

**U.S. Nuclear Regulatory Commission
Site-Specific SRO Written Examination**

Applicant Information

Name:

Date: 06/25/19

Facility/Unit FARLEY 1 & 2

Region: I II III IV Reactor Type: W CE BW GE

Start Time:

Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80 percent overall, with 70 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80 percent to pass. You have 9 hours to complete the combined examination and 3 hours if you are only taking the SRO-only portion.

Applicant Certification

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

Applicant's Signature

Results

RO/SRO-Only/Total Examination Values 75 / 25 / 100 Points

Applicant's Score / / Points

Applicant's Grade / / Percent

75. Given the following plant conditions:

- Unit 1 has experienced a Large Break LOCA.

Subsequently, ECP-1.1, Loss of Emergency Coolant Recirculation, has been entered and the following indications are observed:

- Only **one** Containment Cooler is running.
- RWST level is 8.0 ft and slowly lowering.
- Containment pressure is 28 PSIG and slowly lowering.
- The operating crew is at the step to evaluate Containment Spray requirements.

Which one of the following completes the statement below per ECP-1.1?

(1) Containment Spray pump(s) are required to be running.

Containment Spray (2) be aligned for recirculation mode, **assuming the appropriate conditions are met.**

REFERENCE PROVIDED

- A. (1) TWO
(2) CAN
- B. (1) TWO
(2) CANNOT
- C. (1) **only** ONE
(2) CAN
- D. (1) **only** ONE
(2) CANNOT

76. Given the following plant conditions:

- Unit 1 is stable at 58% power.
- Control Bank D is at 132 steps.
- Control Bank D, Rod K10 is at 62 steps.
- FF5, COMP ALARM ROD SEQ/DEV OR PR FLUX TILT, is in alarm.

Which one of the following completes the statements below?

AOP-19.0, Malfunction of Rod Control, (1) contains directions to mitigate the conditions above.

Per the BASES of TRM 13.1.1, Shutdown Margin (SDM) - Modes 1 and 2, the most limiting accident for Shutdown Margin requirements is based on a (2).

- A. (1) Section 1.2, Misaligned Rods in MODE 1
(2) Control Rod Ejection accident
- B. (1) Section 1.2, Misaligned Rods in MODE 1
(2) Steam Line Break accident
- C. (1) Section 1.3, Dropped Rods In MODE 1
(2) Control Rod Ejection accident
- D. (1) Section 1.3, Dropped Rods In MODE 1
(2) Steam Line Break accident

77. Given the following plant conditions:

- 1B RHR pump is in service for the RCS cooldown.
- RCS Temperature is 250°F.

Which one of the following completes the statements below?

Per SOP-7.0, Residual Heat Removal System, 'B' train ECCS (1) operable.

The reason for the RHR operability temperature limit is because the RHR pump (2) if an ECCS actuation were to occur.

- A. (1) IS
(2) **suction** piping may be susceptible to flashing
- B. (1) IS
(2) **discharge** piping may be susceptible to thermal transients
- C. (1) is NOT
(2) **suction** piping may be susceptible to flashing
- D. (1) is NOT
(2) **discharge** piping may be susceptible to thermal transients

78. Given the following plant conditions:

- Unit 1 has experienced a Reactor Trip and Safety Injection.
- The operating crew verified that electrical busses were powered and are working their way through the subsequent steps of EEP-0, Reactor Trip or Safety Injection.

Which one of the following completes the statements below?

After the Immediate Operator Actions, the first (**earliest**) possible transition out of EEP-0 is ____.

- A. FRP-H.1, Response to Loss of Secondary Heat Sink, due to not having a secondary heat sink available
- B. EEP-1, Loss of Reactor or Secondary Coolant, due to a stuck open PORV and the associated PZR PORV ISO cannot be closed or a stuck open PRZR SAFETY valve
- C. EEP-2, Faulted Steam Generator Isolation, due a SG's pressure falling in an uncontrolled manner
- D. EEP-3, Steam Generator Tube Rupture, due to a SG's level rising in an uncontrolled manner

79. Given the following plant conditions:

- Unit 1 is operating at 100% power.

At 1000:

- AA4 and AB4, CCW SRG TK LVL A (B) TRN HI-LO, comes into alarm.

At 1020:

- AA5, CCW SRG TK LVL A TRN LO-LO, comes into alarm.
- 'A' Train surge tank level is falling.

Which one of the following completes the statements below?

The **earliest** time that CCW system automatic isolation(s) will occur is at (1).

(2) contains the directions to refill the CCW surge tank.

- A. (1) 1000
(2) ARP AA4
- B. (1) 1020
(2) ARP AA4
- C. (1) 1000
(2) AOP-9.0, Loss of Component Cooling Water
- D. (1) 1020
(2) AOP-9.0, Loss of Component Cooling Water

80. Given the following plant conditions:

At 1000:

- The crew is performing actions of ECP-1.1, Loss of Emergency Coolant Recirculation.
- RWST level is 10 feet and lowering.

At 1030:

- Integrity CSF Status Tree indicates ORANGE.
- No other CSF Status Tree indications are ORANGE or RED.
- Cold Leg recirculation is not available.

Which one of the following completes the statements below per ECP-1.1?

At 1000, the operating crew is required to (1).

At 1030, the operating crew is required to (2).

Nomenclature: FRP-P.1, Response to Imminent Pressurized Thermal Shock

- A. (1) stop all safeguards pumps taking suction from the RWST
(2) go to FRP-P.1
- B. (1) stop all safeguards pumps taking suction from the RWST
(2) remain in ECP-1.1
- C. (1) establish **one** train of ECCS equipment
(2) go to FRP-P.1
- D. (1) establish **one** train of ECCS equipment
(2) remain in ECP-1.1

81. Given the following plant conditions:

- A Large Break LOCA occurred on Unit 1.

At 1000:

- After exiting from EEP-0, Reactor Trip or Safety Injection, the first indications of an ORANGE path on CORE COOLING are received.
- Containment pressure is 26 psig and lowering.
- R-27A & B, Containment (High Range), indicates 5R/hr.

At 1010:

- An ORANGE path still exists on CORE COOLING.
- The Emergency Director classifies the event.

Which one of the following completes the statements below based upon the conditions given above?

