

2011 HNP SRQ NRC Written Exam

76. 2011 NRC SRO 001/BANK/C/A///EARLY SUBMITTAL/011E G2.4.9/

Given the following plant conditions:

- The plant is in Mode 6
- An assembly is in the Manipulator Crane
- A 140 gpm RCS leak occurs
- The crew has adjusted Charging flow
- Reactor cavity level has been stabilized at 23.2' above the Reactor Flange
- The crew has just entered AOP-020, Loss of RCS Inventory or Residual Heat Removal While Shutdown

Which ONE of the following (1) describes the applicable procedure to be used for this condition AND (2) the required action to respond to this condition?

(RCS temperature will remain below 200°F)

- A. (1) Remain in AOP-020;
(2) Initiate flow through the BIT
- B✓ (1) Remain in AOP-020;
(2) Control Charging flow through the normal charging line
- C. (1) Transition to AOP-031 Loss of Refueling Cavity Integrity;
(2) Initiate flow through the BIT
- D. (1) Transition to AOP-031 Loss of Refueling Cavity Integrity;
(2) Control Charging flow through the normal charging line

Feedback

Plausibility and Answer Analysis

In Mode 6 (with refueling in progress) the Reactor Cavity level is maintained >23' above the Reactor Vessel flange. AOP-020, Loss of RCS Inventory or Residual Heat Removal While Shutdown is the appropriate AOP and the Charging line is the flowpath used in Section 3.4 for a minor RCS leak. Only 1 CSIP is available since the other CSIP would be tagged out during Mode 5 .

- A. Incorrect. Plausible since the correct procedure is listed but the action is only performed in AOP-020 IF the leak is > 150 gpm.*
- B. Correct.*
- C. Incorrect. Plausible since an assembly is NOT in the safe position but transition to AOP-031 would only occur if Reactor Cavity level is decreasing or below 23'. The second part is plausible but the action is only performed in AOP-031 IF the leak is > 150 gpm.*
- D. Incorrect. Plausible since an assembly is NOT in the safe position but transition to AOP-031 would only occur if Reactor Cavity level is decreasing or below 23'. The second part (action) is plausible and correct per AOP-020 or AOP-031.*

Notes

000011 Large Break LOCA / 3 (SRO)

011EG2.4.9 Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

Importance Rating: 3.8 4.2

Technical Reference: AOP-020 Page 45, and Section 3.4 step 19 RNO, Rev. 34

References to be provided: None

Learning Objective: EOP-LP-3.1 Objective 1.a

Question Origin: Bank OIT Dev 025 AA1.20 2

Comments: None

Tier/Group: T1G1

SRO justification: Requires assessing plant conditions and determining procedure and section that should be implemented and knowing specific mitigative actions in that section.

77. 2011 NRC SRO 002/BANK/C/A//AOP-020//EARLY SUBMITTAL/025 AA2.02/

Given the following plant conditions:

- The plant is in Mode 4
- RCS makeup capability is limited to 80 gpm
- RHR Train 'B' has been placed in service
- RCS temperature is stable at 325°F
- RCS pressure is 320 psig and lowering
- Containment sump level is 20 inches and rising
- Pressurizer level is 28% and lowering

The OAC responded by taking manual control of FK-122.1 and has increased Charging flow to 90 gpm. Pressurizer level is now stable.

Which ONE of the following describes (1) the correct procedure to address the event in progress AND (2) the mitigative actions this procedure will direct?

- A. (1) AOP-016, Excessive RCS Leakage
 - (2) Stop all running RHR pumps and isolate RHR
- B. (1) AOP-016, Excessive RCS Leakage
 - (2) Establish BIT flow
- C✓ (1) AOP-020, Loss of RCS Inventory or Residual Heat Removal While Shutdown
 - (2) Stop all running RHR pumps and isolate RHR
- D. (1) AOP-020, Loss of RCS Inventory or Residual Heat Removal While Shutdown
 - (2) Establish BIT flow

Feedback

Plausibility and Answer Analysis

With the plant is in Mode 4, AOP-020 is the correct procedure. For charging flow greater than 50 gpm AOP-020 will direct securing all RHR pumps and isolating RHR immediately.

- A. Incorrect. Plausible because entry conditions are met for AOP-016 but this procedure would not direct isolation of the RHR system but this is an action that would be correct for the conditions in AOP-020.*
- B. Incorrect. Plausible because entry conditions for AOP-016 are met, however AOP-016 would direct operator to go to AOP-020. The second part is plausible because RCS leakage exceeds makeup capability and AOP-016 would direct actuation of Safety Injection (aligning high head SI flow through the BIT)*
- C. Correct.*
- D. Incorrect. Plausible because procedure selection is correct, however the second part is incorrect but plausible because RCS leakage exceeding 150 gpm would require alignment of charging through the BIT.*

Notes

000025 Loss of RHR System / 4 (SRO)

025AA2.02 Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Leakage of reactor coolant from RHR into closed cooling water system or into reactor building atmosphere

Importance Rating: 4.0 4.2

Technical Reference: AOP-020 page 34, Rev. 34

References to be provided: None

Learning Objective: AOP-LP-3.20 Objective 3

Question Origin: BANK OIT Development 025 AA2.02

Comments: Based on other items in the K/A catalog, the "reactor building" is interpreted to be containment. Examples: 006 K4.08 - Recirculation flowpath of reactor building sump, 039 K4.07 - Reactor building isolation, 034 task list - Operate the control rod change machine/fuel handling bridge/reactor building crane (control rod change), 036 AK3.01 - Different inputs that will cause a reactor building evacuation.

Tier/Group: T1G1

SRO Justification Question requires assessing plant conditions and selecting the correct procedure and then knowing specific mitigative actions in the procedure.

78. 2011 NRC SRO 003/NEW/C/A/////029E A2.02/

Given the following plant conditions:

- Reactor power is 7%
- RCS pressure is at 1900 psig and lowering
- 'A' SG Levels are: LI-474 = 27%, LI-475 = 23%, LI-476 = 23%, LI-473 = 27%
- An automatic Reactor trip has not occurred and attempts to manually trip the Reactor from both trip switches are unsuccessful
- Immediate actions of FRP-S.1 have just been completed

Which ONE of the following:

- (1) Describes the Reactor Trip annunciator (Reactor first out) in alarm?
 - (2) If a Safety Injection occurs now is PATH-1 GUIDE, Attachment 6, Safeguards Actuation Verification required to be performed at this time?
- A. (1) REACTOR TRIP STEAM GEN-A LOW-LOW LEVEL
(2) Yes
- B. (1) REACTOR TRIP PRESSURIZER LOW PRESS
(2) Yes
- C✓ (1) REACTOR TRIP STEAM GEN-A LOW-LOW LEVEL
(2) No
- D. (1) REACTOR TRIP PRESSURIZER LOW PRESS
(2) No

Feedback

Plausibility and Answer Analysis

The 2/3 coincidence is met on the correct 3 channels for SG low-low level. The Pressurizer low pressure trip is blocked below P-7 and thus the associated first out would not be in. PATH-1 GUIDE Attachment 6 is implemented while continuing with FRP-S.1 per a foldout in FRP-S.1.

- A. Incorrect. Plausible since the first part is correct. The second part is plausible since Attachment 6 is contained in PATH-1 Guide and verifying safeguards actuations could be considered lower priority than taking actions for an ATWS.*

- B. Incorrect. Plausible since a Pzr low press trip would occur if above P-7 and SG level is above the setpoint on 2/4 channels and only 3 channels are used for the low-low level trip. If the wrong 3 channels are selected for coincidence the first out would not be in. The second part is plausible since Attachment 6 is contained in PATH-1 Guide and verifying safeguards actuations could be considered lower priority than taking actions for an ATWS.*

- C. Correct.*

- D. Incorrect. Plausible since a Pzr low press trip would occur if above P-7 and SG level is above the setpoint on 2/4 channels and only 3 channels are used for the low-low level trip. If the wrong 3 channels are selected for coincidence the first out would not be in. The second part is correct.*

Notes

000029 ATWS / 1 (SRO)

029EA2.02 Ability to determine or interpret the following as they apply to a ATWS:
Reactor trip alarm

Importance Rating: 4.2 4.4

Technical Reference: APP-ALB-012, FRP-S.1

References to be provided: None

Learning Objective: EOP-LP-3.15, Obj. 5

Question Origin: NEW

Comments: None

Tier/Group: T1G1

SRO Justification Knowledge of when to implement attachments.

