Final Submittal
(Blue Paper)

COMBINED RO/SRO WRITTEN EXAM

WITH KAS, ANSWERS, REFERENCES,

FARLEY NOV. 2008
EXAM 301

1.

Unit 1 is currently at 40% power and ramping up.

At 1000 am the following conditions exist:

- Rod control is in AUTO.
- The ramp rate is 2 MW/min.
- Tavg is 556°F and Tref is 557°F.
- CONT BANK D1 and D2 indicate 172 steps on the Group Step Counters.
- All Bank D DRPI red lights are at 168 steps.

At 1015 am the following occurs:

- CB D rods begin stepping out for Tavg control and stop at 174 and 173 steps as indicated on Demand Position Indication.
- CB D rods F6 and K10 continue **stepping out** as indicated by DRPI and RCS Tavg.
- The OATC places rods in MANUAL.
- Rods F6 and K10 stop at 192 steps as indicated by DRPI.

Which one of the following describes the Technical Specification that is required to be entered for this condition and the reason?

A. • Enter T.S. 3.1.4, Rod Group Alignment Limits, since more than one rod is untrippable.

B. • Enter T.S. 3.1.4, Rod Group Alignment Limits, since two rods are not within the proper alignment limits.

C. • Enter T.S. 3.1.7, Rod Position Indication, since more than one DRPI indication is INOPERABLE.

D. • Enter T.S. 3.1.7, Rod Position Indication, since there is a mismatch between the Group Step Counters and DRPI.

Technical Reference: Tech Specs 3.1.4 and 3.1.7 and bases. Also lesson plan for DRPI OPS-52201F

Learning Objective:
Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the Digital Rod Position Indication System (OPS52201F10).

- Technical Specification 3.1.7, Rod Position Indication
- TR 13.1.8, Position Indication System – Shutdown
- TR 13.1.9, Test Exception for Position Indication System – Shutdown

Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the Rod Control System (OPS-52201E01).

- 3.1.4, Rod Group Alignment Limits
- 3.1.5, Shutdown Bank Insertion Limits
- 3.1.6, Control Bank Insertion Limits
- 3.1.7, Rod Position Indication
- 3.1.8, PHYSICS TESTS Exceptions

Comments: This question meets the KA in that during this continuous rod withdrawal of 2 rods, they become misaligned and then Tech Specs have to be entered. The reason that the tech Spec is entered is part of the answer and distracters to meet the KA that says "knowledge of the reasons for..... TS limits on rod operability." at an RO level.

2.

Unit 1 was at 63% power and stable while preparing to place the second SGFP in service.

At 1000, conditions were as follows:

- Control Rods were in AUTO.
- Group Rod position was bank D at 181 steps.
- ALL Power Range Nuclear Instruments indicated 63.2%.
- Delta I indicated (-) 2.5%.
- Tavg was at 561.6°F.

At 1001, Control Rods begin moving and the following alarms come in:

- FB4 PR UPPER DET HI FLUX DEV OR AUTO DEF
- FB5 PR LOWER DET HI FLUX DEV OR AUTO DEF
- FC5 PR CH DEV
- FF5 COMP ALARM ROD SEQ/DEV OR PR FLUX TILT

At 1005, the following MCB indicators read as follows:

PR Instruments	Delta I	Tavg
N-41B 66.4%	N-41C (+) 6.4%	560.7°F
N-42B 66.4%	N-42C (+) 6.3%	
N-43B 43.7%	N-43C (+) 5.2%	
N-44B 69.2%	N-44C (+) 6.4%	

Which one of the following is correct concerning the cause of these indications?

A. • A rod has dropped near N-43 and
   • Rods have stepped OUT ONLY.

B. • N-43 upper detector has failed low and
   • Rods have stepped OUT ONLY.

C. • A rod has dropped near N-43 and
   • Rods have stepped IN ONLY.

D. • N-43 upper detector has failed low and
   • Rods have stepped IN ONLY.

Technical Reference: FNP-1-ARP-1.6, Simulator model for Farley Nulear Plant, Fundamentals (GFES) lesson plan: OPS-31301E.

Learning Objective:

4. **DEFINE AND EVALUATE** the operational implications of abnormal plant or equipment conditions associated with the operation of the Rod Control System components and equipment to include the following:

    - Normal Control Methods
    - Abnormal and Emergency Control Methods
    - Automatic actuation including setpoint (example SI, Phase A, Phase B, MSLIAS, LOSP, SG level)
    - Actions needed to mitigate the consequence of the abnormality

Comments: k/a match: Indications are given which require knowledge that a dropped rod would cause the indications. With a dropped rod, Axial Flux difference remains relatively unchanged (as shown on delta I indications) even though the radial flux difference becomes very different (as shown on NI indications). Also required is the effect on the CRDM system with rods in auto at a power level and rod height that rods would be demanded to move. Effect of fluxdistribution throughout the core after the rod is dropped is required to know how a rod drop on one side of the core will affect flux on the other side of the core (N-43 is on the opposite side of the core from N-44), and the axial flux difference in every quadrant.

3.

Given the following:

- A Loss of Feedwater has occurred.
- The crew is performing actions of FRP-H.1, Response to Loss of Secondary Heat Sink.
- ALL RCPs have been secured.
- CETCs are 632°F and rising.
- RCS pressure is being controlled by the PORVs lifting.

Which ONE of the following indicates:
(1) that a loss of secondary heat sink has occurred, and
(2) the required actions to be taken IAW FRP-H.1?

A. (1) A high loop Delta T.

(2) Establish an RCS Feed and Bleed.

B. (1) A low loop Delta T.

(2) Establish an RCS Feed and Bleed.

C. (1) A low loop Delta T .

(2) Using the steam dumps, dump steam at the maximum attainable rate.

D. (1) A high loop Delta T.

(2) Using the steam dumps, dump steam at the maximum attainable rate.

Technical Reference: FRP-H.1 Rev. 26

Learning Objective:
State the basis for all cautions, notes, and actions associated with FRP-H.1/2/3/4/5. (OPS52533F03).
Describe the sequence of major actions and when and how continuous actions will be implemented associated with FRP H.1/2/3/4/5 (OPS52533F04).
Evaluate plant indications to determine the successful completion of any step in FRP-H.1/2/3/4/5 (OPS52533F07).

Comments: This meets the KA since it tests a loss of heat sink and the indications of a loss of heat sink and then the actions that will need to be taken based on the loss of heat sink indications at an RO level.

4.

Given the following conditions:

- Unit 1 is operating at 100% power.
- FF2, ROD CONT SYS NON-URGENT FAILURE, has come into alarm.
- Due to an over voltage protector actuation, the power supplies (PS1 and PS2) for Power Cabinet 1BD have shutdown.
- The ROVER and SSS-plant have tried to reset the power supplies and neither would reset.

Which one of the following is a result of taking **NO** other action for this condition?

A. Multiple rods will drop into the core.

B. Rods in the 1BD cabinet will not move in any mode.

C. ALL control bank D rods can be moved in individual bank select ONLY.

D. Rods in the unaffected cabinets can be moved in individual bank select ONLY.

Technical Reference: ARP-1.6, FF1, Ver. 58 and 2 and lesson plan for rod control OPS-52201E

Learning Objective:
Identify the power supply for each major electrical component associated with the Rod Control System including (OPS40204I04):

- Logic Cabinets
- Power Cabinets
- DC Hold Cabinet
- Control Rod Drive Mechanisms

Comments: This meets the KA since the interrelation between rod control power supplies and dropped rods is tested at a memory level for an RO.

5.

If one Reactor Coolant Pump became degraded and RCS total flow fell below the minimum required flow rate, which one of the following conditions would occur?

A. Quadrant Power Tilt Ratio limits would be exceeded.

B. Heat Flux Hot Channel Factor limits would be exceeded.

C. Departure from Nucleate Boiling (DNB) limits would be exceeded.

D. Nuclear Enthalpy Rise Hot Channel Factor limits would be exceeded.

Technical Reference: Tech Spec bases background information and TS 3.4.1 information
TSs 3.2.1, 3.2.2, 3.24 and SL 2.1

Learning Objective:
State the components, processes, or parameters of the Reactor Coolant System that are addressed in Technical Specifications and/or the Technical Requirement Manual (OPS40301A10).

- TS 3.4.4 RCS Loops — MODES 1 and 2
- TS 3.4.5 RCS Loops -- MODE 3

Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the Reactor Coolant Pumps (OPS52101D01).

- 3.4.4 RCS Loops - Modes 1 and 2
- 3.4.5 RCS Loops - Mode 3

Comments: This meets the KA since the RCS flow rate is reduced which affects the DNB parameters. The operational implications are the limits being exceeded. Since this is a knowledge KA, it is written to a memory level and knowledge of Tech Specs vs RCS flow would provide the RO with the knowledge required to answer the question.

6.

Unit 1 is operating at 100% power when the following indications are received:

- DE3, LTDN ORIF ISO VLV REL LINE TEMP HI, comes into alarm.
- PI-145, LTDN HX OUTLET PRESS, decreases to 0 psig.
- FI-150, LTDN HX OUTLET FLOW, decreases to 0 gpm.
- PK-145, LP LTDN PRESS controller, goes to 0% and the minimum RED light is LIT.

Which one of the following describes the the event in progress?

A. HV-8152, LTDN LINE CTMT ISO, has lost air.

B. Pressurizer level on LT-459 is less than 15%.

C. A Phase A isolation has occurred.

D. PCV-145, LTDN PCV, has lost air.

Technical Reference: OPS-52101F lesson plan, AOP-6.0 Ver. 31, loss of air
D175039 P&ID

Learning Objective: (OPS40301F02)

Comments: This meets the KA in that the operator has to be able to evaluate the response of letdown to the indications given, and based on that evaluation determine how the automatic operation of letdown responded.

modified from CVCS-40301F08 #17

7.

Unit 1 has been operating at 100% power.

The following conditions exist:

- The cation bed demineralizer was last placed in service prior to the refueling outage during coastdown of the unit.
- The cation bed demineralizer was left vented to the atmosphere for maintenance for 20 days during the outage.
- Chemistry has asked Operations to place the cation bed demineralizer in service.
- The cation bed demineralizer was placed in service but was not vented or flushed as required by SOP-2.5, Appendix 2, Flushing Cation and Mixed Bed Demineralizers to the RHT's.

Which one of the following correctly lists two problems that could result from not placing the cation bed demineralizer in service correctly?

A. • The RCS filter may clog due to high particulate.

• A **boration** of the RCS will occur.

B. • The RCS filter may clog due to high particulate.

• A **dilution** of the RCS will occur.

C. • Charging pump suction voiding may occur.

• A **boration** of the RCS will occur.

D. • Charging pump suction voiding may occur.

• A **dilution** of the RCS will occur.

Technical Reference: SOP-2.1 appendix J Ver. 96 and SOP-2.5 version 62

Learning Objective:

1. Discuss the normal operation and alignment of each of the following component including precautions and limitations of operation, and applicable procedures (SOPs, ARPs, UOPs) associated with the CHEMICAL AND VOLUME CONTROL System (OPS-40301F11):
   - Filters and demineralizers
     - Mixed Bed Demineralizers
     - Cation Bed Demineralizers
     - RCS Filter
     - Seal Injection Filter
     - RCP Seal Return Filter

2. Identify the symptoms and predict the impact a loss or malfunction of CHEMICAL AND VOLUME CONTROL system components will have on the operation of the CHEMICAL AND VOLUME CONTROL system (OPS-52101F02)
3. Discuss the operation and alignment of components including precautions and limitations of operation, and applicable procedures (SOPs, ARPs, UOPs) associated with the CHEMICAL AND VOLUME CONTROL System (OPS-52101F04)

Comments: This meets the KA at an RO knowledge level since it tests the results of placing the mixed bed in service after not being aligned for several months and the effects of the high particulate and boron in relation to the RCS and CVCS components. This is past OE from FNP (OR 2-99-875)

8.

Given the following plant conditions on Unit 1:

- The RCS is solid.
- The letdown orifice isolation valves are closed.
- RHR is on service and supplying low pressure letdown.
- RCS pressure is 350 psig.
- RCS temperature is stable.
- FCV-122 is in Manual.
- HCV-142, RHR to LETDOWN Flow, controller setting is at 40% demand.
- PK-145, LP LTDN PRESS controller, is in AUTO.
- The Plant Operator adjusts HCV-142 controller to 100% demand.

Which one of the following describes the initial response of the systems after the operator action?

A. Letdown pressure **DECREASES** and RCS pressure **DECREASES**.

B. Letdown pressure **INCREASES** and RCS pressure **DECREASES**.

C. Letdown pressure **DECREASES** and RCS pressure **INCREASES**.

D. Letdown pressure **INCREASES** and RCS pressure **INCREASES**.

Technical Reference: Lesson plan OPS-52101F

Learning Objective:
also the following:
Identify any special considerations such as safety hazards and plant condition changes that apply to the Residual Heat Removal System (OPS52101K04).
- Decrease in low pressure letdown flow
- HCV-142 fails closed
- HCV-142 fails open

List the automatic actions associated with the Residual Heat Removal System components and equipment during normal and abnormal operations including (OPS40301K07):
- Normal control methods

Describe the operation of PCV-145 during normal operations and solid plant pressure control including the conditions of air and electrical power failures (OPS52101F05).

