled releases).

10. Loss of a licensed radioactive source.

11. An unanticipated event below the threshold to declare an emergency that draws public attention and concern (by noise or visible display) for the activity on TMI-1. Examples of this would be the noise associated with the Main Steam Safety Valves following a reactor trip, or other unusual steam plumes which may not generate the noise of MSSV's.

12. Planned evolutions that, in the judgement of the Shift Supervisor/Foreman or GPUNC management, may be of public interest.

Enclosure 7

POTENTIALLY REPORTABLE EVENT FORM

Title ____________________

1. Reportable per: 10 CFR 50.72, item: ____________
   10 CFR 50.73, item: ____________
   10 CFR 20, item: ____________
   10 CFR 50.36, item: ____________
   10 CFR 73.71, item: ____________
   10 CFR 21, item: ____________
   Emergency Plan item: ____________

2. Time ____________ and Date ____________ of occurrence.

3. Document Tech Spec Section Violated ____________________

4. Detailed description of event, plant status, training concerns (if applicable), and immediate corrective actions. Attach additional sheets if necessary. Especially, include information which may not be available the following normal work day.

SHIFT SUPERVISOR: ____________________ DATE: ____________

cc: Director, Operations and Maintenance
Director of System Engineering, Parsippany
Plant Operations Director
PRG Chairman
Manager, QA Mod/Ops
Manager, Nuclear Safety (IOSRG)
Plant Analysis Manager, TMI-1
Manager, Plant Training
TMI Emergency Preparedness Manager

Enclosure 8

Public Inquiry Policy

I. Control Room Action

A. Determine the following information:

1. Name of Caller: ______________________

2. County of Residence: ______________________

3. Telephone Number: ______________________

4. Date and Time of Call: ______________________

5. Brief Description of Problem: ______________________

______________________
______________________
______________________
______________________
______________________
______________________

B. Inform the caller that someone will get back to him as soon as possible.

C. Refer to the Initial Response Emergency Organization Duty Roster and notify the Public Information Representative of the above situation.

II. Public Information Action

A. If the problem is siren related: upon receipt of the above information the Public Information Representative should contact the Public Affairs duty person who, in turn, should contact the respective County Emergency Management Office to determine the extent of the problem and to confirm that Mark Bitting has been notified and contact the caller.

County Emergency Management Office Phone Numbers:

________ Cumberland - 238-9676
________ Dauphin - 236-7976
________ Lancaster - 299-8373
________ Lebanon - 272-7621
________ York - 854-5571 or 843-5111

The next working day the Public Affairs Department shall notify the following:

C. Clawson - 7706 (Parsippany)
G. Simonetti - 8490
A. Knoche - 8439

ATTACHMENT 2 ES-501
Rev 6 06/01/90

# SIMULATION FACILITY REPORT

Facility Licensee: TMI-1

Facility Docket No.: 50-289

Operating Tests Administered on: February 11-12, 1992

This form is used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of non-compliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information which may be used in future evaluations. No licensee action is required in response to these observations.

During the conduct of the simulator portion of the operating tests, the following item was observed.

| ITEM | DESCRIPTION |
| --- | --- |
| Communications | Communications network in the simulator does not mimic that in the control room. Also, verbal communications via the simulator loudspeaker was muffled to the point where conversations were not audible. |