79. 2011 NRC SRO 004/BANK/FUNDAMENTAL/////056A G2.2.25/

Which ONE of the following satisfies the Tech Spec bases requirement for off-site power distribution with the plant in Mode 1?

- A✓ The requirement can be satisfied by any two separate off-site transmission lines that can power the SUTs.
- B. The requirement can ONLY be satisfied by two off-site transmission lines that feed the SUTs directly (Cary Regency Park and Cape Fear North).
- C. The requirement can ONLY be satisfied by the off-site transmission lines that do not feed the respective North or South switchyard bus through a jumper.
- D. The requirement is satisfied as long as the switchyard alignment is such that power is available from the off-site transmission network to both SUTs regardless of the number of transmission lines available.

Feedback

Plausibility and Answer Analysis

The minimum offsite power sources will be maintained so that at least 2 independent offsite circuits are available. Circuits may consist of any two of the incoming transmission lines to the SATs (either through the switchyard or directly).

- A. *Correct.*
- B. *Incorrect. Plausible since this would meet the operability requirement, but is not the only permitted alignment.*
- C. *Incorrect. Plausible since BKR 52-16 can only be used to maintain operability of Train B power if the disconnects for 52-17 are closed with the jumpers installed, but this is an acceptable source.*
- D. *Incorrect. Plausible since a single transmission line can provide power to both SUTs, but 2 transmission lines are required for redundancy.*

Notes

000056 Loss of Off-site Power / 6 (SRO)

056AG2.2.25 Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.

Importance Rating: 3.2 4.2

Technical Reference: TS Basis section 3.8, OST-1023

References to be provided: NONE

Learning Objective: ADEL-2.7-2

Question Origin: OIT Dev Bank ADEL-2.7-2 5

Comments: None

Tier/Group: T1G1

SRO Justification Requires knowledge of TS bases that is required to analyze TS required actions.

80. 2011 NRC SRO 005/NEW/C/A///EARLY SUBMITTAL/058 AA2.01/

Given the following plant conditions:

- The plant is operating at 100% power
- ALB-015-4-5, Channel III UPS Trouble has just alarmed
- Feed flows to all SG's have not changed

Which ONE of the following completes the statements below?

The Instrument Bus III Inverter input has lost (1). IAW Tech Spec 3.8.3.1 the normal power supply alignment must be restored to the Inverter within (2) hours.

- A. (1) DC power ONLY
(2) 2
- B✓ (1) DC power ONLY
(2) 24
- C. (1) AC and DC power
(2) 2
- D. (1) AC and DC power
(2) 24

Feedback

Plausibility and Answer Analysis

Annunciator ALB-015-4-5 has five (5) potential causes - Loss of AC input voltage, Loss of AC output voltage, Loss of DC input voltage, Loss of DC voltage, and Alarm circuit or instrumentation malfunction. A loss of DC power ONLY will cause the alarm to annunciate. A loss of Instrument Bus III automatic function is loss of power to Channel III SG level instruments and will cause all Feed Regulating valves to fail open. IF power (AC) has not been affected then there will be no affect on SG level control.

The TS 3.8.3.1 action for the inverter not being connected to its associated DC bus is to re-energized from DC within 24 hours (Action c.).

- A. Incorrect. The first part is correct. The second part is plausible since the action is correct if the inst bus is not energized from its inverter (Action b.).*
- B. Correct.*
- C. Incorrect. The first part is plausible since the SII and SIV inverters have a static switch that would maintain the inst bus energized on a loss of AC and DC inputs to the inverter. The second part is plausible since the action is correct if the inst bus is not energized from its inverter (Action b.).*
- D. Incorrect. The first part is plausible since the SII and SIV inverters have a static switch that would maintain the inst bus energized on a loss of AC and DC inputs to the inverter. The second part is correct.*

Notes

000058 Loss of DC Power / 6 (SRO)

058AA2.01 Ability to determine and interpret the following as they apply to the Loss of DC Power: That a loss of DC power has occurred; verification that substitute power sources have come on line

Importance Rating: 3.7 4.1

Technical Reference: AOP-025-BD R9 pg 45, TS 3.8.3.1

References to be provided: None

Learning Objective: AOP-LP-3.25 Objective 6

Question origin: NEW

Comments: For HNP, DC power is normally the single source of power or the backup power supply to components. Inverters are the only components that have another source in addition to DC and thus the only source for a question for this K/A.

Tier/Group: T1G1

SRO justification: Application of required TS actions (> 1 hr TS).

81. 2011 NRC SRO 006/BANK/C/A/////WE04 EG2.1.23/

Given the following plant conditions:

- The plant has experienced a Reactor Trip and Safety Injection
- The crew has implemented PATH-1
- A transition was made to EPP-013, LOCA Outside Containment
- The RAB radiological conditions are being evaluated by HP and currently HP will NOT allow any personnel entry

Which ONE of the following parameters will be used to determine if the break is isolated IAW EPP-013, AND the procedure transitioned to when the leak is isolated?

- A✓ RCS pressure increasing
PATH-1, entry point C
- B. Pressurizer level increasing
PATH-1, entry point C
- C. RCS pressure increasing
EPP-012, Loss Of Emergency Coolant Recirculation
- D. Pressurizer level increasing
EPP-012, Loss Of Emergency Coolant Recirculation

Feedback

Plausibility and Answer Analysis

RCS pressure increasing is the parameter that is a correct indication of the LOCA being isolated IAW EPP-013 step 7.b. Second part- EPP-013 directs a transition to PATH-1 Entry Point C when RCS pressure is obtained.

A. Correct

B. Incorrect Plausible because the PZR level could be used to determine RCS inventory but alone is not sufficient indication of break isolation. The second part is plausible since Pressurizer level increasing could mean that the leak is isolated, but it could also mean that the SI flow is greater than the break flow or that a bubble has formed in the head region. Second part- correct since EPP-013 directs a transition to PATH-1 Entry Point C when RCS pressure is obtained.

C. Incorrect Plausible because the first part is correct, RCS pressure increasing is the parameter that is a correct indication of the LOCA being isolated EPP-013 step 7.b. Second part- is incorrect, but plausible, since EPP-013 does direct to EPP-012 if the leak outside of containment is NOT isolated. This procedure would also be entered if the leak continued long enough to reduce the RWST level and the Containment accident sump level to a predetermined level.

D. Incorrect Plausible because the PZR level could be used to determine RCS inventory but alone is not sufficient indication of break isolation. Pressurizer level increasing could mean that the leak is isolated, but it could also mean that the SI flow is greater than the break flow or that a bubble has formed in the head region. Second part is incorrect, but plausible, since EPP-013 does direct to EPP-012 if the leak outside of containment is NOT isolated. This procedure would also be entered if the leak continued long enough to reduce the RWST level and the Containment accident sump level to a predetermined level.

Notes

W/E04 LOCA Outside Containment / 3 (SRO)

WE04EG2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Importance Rating: 3.4 4.4

Technical Reference: EPP-013 Step 6, Page 5, Rev. 10

References to be provided: None

Learning Objective: EOP-LP-2.3/3.2. Obj. 5

Question Origin: BANK OIT Development E04G2.1.7 1

Comments: None

Tier/Group: T1G1

SRO Justification SRO only knowledge by requiring the proper procedure flowpath selection. This question tests the SRO knowledge of assessing plant conditions, prescribing a procedure or section of a procedure, and recalling what strategy or action is written into a plant procedure, including when the strategy or action is required.

82. 2011 NRC SRO 007/NEW/C/A/////028 AA2.04/

Given the following plant conditions:

- The plant is operating at 100% power
- Pressurizer Level Instrument, LT-461, is isolated due to a leak on the transmitter
- 'A' CSIP has been under clearance for electrical inspection
- Pressurizer Level Controller Selector switch is selected to 459/460

The OAC reports the following indications:

- EI-222, B CSIP motor amps, indicates 45 amps
- PI-121, Charging HDR Press, indicates 2800 psig
- Pressurizer level is lowering on Pressurizer Level Instrument LT-460

Which ONE of the following describes (1) the malfunction AND (2) the required action?

- A✓ (1) Pressurizer Level Instrument, LT-459, has failed high
(2) Place the unit in Mode 3 within 7 hours
- B. (1) Pressurizer Level Instrument, LT-459, has failed high
(2) Place Level Channel 459 in a tripped condition within 6 hours
- C. (1) The B CSIP has a shaft shear
(2) Place the unit in Mode 3 within 7 hours
- D. (1) The B CSIP has a shaft shear
(2) Restore one CSIP to an OPERABLE status within 72 hours

Feedback

Plausibility and Answer Analysis

The Charging header is monitored by a flow instrumentation loop that operates a flow control valve. This instrumentation loop receives a signal from the PZR level control system LK-459F, which controls flow control valve FK-122.1 to maintain PZR level at the desired level. With PZR level channel 460 lowering the output on LK-459F should be increasing to restore PZR level with increased Charging flow. Additionally, the output signal on FK-122.1 should be increasing.