Comments: question tests the operational implications of the plant while solid and how the different valves and plant parameters will be affected.

FNP BANK: RHR-40301K02 15

9.

Given the following at 1015:

- Unit 1 is performing a plant cooldown using the "A" Train RHR system.
- HIK-603A, 1A RHR HX DISCH VLV, controller is at 50%.
- FK-605A, 1A RHR HX BYP FLOW, controller is at 50%.

At 1020 the following occurs:

- Instrument Air is lost to FCV-605A, 1A RHR HX BYP FLOW, due to a supply line leak.
- NO other equipment is affected.

Which ONE of the following describes the effect on total RHR flow on FI-605A, 1A RHR HDR FLOW, **and** RHR HX outlet temperature on TR-604A, 1A RHR PUMP DISCH TEMP, when the plant stabilizes from the transient?

Assume no operator action is taken

	Total RHR Flow	RHR HX outlet temperature
A.	INCREASES	INCREASES
B.	DECREASES	INCREASES
C.	INCREASES	DECREASES
D.	DECREASES	DECREASES

Technical Reference: P&ID D-175041 and figure 2 of lesson plan

Learning Objective: 40301K08

Comments: This question tests the malfunction of a valve in the RHR discharge line that bypasses flow around or causes more flow to go thru the RHR Ht exchanger. This malfunction affects RHR flow thru the RHR ht exchanger and outlet temperature.

FNP BANK: RHR-40301K08 02

10.

A Large Break LOCA has occurred on Unit 1. Containment pressure peaked at 28.7 psig and is now decreasing.

If the RWST were allowed to drop to 4 feet 5 inches with **NO** operator action, which one of the following correctly describes the flow path from the suction source(s) to the ECCS pumps?

A. Containment sump ONLY aligned to two RHR pumps which are providing flow to the suction of two HHSI pumps.

B. RWST ONLY aligned to two HHSI pumps.
RWST ONLY aligned to two RHR pumps.

C. Containment sump **AND** the RWST aligned to two RHR pumps which are providing flow to the suction of two HHSI pumps.

D. RWST ONLY aligned to two HHSI pumps.
Containment sump **AND** the RWST aligned to two RHR pumps.

Technical Reference: OPS-52102B ECCS figure 14 ESP-1.3 Rev. 19 for distracter plausibility and FSD - CVCS/HHSI/ACCUMULATOR/RMWS A-181009

Learning Objective:
Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Emergency Core Cooling System including (OPS40302C11):
- High-Head Injection Pumps (Charging Pumps)
- Low-Head Injection Pumps (RHR Pumps)
- Accumulators
- Refueling Water Storage Tank (RWST)
- Hydrostatic Test Pump
- RHR Heat Exchangers

Comments: This meets the KA since the physical connections and the cause and effect of the RWST lo-lo level on the alignment is tested and the operator would have to know what the normal alignment of the ECCS/chg system is for a LB LOCA and then what happens on a lo-lo level vs operator action at this level.

11.

Unit 1 was operating at 92% power when ALL AC power was lost.

Which one of the following lists indications that are available, and approximately what the indications would read, to determine the reactor is operating correctly and is shutdown, five (5) minutes after ALL AC power is lost on Unit 1?

A. ALL rod bottom lights are lit.
SR counts = 2000 cps

B. ALL rod bottom lights are lit.
IR amps = 2×10^{-8} Amps

C. ALL reactor trip and bypass breakers are LIT and open.
SR counts = 2000 cps

D. ALL reactor trip and bypass breakers are LIT and open.
IR amps = 2×10^{-8} Amps

Technical Reference: EEP-0 Rev. 36 and ECP-0.0 Rev. 22 IOAs, FNP load list for unit 1
A-506250 Pages D-97, G-82, F-54, G-50

Learning Objective:
2. Evaluate plant conditions to determine if entry into EEP-0/ESP-0.0 is required. (OPS52530A02)
Predict and explain the following instrument/equipment response expected when performing Excore Nuclear Instrumentation System evolutions including the fail condition, alarms, and trip set points (OPS52201D08).

- Power Range Channels
- Intermediate Range Channels

Source Range Channels

Comments: This meets the KA since this question asks the candidate to determine if the reactor is shutdown from the available indications. The candidate will have to determine from the available indications given with the available power supplies if the reactor is remaining subcritical and how IR or SR power would react.

12.

Unit 1 is in Mode 4 with the following conditions:

- A transient has occurred that caused the RHR suction relief to lift and start leaking to the PRT.
- The RHR relief was isolated IAW SOP-7.0, Residual Heat Removal System.

The following Pressurizer Relief Tank (PRT) parameter changes have occurred:

- PRT pressure has increased from 2.0 psig to 4.0 psig.
- PRT temperature has increased from 115°F to 140°F.
- PRT level has increased from 70% to 77%.

Which one of the following describes the preferred action to return the PRT parameters to nominal values IAW SOP-1.2, Reactor Coolant Pressure Relief System?

A. • The PRT should be cooled down by spraying cool reactor makeup water into the PRT.

B. • The PRT should be cooled down by recirculating the PRT water through the RCDT heat exchanger.

C. • The PRT level should be reduced by draining to the Waste Holdup Tank (WHT).

D. • The PRT pressure should be reduced by venting the PRT to the Waste Gas Decay Tank (WGDT).

Technical Reference: SOP- 1.2 Ver. 26, Reactor coolant relief system, ARP-1.8 Ver. 31 HE3, 4 and 5, Ops- 52101E, pressurizer lesson plan.

Learning Objective:

Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Pressurizer System including (OPS40301E11):

- Pressurizer
- Pressurizer Relief Tank

Comments: This meets the KA since the RHR relief valve has lifted causing PRT parameters to be affected and then due to the PRT parameters that are affected, the candidate will have to evaluate and then make operational judgements at an RO level to determine what to do when this condition occurs.

13.

Given the following conditions:

- A reactor trip has occurred.
- Pressurizer pressure is lowering rapidly and pressurizer level is rising rapidly.

Which one of the following indications are consistent with the event in progress?

Assume no operator action is taken

A. LK-459F, PRZR LVL Master Controller, indicates 100% and FK-122, CHG FLOW controller indicates 100%.

B. PK-464, STM HDR PRESS Controller, indicates 100% and the red lights for Steam Dump Valves V501C and E are LIT.

C. PK-444A, PRZR PRESS Master Controller, indicates 0% and the red light for PORV-444B, PRZR PORV, is LIT.

D. PK-444C, 1A LOOP SPRAY VLV Controller, indicates 100% and the 4 green lights for 1A LOOP PRZR SPRAY VLV are LIT.

Technical Reference: OPS-52201H

Learning Objective:

Evaluate abnormal plant or equipment conditions associated with the Pressurizer Pressure and Level Control System and determine the integrated plant actions needed to mitigate the consequence of the abnormality (OPS52201H12).

Given a set of plant conditions describe the actions/effects that will occur following a PZR Pressure Malfunction with no operator action (OPS52201H17).

Comments: This meets the KA since the question asks for the interrelations between the controllers/ positioners that affect the valves listed and a stuck open PORV (vapor space accident). They have to relate the indications with the event to determine what is happening.

14.

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

- "A" Train is the "On Service" train.
- 1B CCW pump is running and supplying loads in the on-service train.
- 1A CCW pump is running to support charging pump operations.
- 1C CCW pump is aligned and OPERABLE.

A Safety Injection occurs at this time.

Which one of the following combinations of CCW pumps will be running following the operation of the ESF sequencers?

(Assume no operator action is taken)

A. 1A and 1C CCW pumps ONLY

B. 1B and 1C CCW pumps ONLY

C. 1A and 1B CCW pumps ONLY

D. 1A and 1B and 1C CCW pumps

Technical Reference: FSD A-181000

Learning Objective: 40204A07
List the automatic actions associated with the Component Cooling Water System components and equipment during normal and abnormal operations including (OPS40204A07):

- Normal control methods
- Automatic actuation including setpoint (example SI, Phase A, Phase B, High Radiation, LOSP)
- Protective isolations such as high flow, low pressure, low level including setpoint
- Protective interlocks

also 52102G02

Comments: This meets the KA since it tests the standby feature of the standby pump for the train it is aligned to. This is the standby feature for the main pump (ie., 1C or 1A CCW pump).

Our SW pumps do not have a feature where the standby pump looks to see if the other pump is running before starting or not starting the other pump in that train for an SI signal. In that case there would be 5 SW pumps running. For CCW, if the swing pump is running, then the other pump in that train will not start on the SI signal.

All distracters are plausible since our trains are not set up in a logical way and C CCW pump is A train and A CCW pump is B Train. Most other components are configured correctly and differently.

Had to change the stem to take into account the new CCW and charging pump line up.

FNP BANK: CCW-52102G02 05

15.

Given the following conditions on Unit 1:

- A manual Safety Injection has been initiated IAW AOP-1.0, RCS Leakage.
- The crew is at diagnostics of EEP-0, Reactor Trip or Safety Injection, to check the RCS intact.

The following conditions exist:

- Containment pressure is reading 3.0 psig.
- Containment temperature is reading 120°F.

Which one of the following is the parameter used to transition to EEP-1.0, Loss of Reactor or Secondary Coolant, and the reason <u>that value</u> is used?

A. • Containment temperature

• To ensure the proper performance of safety related equipment inside containment.

B. • Containment temperature

• Since this is the Technical Specification LCO upper temperature limit.

C. • Containment pressure

• To ensure the proper performance of safety related equipment inside containment.

D✓ • Containment pressure

• Since this is the Technical Specification LCO upper pressure limit.

Technical Reference:EEP-0, EEP-1 and ESP-1.1. FNP-0-EEB-0.0 Reactor trip or safety injection plant specific background information

Learning Objective:
Evaluate plant conditions and determine if transition to another section of EEP-0/ESP-0.0 or to another procedure is required. (OPS52530A08)
Evaluate plant conditions to determine if entry into EEP-1 is required. (OPS52530B02)

Comments: This meets the KA since the question asks about the reason that the value of containment pressure is used to make a determination while in EEP-0 for a small break LOCA.

ERP StepText: Check RCS intact.
ERG StepText: *Check If RCS Is Intact*
Purpose: To identify any failure in the RCS pressure boundary into the containment.
Basis: Abnormal containment radiation, pressure, or recirculation sump level is indicative of a high energy line break in containment. Since the SGs have been determined to be non-faulted in an earlier step, then the break must be in the reactor coolant system. For smaller size breaks containment pressure and recirculation sump level may not increase for a period of time; however, containment radiation would be apparent. Guideline E-1, LOSS OF REACTOR OR SECONDARY COOLANT, is used for breaks in the RCS.
Knowledge: "Normal" means the value of a process parameter experienced during routine plant operations.
References:
Justification of Differences:
1 Specific setpoints for normal containment pressure and ECCS sump level were added in accordance with the guidance in AP-74. 3 psig for containment pressure was chosen due to it being the Tech Spec maximum pressure and 0.4 ft for ECCS sump level due to it being the minimum discernable level on the MCB indicators.
2 Deleted reference to step 1 of EEP-1. The operator should always enter a procedure at the beginning unless otherwise directed.

16.

Unit 1 is at 100% power. PT-444, PRZR PRESS, transmitter has failed LOW and the following actions have been taken:

- PK-444A, PRZR PRESS REFERENCE, master controller is in manual and demand is set at 35%.
- ALL Backup Heaters have been placed in the ON position.
- PK-444C, 1A LOOP SPRAY VLV, is in MAN and 0% on the controller.
- PK-444D, 1B LOOP SPRAY VLV, is in AUTO and at 20% on the controller.
- RCS pressure is currently 2270 psig and stable.

Which one of the following actions will **LOWER** RCS pressure?

A. Place PK-444C, 1A LOOP SPRAY VLV, in AUTO.

B. Place PK-444A, PRZR PRESS REFERENCE, in AUTO.

C. Raise the demand on PK-444A, PRZR PRESS REFERENCE, to 57.5%.

D. Place PK-444D, 1B LOOP SPRAY VLV, in MAN and lower the demand on the controller to 0%.

Technical Reference: OPS lesson plan 52201H. Przr press and level control

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of the following major components associated with the Pressurizer Pressure and Level Control System (OPS52201H02):

- Pressurizer Spray Valves
- Pressurizer Heaters
- Pressurizer Pressure Detectors
- Master Pressure Controller

Comments: This meets the KA since it tests the ability to operate and monitor the affects of the spray valves and integrates knowledge of how the master pressure controller affects RCS pressure.

17.

Unit 1 is operating at 50% power. Given the following conditions:

- Pressurizer pressure is 2235 psig.
- Pressurized Relief Tank (PRT) pressure is 10.2 psig and rising.
- PRT temperature is 125°F and rising.
- PRT level is 81% and rising slowly.
- One pressurizer PORV is blowing by its seat.