At 1010, the Emergency Director declared a(n) (1) per NMP-EP-141, Event Classification. (Do not use ED judgment as a basis for the classification)

Local agencies must be notified **no later than** (2) per NMP-EP-142, Emergency Notification.

REFERENCE PROVIDED

- A. (1) SITE AREA EMERGENCY
(2) 1025
- B. (1) ALERT
(2) 1025
- C. (1) SITE AREA EMERGENCY
(2) 1015
- D. (1) ALERT
(2) 1015

82. Unit 1 is at 100% power with the following conditions:

- PT-950, CTMT PRESS (Channel 1), was declared INOPERABLE.

Subsequently the following occurs:

- PT-950 was positioned as required by Tech Spec 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation, for continuous operation with an inoperable channel.
- The Surveillance Test for PT-953, CTMT PRESS (Channel 4), is required to be performed at this time.

Which one of the following completes the statements below?

Based on the inoperability of PT-950, the Tech Spec REQUIRED ACTION was to place PT-950 bistables in the (1) position.

During the time that the Surveillance Test is being performed on PT-953, a valid automatic Containment Spray actuation (2) occur.

REFERENCE PROVIDED

	<u>(1)</u>	<u>(2)</u>
A.	trip	CAN still
B.	bypass	CAN still
C.	trip	CANNOT
D.	bypass	CANNOT

83. Given the following plant conditions:

- Unit 1 is in MODE 3.
- All RCPs are running.
- A CCW leak occurs on the 1A RCP Oil Cooler inlet connection.

Which one of the following completes the statements below?

The method used in the **Main Control Room (MCR)** to isolate the leak is to isolate CCW to (1).

After operators in the MCR isolate the CCW leak, the CCW System is (2) per the BASES of LCO 3.7.7 - CCW System.

- A. (1) **all** RCPs
(2) OPERABLE
- B. (1) **all** RCPs
(2) **not** OPERABLE
- C. (1) the 1A RCP **only**
(2) OPERABLE
- D. (1) the 1A RCP **only**
(2) **not** OPERABLE

84. Given the following plant conditions:

Unit 1 and Unit 2 are at 100% power when the following occurs:

- A Loss of Offsite Power occurs on Unit 2 **only**.
- The 1-2A DG fails to start.

Subsequently, the following occurs:

At 1000:

- The crew is evaluating the step to "Verify power to 4160V ESF busses" in accordance with EEP-0, Reactor Trip or Safety Injection.

At 1200:

- The crew transitions to the appropriate Unit Operating Procedure for recovery.
- The status of the 1-2A DG is unchanged.
- The crew reviews the following LCO and CONDITION STATEMENT:
 - LCO 3.8.1, AC Sources - Operating
 - CONDITION B: One DG set inoperable.

Which one of the following completes the statements below for **Unit 2**?

At 1000 the 2F 4160V AC bus (1) energized.

At 1200 REQUIRED ACTIONs of LCO 3.8.1, CONDITION B, (2) required to be performed.

- A. (1) IS
(2) are NOT
- B. (1) IS
(2) ARE
- C. (1) is NOT
(2) are NOT
- D. (1) is NOT
(2) ARE

85. Given the following plant conditions:

At 1000:

- Unit 1 is at 100% power.

At 1030:

- Unit 1 Generator Voltage is 20.45 kV.
- The following alarms have actuated:
 - WE2, 1F 4KV BUS OV-OR-UV OR LOSS OF DC.
 - VE2, 1G 4KV BUS OV-OR-UV OR LOSS OF DC.
- Grid frequency has fallen to 59.6 hertz and is stable.
- 4160V Bus voltages are 3780 Volts.

At 1135:

- 4160V Bus voltages are 3740 Volts.
- ACC has informed the plant that grid conditions will not improve for the next 8 hours.
- AOP-5.2, Degraded Grid, is in progress at the step to "Evaluate need for plant Shutdown".

Which one of the following completes the statements below?

From **1000** to **1030**, the Generator stator temperatures (1).

At 1135, the crew (2) required to initiate action to place Reactor in MODE 3 within the next 6 hours per AOP-5.2.

- A. (1) ROSE
(2) is NOT
- B. (1) FELL
(2) is NOT
- C. (1) ROSE
(2) IS
- D. (1) FELL
(2) IS

86. Given the following plant conditions:

- Unit 1 has experienced a large break LOCA.
- ONLY the 1A Containment Cooler is running.
- MOV-3024A, EMERG SW FROM 1A CTMT CLR, did not open.

Which one of the following completes the statements below based upon the given conditions?

Service Water flow through the 1A Containment Cooler is approximately (1).

Per the Bases of LCO 3.6.6, Containment Spray and Cooling Systems, the current Containment Cooler alignment and Service Water flow rate (2) provide sufficient cooling capacity to meet post-accident heat removal requirements.

- A. (1) 800 gpm
(2) DOES
- B. (1) 800 gpm
(2) does NOT
- C. (1) 2000 gpm
(2) DOES
- D. (1) 2000 gpm
(2) does NOT

87. Given the following plant conditions:

- Unit 1 is operating at 100%.
- The 1B Charging Pump is tagged out.
- 1B DG is in parallel with the grid for FNP-1-STP-80.6, Diesel Generator 1B 24 Hour Load Test.

At 1000 on January 1st:

- The 1A Charging pump **trips**.

At 1200 on January 1st:

- A loss of the 1B Startup Transformer occurs.

At 1600 on January 1st:

- Maintenance reports the following return to service times:
 - 1B Startup Transformer: 28 hours.
 - 1A Charging pump: 26 hours.
 - 1B Charging pump: 30 hours.

Which one of the following completes the statements below based upon the given conditions?

At 1300 on January 1st, assuming no operator action, the 1B DG is operating in (1) mode.

At 1400 on January 2nd, the crew (2) required to declare the 1C Charging Pump INOPERABLE per LCO 3.8.1, AC Sources - Operating.

REFERENCE PROVIDED

- A. (1) isochronous
(2) is NOT
- B. (1) isochronous
(2) IS
- C. (1) speed droop
(2) is NOT
- D. (1) speed droop
(2) IS

88. Unit 1 is operating at 100% power when the following occurs:

- The instrument power supply fuse to R-27A, CTMT HIGH RANGE, blows.

Which one of the following completes the statements below?

R-27A indication will fail (1).