HNP Simulator data indicated that Charging pumps amperage during full power steady state operation is approximately 47 amps with a discharge pressure of 2755 psig. With LK-459F output at 0 and FK-122.1 output at 0 the Charging pump amps decreased slightly to 45 amps and discharge pressure increased slightly to 2809 psig.

- A. Correct. Conditions provided indicate LT-459 has failed high and T.S. 3.0.3 is applicable (1 hour to initiate action, 6 hours to Hot Standby).*
- B. Incorrect. The first part is correct but the TS Action is incorrect. With two PRZ level channels inoperable, T.S. 3.0.3 is applicable.*
- C. Incorrect. Plausible because conditions could be misdiagnosed as CSIP shaft shear and T.S. 3.0.3 would be applicable with two CSIPs inoperable.*
- D. Incorrect. Plausible because conditions could be misdiagnosed as CSIP shaft shear and T.S. 3.5.2 allows 72 hours to restore when only one CSIP is inoperable.*

Notes

000028 Pressurizer Level Malfunction / 2 (SRO)

028AA2.04 Ability to determine and interpret the following as they apply to the Pressurizer Level Control Malfunctions: Ammeters and running indicators for CVCS charging pumps

Importance Rating: 2.6 3.1

Technical Reference: Tech Spec 3.3.1, 3.0.3

References to be provided: None

Learning Objective: PZRLC Objective 7.f

Question Origin: NEW

Comments: None

Tier/Group: T1G2

SRO Justification Application of T.S. 3.0.3

83. 2011 NRC SRO 008/NEW/C/A/////051 AG2.4.8/

Given the following plant conditions:

- The plant is operating at 100% power
- Degrading Condenser vacuum was observed
- CTMP-7-1, Cooling Tower 1 Level HI/LO is in alarm
- AOP-012, Partial Loss of Condenser Vacuum has been entered
- IAW AOP-012, The Reactor has been tripped, PATH-1 has been entered

Which ONE of the following describes (1) a condition/parameter that would require the operator to continue taking actions IAW AOP-012, AND (2) when will it be appropriate to take those actions?

- A. (1) Condenser Pit High Level alarm annunciates
 - (2) Continue performing the actions of AOP-012 only after EPP-004 is exited.
- B✓ (1) Condenser Pit High Level alarm annunciates
 - (2) Continue performing the actions of AOP-012 during the performance EPP-004 as time allows
- C. (1) Continuous running of both Industrial Waste Sump pumps is observed
 - (2) Continue performing the actions of AOP-012 only after EPP-004 is exited
- D. (1) Continuous running of both Industrial Waste Sump pumps is observed
 - (2) Continue performing the actions of AOP-012 during the performance EPP-004 as time allows

Feedback

Plausibility and Answer Analysis

Per AOP-012, section 3.0, step 13, if a Condenser pit high level alarm is received in conjunction with either a known expansion joint failure or a Cooling Tower low level alarm, a complete failure of a Circulating Water expansion joint is indicated. AOP-012 will then direct a Reactor trip and transition to EOP-PATH-1, with follow up action to secure all Circulating Water pumps and Normal Service water pumps.

Per EOP User's Guide, while implementing EOPs, it may be necessary to implement actions identified in the AOPs. This is acceptable assuming that referencing an AOP does not delay accident mitigation as outlined in the EOPs. Particular attention should be given to actions that will protect major plant equipment and/or enhance plant control. The option does not delay accident mitigation and these substeps do protect major plant equipment.

- A. Incorrect. Part 1 is correct. Part 2 is plausible since the last step of EOP-EPP-004 is to maintain stable plant conditions and perform the appropriate plant procedures. The candidate may assume that at this time AOP procedures should be performed since EOP procedure performance has ended.*
- B. Correct.*
- C. Incorrect. Part 1 is plausible since flooding in other areas of the turbine bldg and if the condenser pit overflowed would cause both industrial waste sump pumps to run continuously. Part 2 is plausible since the last step of EOP-EPP-004 is to maintain stable plant conditions and perform the appropriate plant procedures. The candidate may assume that at this time AOP procedures should be performed since EOP procedure performance has ended.*
- D. Incorrect. Part 1 is plausible since flooding in other areas of the turbine bldg if the condenser pit overflowed would cause both industrial waste sump pumps to run continuously. Part 2 is correct.*

Notes

000051 Loss of Condenser Vacuum / 4 (SRO)

051AG2.4.8 Knowledge of how abnormal operating procedures are used in conjunction with EOPs.

Importance Rating: 3.8 4.5

Technical Reference: AOP-012, Step 13, Page 6 Rev. 22
EOP User's Guide, Section 5.1.2 General Usage,
Page 11 Rev. 30

References to be provided: None

Learning Objective: EOP-LP-3.19, Obj. 1.b., AOP-LP-3.12, Obj. 3

Question Origin: NEW

Comments: None

Tier/Group: T1G2

SRO Justification Knowledge of administrative procedures that specify coordination of plant abnormal and emergency procedures.

84. 2011 NRC SRO 009/NEW/FUNDAMENTAL/////WE15E G2.4.18/

The crew is implementing FRP-J.2, Response to Containment Flooding

Which ONE of the following:

(1) Describes the basis for obtaining Containment sump activity samples in FRP-J.2?

(2) Describes when a transition from FRP-J.2 to the procedure and step in effect is allowed?

A. (1) To determine if ESW to Containment Fan Coolers should be isolated.

(2) After completion of required actions in FRP-J.2 even if the associated Orange Path still exists.

B. (1) To determine if ESW to Containment Fan Coolers should be isolated.

(2) ONLY after the condition causing the associated Orange Path has been corrected.

C. (1) To determine if sump water can be transferred to tanks outside containment.

(2) ONLY after the condition causing the associated Orange Path has been corrected.

D✓ (1) To determine if sump water can be transferred to tanks outside containment.

(2) After completion of required actions in FRP-J.2 even if the associated Orange Path still exists.

Feedback

Plausibility and Answer Analysis

WOG step description for reason to check for Containment sump activity level during a response to Containment Flooding states that the water should be sampled in order to provide information concerning the possible transfer of Containment sump water to plant storage tanks outside the Containment. The disposition of this water outside the Containment will depend in large part on the level of radioactivity in the water.

The EOP Users Guide says that once an FRP is entered due to a RED or ORANGE condition, that FRP is performed to completion, unless preempted by some higher priority condition. It is expected that the actions in the FRP will clear the RED or ORANGE condition before all the operator actions are complete. However, the FRPs should be performed to the point of the defined transition to a specific EOP (or SAMG) or to the "procedure and step in effect."

- A. Incorrect. The first part is plausible because cnmt fan coolers are isolated based on conditions in FRP-J.1 and ESW is a non-borated water source so the sump sample could help distinguish the source of water. The second part is correct.*
- B. Incorrect. The first part is plausible because cnmt fan coolers are isolated based on conditions in FRP-J.1 and ESW is a non-borated water source so the sump sample could help distinguish the source of water. The second part is plausible since operation of components in cnmt could be challenged by leaving FRP-J.2 without lowering containment sump level.*
- C. Incorrect. The first part is correct. The second part is plausible since operation of components in cnmt could be challenged by leaving FRP-J.2 without lowering containment sump level.*
- D. Correct.*

Notes

W/E15 Containment Flooding / 5 (SRO)

WE15EG2.4.18 Knowledge of the specific bases for EOPs

Importance Rating: 3.3 4.0

Technical Reference: FRP-J.2 WOG background document, FR-Z.2, Rev. 1, Page 8
EOP User's Guide, Section 5.2.3 General Usage, page 21, Rev. 30

References to be provided: None

Learning Objective: EOP-3.13 R4

Question Origin: OIT Dev Bank EOP-3.13-R4-4 modified to be SRO (NEW SRO question)

Comments: None

Tier/Group: T1G2

SRO Justification Knowledge of decision points in the EOPs that involve transitions. Knowledge of admin procedures that specify hierarchy and implementation of emergency procedures.