Which one of the following describes the effect on the PRT and PORV downstream piping of the PORV blowing by for a sustained period of time?
(Assume no operator action)

A. • The PRT pressure will increase to a maximum of 100 psig.
   • PORV downstream temperature will rise to 500-650°F.

B. • The PRT pressure will increase to 150 psig.
   • PORV downstream temperature will rise to a maximum of 200-350°F.

C. • The PRT pressure will increase to a maximum of 100 psig.
   • PORV downstream temperature will rise to a maximum of 200-350°F.

D. • The PRT pressure will increase to 150 psig.
   • PORV downstream temperature will rise to 500-650°F.

Technical Reference: Ops- 52101E, pressurizer lesson plan.

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of the following major component associated with the Pressurizer System (OPS40301E02):
• Pressurizer
• Pressurizer Relief Tank
• Code Safety Valves and PORVs

Comments: This question meets the KA since it tests the effects of a PZR PCS component that is malfunctioning and the effects on the PRT which is directly and physically connected to it.
I revised D distracter to make it more plausible and made B the correct answer due to length of distracters instead of C.

PZR-40301E02 10

18.

Given the following conditions on Unit 2:

- "A" Train is the "On Service" train.
- 2B CCW pump is running and supplying loads in the on-service train.
- 2A CCW pump is running to support charging pump operations.
- 2A Charging Pump breaker has been racked out for maintenance.

2G 4160 volt bus has just been lost due to a fault. There is no power on the 2G 4160 volt bus at this time.

Which one of the following states the ECCS pumps that will **NOT** have power due to the fault based on current conditions?

A. 2B Charging Pump, 2A RHR Pump.

B. 2B Charging Pump, 2B RHR Pump.

C. 2C Charging Pump, 2A RHR Pump.

D. 2C Charging Pump, 2B RHR Pump.

Technical Reference: Load list for unit 2 page F-1 and G-1 A-506250

Learning Objective:

Identify the power supply for each of the following component associated with the CHEMICAL AND VOLUME CONTROL System including (OPS-40301F04):

- Charging Pumps

Identify the power supply for each major electrical component associated with the Residual Heat Removal System including (OPS40301K04):

- RHR Pumps

Comments: This meets the KA since the question directly tests the power supply for a charging pump at an RO level.

LO/INT VOLT-40102B06 3

19.

Given the following plant conditions on Unit 2:

- The reactor was at 25% power.
- A reactor trip signal came in and the reactor trip breakers failed to open.
- The operators tripped the reactor by opening the CRDM MG set supply breakers.

Which one of the following correctly describes the immediate effects if no operator action is taken?

A. • The Main Turbine will trip.
   • The SGFP will trip.

B. • The Main Turbine will trip.
   • The SGFP will **NOT** trip.

C. • The Main Turbine will **NOT** trip.
   • The SGFP will trip.

D. • The Main Turbine will **NOT** trip.
   • The SGFP will **NOT** trip.

Technical Reference: FSD - REACTOR PROTECTION SYSTEM A-181007 and OPS 52201i and 52105A (main turbine)
Plant Specific Background Information - RESPONSE TO NUCLEAR POWER GENERATION/ATWT

Learning Objective:
Describe the operation and function of the following reactor trip signals, permissives, control interlocks, and engineered safeguards actuation signals associated with the Reactor Protection System and Engineered Safeguards Features to include setpoint, coincidence, rate functions (if any), reset features, and the potential consequences improper conditions (OPS52201I07):

- All reactor trip signals
- All permissive signals (P-4, P-6, P-7, P-8, P-9, P-10, P-11, P-12, P-13, and P-14)

Comments: The question tests the KA since it has a Rx protection failure in that the RTBs do not open and then the effects on the main turbine and the plant.

20.

Given the following:

- A small break LOCA has occurred on Unit 1.
- Containment pressure has reached 6 psig.

The crew is in ESP-1.2, Post LOCA Cooldown and Depressurization.

- The operator has depressed the SI reset pushbuttons on the MCB.
- MLB 1, 1-1 is **NOT LIT**.
- MLB 1, 11-1 is **LIT**.

Which one of the following describes the operation of the slave relays when the SI signal is received and the method, by procedure, to restore operation of B Train Safety Injection Equipment IAW ESP-1.2?

The slave relays will ___(1)___ when the SI signal is received.

The operator will reset Train B relays ___(2)___.

A. (1) energize

(2) by turning the S821 reset handswitch inside SSPS Test Cabinet for Train B

B. (1) energize

(2) by cycling the reactor trip breakers, then pushing the SI reset pushbutton for Train B again

C. (1) de-energize

(2) by turning the S821 reset handswitch inside SSPS Test Cabinet for Train B

D. (1) de-energize

(2) by cycling the reactor trip breakers, then pushing the SI reset pushbutton for Train B again

Technical Reference: ESP-0.1 Rev. 28

Learning Objective:
Describe the sequence of major actions and when and how continuous actions will be implemented associated with ESP- 1.3/1.4 (OPS52531G04).
Evaluate plant conditions to determine if any system components need to be operated while performing EEP-0/ESP-0.0. (OPS52530A06)
Evaluate plant conditions and determine if transition to another section of EEP-0/ESP-0.0 or to another procedure is required. (OPS52530A08)

Comments:
The questions asks for the impacts of a LOCA on the ESF system and then a subsequent failure of some ESF components.

21.

Unit 1 is at 100% power with the following condition:

- PI-953, CTMT Pressure, (Channel IV), pressure indication is oscillating and has been declared inoperable.

Which ONE of the following identifies the logic associated with the High-1 and High-3 Containment Pressure actuations **after** Channel IV is placed in TEST?

	High-1 SI Actuation	High-3 CS Actuation
A.	1/2	2/3
B.	1/2	1/3
C.	1/3	2/3
D.	1/3	1/3

Technical Reference: Lesson plan 52201I, STP-220.4

TS 3.3.2 condition D and E for Hi 1and 2 and Hi 3 respectively.
bases 3.3.2 page B3.3.2-34 thru 36

Learning Objective:

Describe the operation and function of the following reactor trip signals, permissives, control interlocks, and engineered safeguards actuation signals associated with the Reactor Protection System and Engineered Safeguards Features to include setpoint, coincidence, rate functions (if any), reset features, and the potential consequences improper conditions (OPS52201I07):

Comments:
This meets the KA by testing the operational implications of placing a CS actuation CTMT pressure indicator in BYPASS which takes it out of the logic circuitry. Most channels are placed in trip in this condition and it removes it from the logic in entirety. In bypass, the logic for CS actuation becomes 2/3 instead of 2 of 4 and the SI portion is placed in trip and becomes 1/2 vs 2 of 3. This still meets TS standards since bases says only 3 is required anyway and this is a fail safe position.

This question is not yet in the FNP Bank.

22.

Unit 1 is operating at 45% power with conditions as follows:

- 1A RCP #1 SEAL LKOF HIGH RANGE reads 6.2 gpm.
- RCDT level is rising at 0.4 gpm.
- RCP SHAFT SEAL FLOWs:
  - 1A RCP = 12.5 gpm
  - 1B RCP = 7.1 gpm
  - 1C RCP = 7.2 gpm

Which ONE of the following describes the:

1) correct annunciator LIT and

2) actions required IAW AOP-4.1, Abnormal Reactor Coolant Pump Seal Leakage?

Consider ONLY Annunciators:
- DA5, 1A RCP #2 SEAL LKOF FLOW HI
- DC2, RCP #1 SEAL LKOF FLOW HI

A. 1) DC2
   2) Perform a controlled shutdown

B. 1) DA5
   2) Perform a controlled shutdown

C. 1) DA5
   2) Trip the reactor

D. 1) DC2
   2) Trip the reactor

Technical Reference: ARP 1.4 Ver. 44 DC2 and 3, AOP-4.1 Ver. 4

Learning Objective:
Given a set of plant conditions, determine what actions are required to be performed with a possible Reactor Coolant Pump (RCP) #1 seal failure. (OPS52522A05)

Comments: meets KA since alarms come in and they have to be analyzed as to what they mean and then operate the controls in reaction to what indications are telling them. This is a RCP malfunction and the ARP sends the operator to AOP-4.1. We no longer operate the MCB from an ARP for any RCP problem.

FNP BANK:

E-0/ESP-0.0-52530A02 22 currently in exam bank here.

Need to change this objective to AOP -4.1.

Rewrote based on NRC review to better meet k/a. Now requires determining if alarms should or should not be in and determine actions expected. 9-9-2008.

23.

Given the following plant conditions:

- Unit 1 is at 13% power and ramping off line.
- The power range upper detector, N-44 is in test.
- The power range upper detector, N-43A, fails low.

Which one of the following identifies the method used to reinstate P-10, Nuclear At Power Permissive, when turbine load is reduced to < 10%, and the **minimum** coincidence required to reinstate P-10?

A. Manually reinstated when N-41 AND N-42 < 10% power.

B.✔ Automatically reinstated when N-41 AND N-42 < 10% power.

C. Manually reinstated when either N-41 OR N-42 < 10% power.

D. Automatically reinstated when either N-41 OR N-42 < 10% power.

Technical Reference: OPS-52201D lesson plan, FSD A181007 Reactor protection system.

Learning Objective:
Predict and explain the following instrument/equipment response expected when performing Excore Nuclear Instrumentation System evolutions including the fail condition, alarms, and trip set points (OPS52201D08).
Power Range Channels
Intermediate Range Channels
Source Range Channels

Comments: meets KA since this a knowledge level KA and there is failure of the NIs and it affects the indicators/ status lights on the bypass and permissive panel as well as TSLB lights on the vertical panel of the MCB.

FNP BANK: EXCORE-52201D08 18
SQNP 2002

mod based on NRC review and added the channel in test to the failed channel. Made the failed channel low so that a trip would not occur. 9-8-2008.

24.

At 1000 am, the following conditions exist on Unit 1:

- Unit 1 is operating at 55% power.
- 1A is selected on the CTMT CLR FAN SEL SWITCH.
- All containment cooler fans are running in FAST speed.

At 1015 am, the following events occur:

- A Large Break LOCA with containment pressure reaching 33 psig.
- A Dual Unit LOSP.
- The 1B DG tripped when it auto started.
- BA1, 1A CTMT CLR FAN FAULT, is in alarm.
- The AMBER light above 1A CTMT CLR FAN SLOW SPEED handswitch is illuminated.

Which one of the following is the expected plant line up of the containment coolers and the required action due to the above events?

A. • No containment cooler fans will be running.
   • Start the 1A CTMT CLR FAN in fast speed.

B. • No containment cooler fans will be running.
   • Start the 1B CTMT CLR FAN in slow speed.

C. • The 1B CTMT CLR FAN will be running in slow speed.
   • Start the 1A CTMT CLR FAN in fast speed.

D. • The 1B CTMT CLR FAN will be running in slow speed.
   • Shift the 1B CTMT CLR FAN to fast speed.

Technical Reference: EEP-0 Rev. 36 att. 2, OPS 52102C lesson plan
FSD-181013 CONTAINMENT VENTILATION SYSTEM
D-177222-1&2 ELEMENTARY DIAGRAM-CONTAINMENT COOLERS LOW SPEED
D-177221-1&2 ELEMENTARY DIAGRAM-CONTAINMENT COOLERS 1B, 1C & 1D HIGH SPEED

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of the following major components associated with the Containment Spray and Cooling System (OPS40302D02):

Containment Cooling Fans
Identify the power supply for each major electrical component associated with the Containment Spray and Cooling System including (OPS40302D04):

Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Containment Spray and Cooling System including (OPS40302D11):

Evaluate abnormal plant or equipment conditions associated with the Containment Spray and Cooling System and determine the integrated plant actions needed to mitigate the consequence of the abnormality (OPS52102C02).

Comments:
This question meets the KA since the question asks about the impacts of the fan overload during a LB LOCA and LOSP and implies which fan, if any, is running. Then the question asks what needs to be done procedurally to correct the problem, which is found in an attachment in EEP-0. This is RO knowledge.

25.

FRP-Z.1, Response to High Containment Pressure, has a caution in the procedure which directs that if ECP-1.1, Loss of Emergency Coolant Recirculation, is in effect then containment spray should be operated as directed in ECP-1.1.

Which one of the following describes the basis for giving priority to ECP-1.1?

ECP-1.1 operates the containment spray pumps to _____

A. conserve RWST level.

B. raise level in the containment sump for the RHR pumps.

C. prevent automatic swapover of the containment spray pumps to the containment sump.

D. ensure the maximum available heat removal systems are running in order to reduce containment pressure as quickly as possible.

Technical Reference:
FRP-Z.1 Rev 15, ECP-1.1 and background document for FRP-Z.1, FNP-0-FRB-Z.1, Plant Specific Background Information, FNP-1/2-FRP-Z.1 RESPONSE TO HIGH CONTAINMENT PRESSURE

Learning Objective:
State the basis for all cautions, notes, and actions associated with FRP-Z.1/Z.2/Z.3. (OPS52533M03)

Comments:
This meets the KA since it tests the knowledge of a caution in a high level procedure (FRP) about the operation of the CS pumps and the affect on the plant. Since this is an RO question, it does not test which procedural transition to go to as an SRO question would or the criteria which is used when in ECP-1.1 as to what is looked at and the number of pumps vs fans vs rwst level is running. This is a very high level basis question about the caution in this procedure.
The operational implication is the loss of RWST level while in a loss of emergency recirc procedure with high ctmt pressure and why CS is operated the way it is for this event.