Per Tech Spec 3.3.3, Post Accident Monitoring Instrumentation, the REQUIRED ACTION is to (2).

REFERENCE PROVIDED

A. (1) HIGH

(2) initiate action in accordance with Specification 5.6.8

B. (1) HIGH

(2) restore R-27A to OPERABLE status

C. (1) LOW

(2) initiate action in accordance with Specification 5.6.8

D. (1) LOW

(2) restore R-27A to OPERABLE status

89. Given the following plant conditions:

- Unit 1 has tripped and an SI has been actuated.
- The operating crew was performing ESP-1.2, Post LOCA Cooldown and Depressurization.

Subsequently, the operating crew has transitioned to FRP-C.1, Response to Inadequate Core Cooling, and the following conditions exist:

- The operating crew has **not** been able to establish any injection flow.
- The crew is at the step "Check if RCPs should be started" and the following is observed:
 - Core exit T/Cs are all above 1200°F.
 - All SG Narrow Range levels are 10%.
 - All RCPs are stopped but available.

Which one of the following completes the statements below?

The **next** required action, based on given plant conditions, is to (1).

When Core Cooling is restored and all operator actions directed by FRP-C.1 are complete, the operating crew is required to transition to (2).

- A. (1) open all PRZR PORVs and PRZR PORV ISOs
(2) EEP-1, Loss of Reactor or Secondary Coolant
- B. (1) open all PRZR PORVs and PRZR PORV ISOs
(2) ESP-1.2, Post LOCA Cooldown and Depressurization
- C. (1) start a RCP in one of the loops
(2) EEP-1, Loss of Reactor or Secondary Coolant
- D. (1) start a RCP in one of the loops
(2) ESP-1.2, Post LOCA Cooldown and Depressurization

90. Given the following plant conditions:

- Unit is at 85%.

At 0800 on April 1, 2019:

- RCS Dose Equivalent Iodine (DEI) -131 is 6.3 $\mu\text{Ci/gm}$.

Which one of the following completes the statements below?

At 0800 on April 1, 2019, per LCO 3.4.16, RCS Specific Activity, the operating crew is required to (1).

Per the BASES of LCO 3.4.16, the limit on RCS specific activity is based on maintaining acceptable site boundary dose values during a (2).

REFERENCE PROVIDED

- A. (1) continue to monitor DEI-131 to ensure it remains within the acceptable region once every 4 hours and restore DEI-131 to within limit in 48 hours
(2) LOCA
- B. (1) continue to monitor DEI-131 to ensure it remains within the acceptable region once every 4 hours and restore DEI-131 to within limit in 48 hours
(2) Steam Generator Tube Rupture
- C. (1) place the unit in Mode 3 with $T_{\text{avg}} < 500^{\circ}\text{F}$ within 6 hours
(2) LOCA
- D. (1) place the unit in Mode 3 with $T_{\text{avg}} < 500^{\circ}\text{F}$ within 6 hours
(2) Steam Generator Tube Rupture

91. Given the following plant conditions:

- The Motor Driven Fire pump (MDFP) was started from the MCB.

Subsequently, the following occurred:

- The MDFP supply breaker tripped on overload.

Which one of the following completes the statements below?

The MDFP control switch amber light at the MCB is (1).

The Fire Suppression Water System (2) FUNCTIONAL per SOP-0.4, and FP LCO 4.3 - Fire Suppression Water System.

Nomenclature: SOP-0.4, Fire Protection Operability and LCO Requirements

- A. (1) LIT
(2) is NOT
- B. (1) NOT lit
(2) is NOT
- C. (1) LIT
(2) IS
- D. (1) NOT lit
(2) IS

92. Given the following plant conditions:

- A Unit 1 Containment Rapid Entry is being performed per STP-34.1, Containment Inspection (Post Maintenance), Attachment 3, Containment Inspection (Rapid Entry) to disprove a fire alarm.
- Moveable Incore Detector System (MIDS) is not in service.

Which one of the following completes the statements below?

Per STP-34.1, after evaluating impacts to plant safety, the **Shift Supervisor** (1) approve the Containment Rapid Entry.

Use of a (2) is the minimum acceptable administrative method to ensure power is removed from MIDS.

- A. (1) CANNOT
(2) Status Tag
- B. (1) CANNOT
(2) LHRA locking device (padlock)
- C. (1) CAN
(2) Status Tag
- D. (1) CAN
(2) LHRA locking device (padlock)

93. Which one of the following completes the statements below in accordance with FNP-1-FHP-1.0, Refueling Operations?

The Control Room refueling station Engineer (1) give the **final** permission for unlatching a fuel assembly that has been placed in the Reactor Vessel.

The Refueling SRO (2) allowed to grant permission for bypass switch operation of the manipulator crane.

A. (1) CANNOT

(2) is NOT

B. (1) CANNOT

(2) IS

C. (1) CAN

(2) is NOT

D. (1) CAN

(2) IS

94. Which one of the following completes the statement below per NMP-AD-003, Equipment Clearance and Tagging?

Using a(n) ____ as a Boundary Point in a Clearance requires concurrence from both the Shift Manager and a Department Supervisor responsible for the work being performed.

- A. needle valve
- B. breaker control power fuse
- C. AOV that fails open but is mechanically gagged closed
- D. check valve that cannot be physically restrained in the isolated position

95. Given the following plant conditions:

- Unit 1 is approaching Mid-Loop prior to core offload.
- Maintenance on the 1C Condensate pump was started 2 days ago, and is currently in progress.

Which one of the following completes the statements below per NMP-OS-010, Protected Train/Division and Protected Equipment Program, during mid-loop operations?

Work on the 1C Condensate pump (1) require a Green Sheet.

An SRO (2) allowed to issue a Green Sheet for work on the 1-2A DG.

A. (1) does NOT

(2) is NOT

B. (1) does NOT

(2) IS

C. (1) DOES

(2) is NOT

D. (1) DOES

(2) IS

96. Given the following plant conditions:

- Unit 1 is shutdown.
- STP-18.4, Containment Mid-Loop and/or Refueling Integrity Verification and Containment Closure, has been completed to allow refueling operations.
- The Containment Equipment Hatch is open.
- During fuel movement, a spent fuel assembly has dropped from the Manipulator Crane to the bottom of the cavity.
- Both R-24A & B, CTMT PURGE, are in alarm.
- AOP-30, Refueling Accident, actions are in progress.