85. 2011 NRC SRO 010/BANK/C/A/////WE08 EA2.1/

Initial Conditions:

- A LOCA has occurred
- The crew is performing actions of EPP-012, Loss of Emergency Coolant Recirculation, based on plant conditions upon transition from PATH-1
- RWST level is 2.9%

Current Conditions:

- RCS Integrity CSF Status Tree indicates ORANGE

Which ONE of the following describes the action and procedure usage required?

A. Stop all pumps taking suction from the RWST;

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

B. Align the RHR pump suction to Containment Recirc Sump;

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

C. Stop all pumps taking suction from the RWST;

Remain in EPP-012 because actions in EPP-012 are expected to cause an Orange condition on Integrity.

D. Align the RHR pump suction to Containment Recirc Sump;

Remain in EPP-012 because actions in EPP-012 are expected to cause an Orange condition on Integrity.

Feedback

Plausibility and Answer Analysis

IAW EPP-012 Foldout criteria for loss of suction. If RWST level decreases to 3% (Empty alarm/ALB-004-2-5), THEN secure all pumps taking suction only from the RWST.

An ORANGE condition for RCS Integrity requires implementation of FRP-P.1 based on the EOP rules of usage as described in the EOP Users Guide.

A. Correct.

B. Incorrect. Action is plausible but would have been performed at 23.4% not at RWST empty. At 3% in the RWST the required action is to stop all pumps taking a suction only from the RWST. Procedure usage is correct.

C. Incorrect. Action is correct based on RWST level, but procedure usage is incorrect. Plausible since EOP Network does often direct user not to implement an FRP if their actions are expected to cause a Red or an Orange (for instance caution in FRP-H.1) but no such caution exists for this condition.

D. Incorrect. Incorrect procedure usage and incorrect action. Action is plausible but would have been performed at 23.4% not at RWST empty. At 3% in the RWST the required action is to stop all pumps taking a suction only from the RWST.

Notes

CE/A11; W/E08 RCS Overcooling - PTS / 4 (SRO)

WE08EA2.1 Ability to determine and interpret the following as they apply to the (Pressurized Thermal Shock) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Importance Rating: 3.4 4.2

Technical Reference: EPP-012 Foldout criteria, Page 3, Rev 26
 CSFSTs
 EOP Users Guide Section 5.2.3 General Usage pages
 20 and 21 Rev. 30

References to be provided: NONE

Learning Objective: LP-EOP-2.3/3.3, Obj. 5.a

Question Origin: BANK 2008 NRC SRO OIT Dev E11 EA2.2 5

Comments: None

Tier/Group: T1G2

SRO Justification Requires assessing plant conditions and then selecting a procedure to mitigate, recover, or with which to proceed.

86. 2011 NRC SRO 011/NEW/FUNDAMENTAL/////006 A2.10/

Given the following plant conditions:

- The plant is in MODE 3
- RCS pressure is 2235 psig
- RCS Tavg is 557°F
- Chemistry reports the 'B' SI Accumulator boron concentration is 2392 ppm

Which ONE of the following completes the statements below?

(Each statement is to be evaluated independently)

The 'B' SI Accumulator boron concentration must be restored to within Tech Spec 3.5.1 limits within (1) hour(s).

The lineup for simultaneous fill and drain of 'B' SI Accumulator per OP-110, Safety Injection, will make (2) inoperable.

- A. (1) 1
(2) ONLY the RWST
- B. (1) 1
(2) BOTH the RWST and 'B' SI Accumulator
- C. (1) 72
(2) ONLY the RWST
- D✓ (1) 72
(2) BOTH the RWST and 'B' SI Accumulator

Feedback

Plausibility and Answer Analysis

TS 3.5.1 LCO Action c states that with one accumulator inoperable due to boron concentration not within limits, restore the boron concentration within limits within 72 hours or be in at least HSB within the next 6 hours and reduce PZR pressure to < 1000 psig within the following 6 hours.

OP-110, Safety Injection, Section 8.7, Simultaneous Fill and Drain of an Accumulator contains a NOTE stating that a portion of the line to the hydrotest pump and to the Accumulators is Non-Safety. Opening 1CT-22 will cause the RWST to be inoperable per Tech Spec 3.1.2.5, 3.1.2.6 and 3.5.4 (a one hour action statement in Mode 1 through 4).

This "Non-Safety" line referred to in this note is a line containing non-seismic rated piping.

- A. Incorrect. The first part is plausible since subsequent action times in TS 3.5.1 action a. is 1 hour. The second part is plausible since the CLA could be protected from the connection to non-seismic piping by a check valve.*
- B. Incorrect. The first part is plausible since subsequent action times in TS 3.5.1 action a. is 1 hour. The second part is correct.*
- C. Incorrect. The first part is correct. The second part is plausible since the CLA could be protected from the connection to non-seismic piping by a check valve.*
- D. Correct.*

Notes

006 Emergency Core Cooling (SRO)

006A2.10 Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Low boron concentration in SIS

Importance Rating: 3.4 3.9

Technical Reference: TS 3.5.1 and OP-110, Section 8.7, Rev. 35.

References to be provided: None

Learning Objective: Safety Injection System. Obj. 12

Question Origin: NEW

Comments: None

Tier/Group: T2G1

SRO Justification Knowledge of required TS action time (>1 hour TS).
Knowledge of the content of the procedure to restore
CLA boron concentration within limits.

87. 2011 NRC SRO 012/BANK/C/A/////022 A2.03/

Given the following plant conditions:

- The plant is operating at 100% power
- OST-1010A, A Train Containment Cooling System Operability Test is in progress
- Containment Fan Cooling Unit AH-2 A-SA, is in operation in low speed
- Containment Fan Cooling Unit AH-2 A-SA is selected as the lead fan
- ALB-027-7-2, Containment Fan Coolers AH-2 LOW FLOW O/L has just alarmed

The BOP operator reports the AH-2 A-SA control switch white light is illuminated.

Which ONE of the following:

- 1) Describes the required Tech Spec 3.6.2.3 action?
 - 2) Describes the action that will restore Train SA Containment Fan Cooler operability?
- A✓ (1) Restore the inoperable train of fan coolers to operable within 7 days.
(2) Select AH-2 B-SA as the lead fan.
- B. (1) Restore the inoperable train of fan coolers to operable within 7 days.
(2) Select AH-3 A-SA as the lead fan.
- C. (1) Restore the inoperable train of fan coolers to operable within 72 hours.
(2) Select AH-3 A-SA as the lead fan.
- D. (1) Restore the inoperable train of fan coolers to operable within 72 hours.
(2) Select AH-2 B-SA as the lead fan.

Feedback

Plausibility and Answer Analysis

TS 3.6.2.3 Action a - with one train of Containment fan coolers inoperable and both Containment Spray Systems OPERABLE, restore the inoperable train of fan coolers to OPERABLE status within 7 days or be in at least HSB within the next 6 hours and in CSD within the following 30 hours.

OST-1010A and will be used to identify which fan of the two AH-2 fans are operable. Initially AH-2 A-SA was selected as the lead fan but is now inoperable. The operator will have to select AH-2 B-SA as the lead fan in AH-2 and then Train SA fan coolers are considered operable IAW OST-1010A.

- A. Correct.*
- B. Incorrect. The first part is correct. The second part is plausible since AH-2 and AH-3 are the SA train fan coolers and the selector switch selects the AH-2A-SA or AH-2B-SA fan, not the AH-2A-SA or AH-3A-SA fan.*
- C. Incorrect. The first part is plausible since the TS action for both trains of fan coolers inop is 72 hours and the TS action for one train of fan coolers and one CS system inop is 72 hours. The second part is plausible since AH-2 and AH-3 are the SA train fan coolers and the selector switch selects the AH-2A-SA or AH-2B-SA fan, not the AH-2A-SA or AH-3A-SA fan.*
- D. Incorrect. The first part is plausible since the TS action for both trains of fan coolers inop is 72 hours and the TS action for one train of fan coolers and one CS system inop is 72 hours. The second part is correct.*

Notes

022 Containment Cooling (SRO)

022A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations Fan motor thermal overload/high-speed operation

Importance Rating: 2.6 3.0

Technical Reference: TS 3.6.2.3, OST-1010A Section 7.3 Lead Fan Selector Switch Position Verification, page 14 Rev. 1

References to be provided: None

Learning Objective: Containment Cooling System, Obj. 12

Question Origin: BANK OIT Dev 022 A2.03 1 (significant re-write to make the question SRO level and distractors plausible)

Comments: None

Tier/Group: T2G1

SRO Justification Knowledge of required TS action (>1 hour TS).
Knowledge of the content of the procedure to restore operability.