The question was modified slightly in that the distracters were rearranged based on length, the correct answer shortened and moved to A. and distracter B. changed to make it more plausible since it said, "ECP-1.1 operates the containment spray pumps to ensure sufficient power is available from the diesel generators for the RHR pumps" and since there is NO LOSP, power is not an issue.

26.

At 1000 am, Unit 1 is in Mode 6 with the refueling cavity at 153' 6".

- 1A RHR pump is in the cooldown line up and running.
- 1B RHR pump is in standby.

At 1015 am, the 1A RHR pump trips.

- In accordance with AOP-12.0, Residual Heat Removal System Malfunction, the operator starts the 1B RHR pump.

Which one of the following is the RHR flow requirement for this condition?

RHR flow is required to be maintained _____

A. < 1750 gpm.

B. ≥ 1750 gpm, but < 2750 gpm.

C. ≥ 2750 gpm, but < 3000 gpm.

D. ≥ 3000 gpm, but < 3300 gpm.

Technical Reference: TS 3.9.4 and SOP-7.0 Ver. 78 precaution and limitations.
AOP-12 Ver. 19 for procedural guidance

Learning Objective:
Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Residual Heat Removal System including (OPS40301K11):

- RHR Pumps including capacity

1. Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the Residual Heat Removal System (OPS52101K01).
- 3.9.4, Residual Heat Removal (RHR) and Coolant Circulation - High Water Level
- 3.9.5, Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level

Comments: This question meets the KA since there is a loss of RHR and the operator is returning the RHR system to service and has to know what the flow requirements are for this situation. These are found in SOP-7.0, P&Ls and in NOTES within SOP-7.0 that describe how to adjust flow in the cooldown lineup.

27.

Unit 1 has experienced a Loss of ALL AC. The OATC has directed a systems operator to isolate RCP seals IAW Attachment 3 of ECP-0.0, Loss of All AC Power.

Which one of the following are the reasons RCP seal return and thermal barrier CCW return is isolated from the RCP seals?

1. Seal return is isolated to _____

2. Thermal Barrier CCW return is isolated to prevent steam binding in the _____

A. 1. prevent a potential radioactive release in the Auxiliary building.

   2. CCW system.

B. 1. maintain a back pressure on the number 2 seal to limit seal leakage.

   2. HHSI system.

C. 1. prevent a potential radioactive release in the Auxiliary building.

   2. HHSI system.

D. 1. maintain a back pressure on the number 2 seal to limit seal leakage.

   2. CCW system.

Technical Reference:
FNP-0-ECB-0.0 LOSS OF ALL AC POWER Plant Specific Background Information
ECP-0.0 Rev. 22 attachment 3 and step 8

Learning Objective:
Evaluate abnormal plant or equipment conditions associated with the Component Cooling Water System and determine the integrated plant actions needed to mitigate the consequence of the abnormality (OPS52102G02).

52532A01

Comments:
This meets the KA since there is a loss of CCW due to the loss of all AC and this question asks for the reasons why the actions of the EOP (ECP-0) are completed, which entails isolating equipment that is affected by the loss of CCW.

28.

Given the following plant conditions on Unit 1:

- RWST level is 4.4 feet and dropping slowly.
- Both Trains of RHR have been aligned for recirculation IAW ESP-1.3, Transfer to Cold Leg Recirculation.
- Both Trains of Containment Spray (CS) are aligned for injection.
- The crew is currently aligning the CS system for recirculation.
- Phase B has been reset.

When the operator places the handswitch for MOV-8817A, RWST 1A CS PUMP, to the CLOSED position, the GREEN and RED lights go out (are NOT LIT).

When the 1B CS pump is aligned for recirculation, FI-958B, CS FLOW, drops to 600 gpm and starts to fluctuate.

Which one of the following describes the long term affects on CS recirculation based on the above indications?

A. • A Train CS system is available for recirculation.

• B Train CS system is available for recirculation.

B. • A Train CS system is **NOT** available for recirculation.

• B Train CS system is available for recirculation.

C. • A Train CS system is **NOT** available for recirculation.

• B Train CS system is **NOT** available for recirculation.

D. • A Train CS system is available for recirculation.

• B Train CS system is **NOT** available for recirculation.

Technical Reference: ESP-1.3 Rev. 19, ECP-1.3 Rev. 3 and OPS-52102C lesson plan drawing.

Learning Objective:
State the basis for all cautions, notes, and actions associated with ESP-1.3/1.4. (OPS52531G03).
Evaluate plant conditions to determine if any system components need to be operated while performing ESP-1.3/1.4 (OPS52531G06).
Evaluate plant indications to determine the successful completion of any step in ESP-1.3/1.4 (OPS52531G07).
Evaluate plant conditions and determine if transition to another section of ESP-1.3/1.4 or to another procedure is required (OPS52531G08).

Comments: This question meets the KA since it tests the ability to determine if a CS train is available for recirc flow with two different malfunctions in, one that makes one train unavailable and one that does not affect the availability. Procedural knowledge as well as system knowledge is required to properly evaluate this condition.

29.

At 1010 the following conditions exist:

- Unit 2 is at 8% power.
- The operators are raising reactor power to 13%.
- Main Turbine startup preparations are in progress.
- HC1, PRZR PRESS HI-LO, comes into alarm.

At 1011 the following indications are observed:

- PI-444, PRZR PRESS, reads 2090 psig and is decreasing.
- PI-445, PRZR PRESS, reads 2090 psig and is decreasing.

The OATC determines that PCV-444D, 2B LOOP SPRAY VLV, is mechanically stuck open.

Which one of the following describes the actions required for this condition IAW AOP-100, Instrumentation Malfunction?

A. • Trip the reactor immediately.
   • then secure 2A and 2B RCPs to stop the pressure decrease.

B. • Trip the reactor immediately.
   • then secure 2B RCP ONLY to allow use of 2A RCP for pressure control.

C. • Trip the reactor prior to 1865 psig.
   • then secure 2A and 2B RCPs to stop the pressure decrease.

D. • Trip the reactor prior to 1865 psig.
   • then secure 2B RCP ONLY to allow use of 2A RCP for pressure control.

Technical Reference:
AOP-100 Ver. 6, ARP-1.8 Ver. 31 HC1 annunciator, OPS-52201H, SEN 230, DW02002v.doc

Learning Objective:
Describe the local actions needed to support plant operation during normal, abnormal and emergency conditions associated with the Pressurizer Pressure and Level Control System (OPS52201H09).

Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Pressurizer Pressure and Level Control System including (OPS52201H11):

Pressurizer Spray Valves

Given a set of plant conditions describe the actions/effects that will occur following a PZR Pressure Malfunction with no operator action (OPS52201H17).

Given a set of plant conditions describe the actions/effects that will occur following a PZR Pressure Malfunction with no operator action (OPS52201H17).

Comments: This question meets the KA since it asks about the mitigation strategy of a failed open spray valve which is a pressure control system malfunction. The mitigation strategy is that a reactor trip is required when a RCP trip is required and BOTH RCPs are required to be secured to stop the pressure drop that is being caused by the spray stuck open.
This is an industry event captured back in 2003, SEN 230 that explored the actions and responses of different combinations of RCPs being secured with a stuck open spray valve and the affects on the RCS pressure.

30.

Which one of the following states the purpose of the trisodium phosphate (TSP) that is placed in the three (3) baskets on the 105 foot elevation in containment?

The TSP will cause sump pH to be a more _____

A. acidic solution in order to ensure that most of the dissolved boron will remain in solution.

B. acidic solution in order to ensure that chloride induced stress corrosion cracking of austenitic stainless steel is minimized.

C. alkaline solution in order to ensure that most of the dissolved iodine will be converted to a volatile form and evolve out of solution.

D. alkaline solution in order to ensure that iodine is retained in solution.

Technical Reference: Bases page B3.5.6-1 and 2 OPS-52102C CS lesson plan

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of the following major components associated with the Containment Spray and Cooling System (OPS40302D02):

- Trisodium Phosphate Baskets

State the portions of the Containment Spray and Cooling System that are addressed in the Technical Specifications and/or the Technical Requirement Manual (OPS40302D10).

Comments:This meets the KA since it tests the purpose of the CS system iodine removal system which is the TSP at an RO level.

31.

During an ATWT at 100% Reactor Power, EOL conditions, which ONE of the following actions will insert the MOST negative reactivity within the first 30 seconds of the ATWT?

A. Manual Turbine Trip.

B. Manual Control Rod Insertion.

C. Initiation of Emergency Boration.

D. Automatic Control Rod Insertion.

Technical Reference:FNP-0-FRB-S.1
RESPONSE TO NUCLEAR POWER GENERATION/ATWT
Plant Specific Background Information
FRP-S.1 Rev. 25 procedure

Learning Objective:
Describe the sequence of major actions and when and how continuous actions will be implemented associated with FRPS.1/FRP-S.2. (OPS52533A04)

Comments: This meets the KA since the question asks about actions contained in FRP-S.1, ATWT event, that will cause an increase or decrease in RCS temperature or boron and the effect of that action (operational implications). The reason that the main turbine is tripped is two fold, one is to remove the heat removal source which is cooling down the plant and causing an increase in positive reactivity due to the moderator temp coefficient, and the other reason is to conserve SG inventory. All of the actions shown are actions that are taken or checked in FRP-S.1. Knowledge of the negative MTC is required to correctly answer this question.

32.

With Unit 2 in Mode 4, which one of the following correctly states the equipment and discharge path used to maintain containment pressure within the limits established by Technical Specifications IAW SOP-12.2, Containment Purge and Pre-access Filtration?

A. Main Purge supply and exhaust fans discharging to the main exhaust plenum.

B. Main Purge supply and exhaust fans discharging directly to the plant vent stack.

C. Mini-purge supply and exhaust fans discharging to the main exhaust plenum.

D. Mini-purge supply and exhaust fans discharging directly to the plant vent stack.

Technical Reference: OPS-52107A lesson plan

SOP-12.2 Ver. 44 Containment purge and preaccess filtration

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of each major component associated with the Containment Ventilation and Purge System including (OPS40304A02):

- Containment Main Purge Fans
- Containment Minipurge Fans

Comments: This is a hard KA to make fit at FNP since we do not have a system or interlock that directly provides for negative pressure in ctmt.
The lead examiner suggested I use the 2 different systems such as main purge and mini purge which are used to maintain ctmt pressure below the TS values and each is used in a different mode, then play off how the system is used vs. could be used inappropriately or not by procedure.

33.

Given the following plant conditions:

- A Unit 1 shutdown is in progress.
- All rods in the control banks are at 0 steps as indicated by the Group Step Counters.
- Intermediate range channel N-35 has leveled off at 2×10^{-11} amps.
- Intermediate range channel N-36 has leveled off at 8.5×10^{-10} amps.

Which ONE of the following correctly describes the difference in the readings of the Intermediate Range detectors?

A. • N-36 is overcompensated.

B. ✓ • N-36 is undercompensated.

C. • N-35 is overcompensated.

D. • N-35 is undercompensated.

Technical Reference: OPS-52201D lesson plan on excore instruments.

Learning Objective:

Evaluate abnormal plant or equipment conditions associated with the Excore Nuclear Instrumentation System and determine the integrated plant actions needed to mitigate the consequence of the abnormality (OPS52201D12).

Predict and explain the following instrument/equipment response expected when performing Excore Nuclear Instrumentation System evolutions including the fail condition, alarms, and trip set points (OPS52201D08).

- Power Range Channels
- Intermediate Range Channels
  Source Range Channels

Comments: This meets the KA since there are indications of unreliable IR instruments (not reading correctly) and the candidates have to determine the problem and then interpret what that means to them in response to the plant (SR instruments being energized automatically or manually)

34.

Unit 2 is at 85% reactor power and stable, holding for chemistry with the following conditions:

- Rod control is in AUTO.
- All other systems are in automatic.

A 200 MW load rejection occurs. Which one of the following describes the **overall** response and the final condition for the Feed Regulating Valves (FRV) position and SG water level?

Assume NO operator action.

The FRVs _____; SG water level _____.

A. ✓ • Open, then return to a position more closed than its original position.
• Decreases, then returns to original level.

B. • Close, then return to a position more closed than its original position.
• Increases, then returns to original level.

C. • Close, then return to its original position.
• Increases, then stabilizes at a level lower than the original level.

D. • Open, then return to its original position.
• Decreases, then stabilizes at a level lower than the original level.

Technical Reference: ran on simulator: FRVs open 15 percent and then close down at least 20%, so the change is a lot and SGWL does return to the original value.
OPS-52201B SGWLC lesson plan

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of the following major components associated with the Steam Generator Water Level Control System (OPS52201B02):
• Program DP for Feedwater Regulating Valves
• FRVs
• SGFPs

Comments: This meets the KA since the need to monitor the SGWL control system due to the load rejection is required and then the knowledge of how that system will respond is required. This also does not use failure mechanisms that could be related to the simulator exam.