Which one of the following completes the statements below?

The ACCEPTANCE CRITERIA of STP-18.4 for Refueling Integrity states that the Containment Equipment Hatch is capable of being closed within (1) of notification.

Per AOP-30, actions are required to place (2) in service without delay.

- A. (1) two hours
(2) PRF (Penetration Room Filtration)
- B. (1) two hours
(2) CREFS (Control Room Emergency Filtration System)
- C. (1) four hours
(2) PRF (Penetration Room Filtration)
- D. (1) four hours
(2) CREFS (Control Room Emergency Filtration System)

97. Given the following plant conditions:

- A SGTR has occurred on the 2C SG.
- EEP-3, Steam Generator Tube Rupture is in progress.
- The operating crew has just completed depressurizing the RCS to minimize break flow and refill the Pressurizer using PCV-445A, PRZR PORV and the following indications are observed:
 - MOV-8000A and MOV-8000B, PRZR BLOCK VLV, are closed.
 - RCS pressure is 690 psig and slowly lowering.
 - 2C SG pressure is 700 psig and slowly lowering.
 - CETCs are 480°F.

Which one of the following completes the statement below?

The next required procedure transition is to ____.

- A. ESP-3.1, Post-SGTR Cooldown using Backfill
- B. ESP-3.3, SGTR Without Pressurizer Pressure Control
- C. ECP-3.1, SGTR with Loss of Reactor Coolant Subcooled Recovery Desired
- D. ECP-3.3, SGTR with Loss of Reactor Coolant Saturated Recovery Desired

98. Given the following plant conditions:

- A Unit 1 RCS heatup is in progress.
- CB1, 1A ACCUM OUTLET ISO VLV NOT FULLY OPEN, has alarmed.
- HD2, PRZR PRESS SI PORV BLOCK P-11, has just cleared.

The following indications are observed:

- RCS temperature is 400°F and slowly rising.



Which one of the following completes the statements below?

When power is applied to MOV-8808A and with no MCB switch manipulation, MOV-8808A (1) automatically open.

Per the BASES of LCO 3.5.1, Accumulators, MOV-8808A must be fully open with power (2) the valve motor for the 1A Accumulator to be OPERABLE. (assume all other requirements of operability for the 1A Accumulator are met)

REFERENCE PROVIDED

- A. (1) will NOT
(2) removed from
- B. (1) will NOT
(2) applied to
- C. (1) WILL
(2) removed from
- D. (1) WILL
(2) applied to

99. Given the following plant conditions:

- EEP-1, Loss of Reactor or Secondary Coolant, is in progress on Unit 1.
- The crew is checking LHSI flow in progress and the following is observed:
 - RCS subcooling is 50°F and improving.
 - SG pressures are 800 psig and stable.
 - Total AFW flow is 400 gpm.
 - RCS pressure is 500 psig and slowly rising.
 - Pressurizer level is 44% and slowly rising.
 - Containment pressure is 6 psig.
 - RWST level is 14 ft and slowly lowering.

Which one of the following is currently required per EEP-1?

- A. Remain in EEP-1.
- B. Go to ESP-1.1, SI Termination.
- C. Go to ESP-1.3, Transfer to Cold Leg Recirculation.
- D. Go to ESP-1.2, Post LOCA Cooldown and Depressurization.

100. Given the following plant conditions:

- Unit 1 experienced a Reactor Trip and Safety Injection.
- The crew transitioned to FRP-P.1, Response to Imminent Pressurized Thermal Shock, from EEP-1, Loss of Reactor or Secondary Coolant.
- The crew is evaluating the step, "Check RCS pressure - GREATER THAN 275 psig {435 psig}"

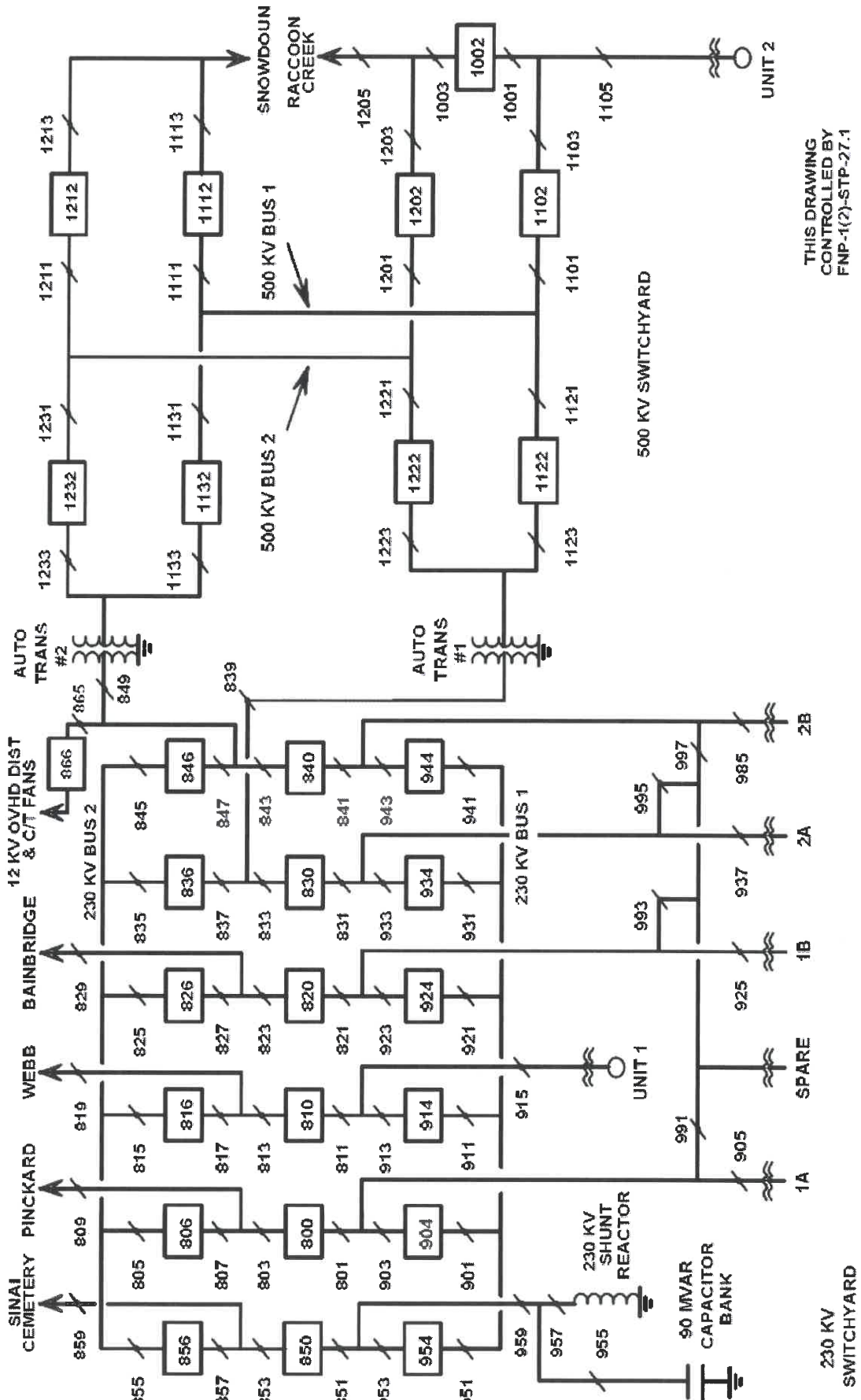
Which one of the following completes the statements below per FRP-P.1?