88. 2011 NRC SRO 013/NEW/C/A/////039 A2.03/

Given the following initial plant conditions:

- 'B' Main Steam Line radiation monitor is in HIGH alarm
- The operating crew initiated a Reactor trip and Safety Injection
- Both MDAFW pumps are unavailable due to common cause motor problems

- After the Reactor Trip, one 'B' SG safety valve stuck open
- MSIV's will not close

Which ONE of the following describes:

- (1) The required operation of 1MS-70, MAIN STEAM B TO AUX FW TURBINE
- (2) Which procedure will be used to close 1MS-70

- A. (1) maintained open
(2) EOP-EPP-014, Faulted Steam Generator Isolation
- B. (1) maintained closed
(2) EOP-EPP-014, Faulted Steam Generator Isolation
- C. (1) maintained open
(2) PATH-2
- D✓ (1) maintained closed
(2) PATH-2

Feedback

Plausibility and Answer Analysis

Given the current plant conditions, there will be no AFW source other than the TDAFW pump. TDAFW steam supply valves will be addressed in multiple procedures for this scenario. EOP-EPP-014 will be entered from PATH-1, based on lowering SG pressure. EOP-EPP-14 will transition to EOP-EPP-015 based on all SG pressures going down. The first step in EOP-EPP-015 directs foldouts to be implemented, at which time the foldout for PATH-2 transition will apply based on high radiation. PATH-2 directs isolating 1MS-70 as long as another supply is available.

- A. Incorrect Plausible as the TDAFW pump is the only source of AFW available. The second part is plausible because EPP-014 will isolate a faulted SG by shutting the faulted SG steam supply valve to the TDAFW pump. With the conditions given in this question this step would not be performed because the procedure will be exited prior to reaching the actions to close the valve. In step 3 of EPP-014 the check for ANY SG not faulted is performed. Since one 'B' SG safety valve is stuck open and ALL MSIV's will not close ALL SGs are faulted and all SG pressures would be decreasing. Therefore a transition to EPP-015 would be made prior to reaching step 5 to isolate 1MS-70.*
- B. Incorrect First part is correct. The second part is plausible because EPP-014 will isolate a faulted SG by shutting the faulted SG steam supply valve to the TDAFW pump. With the conditions given in this question this step would not be performed because the procedure will be exited prior to reaching the actions to close the valve. In step 3 of EPP-014 the check for ANY SG not faulted is performed. Since one 'B' SG safety valve is stuck open and ALL MSIV's will not close ALL SGs are faulted and all SG pressures would be decreasing. Therefore a transition to EPP-015 would be made prior to reaching step 5 to isolate 1MS-70.*
- C. Incorrect First part is plausible as the TDAFW pump is the only source of AFW available. Second part is correct.*
- D. Correct*

Notes

039 Main and Reheat Steam (SRO)

039A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Indications and alarms for main steam and area radiation.

Importance Rating: --- ---

Technical Reference: EOP-EPP-014, rev. 18, page 3; EOP-EPP-015, rev. 22, page 3; PATH-2 guide, rev. 23, sheet 8.

References to be provided: None

Learning Objective: ---

Question Origin: NEW

Comments: None

Tier/Group: ---

SRO Justification Requires assessing plant conditions and selecting a procedure sequence with which to proceed.

89. 2011 NRC SRO 014/NEW/C/A//AOP-022/NONE//076 G2.4.47/

The plant is operating at 100% power. The following MCB indications exist:

	Time	1000	1003	1005
<u>A ESW Header</u>				
PI-9101A SA, A Disch Press		87 psig	84 psig	78 psig
FI-9101A1 SA, A Hdr Flow		15650 gpm	18650 gpm	20650 gpm
<u>B ESW Header</u>				
PI-9101B SB, B Disch Press		89 psig	85 psig	95 psig
FI-9101B1 SB, B Hdr Flow		14450 gpm	11760 gpm	13380 gpm
<u>NSW Header</u>				
PI-9302.1, Disch Hdr Press		83 psig	79 psig	110 psig
FI-9304, WPB SW Flow		9850 gpm	8210 gpm	11820 gpm
FI-9276, Cnmt Coil Units SW Return		1800 gpm	1505 gpm	2875 gpm

AOP-022, Loss of Service Water has been entered. At 1004 the immediate actions and isolation of both the ESW and NSW headers have been completed.

Which ONE of the following completes the statements below?

The Service Water line rupture is located in the (1) ESW Header and Tech Spec 3.7.4 requires at least two loops are restored to operable status within (2) hours or be in at least Hot Standby within the next 6 hours.

- A. (1) 'A'
(2) 24
- B. (1) 'B'
(2) 24
- C. (1) 'A'
(2) 72
- D. (1) 'B'
(2) 72

Feedback

Plausibility and Answer Analysis

The ruptured ESW or NSW header is typically indicated by lower pressure and higher flow in the same header than those existing prior to the breach. By utilizing the data trends the candidate should be able to identify the ruptured header as the 'A' header. The LCO action time with only one ESW loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HSB within the next 6 hours and in CSD within the following 30 hours.

- A. Incorrect. Plausible because the rupture is on the correct header but the action time for TS is incorrect but the 24 hour TS action is associated with multiple TS actions.*
- B. Incorrect. Plausible because the decreasing pressure and flow indications on 'B' ESW header could lead someone to believe the rupture is on the 'B' line. The 24 hour TS action is associated with multiple TS actions.*
- C. Correct.*
- D. Incorrect. Plausible because the decreasing pressure and flow indications on 'B' ESW header could lead someone to believe the rupture is on the 'B' line. The TS action time is correct.*

Notes

076 Service Water (SRO)

076G2.4.47 Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

Importance Rating: 4.2 4.2

Technical Reference: AOP-022 Rev 34 Section 3.0 step 8

References to be provided: None

Learning Objective: LP-AOP-3.22, Obj. 4, Service Water System, Obj. 10

Question origin: NEW

Comments: None

Tier/Group: T2G1

SRO justification: Identification of a ruptured Service Water line is determined through the Abnormal Operating Procedure guidance that would be carried out by the SRO. This question also requires the knowledge of LCO required TS actions that are >1 hour.

90. 2011 NRC SRO 015/NEW/FUNDAMENTAL/////103 G2.2.36/

Given the following plant conditions:

- The plant is operating at 100% power
- 1ED-95, Containment Sump Pump Discharge valve is OPEN
- Breaker PM is being performed with the breaker OPEN

Which ONE of the following describes (1) the Tech Spec LCO that is not met AND (2) the applicable action statement?

- A. (1) TS 3.3.2 for Phase 'A' isolation is not met
(2) restore isolation capability within 4 hours.
- B. (1) TS 3.3.2 for Phase 'A' isolation is not met
(2) restore isolation capability within 6 hours.
- C✓ (1) TS 3.6.3 for Containment Isolation Valves is not met
(2) restore the valve to operable or isolate the penetration within 4 hours.
- D. (1) TS 3.6.3 for Containment Isolation Valves is not met
(2) restore the valve to operable or isolate the penetration within 6 hours.

Feedback

Plausibility and Answer Analysis

*With one Containment isolation valve inoperable maintain at least one isolation valve OPERABLE in each affected penetration that is open **and**:*

Restore the inoperable valve to OPERABLE status within 4 hours or isolate each affected penetration within 4 hours by use of at least one deactivated automatic valve secured in the isolation position OR isolate each affected penetration within 4 hours by use of at least one closed manual valve or blind flange OR be in at least HSB within the next 6 hours and CSD within the following 30 hours.

- A. Incorrect. Plausible because 1ED-95 is a Phase "A" isolation component and the action time could be mistaken for the Containment isolation valve action time.*
- B. Incorrect. Plausible because 1ED-95 is a Phase "A" isolation component and the action time is correct for Phase "A" actuation logic and relay inoperability.*
- C. Correct.*
- D. Incorrect. Plausible because the Containment isolation valve LCO is correct and the action time could be mistaken for the 3.6.3 action d. time to be in hot standby.*

Notes

103 Containment (SRO)

103G2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.

Importance Rating: 3.1 4.2

Technical Reference: TS 3.6.3, PLP-106

References to be provided: None

Learning Objective: LP-TS-2.0, Obj. RO-5

Question Origin: NEW

Comments: None

Tier/Group: T2G1

SRO Justification Knowledge of required TS action (>1 hour TS).