Failures on simulator portion of exam: PT508 fails low, FT-486 fails low and 1A SGFP trips at 12% power. There is no load rejection on the exam.

35.

Given the following on Unit 1:

- A Steam Generator Tube Rupture has occurred.
- EEP-3, Steam Generator Tube Rupture, has been entered.
- ALL RCPs have been tripped.

Which one of the following could be a result of the step, "Reduce RCS pressure using pressurizer PORV to minimize break flow and refill pressurizer", per EEP-3?

Pressurizer level could rapidly _____

A. increase due to increased SI Flow.

B. decrease due to increased RCS cooling.

C. increase due to reactor vessel steam voiding.

D. decrease due to increased inventory loss through the PORV.

Technical Reference: EEP-3.0 Rev. 24 and the background documents for EEP-3, FNP-0-EEB-3.0 SGTR

Learning Objective:
State the basis for all cautions, notes, and actions associated with EEP-3 (OPS52530D03)

Comments:This meets the KA since in EEP-3 with NC flow the task is to shutdown and the steps lead to the shutdown. There are only 3 issues that deal with NC flow in EEP-3,
1. one is what Tcold will do and to ignore this parameter while cooling down and depressurizing due to FRP-P.1 may come in for the stagnant loop and this is expected. I believe this to be an SRO level topic.
2. This topic
3. Then the parameters for NC flow. Since the parameters for NC are a topic generic to other procedures that monitor NC flow, I chose to test this topic of what will happen while shutting down, which includes cooling down and depressurizing, and what the effects could be and what that means to the operator who is performing these actions.

36.

The Unit Operator is starting the Unit 1 TDAFW pump using the MCB handswitches.

Which one of the following indications will ensure the pump is running, and then positively ensure that HV-3235A, STM LINE B TO TDAFW PUMP SHUTOFF, HV-3235B, STM LINE C TO TDAFW PUMP SHUTOFF and HV-3226, MAIN STM TO TDAFW PUMP AUTO VALVE, are open and will remain open after the handswitches for HV-3235B and HV-3235A/26 are returned to the AUTO position?

A. • ZERO SPEED IND green light is **LIT**.

• MLB-4 lights are LIT for HV-3235A, HV-3235B and HV-3226.

B. ✓ • ZERO SPEED IND red light is LIT.

• MLB-4 lights are LIT for HV-3235A, HV-3235B and HV-3226.

C. • ZERO SPEED IND red light is LIT.

• MLB-4 lights are **NOT** LIT for HV-3235A, HV-3235B and HV-3226.

D. • ZERO SPEED IND green light is LIT.

• MLB-4 lights are **NOT** LIT for HV-3235A, HV-3235B and HV-3226.

Technical Reference: SOP-22.0 Ver. 59, AFW, D177188, D177189, D177394 sh 4

Learning Objective:

Predict and explain the following instrument/equipment response expected when performing auxiliary feedwater evolutions including the fail condition, alarms, trip setpoints (OPS-40201D08). This also includes:

- HV-3235A, B - TDAFW Steam Supply from Steam Generator B (C)
  HV-3226 - TDAFW Steam Supply Isolation Valve

Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the auxiliary feedwater system including (O40201D11).

Comments: meets KA since this is the ability to monitor the TDAFW pump speed and steam admission valves in the control room and then to know when the valves will remain open so the pump will continue to run.

37.

Given the following plant conditions:

- A Main Steam line has ruptured inside containment.
- A rapid plant depressurization has occurred.
- An SI is in progress and pressurizer pressure is currently 1350 psig.
- Containment temperature is 185°F.
- Actual Pressurizer level is 25%.

Which one of the following combinations below completes the following statement to describe how **indicated** Pressurizer level compares to **actual** Pressurizer level?

The low Pressurizer pressure (1350 psig) tends to make the **indicated** Pressurizer level on LI-460 read ___(X)___ than the **actual** Pressurizer level.

The high containment temperature (185°F) tends to make the **indicated** level on LI-460 read ___(Y)___ than the **actual** level.

	(X)	(Y)
A.	Higher	Higher.
B.	Lower	Higher.
C.	Higher	Lower.
D.	Lower	Lower.

Technical Reference: Pzr level control lesson plan ops-52201H, General physics Sensors and detectors OPS-31701G

Learning Objective:
Predict and explain the following instrument/equipment response expected when performing Pressurizer Pressure and Level Control System evolutions including the fail condition, alarms, trip setpoints (OPS52201H08):

State the theory of operation of the following level measuring devices using a differential pressure cell: (OPS31701G08)
a. Open vessel
b. Dry reference leg
c. Wet reference leg

Comments: This question tests the theory of operation of the Pzr level indications for a steam line rupture for a rapid depressurization that can occur and the increased temperture in containment that can occur. All the distracters are plausible since different reference legs exist (wet vs dry) and different design considerations. Also different failure mechanisms can cause different indications.

FNP Bank: PZR PRS/LVL-52201H08 4

Source: INEL Question Bank

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38.

During a cooldown on Unit 2 the following conditions exist:

- RCS loop Tavg:
  - Loop 1: 545°F and decreasing
  - Loop 2: 544°F and decreasing
  - Loop 3: 542°F and decreasing
- Steam header pressure: 1000 psig and decreasing
- Steam Dump Mode Selector switch is in STM PRESS MODE.
- Steam dump pressure controller PK-464 is in AUTO.
- Steam dump demand is 35%.

Which one of the following will occur if actions are not taken to stop the cooldown in progress?

A. • A and E steam dumps will remain open, all other steam dumps will close.
   • PK-464 will remain in automatic.

B. • A and E steam dumps will remain open, all other steam dumps will close.
   • PK-464 will shift to manual.

C. • ALL steam dumps will go closed.
   • PK-464 will remain in automatic.

D. • ALL steam dumps will go closed.
   • PK-464 will shift to manual and go to minimum demand.

Technical Reference: SD LP OPS-52201G;

Learning Objective:
List the automatic actions associated with the Steam Dump System components and equipment during normal and abnormal operations including (OPS52201G07):

- Steam dump valves
- Steam dump system solenoid-operated three-way valves
- High-1 and High-2 trip bistables
- Plant trip controller
- Loss of load controller, C-7
- Condenser available, C-9

Low-Low T_{AVG} signal, P-12

Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of the following major components associated with the Steam Dump System (OPS52201G02):

- Steam dump valves
- Steam dump valve positioners
- Steam dump system pneumatic control and solenoid-operated three-way valves
- Steam dump mode selector switch
- Interlock bypass switches
- Plant trip controller

Loss of load controller

Comments: This meets the KA since the operator is controlling the plant, and has to predict and monitor changes to the plant based on the current activity associated with the SDS controls and then know what will happen when P-12, 543°F is reached to the steam dump system to prevent cooling down below the lo/lo setpoint.

FNP BANK: STM DUMP-52201G08 15 and STM DUMP-52201G07 32

39.

ECP-0.0, Loss of All AC Power, directs the operator to:

- "Reduce intact SGs to 200 psig:"

Which ONE of the following correctly describes the reason for stopping the SG pressure reduction at 200 psig?

A. To prevent losing Pressurizer level.

B. To minimize RCS inventory loss out of the RCP seals.

C. To prevent steam voiding in the reactor vessel upper head.

D. To prevent injection of SI Accumulator nitrogen into the RCS.

Technical Reference: ECP-0 rev 22 and and the background documents for ECP-0, FNP-0-ECB-0.0 Loss of ALL AC

Learning Objective:
State the basis for all cautions, notes, and actions associated with EEP-3 (OPS52530A03)

Comments:
- This question matches the K/A in that it asks the applicant to describe the reason for a particular action contained in the EOP for this event.

40.

Unit 1 was operating at 80% power. The following conditions exist:

- Auxiliary Steam is supplying the SJAEs.
- V902, MAIN STM TO SJAE, valve is closed.
- V521, SJAE STEAM STOP, fails closed.

Which one of the following correctly describes the effect of the loss of auxiliary steam to the SJAES on condenser pressure and MW output if NO operator action is taken?

	Pressure (psia)	MW Output
A.	Rise	Increase
B.	Lower	Increase
C✓	Rise	Decrease
D.	Lower	Decrease

Technical Reference: AOP-6.0 Ver. 31 Loss of instrument air
OPS-lesson plan 52104C Condensate and feedwater,
OPS-31701C, Heat exchangers and condensers (GFES text)

Learning Objective:
Explain the relationship between condenser vacuum and backpressure (OPS31701C16).

Comments:This meets the KA since it tests the effects of a loss of the SJAEs and what will happen to condenser vacuum and MWs which correlates to the effects on the MAIN CONDENSER.

41.

Given the following conditions on Unit 1:

- 1B DG is tagged out.
- A reactor trip has occurred.
- ESP-0.1, Reactor Trip Response, has been entered.

A Unit 1 LOSP occurs at this time and the following conditions exist:

- 1-2A DG did NOT start.
- The white power available lights on the EPB are NOT illuminated for 4160V buses F, K, G, and L.
- The STA reports the status of the Critical Safety Functions has just changed to the following:
  - Containment has just turned ORANGE.
  - Heat Sink has just turned RED.

Which one of the following are the **NEXT** operator actions the crew is required to take for these conditions?

A. Check the reactor tripped and check the main turbine tripped.

B. Attempt to start 1-2A DG and check adequate SW flow to the 1-2A DG.

C. Check containment pressure has risen to greater than 27 psig and check at least one CS pump running with flow.

D. Check RCS pressure is greater than any non-faulted SG and check RCS hot leg temperatures are greater than 350°F.

Technical Reference:ECP-0 Rev. 22, FRP-H.1 Rev. 26, FRP-Z.1 Rev. 15, EEP-0 Rev. 36 and SOP-0.8 Ver. 15.

Learning Objective:
Evaluate plant conditions to determine if entry into ECP-0.0 is required. (OPS52532A02)

Comments:
This question meets the KA in that it tests which procedure the candidate would enter by the IOAs the operator would do. This tests the entry conditions since the IOAs of a procedure are only done if the parameters meet the entry level conditions. This is written to the RO level since the RO is required to know the higher level EOPs entry conditions and IOAs.

42.

Which ONE of the following provides water to the shaft seal system for the 2B steam generator feed pump (SGFP)?

A. Service Water.

B. 2B SGFP discharge.

C. Demineralized water.

D. Condensate pump discharge.

Technical Reference: D-170117 sh 1 OPS-52104C cond and feed lesson plan

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of each major component associated with the Condensate and Feedwater System including (OPS40201B02): SGFPs

Comments: This question directly meets the KA since it asks the physical connection of the condensate pump to the MFW system of which this is the only interrelation with the except of the discharge of the cond pump to the suction of the SGFP.

FNP BANK: COND&FEED-40201B05 01

43.

Unit 1 is defueled with the following conditions:

- A Train SFP Cooling is in service per SOP-54.0, Spent Fuel Pit Cooling And Purification System.

A dual unit LOSP occurs at this time and ALL systems function per design.

Which one of the following correctly describes which SFP pump must be started to regain SFP cooling IAW AOP-5.0, Loss of A or B Train Electrical Power?

A. Start the 1A SFP pump since the 1A Load Center load sheds and sequences back on by the LOSP sequencers.

B. Start the 1B SFP pump since the 1C Load Center load sheds and sequences back on by the LOSP sequencers.

C. Start the 1A SFP pump since the 1C Load Center load sheds and sequences back on by the LOSP sequencers.

D. Start the 1B SFP pump since the 1A Load Center load sheds and sequences back on by the LOSP sequencers.

Technical Reference: AOP-5.0 Ver. 26, sop-54.0 Ver. 49, OPS 52503E lesson plan, and OPS-52520E lesson plan. and 52103F

Learning Objective:
Evaluate plant conditions to determine if any system components need to be operated while performing AOP-5.0 (OPS52520E05).
Evaluate plant conditions and determine if transition to another section of AOP-5.0 or to another procedure is required (OPS52520E07).

Comments: This meets the KA since it asks about actions contained in an AOP (EOP) that addresses the reason why the action is taken at an RO level. This requires the knowledge of which train each pump is aligned to, how the load center works for a load shed and sequencer operation and then the recovery actions for this situation. Even though the actions taken are actually in a SOP vs the AOP, the AOP sends the operator to that procedure to take those actions. The precautions and limitations need to be known and understood as well as how the system works and the procedural alignments required for this situation.
NOTE:
We do not have Vital busses at FNP. We have vital panels which when these are lost there is annunciator response procedures to deal with them, not EOPs or even AOPs. In the past, for FNP, we have been allowed to go to emergency busses and their immediate load centers which are vital to plant operation. EOPs means AOP and EEPs, ECPs, FRPs, etc.
For this question I needed to stay away from ECP-0 due to other ECP-0 questions on the exam.

44.

A loss of Auxiliary Building DC power has occurred due to a Station Blackout that has lasted for 2 hours. Offsite power has finally been restored and the lineups are complete for restoring the battery charging lineup.

Which ONE of the following describes the operational implications on the Auxiliary Building 125 volt DC System?

A. The battery chargers will be unable to carry steady state normal or emergency loads until its associated battery has been fully charged.