The basis for checking RCS pressure in the step above is (1).

Of the two values listed below, the **maximum** cooldown rate allowed following a soak is (2) in any 60 minute period.

- A. (1) to preclude performance of FRP-P.1 when Pressurized Thermal Shock is not a concern.
(2) 49°F
- B. (1) to preclude performance of FRP-P.1 when Pressurized Thermal Shock is not a concern.
(2) 20°F
- C. (1) to avoid delays caused by unnecessary soak periods required by FRP-P.1
(2) 49°F
- D. (1) to avoid delays caused by unnecessary soak periods required by FRP-P.1
(2) 20°F

SWITCHYARD BKR LAYOUT



THIS DRAWING
CONTROLLED BY
FNP-1(2)-STP-27.1

230 KV
SWITCHYARD

UNIT 1

ENP-1-ECP-1.1	LOSS OF EMERGENCY COOLANT RECIRCULATION	Revision 33.0
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Step	Action/Expected Response	Response NOT Obtained																																				
10	Evaluate containment spray requirements.																																					
10.1	Check containment spray pumps - ALIGNED TO RWST. RWST TO 1A(1B) CS PUMP <input type="checkbox"/> Q1E13MOV8817A open <input type="checkbox"/> Q1E13MOV8817B open	10.1 <u>IF</u> containment spray pumps aligned to the the containment sump, <u>THEN</u> proceed to Step 12.																																				
10.2	Determine number of containment spray pumps required based on the Table below.																																					
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 15%;">RWST LEVEL</th> <th style="width: 30%;">CONTAINMENT PRESSURE</th> <th style="width: 20%;">FAN COOLERS RUNNING IN EMERGENCY MODE</th> <th style="width: 35%;">SPRAY PUMPS REQUIRED</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="vertical-align: middle;">GREATER THAN 12.5 FT</td> <td>GREATER THAN 54 PSIG</td> <td>--</td> <td>2</td> </tr> <tr> <td rowspan="3" style="vertical-align: middle;">BETWEEN 27 PSIG <u>AND</u> 54 PSIG</td> <td>0, 1</td> <td>2</td> </tr> <tr> <td>2, 3</td> <td>1</td> </tr> <tr> <td>4</td> <td>0</td> </tr> <tr> <td></td> <td>LESS THAN 27 PSIG</td> <td>--</td> <td>0</td> </tr> <tr> <td rowspan="3" style="vertical-align: middle;">BETWEEN 4.5 FT and 12.5 FT</td> <td>GREATER THAN 54 PSIG</td> <td>--</td> <td>2</td> </tr> <tr> <td rowspan="2" style="vertical-align: middle;">BETWEEN 27 PSIG and 54 PSIG</td> <td>1, 2</td> <td>1</td> </tr> <tr> <td>3, 4</td> <td>0</td> </tr> <tr> <td></td> <td>LESS THAN 27 PSIG</td> <td>--</td> <td>0</td> </tr> <tr> <td style="vertical-align: middle;">LESS THAN 4.5 FT</td> <td>--</td> <td>--</td> <td>0</td> </tr> </tbody> </table>			RWST LEVEL	CONTAINMENT PRESSURE	FAN COOLERS RUNNING IN EMERGENCY MODE	SPRAY PUMPS REQUIRED	GREATER THAN 12.5 FT	GREATER THAN 54 PSIG	--	2	BETWEEN 27 PSIG <u>AND</u> 54 PSIG	0, 1	2	2, 3	1	4	0		LESS THAN 27 PSIG	--	0	BETWEEN 4.5 FT and 12.5 FT	GREATER THAN 54 PSIG	--	2	BETWEEN 27 PSIG and 54 PSIG	1, 2	1	3, 4	0		LESS THAN 27 PSIG	--	0	LESS THAN 4.5 FT	--	--	0
RWST LEVEL	CONTAINMENT PRESSURE	FAN COOLERS RUNNING IN EMERGENCY MODE	SPRAY PUMPS REQUIRED																																			
GREATER THAN 12.5 FT	GREATER THAN 54 PSIG	--	2																																			
	BETWEEN 27 PSIG <u>AND</u> 54 PSIG	0, 1	2																																			
		2, 3	1																																			
		4	0																																			
	LESS THAN 27 PSIG	--	0																																			
BETWEEN 4.5 FT and 12.5 FT	GREATER THAN 54 PSIG	--	2																																			
	BETWEEN 27 PSIG and 54 PSIG	1, 2	1																																			
		3, 4	0																																			
	LESS THAN 27 PSIG	--	0																																			
LESS THAN 4.5 FT	--	--	0																																			
10.3	Establish required number of running containment spray pumps.																																					