91. 2011 NRC SRO 016/BANK/C/A/////001 G2.2.40/

Given the following plant conditions:

- Following a Main Turbine runback from 100% power, the crew is stabilizing the plant IAW AOP-015, Secondary Load Rejection
- ALB-13-8-2, Bank Low Insertion Limit and ALB-13-8-3, Bank Low-Low Insertion Limit alarms remain locked in
- Control Bank 'D' Rods are at 93 steps
- No rod motion is possible due to a Rod Control Logic Cabinet Urgent Alarm

Which ONE of the following describes the MAXIMUM permitted Reactor Power and the time to complete the power reduction IAW Tech Specs?

(Reference Provided)

- A✓ Reduce Reactor Power to 50% in 2 hours
- B. Reduce Reactor Power to 50% in 4 hours
- C. Reduce Reactor Power to 44% in 2 hours
- D. Reduce Reactor Power to 44% in 4 hours

Feedback

Plausibility and answer analysis

T.S. 3.1.3.6 action b requirements are to reduce thermal power within 2 hours to \leq that fraction of rated thermal power which is allowed by the bank position using the insertion limits specified in the COLR (these limits can also be found on HNP station curve F-17-1 Rod Insertion Limits). The requirement for power reduction based on this curve with Control Bank D at 93 steps is 50% power within 2 hours.

- A Correct.*
- B Incorrect. 50% is correct. 4 hours is plausible because other specifications require action within 4 hours. Examples of 4 hour actions include the surveillance for Rod Insertion Limits (4.1.3.6) is 4 hours when the alarm is inoperable and TS 3.2.3 for FΔH is a 4 hour action.*
- C Incorrect. 44% comes from using the Lo Alarm Line vice the Lo-Lo Alarm (Tech Spec Limit). 2 hours is correct.*
- D Incorrect. 44% comes from using the Lo Alarm Line vice the Lo-Lo Alarm (Tech Spec Limit). 4 hours is plausible because other specifications require action within 4 hours. Examples of 4 hour actions include the surveillance for Rod Insertion Limits (4.1.3.6) is 4 hours when the alarm is inoperable and TS 3.2.3 for FΔH is a 4 hour action.*

Notes

001 Control Rod Drive (SRO)

001G2.2.40 Ability to apply Technical Specifications for a system.

Importance Rating: 3.7 4.1

Technical Reference: Tech Spec 3.1.3.6 action b page 3/4 1-21
Amendment No. 25

References to be provided: Curve F-17-1 Rev. 0 (Rod Insertion Limit Curve)

Learning Objective: Rod Control System Objective 15.d

Question Origin: Bank OIT Development G.2.2.40

Comments: Original K/A of 001 G2.2.12 was replaced on 7/5/2011 by
Garard Laska at HNP's request due to not being able to
write a question at the SRO level for the K/A.

Tier/Group: T2G2

SRO Justification Knowledge of Tech Spec Action that are greater than
one hour.

92. 2011 NRC SRO 017/NEW/C/A/////015 A2.03/

Given the following plant conditions:

- The plant is operating at 100% power Middle-Of-Life conditions
- A divergent xenon oscillation is in progress
- Axial Flux Differential (AFD) is NOT stable

Which ONE of the following identifies (1) the condition that will place the unit closest to the AFD limit AND (2) the Tech Spec basis for the AFD limit?

- A. (1) allowing AFD to trend to positive 6%
(2) assures that the radial power distribution satisfies the design values
- B✓ (1) allowing AFD to trend to positive 6%
(2) assures that the FQ(Z) limit in the COLR is NOT exceeded
- C. (1) allowing AFD to trend to negative 6%
(2) assures that the radial power distribution satisfies the design values
- D. (1) allowing AFD to trend to negative 6%
(2) assures that the FQ(Z) limit in the COLR is NOT exceeded

Feedback

Plausibility and Answer Analysis

Axial flux limit differences in the positive direction are closer to zero than they are in the negative direction therefore allowing AFD to trend positive would place the unit closer to the AFD limit. The basis for the limit can be found in the response section of this question.

- A. Incorrect. The first part is correct. The second part is plausible because this is the Tech Spec basis for QPTR.*
- B. Correct.*
- C. Incorrect. The first part is plausible because AFD has a negative limit but there is more margin on the negative side of the curve. The second part is plausible because this is the Tech Spec basis for QPTR.*
- D. Incorrect. The first part is plausible because AFD has a negative limit but there is more margin on the negative side of the curve. The second part is correct.*

Notes

015 Nuclear Instrumentation (SRO)

015A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the NIS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Xenon oscillations

Importance Rating: 3.2 3.5

Technical Reference: PLP-106 COLR
TS 4.2.1.2 Basis

References to be provided: None

Learning Objective: LP-TS-2.0

Question Origin: NEW

Comments: None

Tier/Group: T2G2

SRO Justification Application of TS basis

2011 HNP SRO NRC Written Exam

93. 2011 NRC SRO 018/NEW/FUNDAMENTAL//AOP-001 ATT. 4/YES//034 K1.04/

Given the following initial plant conditions:

- Core offload activities are in progress
- Both Source Range Nuclear Instruments are OPERABLE
- N32 is selected for audible indication

- Source Range Nuclear Instrument N31 subsequently fails

Which ONE of the following completes the statement below?

Core offload activities may continue...

(Reference provided)

- A. when NFMS monitor N60 is used in place of N31.
- B. when NFMS monitor N61 is used in place of N31.
- C. with either NFMS monitor (N60 or N61) used in place of N31.
- D. with continuous visual monitoring of the operable Source Range N32.

Feedback

Plausibility and Answer Analysis

Technical Specifications require two source range nuclear flux monitors, each with continuous visual indication in the Main Control Room and one with audible indication in Containment and in the Main Control Room, for Refueling operations per Tech Spec 3.9.2. A Nuclear Flux Monitoring System (N60 or N61) monitor may be used in place of an inoperable Source Range monitor to satisfy Tech Spec 3.9.2. The substitute monitor must be located on the opposite side of the core from the operable Source Range NI (N60 may substitute for N31 and N61 may substitute for N32). The operable Source Range NI must be able to provide audible indication in Containment and the MCR.

- A. Correct.
- B. *Incorrect. Plausible since there are 2 WRFMs and substitution is allowed by Tech Specs. OP-105 requires substitute monitor to be located on the opposite side of the core however and if N31 has failed then ONLY N60 can be used in place of N31.*
- C. *Incorrect. Plausible since there are 2 WRFMs and substitution is allowed by Tech Specs. OP-105 requires substitute monitor to be located on the opposite side of the core however and if N31 has failed then ONLY N60 can be used in place of N31.*
- D. *Incorrect. Plausible because "continuous visual indication" is required as a Limiting Condition of the LCO.*

Notes

034 Fuel Handling Equipment (SRO)

034K1.04 Knowledge of the physical connections and/or cause-effect relationships between the Fuel Handling System and the following systems: NIS

Importance Rating: 2.6 3.5

Technical Reference: TS 3.9.2, OP-105, rev. 25, Page 5, section 4.0.12

References to be provided: AOP-001 Rev. 35, page 45 Attachment 4

Learning Objective: LP-GP-3.9, Obj. 3

Question Origin: NEW

Comments: None

Tier/Group: T3

SRO Justification Requires prescribing which NFMS monitor is acceptable in accordance with FHP-014. Tech Spec Note allows substitution but FHP-014 requires one instrument on each side of the core.

94. 2011 NRC SRO 019/BANK/FUNDAMENTAL/////G 2.1.35/

Initial plant conditions:

- Refueling activities are in progress.
- Fuel movement has stopped due to a problem with the Manipulator crane.

The Manipulator crane operator desires to operate TS-5, TROLLEY INTERLOCK BYPASS switch. IAW FHP-020, which ONE of the following describes the permission AND concurrence required to bypass the trolley interlock?

- A. The CRS must approve with the concurrence of the SM.
- B. The SRO-Fuel Handling must approve with the concurrence of the CRS.
- C. The SRO-Fuel Handling must approve with the concurrence of the SM.
- D. The SM must approve with the concurrence of the Maintenance Outage Manager of Refueling.

Feedback

Plausibility and Answer Analysis

- A. *Incorrect. Plausible since concurrence is required from SM per FHP-020 but the SRO-Fuel Handling must approve the operation of the bypass switch not the CRS.*
- B. *Incorrect. Plausible since SRO-Fuel Handling can give permission, but for bypassing interlocks the SM must concur.*
- C. *Correct.*
- D. *Incorrect. Plausible since the SM needs to give concurrence for bypassing the interlock per FHP-020 and the Maintenance Outage Manager is informed if troubleshooting or problems are occurring during refueling activities.*

Notes

G2.1.35

Knowledge of the fuel-handling responsibilities of SROs. (SRO)

Importance Rating: 3.9

Technical Reference: FHP-020 Precaution and Limitation #26, page 11 Rev. 44

References to be provided: None

Learning Objective: PP-LP-2.8 obj. 1

Question Origin: OIT Dev Bank 034 G2.1.14 1

Comments: None

Tier/Group: T3

SRO Justification Knowledge of refueling use procedure that is being directed by the SRO-Fuel Handling. This procedure does not contain any actions or responsibilities of any operators other than SRO licensed individuals specifically the SRO-Fuel Handling and Shift Manager.