B. The battery chargers will be unable to carry steady state normal or emergency loads until its associated battery is charged for at least 2 hours.

C. The battery chargers will be immediately able to carry steady state normal or emergency loads while its associated battery is being charged.

D. The battery chargers will be immediately able to carry steady state normal loads but unable to carry emergency loads until its associated battery has been fully charged.

Technical Reference: FSD- 181004 page E2-1, lesson plan OPS-52103C

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of the following major component associated with the DC Distribution System (OPS40204E02):
•Batteries
•Battery Chargers
•The auxiliary building 125V DC distribution system

Comments: This meets the KA since the question asks about the operational implications for a loss of DC power and that includes the battery chargers and battery.

The answer has been changed to C from B to align the unable to carry loads with the able to carry loads to make it easier for the candidate to read and assess.

FNP BANK: DC DIST-40204E02 19

45.

Given the following plant conditions:

- Unit 2 is at 80% power ramping to 100%.
- Both SGFPs are operating.
- All systems are aligned for automatic operation.
- Annunciator KB4, SGFP SUCT PRESS LO, has just come into alarm.
- Recorder PR-4039 indicates SGFP pressure is 300 psig and decreasing.

Which one of the following correctly describes the soonest that the standby condensate pump for the conditions given with no operator actions?

The standby condensate pump will start _____

A. in 10 secs.

B. in 30 secs.

C. 10 secs after SGFP suction pressure drops below 275 psig.

D. 30 secs after SGFP suction pressure drops below 275 psig.

Technical Reference:FNP-1-ARP-1.10 Ver 56, Annunciators KC5 and KB4

Learning Objective:

3. List the automatic actions associated with the Condensate and Feedwater System components and equipment during normal and abnormal operations including (OPS40201B07):
   - Normal control methods
   - Automatic actuation including setpoint
     - SGFP Trips
     - Auto Start of third Condensate Pump

Comments: This meets the KA since the operator has to know what will happen as they monitor the SGFP suction pressure. I chose to modify a question that existed with another question to come up with a new question to meet the KA.

46.

A #2 Waste Monitor Tank release to the environment is in progress in accordance with a Liquid release permit and SOP-50.1, Appendix 2, Waste Monitor Tank #2 Release to the Environment.

- Annunciator FH2, RMS CH FAILURE, alarms.
- R-18, LIQ WASTE DISCH, is indicating normal on the Radiation Monitoring system console and on the recorder for R-18, RR0200.
- The HIGH Alarm and LOW Alarm red lights are illuminated.
- The control power fuse is found to be illuminated on R-18.

When called, the Radside SO reports that Waste Monitor Tank Pump #2 discharge flow transmitter, FT-1085A, indicates 35 gpm.

Which one of the following describes the actions **required** IAW SOP-50.1, Liquid Waste Processing System Liquid Waste Release From Waste Monitor Tank?

Direct the Radside SO to _____

A. fail air to RCV-18, WMT Disch to Environment
OR
close the manual discharge valve to the environment.

B. fail air to RCV-18, WMT Disch to Environment
OR
using the manual handwheel, close RCV-18, WMT Disch to Environment.

C. close WMT Disch To Environment, RCV-18 at the LWP
OR
close the manual discharge valve to the environment.

D. close WMT Disch To Environment, RCV-18 at the LWP
OR
using the manual handwheel, close RCV-18, WMT Disch to Environment.

Technical Reference:SOP-50.1 Ver. 60.0, AOP-6 Ver. 31, LIQUID WASTE PERMIT, ARP-1.6 Ver. 58, FH1 AND FH2

Learning Objective:
- List the automatic actions associated with the Radiation Monitoring System components and equipment during normal and abnormal operations including (OPS40305A07):
- Evaluate abnormal plant or equipment conditions associated with the Radiation Monitoring System and determine the local actions needed to mitigate the consequence of the abnormality (OPS40301F12).
- Identify any special considerations such as safety hazards and plant condition changes that apply to the Liquid and Solid Waste System (OPS52106A04).

Comments: This question tests the Immediate Actions of a procedure that is used by both the systems operator and CRO to perform a release. Since this deals with the INOPERABLE side of R-18 from the Control room and the required actions should this occur at an RO level for a liquid release, it meets the KA.

47.

Unit 1 started the core unload 142 hours after the reactor was shutdown.

The following conditions exist:

- All ventilation systems are in a normal line up for this condition.

A refueling accident has occurred in the spent fuel pool (SFP) room, resulting in a large release of contaminants from the damaged assembly.

- R-5, SFP Area Radiation Monitor, comes into alarm.
- R-25A and B, SFP Ventilation Radiation Monitors, come into alarm.

Which one of the following are additional radiation monitors that are expected to be in alarm and the correct Fuel Handling area ventilation lineup for this event?

A. ✓
- R-10, PRF DISCH, and R-14 and R-21,VENT STACK GAS
- The fuel handling area supply and exhaust fans trip, the fuel handling area supply and exhaust dampers close.

B.
- R-10, PRF DISCH, and R-14 and R-21,VENT STACK GAS
- The fuel handling area supply and exhaust fans discharging to the main exhaust plenum.

C.
- R-14 and R-21,VENT STACK GAS ONLY
- The fuel handling area supply and exhaust fans discharging to the main exhaust plenum.

D.
- R-14 and R-21,VENT STACK GAS ONLY
- The fuel handling area supply and exhaust fans trip, the fuel handling area supply and exhaust dampers close.

Technical Reference: FSAR chapter 15, section 15.4.5 Fuel handling accident Lesson plans OPS-52106D and 52521H, RCP-252 Ver. 44, radiation monitor setpoints, and UOP-4.1 Ver. 41, controlling procedure for refueling

Learning Objective:
Evaluate plant conditions to determine if entry into AOP-30.0 is required (OPS52521H02).

List the automatic actions associated with the Radiation Monitoring System components and equipment during normal and abnormal operations including (OPS40305A07):

Evaluate abnormal plant or equipment conditions associated with the Radiation Monitoring System and determine the local actions needed to mitigate the consequence of the abnormality (OPS40305A12).

Comments: This KA examines the knowledge of interrelations between area monitors and detectors at each location. Per discussion with the Chief Examiner Under Instruction, this question was written so that the conditions cause one rad monitor to come into alarm and then for that condition, what other monitors associated with that area and system could be expected to come into alarm. This question does just that. For a fuel accident, The FSAR shows that for an accident 100 hours after shutdown, offsite whole body doses at the site boundary could exceed .4 rem. This makes this a credible event. This meets the intent of the KA. I also added to this question what the ventilation systems do with these rad monitors in alarm per our conversation. Three parts were added since it will make it more incorrect and to avoid the argument could be made that not all Fuel handling accidents may cause R-14 and 21 to come into alarm. The rad monitors are needed to meet the KA.

48.

Unit 1 is operating at 100% power. The solenoid to the positioner for HV-3226, MAIN STM TO TDAFW PUMP AUTO VALVE, has lost power and the valve has gone to its fail position.

Which one of the following describes the effects on the TDAFW pump if an auto start signal is received at this time?

Assume no operator action

The TDAFW pump _____

A. will **NOT** start.

B. will start and run at minimum speed.

C. will start and go to maximum speed.

D. will start and speed will fluctuate up and down.

Technical Reference:SOP-22.0 version 59.0, AFW , OPS 52102H AFW lesson plan, EEP-3 Rev. 24, SGTR procedure. AOP-6 Ver. 31, loss of air

Learning Objective:
Predict and explain the following instrument/equipment response expected when performing auxiliary feedwater evolutions including the fail condition, alarms, trip setpoints (OPS-40201D08). This also includes:

- HV-3226 - TDAFW Steam Supply Isolation Valve
- MOV-3406 - Trip Throttle Valve
- Effects of blown fuses on TDAFWP speed control circuitry
- Auxiliary feedwater (AFW) temperature monitoring system

Comments: This meets the KA since there is a loss of power to a positioner for a valve in the control circuitry of the TDAFW pump. Loss of power to this valve affects operability of the pump and loss of control of the valve. This is similar to the fuse blown issue for the TDAFW pump, only a little different in the effects.

49.

The following conditions exist on Unit 1:

- The plant is operating at 100% power.
- SGBD is on service.
- #1 WMT release is in progress.
- The service water pond level has dropped to 179 feet, 10 inches.

Which one of the following will the operator observe as a result of this condition?

A. Service water dilution flow on FR4107 will decrease and RCV-023B, SGBD Dilution Discharge Valve, will close.

B. Service water dilution flow on FR4107 will decrease and RCV-018, Liquid Waste Discharge Valve, will close.

C. Service water pressure on PI-3001A and B, SW TO CCW HX HDR PRESS, will decrease and PCV-562 and 563, Dilution Bypass Valves, will fully open.

D. Service water pressure on PI-3001A and B, SW TO CCW HX HDR PRESS, will decrease and MOV-538 and 539, Master Recirculation Isolation Valves, will fully open.

Technical Reference: Ops- 52102F SW lesson plan, 52106A Liq and solid waste, 52106C SGBD and FSD-A-181001

Learning Objective:

Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Service Water System including (OPS40101B11):

Predict and explain the following instrument/equipment response expected when performing Service Water System evolutions including the fail condition, alarms, and trip setpoints (OPS40101B08).

Comments: This question meets the KA since it asks what the operator is expecting to see (monitor) on the MCB (PI-3001 and FR4107) and what will occur due to the flow to other system components. The candidate will have to know what happens to the SW system on low pond level (loss of SW) and then the effects of the new valve line up on system pressure and flow to other system components (ie. rcv 18 and 23B and PCV-562 and MOV-538)

50.

Unit 2 has had an SI and LOSP. The following conditions exist:

- A Train is energized from the 1C DG.
- B Train is de-energized and the 2C DG will not start.
- The TDAFW pump will not start.
- JJ1, 2A MDAFWP OVERCURRENT TRIP, is in alarm.
- The cause of the 2A MDAFW high current has been corrected.
- The AMBER light above the handswitch for the 2A MDAFW pump is LIT.

The Shift Manager has given permission to start the 2A MDAFW pump.

Which one of the following is the **minimum** actions that will start the 2A MDAFW pump?

A. Turn the 2A MDAFW pump handswitch to START and release it.

B. Turn the 2A MDAFW pump handswitch to STOP and then to START and release it.

C. Locally reset the 86 lockout, then turn the 2A MDAFW pump handswitch to STOP and then to START and release it.

D. Take the LOCAL/REMOTE switch to the LOCAL position, then turn the 2A MDAFW pump handswitch to START and release it.

Technical Reference: SOP-0 Ver. 118, General instructions to OPS personnel, OPS-52103B Intermediate and LV lesson plan and General Physics breakers and relays lesson plan, Lockout relay. OPS- 52102H, AFW.

Learning Objective:

Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the auxiliary feedwater system including (O40201D11).

MDAFW Pumps

Evaluate abnormal plant or equipment conditions associated with the auxiliary feedwater (AFW) system and determine the local actions needed to mitigate the consequence of the abnormality (OPS-40201D12).

Explain the purpose and operation including the design features and functions, capacities, and protective interlocks for the following major components associated with the Intermediate and Low Voltage AC Distribution System (OPS40102B02):

- 4160V AC Buses and breakers

Comments: This meets the KA since the questions applies the knowledge of what an 86 lockout does and what a load shed does. The candidate would have to know that the overcurrent trip will lock out the pump and will not allow it to be started without further evaluation and actions. They will also have to know the indications for both the lockout and load shed and what is procedurally allowed and required for this condition.

51.

Which one of the following correctly defines the interlock and the design feature for Load Center R?

The supply breakers are ___(A)___ so only one supply breaker may be shut at a time.

Load Center R will automatically shift to the unit ___(B)___

A. (A) electrically interlocked

   (B) that 2C DG is supplying.

B. (A) key-interlocked

   (B) that 2C DG is supplying.

C. (A) key-interlocked

   (B) with power available on a loss of voltage.

D. (A) electrically interlocked

   (B) with power available on a loss of voltage.

Technical Reference: OPS-52103B, Intermediate and low voltage lesson plan, A-181004B Elect dist system, D177677 and 177678

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks for the following major components associated with the Intermediate and Low Voltage AC Distribution System (OPS40102B02):

- 600V Load Control Centers and breakers

Describe the effect on the Intermediate and Low Voltage AC Distribution of a loss of an AC or DC bus or instrument air (OPS40102B06).

Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Intermediate and Low Voltage AC Distribution System including (OPS40102B11):

- 600V Load Control Centers and breakers

Comments: This question meets the KA since there is a design feature and interlock associated with these load centers, they are on the emergency bus to protect the emergency DGs and this makes them safety significant.

52.

Unit 1 is at 100% power.

LB-18, 125V DC BUS BATT BKR, on B Train is open for battery maintenance when a loss of electrical power is experienced on the 1G 4160V bus.

Which ONE of the following describes the potential effect on the 1B Diesel Generator?