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 RCS Specific Activity

LCO 3.4.16 The specific activity of the reactor coolant shall be within limits.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS average temperature (T_{avg}) \geq 500°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 > 0.5 μ Ci/gm.	-----Note----- LCO 3.0.4c is applicable. -----	Once per 4 hours
	A.1 Verify DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.16-1.	
	<u>AND</u>	
	A.2 Restore DOSE EQUIVALENT I-131 to within limit.	48 hours
B. Gross specific activity of the reactor coolant not within limit.	B.1 Be in MODE 3 with T_{avg} < 500°F.	6 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. Required Action and associated Completion Time of Condition A not met.</p> <p><u>OR</u></p> <p>DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.16-1.</p>	<p>C.1 Be in MODE 3 with $T_{avg} < 500^{\circ}\text{F}$.</p>	<p>6 hours</p>

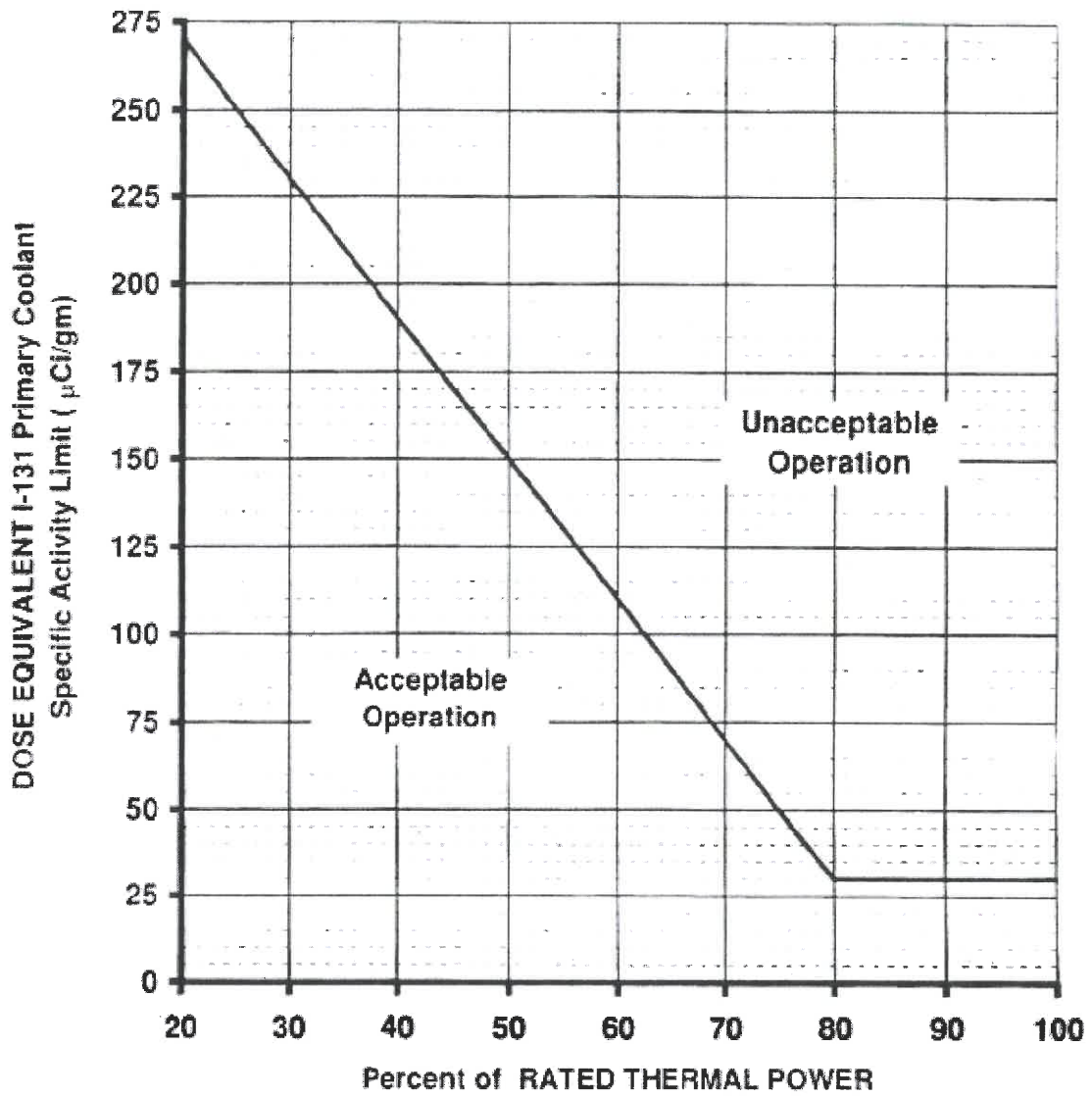


Figure 3.4.16-1

DOSE EQUIVALENT I-131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER with the Primary Coolant Specific Activity $> 0.5 \mu\text{Ci/gm}$ DOSE EQUIVALENT I-131.

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.8.	Immediately
C. One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1 Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.3-1.	E.1 Be in MODE 3.	6 hours
	<u>AND</u> E.2 Be in MODE 4.	12 hours
F. As required by Required Action D.1 and referenced in Table 3.3.3-1.	F.1 Initiate action in accordance with Specification 5.6.8.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----
 SR 3.3.3.1 and SR 3.3.3.2 apply to each PAM instrumentation Function in Table 3.3.3-1.

SURVEILLANCE	FREQUENCY
SR 3.3.3.1 Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.2 Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

Table 3.3.3-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION D.1
1. RCS Hot Leg Temperature (Wide Range)	2	E
2. RCS Cold Leg Temperature (Wide Range)	2	E
3. RCS Pressure (Wide Range)	2	E
4. Steam Generator (SG) Water Level (Wide or Narrow Range)	2/SG	E
5. Refueling Water Storage Tank Level	2	E
6. Containment Pressure (Narrow Range)	2	E
7. Pressurizer Water Level	2	E
8. Steam Line Pressure	2/SG	E
9. Auxiliary Feedwater Flow Rate	2	E
10. RCS Subcooling Margin Monitor	2	E
11. Containment Water Level (Wide Range)	2	E
12. Core Exit Temperature - Quadrant 1	2(a)	E
13. Core Exit Temperature - Quadrant 2	2(a)	E
14. Core Exit Temperature - Quadrant 3	2(a)	E
15. Core Exit Temperature - Quadrant 4	2(a)	E
16. Reactor Vessel Level Indicating System	2	F
17. Condensate Storage Tank Level	2	E
18. Deleted		
19. Containment Area Radiation (High Range)	2	F

(a) A channel consists of two core exit thermocouples.