95. 2011 NRC SRO 020/NEW/FUNDAMENTAL/////G 2.2.14/

Given the following plant conditions:

- The plant is operating at 100% power.
- The low flow input from AH-1 A-SB to annunciator ALB-29/3-2, CONTAINMENT FAN COOLERS AH-1 LOW FLOW - O/L, is failed causing the annunciator to be lit when conditions are not valid.
- Repair of the failed low flow input is not expected to occur for at least one month.
- To enable this annunciator to function for AH-1 B-SB low flow and the overload condition on either fan, leads will be lifted to disable the annunciator input from the AH-1 A-SB low flow output.

IAW OPS-NGGC-1000, Fleet Conduct of Operations, the annunciator should be flagged (1) .

IAW OPS-NGGC-1308, Plant Status Control, (2) tags should be placed on the lifted leads.

- A. (1) blue
(2) Caution
- B. (1) blue
(2) Off Normal
- C. (1) yellow
(2) Caution
- D✓ (1) yellow
(2) Off Normal

Feedback

Plausibility and Answer Analysis

Per OPS-NGGC-1000 a "yellow flag or coded" will be used when one or more inputs to a multiple input annunciator are disabled. Per OPS-NGGC-1308 a plant status control tag (off normal) will be used to identify a component is in an Off Normal Position.

- A. Incorrect. Part 1 is plausible because blue is used for annunciators that are disabled or removed from service. Part 2 is plausible because guidance for caution tags is contained in OPS-NGGC-1308.*
- B. Incorrect. Part 1 is plausible because blue is used for annunciators that are disabled or removed from service. Part 2 is correct.*
- C. Incorrect. Part 1 is correct. Part 2 is plausible because guidance for caution tags is contained in OPS-NGGC-1308.*
- D. Correct.*

Notes

G2.2.14

Knowledge of the process for controlling equipment configuration or status. (SRO)

Importance Rating: 4.3

Technical Reference: OPS-NGGC-1000 page 90, Rev. 3
OPS-NGGC-1308 page 8, Rev. 3

References to be provided: None

Learning Objective: PP-LP-2.0/3.0/5.0, RO obj 3.k

Question Origin: NEW

Comments: None

Tier/Group: T3

SRO Justification Knowledge of administrative process for disabling annunciators.

96. 2011 NRC SRO 021/NEW/FUNDAMENTAL/////G 2.2.38/

Which ONE of the following contains the correct values to complete the statement below?

IAW AP-617, Reportability Determination and Notification, notification for exceeding an instantaneous thermal power level equivalent to (1) requires NRC notification within (2) .

- A. (1) 103%
 (2) 4 hours
- B. (1) 103%
 (2) 24 hours
- C. (1) 102%
 (2) 4 hours
- D✓ (1) 102%
 (2) 24 hours

Feedback

Plausibility and Answer Analysis

AP-617 requires a notification be performed within 24 hours for a violation of the operating license condition of instantaneous thermal power level exceeding 2958 MWt (102%).

- A. Incorrect. Part 1 is plausible because 103% reactor power is the setpoint for the overpower rod stop. Part 2 is plausible because 4 hours is a category for NRC immediate notifications.*
- B. Incorrect. Part 1 is plausible because 103% reactor power is the setpoint for the overpower rod stop. Part 2 is correct.*
- C. Incorrect. Part 1 is correct. Part 2 is plausible because 4 hours is a category for NRC immediate notifications.*
- D. Correct*

Notes

G2.2.38

Knowledge of conditions and limitations in the facility license. (SRO)

Importance Rating: 4.5

Technical Reference: AP-617

References to be provided: None

Learning Objective: LP-PP-2.17, obj 5

Question Origin: NEW

Comments: None

Tier/Group: T3

SRO Justification The SRO must know reporting requirements when the maximum RTP is exceeded.

97. 2011 NRC SRO 022/MODIFIED/FUNDAMENTAL/////G 2.3.5/

A Source Check is being performed on the Plant Vent Stack Wide Range Gas Monitor, (RM-3509-1-SA).

The activity measured by the channel is lower than required when the source is exposed.

Which ONE of the following describes the expected indication and the correct Tech Spec action for this condition?

- A. (1) The Check Source (C/S) button on the RM-23 module flashes
(2) Initiate the preplanned alternate method of monitoring the appropriate parameter(s) within 72 hours.
- B. (1) The Check Source (C/S) button on the RM-23 module flashes
(2) Restore the PVS WRGM to operable status within 72 hours or be in hot standby within the next 6 hours.
- C✓ (1) The symbol (**) is presented on the RM-11 screen indicating Channel Check Source Failed
(2) Initiate the preplanned alternate method of monitoring the appropriate parameter(s) within 72 hours.
- D. (1) The symbol (**) is presented on the RM-11 screen indicating Channel Check Source Failed
(2) Restore the PVS WRGM to operable status within 72 hours or be in hot standby within the next 6 hours.

Feedback

Plausibility and Answer Analysis

*The ** symbol will be displayed on the RM-11 screen to indicate the Channel Check Source has failed. In this instance the PVS WRGM will be inoperable and TS 3.3.3.6 action C will be applicable. Inoperability of RCS leak detection rad monitor, REM-3502a, may require the unit to be placed in Hot Standby within 72 hours if not corrected. This makes distractors B and D plausible.*

- A. Incorrect. First part is plausible because the button is backlit during a source check. Second part is correct.*
- B. Incorrect. First part is plausible because the button is backlit during a source check. Second part is plausible as this is the action required for inoperability of RCS leak detection rad monitor, REM-3502a.*
- C. Correct*
- D. Incorrect. First part is correct. Second part is plausible as this is the action required for inoperability of RCS leak detection rad monitor, REM-3502a*

Original question was used on the 2009A NRC RO exam and modified to be SRO

Original question:

QUESTIONS REPORT

for OIT Development Bank

A Source Check is being performed on the Plant Vent Stack Wide Range Gas Monitor, (RM-3509-1-SA).

The activity measured by the channel is lower than required when the source is exposed.

Which ONE of the following describes the expected indication for this condition?

- A. The Check Source (C/S) button on the RM-11 console flashes
- B. The Check Source (C/S) button on the RM-23 module flashes
- C. The symbol (**) is presented on the RM-11 screen indicating Channel Check Source Failed
- D. The symbol (**) is presented on the RM-23 module indicating Channel Check Source Failed

Notes

G2.3.5

Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. (SRO)

Importance Rating:	2.9
Technical Reference:	OST-1058 Rev. 11, page 4; TS 3.3.3.6
References to be provided:	None
Learning Objective:	RMS, Obj. 5
Question Origin:	OIT Dev Bank G2.3.5-1 (2009A NRC RO modified to be SRO)
Comments:	None
Tier/Group:	T3
SRO Justification	Knowledge of required TS actions (>1 hr TS).

98. 2011 NRC SRO 023/NEW/C/A///EARLY SUBMITTAL/G 2.3.7/

Given the following plant conditions:

- A Site Area Emergency has been declared
- The Technical Support Center has NOT yet been staffed
- The Shift Manager is acting as the Site Emergency Coordinator - Main Control Room (SEC-MCR) and has directed a team of two Maintenance personnel to work in a radiologically hazardous area of the RAB
- The Radiological Control Director (RCD) is standing by to assist
- Each person performing the work is expected to receive 5500 mrem TEDE for this entry

Which ONE of the following correctly describes the limitation basis for the type of entry AND the position that must approve each team member to receive the expected dose IAW PEP-330, Radiological Consequences?

<u>Limitation Basis</u>	<u>Position</u>
A. Protection of large populations ONLY	SEC-MCR
B. Protection of large populations ONLY	RCD
<input checked="" type="checkbox"/> C. Protect valuable property or large populations	SEC-MCR
D. Protect valuable property or large populations	RCD

Feedback

Plausibility and Answer Analysis

PEP-330 Attachment 1 identifies that exposures up to 10 REM are allowed to protect valuable property.