The 1B Diesel Generator _____

A. • can be started at the EPB,
   • and the associated sequencer will **NOT** respond after an LOSP.

B. • can be started at the EPB,
   • and the associated sequencer will respond after an LOSP.

C. • can **NOT** be started at the EPB,
   • and the associated sequencer will **NOT** respond after an LOSP.

D. • can **NOT** be started at the EPB,
   • and the associated sequencer will respond after an LOSP.

Technical Reference: SOP-37.1 Ver. 44, 125 VDC AB dist system, OPS-52103C, DC distribution, A-506250 unit 1 electrical load list.

Learning Objective:
Predict and explain the following instrument/equipment response expected when performing DC Distribution System evolutions including the fail condition, alarms, and trip set points
DC DIST-40204E08

Comments: This meets the KA since the question asks about major loads and whether or not those loads have power on a loss of dc. To answer the question the candidate must know the DC power supplies to the 1B DG, and whether there is an auto transfer device, power to the field flash, output breaker and the sequencers.

DC DIST-40204E08 #6

53.

The 1C DG is running at full load with the 1C Fuel Oil Storage Tank (FOST) at 95% as read from the EPB.

Which one of the following describes the **maximum** amount of time the 1C DG can run **without exceeding** the 1C FOST Tech Spec minimum level as read from the EPB?

References Provided

A. 26 hours

B. 37 hours

C. 39 hours

D. 55 hours

Technical Reference: Tank curves 18B for the DG FOST pages 1-3, SOP-38.0, DG version 96.0

Learning Objective:
Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Diesel Generator and Auxiliaries System including (OPS40102C11):
Describe the local actions needed to support plant operation during normal, abnormal and emergency conditions associated with the Diesel Generator and Auxiliaries System (OPS40102C09).

Comments: This question meets the KA since it tests the ability to calculate FO consumption rates at an RO level. Using the procedure and tank curves, the candidate is expected to be able to determine by properly reading tables and and calculating the remaining run time for a DG to prevent exceeding the TS limits.

This question is not possible to answer without references.

Provide the following references:
1. SOP-38.0 version 96 Attachment C, DG Fuel Oil Consumption, page 1 of 1
2. UNIT Volume II curve 18B DG Fuel oil storage tank capacity (level vs gallons) rev 4

54.

At 1005 am, Unit 1 is at 100% with the following conditions:

- An AUTO makeup is in progress.
- A large rupture in an air line occurs.

At 1007 am, the following annunciators come into alarm:

- KD1, IA TO PENE RM PRESS LO
- KD2, IA PRESS LO
- KD3, SA PRESS LO
- BK1, PENE RM TO ATMOS A TRN DP HI-LO
- BK2, PENE RM TO ATMOS B TRN DP HI-LO

At 1013 am:

- The UO reports that PI-4004A, SVC AIR PRESS, has dropped to 79 psig and is stable and PI-4004B, INST AIR PRESS, has dropped to 52 psig, has stabilized, and is now rising.
- The Turbine Building SO and ROVER report there is no service air in the Turbine Building or Auxiliary Building.
- The OATC reports the following:
  - FCV-113B, MAKEUP TO CHG PUMP HEADER, has closed and can not be re-opened.
  - FCV-114B, REAC MAKEUP WATER TO BLENDER, and FCV-113A, BORIC ACID TO BLENDER, have dual indication.

Based on the above conditions, which one of the following describes which valve isolated the leak?

A. • V-901, SERVICE AIR HDR AUTO ISO

B. ✓ • HV-3825, INST AIR TO PENE RM AUTO ISO

C. • V-903, ESSENTIAL IA HDR AUTO ISO

D. • V-904, NON-ESS IA HDR AUTO ISO

Technical Reference: AOP-6.0 Ver. 31, loss of instrument air, ARP-1.10 Ver. 56 KD1, KD2, KD3, ARP-1.2 Ver. 43 BK1, and OPS-52108a , compressed air lesson plan

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of the following major components associated with the Compressed Air System (OPS40204D02):
Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Compressed Air System including (OPS40204D11):
Evaluate abnormal plant or equipment conditions associated with the Compressed Air System and determine the local actions needed to mitigate the consequence of the abnormality (OPS40204D12)

Comments: This question meets the KA since it asks for the valves that will go shut due to the indications given. The candidate will have to determine the correct valve that went shut and the correct location. HV3825 is not typically thought of as a leak isolation type valve even though this is what it does. Determination will have to be made where the valves are located as well as their trip setpoints and fail position. The fact that FCV-113B, MAKEUP TO CHG PUMP HEADER, has closed and can not be re-opened will tell the candidate where the leak is if they know the location of the valve, the fail position, realize the auto makeup is affecting the position and recognize the other two valves are still in the auto makeup position.

55.

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

- A Train CCW is the "On Service" train.
- B Train CCW is running to support charging pump operations.
- R-17B, CCW SUCTION TRN A, (RED) LOW Alarm light is LIT.

Which one of the following will result from this failure and what are the procedural actions the Operating Team is required to perform while R-17B is out of service?

A. • CCW Surge Tank Vent Valve, HV-3028, does **NOT** close.

• Close HV-3028 and cycle HV-3028 and document in AutoLog once every eight hours.

B. • CCW Surge Tank Vent Valve, HV-3028, does **NOT** close.

• Close HV-3028 and place B Train CCW on service.

C. • CCW Surge Tank Vent Valve, HV-3028, closes.

• Cycle HV-3028 and document in AutoLog once every eight hours.

D. • CCW Surge Tank Vent Valve, HV-3028, closes.

• Place B Train CCW on service.

Technical Reference: OPS-52102C, CCW lesson plan, ARP-1.6 Ver. 58 FH1, RMS HI RAD

Learning Objective:
State the portions of the Component Cooling Water System that are addressed in the Technical Specifications and/or the Technical Requirement Manual (OPS40204A10).

Predict and explain the following instrument/equipment response expected when performing Component Cooling Water System evolutions including the fail condition, alarms, and trip setpoints as applicable (OPS40204A08).

- Radiation Monitors R-17A and B

Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Component Cooling Water System including (OPS40204A11):

- Component Cooling Water Radiation Monitor

Comments: This meets the KA since there is a failed rad monitor, the question asks what will happen and the procedural requirements. Due to having R-18 and R-14 questions on this test, I tried to stay away from these two areas due to concern for overlap.

56.

Unit 1 is operating at 100% power.

The following conditions exist:

- 1-2A Diesel Generator (DG) is running at full load for STP-80.1, DG 1-2A Operability Test.
- FCV-3009B, SW FROM 1B CCW HX, is at 10% open and is on service.

While shifting CCW heat exchangers from 1B CCW HX to 1C CCW HX, the Unit Operator opens FCV-3009C, SW FROM 1C CCW HX to the maximum position by placing the valve on the open stop.

Which one of the following describes the affect this action could have on the plant and components below?

A. A **dilution** could occur and RCP oil level annunciators could come into alarm.

B. A **boration** could occur and RCP oil level annunciators could come into alarm.

C. A **dilution** could occur and 1-2A DG could trip on high oil temperature.

D. A **boration** could occur and 1-2A DG could trip on high oil temperature.

Technical Reference: SOP-23, version 74, and SW FSD A181001

Learning Objective:
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks of the following major components associated with the Service Water System (OPS40101B02):

- FCV-3009A, B, and C, CCW HX Service Water Discharge Flow Control Valves

Identify any special considerations such as safety hazards and plant condition changes that apply to the Service Water System (OPS52102F04)

Comments: This question meets the KA since it asks what will happen when operating a controller that supplies flow through the CCW Hx and the effects on or changes in parameters that will affect plant reactivity and equipment in the Reactor building, auxiliary building and Diesel Building.

* Question Deleted.

57.

Plant conditions are as follows:

- Unit 1 has been operating at 95% power for several days.
- FG5, GFFD SYS TRBL, has just come into alarm.
- Investigation reveals that the GFFD was steady near 2000 cpm for the first 4 hours of the shift and has suddenly increased.
- Ten (10) minutes later a reactor trip and safety injection occurs.

Which ONE of the following is the **MINIMUM** GFFD reading that would cause FG5 to come into alarm and what the status of the GFFD will be after the safety injection ?

High Alarm	Status
A. 2×10^4 cpm	Flow through the GFFD
B. 2×10^4 cpm	Isolated
C. 2×10^5 cpm	Isolated
D. 2×10^5 cpm	Flow through the GFFD

Technical Reference: ARP-1.6 Ver. 58 FG5 and OPS 52106E

Learning Objective:
Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Gross Failed Fuel Detector including (OPS52106E11).
Explain the purpose and operation including the design features and functions, capacities, and protective interlocks following major component associated with the Gross Failed Fuel Detector (OPS52106E02).

Comments: This question meets the KA since the operator would have to know when the alarm comes in vs when the AOP-32 restrictions apply and then would have to know what occurs on an SI for this system which is part of monitoring.

58.

The following conditions exist on Unit 1:

- The plant is stable in Mode 3 following a reactor trip.
- Power has been lost to 4160V AC buses G, J, and L.
- A rupture has developed in the Turbine Building on the service water header.

Which one of the following lists the valves that the OATC can close from the MCB to isolate the rupture?

Q1P16V514, SW TO TURB BLDG ISO B TRN
Q1P16V515, SW TO TURB BLDG ISO A TRN
Q1P16V516, SW TO TURB BLDG ISO A TRN
Q1P16V517, SW TO TURB BLDG ISO B TRN

A. MOVs 514 and 517

B. MOVs 514 and 516

C. MOVs 515 and 517

D. MOVs 515 and 516

Technical Reference: OPS-52102F SW lesson plan and A-506250 unit 1 electrical load list.

Learning Objective:
Identify the power supply for each major electrical component associated with the Service Water System including (OPS40101B04):

- MOV-514, 515, 516 and 517, Service Water Supply to Turbine Building

Comments: This question meets the KA since it asks for the power supply to service water MOVs that are safety related.

59.

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

- AOP-5.2, Degraded Grid, has just been entered.
- Voltage on all emergency busses for both units is reading 3965 volts.
- MEGAVARS are reading (+) 480 on the MCB.
- The Shift Supervisor has directed to maintain (+) 200 MVARS.

Which one of the following will be required, and what will be the operational implications to the plant?

The operator will ___(A)___ Voltage, and

current to the electrical equipment in the plant will ___(B)___ .

A. (A) raise

(B) lower

B. (A) raise

(B) rise

C. (A) lower

(B) lower

D. (A) lower

(B) rise

Technical Reference: OPS-52521N, AOP-5.1 Ver. 8 and 5.2 Ver. 11 lesson plan
OPS-52105C Main generator lesson plan and OPS-30501C, AC circuits lesson plan

Learning Objective:

Define the term power factor and describe the factors that affect it (OPS30501C08)
9. Define the terms apparent power, true power, and reactive power and describe the factors that affect them (OPS30501C09).
10. Using the appropriate formulas, solve problems for inductive reactance, capacitive reactance, total impedance, power factor, true power, apparent power, and reactive power (OPS30501C10).

Comments: This meets the KA since the questions asks about a degraded grid condition which is the result of electric grid disturbances and asks the operational implications of reducing VARS on the main generator to the grid voltage and then knowing the effects on voltage and current, and their relationships to power (P = IE 3pf). The operational implications are the effects on Bus voltage and current to components.

60.

Unit 1 is operating at 8% power and in preparation of ramping up to 12% to roll the Main Turbine.

At 1010 am, the following conditions exist:

- Pressurizer pressure control is in automatic maintaining 2235 psig.
- All PRZR Backup Heaters are in the ON position.

At 1015 am, HV-3611, IA to CTMT, has closed due to an airline break.

Which one of the following describes the **FIRST** effect this failure will have on the plant?

Assume no operator action is taken

Which of the following is the first effect?

A. Pressurizer pressure increases until the PORV(s) open.

B. Pressurizer level increases until the pressurizer goes solid.

C. Pressurizer level increases until the reactor trips on pressurizer high level.

D✓ Pressurizer pressure increases until the reactor trips on Pressurizer high pressure.

Technical Reference: OPS-52108A compressed air, OPS-52207H Pzr pressure and level control, OPS-52101E Pzr, EEP-0 Ver. 36 rx trip or safety injection.

Learning Objective:
PZR PRS/LVL-52201H07
Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Pressurizer Pressure and Level Control System including (OPS52201H11):

List the automatic actions associated with the Pressurizer Pressure and Level Control System components and equipment during normal and abnormal operations including (OPS52201H07):

- Normal control methods

Describe the physical in plant location of the following major components associated with the Compressed Air System (OPS40204D03):
Describe, when applicable, the Compressed Air System flow paths to include all major components (OPS40204D05).

Instrument air valves to containment, HV-3611 and HV-2228

Evaluate abnormal plant or equipment conditions associated with the Compressed Air System and determine the local actions needed to mitigate the consequence of the abnormality (OPS40204D12

Comments: This KA requires a question about cause/effect relationships between IA and containment air. Containment air supplies several components in containment, and losing air to these components affects RCS pressure. This question requires knowledge of the cause-effect relationships between IA and containment air.

I changed one distracter from the original bank question and then moved the correct answer from C to A. I also reformatted the question and slightly changed the stem and reworded each distracter to remove lift and trip setpoints.

61.