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

LCO 3.3.2 The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).	Immediately
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u> B.2.1 Be in MODE 3.	54 hours
	<u>AND</u> B.2.2 -----NOTE----- LCO 3.0.4.a is not applicable when entering MODE 4. ----- Be in MODE 4.	60 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. One train inoperable.</p>	<p>C.1 -----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----- Restore train to OPERABLE status.</p> <p><u>OR</u></p> <p>C.2.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>C.2.2 -----NOTE----- LCO 3.0.4.a is not applicable when entering MODE 4. ----- Be in MODE 4.</p>	<p>24 hours</p> <p>30 hours</p> <p>36 hours</p>
<p>D. One channel inoperable.</p>	<p>D.1 -----NOTE----- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ----- Place channel in trip.</p> <p><u>OR</u></p> <p>D.2.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>D.2.2 Be in MODE 4.</p>	<p>72 hours</p> <p>78 hours</p> <p>84 hours</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. One Containment Pressure channel inoperable.</p>	<p>E.1 -----NOTE----- One additional channel may be bypassed for up to 12 hours for surveillance testing. -----</p>	
	<p>Place channel in bypass.</p>	72 hours
	<p><u>OR</u></p>	
	<p>E.2.1 Be in MODE 3.</p>	78 hours
	<p><u>AND</u></p>	
	<p>E.2.2 Be in MODE 4.</p>	84 hours
<p>F. One channel or train inoperable.</p>	<p>F.1 Restore channel or train to OPERABLE status.</p>	48 hours
	<p><u>OR</u></p>	
	<p>F.2.1 Be in MODE 3.</p>	54 hours
	<p><u>AND</u></p>	
	<p>F.2.2 Be in MODE 4.</p>	60 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>G. One train inoperable.</p>	<p>G.1 -----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. -----</p>	
	<p>Restore train to OPERABLE status.</p>	<p>24 hours</p>
	<p><u>OR</u></p>	
	<p>G.2.1 Be in MODE 3.</p>	<p>30 hours</p>
	<p><u>AND</u></p>	
	<p>G.2.2 Be in MODE 4.</p>	<p>36 hours</p>
<p>H. One train inoperable.</p>	<p>H.1 -----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. -----</p>	
	<p>Restore train to OPERABLE status.</p>	<p>24 hours</p>
	<p><u>OR</u></p>	
	<p>H.2 Be in MODE 3.</p>	<p>30 hours</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. One channel inoperable.	I.1 -----NOTE----- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ----- Place channel in trip.	72 hours
	<u>OR</u> I.2 Be in MODE 3.	78 hours
J. One or more Main Feedwater Pump trip channels inoperable on one or more Main Feedwater Pumps.	J.1 Restore channel(s) to OPERABLE status.	Prior to next required TADOT
K. One or more channels inoperable.	K.1 Verify interlock is in required state for existing unit condition.	1 hour
	<u>OR</u>	
	K.2.1 Be in MODE 3.	7 hours
	<u>AND</u>	
	K.2.2 Be in MODE 4.	13 hours
L. One train inoperable.	L.1 Verify interlock is in required state for existing unit condition.	1 hour
	<u>OR</u>	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>L. (continued)</p>	<p>L.2 -----NOTE----- One train may be bypassed for up to 4 hours for Surveillance testing, provided the other train is OPERABLE. ----- Restore train to OPERABLE status.</p> <p><u>OR</u></p> <p>L.3.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>L.3.2 Be in MODE 5</p>	<p>24 hours</p> <p>30 hours</p> <p>60 hours</p>
<p>M. -----NOTES----- 1. Only applicable prior to steam flow channel normalization. 2. Only applicable within 7 days after reaching 100% RTP following refueling. ----- One or more steam lines with two channels inoperable due to trip setting not within Allowable Value.</p>	<p>M.1 -----NOTE----- Only applicable when below P-12 interlock. ----- Verify one Manual Initiation channel per steam line is OPERABLE.</p> <p><u>AND</u></p> <p>M.2 Restore one channel per steam line to OPERABLE status.</p>	<p>Immediately</p> <p>48 hours</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
N. Required Action and associated Completion Time of Condition M not met.	N.1.1 Be in MODE 2.	6 hours
	<u>OR</u>	
	N.1.2 Be in MODE 3.	6 hours
	<u>AND</u>	
	N.2 Isolate steam lines.	12 hours

Table 3.3.2-1 (page 1 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
1. Safety Injection						
c. Containment Pressure — High 1	1,2,3	3	D			

Table 3.3.2-1 (page 2 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
2. Containment Spray						
c. Containment Pressure High - 3	1,2,3	4	E			
(3) Containment Pressure High - 3	1,2,3	4	E			

Table 3.3.2-1 (page 3 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
4. Steam Line Isolation						
c. Containment Pressure - High 2	1,2 ^(d) , 3 ^(d)	3	D			

F	FGI Loss of ANY two barriers and loss or potential loss of the third barrier. 1 2 3 4	FS1 Loss or potential loss of ANY two barriers. 1 2 3 4	FA1 ANY loss or ANY potential loss of either the Fuel Clad or RCS barrier. 1 2 3 4	Not Applicable
	(1) Loss of any two barriers and Loss or Potential Loss of the third barrier (Table F-1)	(1) Loss or Potential Loss of any two barriers (Table F-1)	(1) Any Loss or any Potential Loss of either Fuel Clad or RCS barrier (Table F-1)	Not Applicable