PEP-230, SEC-MCR Attachment 1 step 29 states the following: Authorize Progress Energy emergency worker exposures > 5 Rem TEDE or entry into fields > 25 Rem/Hr per PEP-330, Att. 1, as necessary.

- A. Incorrect- The first part is incorrect. PEP-330 Attachment 1 identifies that emergency exposure limits of 25 REM are in place to protect large populations or life saving activities. Plausible since during maintenance activities, exposure can be received resulting in a dose exceeding 5 REM, and misundersanding of basis could occur since the intent of the emergency plans is to protect the health and safety of the public. The second part is correct since PEP-230, Attachment 1 step 29 states the following: Authorize Progress Energy emergency worker exposures > 5 Rem TEDE or entry into fields > 25 Rem/Hr per PEP-330, Att. 1, as necessary.*
- B. Incorrect- The first part is incorrect (See A). The second part is incorrect. Plausible since the RCD evaluates the need for and coordinates with the SEC -TSC authorization of the allowance of onsite emergency worker exposures > 5 Rem TEDE or entry into fields > 25 Rem/Hr per Attachment 8 of PEP-240.*
- C. Correct*
- D. Incorrect- The first part is correct (See C). The second part is incorrect (See B).*

Notes

G2.3.7

2.3 Radiation Control

2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions. (SRO)
(CFR: 41.12 / 45.10)

Importance Rating: 2.4 4.4

Technical Reference: PEP- 330, Rev 9, Page 17, PEP-240, Attachment 8 –
RADIOLOGICAL CONTROL DIRECTOR CHECKLIST,
rev.13, page 37

References to be provided: None

Learning Objective:

Question Origin: OIT Exam Bank

Comments: K/A match: Question tests SRO only knowledge of ED actions in the emergency plan and the ED responsibilities for directing and authorizing relocations and re-entries, as well as authority that the ED and/or HP Manager does and does not have.

SRO Justification 10 CFR 55.43(b) (5) RO importance rating of < 2.5. The Emergency Coordinator (Emergency Director, ED) is an SRO only job function, and thus the ED actions, and responsibilities for directing entries into hazardous areas during an emergency are SRO-only knowledge.

99. 2011 NRC SRO 024/PREVIOUS/C/A/////G 2.4.27/

Given the following plant conditions:

- The plant is operating at 100% power

The following occur

- A fire is reported in the 'A' Transfer panel
- The fire brigade is fighting the fire using water and the fire continues to burn
- The RO reports that the 'A' Group of PZR Backup Heaters is cycling ON and OFF
- The crew enters FPP-002, Fire Emergency, and AOP-036, Safe Shutdown

Following A Fire

- The CRS is evaluating if a normal plant shutdown can be achieved with at least one train of equipment using normal plant procedures

Which ONE of the following describes the action that will be taken with regards to AOP-036 (and it's subset procedures) and the action required for the 'A' Group of PZR Backup Heaters IAW FPP-002?

- A. Exit AOP-036 and go to procedure and step in effect
OPEN the feeder breaker to Bus 1A1
- B. Exit AOP-036 and go to procedure and step in effect
Rack out the breaker for the 'A' Group of PZR Backup Heaters
- C. Remain in AOP-036
Rack out the breaker for the 'A' Group of PZR Backup Heaters
- D✓ Remain in AOP-036
OPEN the feeder breaker to Bus 1A1

Feedback

Plausibility and Answer Analysis

The Fire in the 'A' Transfer Panel is considered a MAJOR fire as prescribed in the AOP-036 Basis Document. A MAJOR fire requires the use of AOP-036 to perform the plant shutdown. FPP-002 directs deenergizing the affected bus when components are observed to spuriously operate.

- A Incorrect. Incorrect AOP-036 Action, this is plausible though as only one train of equipment is on fire and the individual may believe a normal shutdown using normal procedures can be performed using the other train. Correct FPP-002 Action.*
- B Incorrect. Incorrect AOP-036 Action, this is plausible though as only one train of equipment is on fire and the individual may believe a normal shutdown using normal procedures can be performed using the other train. Incorrect FPP-002 Action but racking out the breaker will deenergize the affected component and alleviate the effect of the heaters cycling on and off.*
- C Incorrect. Correct AOP-036 Action (remain in AOP-036). Incorrect FPP-002 Action but racking out the breaker will deenergize the affected component and alleviate the effect of the heaters cycling on and off.*
- D Correct. Correct AOP-036 Action (remain in AOP-036). Correct FPP-002 Action.*

Notes

G2.4.27

Knowledge of "fire in the plant" procedures. (SRO)

Importance Rating: 3.9

Technical Reference: AOP-036 Rev. 40 pg 4, AOP-036-BD Rev. 8 pg 3,
FPP-002 Rev. 32 pg 10

References to be provided: None

Learning Objective: LP-AOP-036, Obj. 7, PP-LP-2.15/3.15 Obj. 1

Question origin: Previous 2009A Exam / Slightly modified

Comments: From AOP-036-BD item #4 For consistency in operator response when determining if a normal plant shutdown can be achieved using normal plant procedures, a MAJOR fire in a safe shutdown area is defined below. The term "safety related" is used rather than "safe shutdown related" for ease of operator recognition to minimize delay in procedure implementation when necessary.

A MAJOR fire in a safe shutdown area is defined as a fire affecting more than one safety related component. This includes the following:

Major termination cabinets or junction boxes
Cable trays
Transfer panels
Buses involving more than one cubicle
Control panels affecting more than one safety related switch

Tier/Group: T3

SRO justification: This is a branching step in AOP-036 (step 2). This step determines whether the crew will remain in AOP-036 and perform an emergency plant shutdown due to the fire or return to the procedure and step in effect. To come to the correct answer requires knowledge of the Note prior to step 2 and knowledge of the definition of MAJOR fire contained in the AOP-036-BD. No indications or effects are given on the other train, so the individual must use this knowledge to come to the correct answer otherwise they may believe no shutdown is required or that a normal shutdown can be performed using 'B' Train.

100. 2011 NRC SRO 025/BANK/FUNDAMENTAL////EARLY SUBMITTAL/G 2.4.18/

Given the following plant conditions:

- A Reactor trip has occurred due to a loss of MFW
- FRP-H.1, Response to Loss of Secondary Heat Sink, is being implemented
- The RCS is in a bleed and feed condition
- RCS Tavg is 570°F and stable
- The operators have restored a feedwater source and are preparing to feed the SGs which are dry
- The CRS directs the operator to establish feed water to only one SG

Which ONE of the following describes the reason for feeding only one SG under these conditions?

- A. To prevent a rapid cooldown of the RCS that could lead to a pressurized thermal shock condition.
- B. To demonstrate the reliability of the FW source before filling all of the SGs.
- C. To determine if one SG is capable of maintaining adequate heat sink so that RCS bleed and feed can be terminated.
- D. To ensure that if a SG failure occurs due to excessive thermal stresses, the failure is isolated to one SG.

Feedback

Plausibility and Answer Analysis

WOG background for FRP-H.1 section 2.4 Feeding a Dry Steam Generator

Since the heat removal capability of one steam generator is always greater than decay heat, it is advisable to reestablish feedwater to only one steam generator regardless of the size of the plant or number of loops. Thus, if a failure in an SG occurs due to excessive thermal stresses, the failure is isolated to one steam generator.

- A. Incorrect. Plausible since feeding AFW will cause a cooldown but cooldown rate depends on amount of feedwater, not distribution between generators.*
- B. Incorrect. Plausible since candidate could believe that FW would need to be reliable since a method of heat removal is taking place using bleed and feed but a demonstration of reliability is not required in FRP-H.1*
- C. Incorrect. Plausible if candidate believes that as soon as FW is established to one SG bleed and feed can be terminated but bleed and feed will not be terminated based on having flow to the SG. Termination of bleed and feed is after an adequate secondary heat sink is verified by having SG narrow range level > 25% [40% adverse].*
- D. Correct.*

Notes

G2.4.18

Knowledge of the specific bases for EOPs. (SRO)

Importance Rating: 4.3

Technical Reference: WOG background FRP-H.1 page 51 HP-Rev. 2, 4/30/2005

References to be provided: None

Learning Objective: EOP-3.11 Objective 4.c Revision 10

Question Origin: BANK

Comments: New K/A provided by G. Laska on 6/29/2011 (K/A G2.4.18) unable to write a SRO level question from original K/A G2.4.17 "Knowledge of EOP terms and definitions".

Tier/Group: T3

SRO Justification Candidate must poses detailed knowledge of basis behind step in which to proceed during implementation of a Function Restoration procedure.

You have completed the test!