		Fuel Clad Barrier		RCS Barrier		Containment Barrier	
	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss	
1. RCS or SG Tube Leakage	Not Applicable	A. Core Cooling CSF-ORANGE entry conditions met. OR B. Heat Sink CSF-RED entry conditions met. (Note 8)	A. An automatic or manual ECCS actuation is required by EITHER of the following: 1. UNISOLABLE RCS leakage OR 2. SG tube RUPTURE	A. Operation of a standby charging pump is required by EITHER of the following: 1. UNISOLABLE RCS leakage OR 2. SG tube leakage B. RCS integrity CSF-RED entry conditions met. (Note 8)	A. A leaking or RUPTURED SG is FAULTED outside of containment. Not Applicable	Not Applicable	
2. Inadequate Heat Removal	A. Core Cooling CSF-RED entry conditions met. OR B. Heat Sink CSF-RED entry conditions met. (Note 8)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	A. Core Cooling CSF-RED entry conditions met for 15 minutes or longer. (Note 1)	
3. RCS Activity /CTMT Radiation	A. Containment radiation monitor RE-27 A or B greater than (640 R/Hr). OR B. Indications that reactor coolant activity is greater than 300 µCi/gm dose equivalent I-131.	Not Applicable	A. Containment radiation monitor RE-2 greater than 1 R/hr. OR B. Containment radiation monitor RE-7 greater than 500 mR/hr.	Not Applicable	Not Applicable	A. Containment radiation monitor RE-27 A or B greater than 7970 R/Hr.	
4. CTMT Integrity or Bypass	Not Applicable	Not Applicable	Not Applicable	Not Applicable	A. Containment isolation is required. AND EITHER of the following: 1. Containment integrity has been lost based on Emergency Director judgment. 2. UNISOLABLE pathway from containment to the environment exists. OR B. Indications of RCS leakage outside of containment as indicated by alarms on any of the following instruments (Note 9). • RE-10 • RE-29B • RE-29C	A. Containment CSF-RED entry conditions met. OR B. CTMT hydrogen concentration greater than 6%. OR C. Containment pressure greater than 27 psig. AND Less than one CTMT fan cooler and one full train of CTMT Spray is operating per design for 15 minutes or longer. (Note 1)	
6. Emergency Director Judgment	A. ANY condition in the opinion of the emergency director that indicates loss of the fuel clad barrier.	A. ANY condition in the opinion of the emergency director that indicates potential loss of the fuel clad barrier.	A. ANY condition in the opinion of the emergency director that indicates loss of the RCS barrier.	A. ANY condition in the opinion of the emergency director that indicates potential loss of the RCS barrier.	A. ANY condition in the opinion of the emergency director that indicates loss of the containment barrier.	A. ANY condition in the opinion of the emergency director that indicates potential loss of the containment barrier.	

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources — Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

- a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System; and
- b. Two diesel generator (DG) sets capable of supplying the onsite Class 1E power distribution subsystem(s); and
- c. Automatic load sequencers for Train A and Train B.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

-----NOTE-----
LCO 3.0.4b is not applicable to DGs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for required OPERABLE offsite circuit.	2 hours <u>AND</u> Once per 8 hours thereafter
	<u>AND</u> A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	<u>AND</u>	(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3 Restore required offsite circuit to OPERABLE status.	72 hours

KEY

ANSWER KEY REPORT for SRO EXAM Test Form: 0

#	ID	0	Answers
1	001K2.01 1	D	
2	003K3.02 2	A	<i>delete Q2 from exam</i>
3	003K4.03 3	C	
4	004A4.13 4	C	
5	004K1.15 5	D	
6	005A2.04 6	B	
7	005AA1.01 7	B	
8	006A4.10 8	D	
9	006K6.01 9	A	
10	007A3.01 10	A	
11	007EK3.01 11	B	
12	008AG2.4.47 12	C	
13	008K1.02 13	B	
14	009EK1.02 14	D	
15	010A2.01 15	B	
16	011EA1.17 16	C	
17	011K6.05 17	A	
18	012K5.02 18	A	
19	013G2.1.19 19	A	
20	015AA1.21 20	B	
21	015K3.06 21	A	
22	017A1.01 22	C	
23	022A3.01 23	B	
24	022AK3.05 24	A	
25	022G2.4.8 25	B	
26	025AA2.01 26	C	
27	026AA2.02 27	D	
28	026K2.02 28	A	
29	027AK1.02 29	D	
30	028AK3.03 30	D	
31	028K5.04 31	A	
32	029A4.04 32	D	
33	029EK2.06 33	B	
34	032AG2.4.50 34	A	
35	033AK1.01 35	B	
36	038EA2.13 36	A	
37	039K3.06 37	C	
38	040AK2.02 38	B	
39	041K1.02 39	A	
40	054AK1.02 40	A	
41	056AA1.10 41	A	
42	058AK3.01 42	A	
43	060AA1.01 43	D	
44	061AK3.02 44	D	
45	061K5.01 45	A	
46	061K6.02 46	C	
47	062A4.07 47	C	

delete Q2 from exam
Mitchell Mubs
08/06/2019

KEY

ANSWER KEY REPORT for SRO EXAM Test Form: 0

Answers

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49	064K2.02 49	C
50	064K6.07 50	B
51	067AA2.15 51	D
52	071A2.09 52	C
53	072A3.01 53	A
54	073A1.01 54	B
55	073K3.01 55	B
56	076A1.02 56	C
57	076AG2.1.23 57	B
58	076K1.09 58	C
59	078A3.01 59	A
60	086K4.03 60	A
61	103A1.01 61	B
62	G2.1.19 62	C
63	G2.1.40 63	A
64	G2.2.1 64	D
65	G2.2.36 65	D
66	G2.2.38 66	A
67	G2.3.12 67	C
68	G2.3.13 68	A
69	G2.3.4 69	C
70	G2.4.37 70	C
71	G2.4.9 71	B
72	WE04EG2.1.28 72	B
73	WE05EG2.4.1 73	B
74	WE10EK2.1 74	A
75	WE11EK2.2 75	C

*delete Q61 from exam
Michael Meeks
08/06/2019*

SECTION 1 (75 items)

75.00

76	001A2.17 76	D
77	005G2.1.32 77	C
78	007EG2.4.18 78	A
79	008G2.4.50 79	B
80	009EG2.4.21 80	C
81	011EG2.4.41 81	A
82	026A2.03 82	B
83	026AA2.03 83	A
84	056AA2.14 84	D
85	062A2.09 85	C
86	062AA2.05 86	A
87	064A2.21 87	B
88	072A2.03 88	D
89	074EA2.07 89	A
90	076AG2.2.38 90	B
91	086G2.4.31 91	C

KEY

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93	G2.1.36 93	B
94	G2.2.13 94	D
95	G2.2.18 95	C
96	G2.3.14 96	B
97	G2.4.4 97	C
98	G2.4.50 98	C
99	WE03EA2.1 99	D
100	WE08EG2.4.18 100	A
SECTION BREAK (25 items)		25.00