Unit 1 is ramping up in power at 2 MW/min and the following conditions exist:

- Reactor power is slowly rising and is currently 74% on all NIs.
- Turbine power is currently at 692 MW.
- There are 2 letdown orifices on service.
- Tavg is 565°F and Tref is 562.6°F.
- Pressurizer pressure is 2225 psig and stable.
- Pressurizer level is 45% and slowly lowering.
- Charging flow is 108 gpm and slowly rising.
- Containment pressure is 2.2 psig and slowly rising.
- Containment cooler supply and exhaust moisture is indicating 90°F and is slowly rising.

For the event in progress, which one of the following sets of conditions by themselves represent entry conditions in to AOP-14.0, Secondary System Leakage?

A. Tavg reading higher than Tref.

B. Reactor power and turbine power mismatch.

C. Containment pressure and containment cooler supply and exhaust moisture rising.

D. Pressurizer level slowly lowering with charging flow slowly rising and pressurizer pressure indicating lower than normal.

Technical Reference: AOP-14 Ver. 6, secondary system leakage, EEP-0 Rev. 36 Rx trip or SI and AOP-1.0 Ver. 16 RCS leakage.

Learning Objective:
Evaluate plant conditions to determine if entry into AOP-14.0 is required.
(OPS52521O02)

Comments: part of containment system for Safety Function 5, Containment Integrity number 103 Containment system, under A1.01 as shown in NUREG 1122 is containment pressure, temp and humidity. In order to meet the KA of abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures I had to use these parameters since valves going closed or not stroking that relate to this subject do not cause entry conditions to EOPs or AOPs. This meets the KA since the question asks for entry level conditions and abnormal indications for containment systems as described above and these would be close to normal parameters for a ramp in progress.

62.

Unit 2 has had a Pressurizer Code Safety valve stick open. A Reactor Trip and Safety Injection has occurred. The Pressurizer is solid with subcooling at 100°F and one charging pump is running.

Which one of the following is correct concerning the actions that ESP-1.2, Post LOCA Cooldown and Depressurization, will direct?

A. Normal Charging will be established to control subcooling. Letdown will **NOT** be placed in service.

B. Normal Charging and Letdown will be placed in service to establish a bubble and level in the pressurizer.

C. Safety Injection flow will be maintained to control subcooling. Letdown will **NOT** be placed in service.

D. Safety Injection flow will be reduced and Letdown will be placed in service to establish a bubble and level in the pressurizer.

Technical Reference: ESP-1.2 Rev. 23

Learning Objective:
State the basis for all cautions, notes, and actions associated with ESP-1.2 (OPS52531F03).

Comments: k/a match: This question asks what the operational implications are in the event the Przr is solid in ESP-1.2 and how the plant control for subcooling would be maintained during Post LOCA Cooldown and Depressurization..

FNP BANK: ESP-1.2-52531F03 15

63.

A large steam rupture inside containment has occurred on Unit 2, and conditions are as follows:

- RCS cold leg temperature is 250°F and decreasing slowly.
- RCS pressure is 1500 psig and decreasing slowly.
- FRP-P.1, Response to Imminent Pressurized Thermal Shock Conditions, has been entered on a RED path.

Which ONE of the following describes the operational implications of performing FRP-P.1?

A. • The cooldown must continue.
   • The depressurization must be stopped.

B. • The cooldown must continue.
   • The depressurization must continue.

C. • The cooldown must be stopped.
   • The depressurization must be stopped.

D✓ • The cooldown must be stopped.
   • The depressurization must continue.

Technical Reference: FRP-P.1 Rev 22, Response to Imminent Pressurized Thermal Shock Conditions, OPS-.52533K lesson plan and CSF-0.4 rev 17 for unit 1.

Learning Objective:
State the basis for all cautions, notes, and actions associated with FRP-P.1/2 (OPS52533K03).
Analyze plant indications to determine the successful completion of any step in FRP-P.1/2 (OPS52533K07).

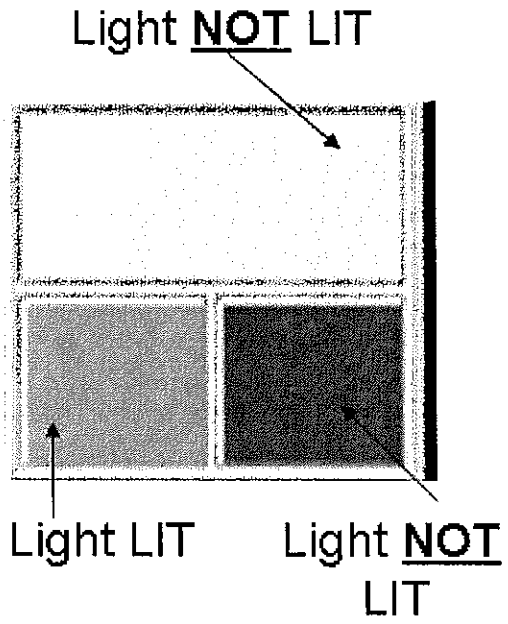
Comments: This meets the KA since the question tests the operational implications of FRP-P.1. The operational implications are having to decrease RCS pressure, stabilize temperature and pressure and soak. Other procedures are allowed during soak as long as these parameters are not changed.

The bases behind this step is to prevent a propagation of an existing flaw that could cause a through wall crack of the vessel at the beltline region of the reactor. The KA does not ask for the reason or bases, but the operational implication which is how would we operate the plant, operate the plant differently or be able to do other actions due to this condition.

64.

Unit 1 has had a Large Break LOCA. EEP-1.0, Loss of Reactor or Secondary Coolant, is in effect and the crew is evaluating cold leg recirculation capability.

Evaluate the possible cases below and determine which one of the sets of component malfunctions would require entry into ECP-1.1, Loss of Emergency Coolant Recirculation IAW EEP-1.0?



Evaluate each case separately and assume all other equipment is available.

A. Loss of power to 1G 4160V emergency bus
and
MOV8706B, 1B RHR HX TO CHG PUMP SUCT, as indicated above

B. Loss of power to 1G 4160V emergency bus
and
MOV8701A, 1C RCS LOOP TO 1A RHR PUMP, as indicated above

C. 1A RHR pump Amber light is LIT
and
MOV8701A, 1C RCS LOOP TO 1A RHR PUMP, as indicated above

D. 1A RHR pump Amber light is LIT
and
MOV8706B, 1B RHR HX TO CHG PUMP SUCT, as indicated above

Technical Reference: EEP-1.0 rev 29

Learning Objective:
Evaluate plant conditions to determine if any system components need to be operated while performing EEP-1. (OPS52530B06)
Evaluate plant conditions and determine if transition to another section of EEP-1 or to another procedure is required. (OPS52530B08)

Comments: This meets the KA since the operator has to be able to monitor the components for emergency coolant recirculation availability and know whether they are available or not as described in step 14.1 of EEP-1. The operating behavior characteristics is the MCB indications for normal operation and emergency operations and what the different lights mean for each handswitch indication.

65.

Given the following:

- A large break LOCA has occurred on Unit 1.
- All automatic functions operated per design.
- Containment pressure peaked at 33 psig and is now 18 psig.
- RWST level indicates 12 feet 5 inches.

The control room team has entered ESP-1.3, Transfer to Cold Leg Recirculation, and are at step 7, Align ECCS for Cold Leg Recirculation, and are checking containment sump level. The indications for containment sump level are as follows:

- LI-3594A, CTMT SUMP LVL, is reading 8.2 feet.
- LR-3594B, POST ACCIDENT CTMT WTR LVL, is reading 8.2 feet.

Which one of the following is the correct procedural flow path for the event in progress and the source of the extra water in containment?

A. • Stop ESP-1.3 actions, implement FRP-Z.2, Response to CTMT Flooding, and then continue in ESP-1.3.

• Reactor Makeup water system.

B. • Continue in ESP-1.3 until step 7 is complete, then implement FRP-Z.2, Response to Containment Flooding.

• Reactor Makeup water system.

C. • Continue in ESP-1.3 until step 7 is complete, then implement FRP-Z.2, Response to Containment Flooding.

• Service Water system.

D. • Stop ESP-1.3 actions, implement FRP-Z.2, Response to CTMT Flooding, and then continue in ESP-1.3.

• Service Water system.

Technical Reference: FRP-Z.2 Rev. 6 Response to Containment Flooding, ESP-1.3 Rev. 19 Transfer to Cold Leg Recirculation and EEP-0 Rev. 36 and OPS-52108, RMW lesson plan

Learning Objective:
Evaluate plant conditions to determine if entry into FRPZ. 1/Z.2/Z.3 is required. (OPS52533M02)
State the basis for all cautions, notes, and actions associated with ESP-1.3/1.4. (OPS52531G03).
Evaluate plant conditions and determine if transition to another section of ESP-1.3/1.4 or to another procedure is required (OPS52531G08)

Comments: This question meets the KA since there are entry conditions to the containment flooding FRP and another procedure is involved. This makes the candidate select the appropriate procedure during the emergency conditions. To make plausible distracters and a level of difficulty >1, I had to add the location or system involved in the leak. Otherwise the selection of the procedure with four different choices would not be plausible or discriminatory.

Th selection of the procedure is normally an SRO task, but in this instance, ESP-1.3 is a procedure that our ROs use without interruption from the SS. They are required to line up the RHR and HHSI system for recirc using this procedure and need to know what to do when different conditions present themselves.

66.

Which one of the following situations **requires** three way communications IAW ACP-1.0, Plant Communications, and NMP-GM-005-GL03, Human Performance Tools?

A. The STA announces to the Shift Supervisor that he is stationed in the control room.

B. The OATC tells the Radside SO by telephone to place the 1A seal injection filter on service.

C. The Shift Manager provides an update to inform the crew of a General Emergency classification.

D. The Shift Supervisor calls for a transient brief after immediate operator actions have been taken for a failure of PT-444, PRZR PRESS.

Technical Reference: ACP-1.0 Ver. 5.0 NMP-GM-005-GL03, Human Performance Tools and OPs policy expectations

Learning Objective:
Outline management's expectations for communications (OPS40502C02).
Explain the purpose of and the method for conducting three-way communications (OPS40502C03).

Comments: This meets the KA since the question addresses the circumstances that three way communications apply to. This idea is an off shoot of a question written for the 2006 wolf creek exam except that exam used a NOT type question and asked for exact procedural guideline such as informational or technical vs giving examples and making the candidate decide which situation 3 way is required for.

67.

A work activity requires multiple personnel to do the job. Personnel will be located in the main control room and in the RHR pump room area and will require data to be taken as well as sign-offs of steps.

Which one of the following describes the requirement that governs the use of the working copy that will be used to accomplish the task IAW AP-6, Procedure Adherence?

A. The working copy is required to be retained with the master copy for historical records.

B. All steps of the master copy do not have to be signed off as long as the working copy is signed.

C. The working copy version is required to be verified correct to include all minor versions prior to starting the job.

D. Two complete procedures of the Official Test Copy is required to be obtained, the master copy is required to be kept in the control room and the working copy is required to be kept at the RHR pump room area during the job.

Technical Reference: AP-6 Ver. 18.0

Learning Objective:
Explain management's expectations associated with procedural usage and adherence (OPS40502E01).

Comments:This meets the KA since the question asks for the requirements of using a working copy. The answer includes verification of the controlled copy with all minor versions which requires the candidate to know the requirements of verifying the correct version.

68.

Which ONE of the following would require suspension of CORE ALTERATIONS?

A. 'A' Train PRF unit is OPERABLE and aligned to the SFP and in operation; 'B' Train PRF is INOPERABLE.

B. Direct communication is lost between the Control Room and Fuel Handling Personnel in Containment.

C. Reactor Cavity water level is 24 feet above the vessel flange with only one RHR loop operable and in operation.

D. Chemicals are added using the unborated water source flowpath and the boron reduction will **not** be below that required in the COLR.

Technical Reference: T.R.M. 13.9.6 and 13.9.2, and T.S. 3.7.12, 3.9.1, 3.9.2, and 3.9.4

Learning Objective:
Identify conditions during performance of UOP-4.1 that might result in equipment damage or degradation and discuss the appropriate precautions and limitations (OPS40503B01).
State the basis for a specific caution or note given in UOP-4.1 (OPS40503B02).
Determine if the conditions given during performance of UOP-4.1 warrant the declaration of an LCO and identify the correct action statement to allow continued operation as allowed by Technical Specifications (OPS52511B02).

Comments: This meets the KA since the question asks about limitations and procedures that apply to core alterations. The immediate action of a TRM is required knowledge for ROs.

UOP4.1-52511B02 #1

69.

Which one of the following describes the meaning of an OPERATING PERMIT TAG hanging on a component as described in NMP-AD-003, Equipment Clearance and Tagging?

A. • The component position can NOT be changed until the tag is cleared.
   • The component is under the control of a Tagout Holder.

B. • The component position can NOT be changed until the tag is cleared.
   • The component has been designated as an isolation boundary for personnel safety.

C. • The component position can ONLY be changed with permission of the Tagout Holder.
   • The component is under the control of a Tagout Holder.

D. • The component position can ONLY be changed with permission of the Tagout Holder.
   • The component has been designated as an isolation boundary for personnel safety.

Technical Reference:
Equipment Clearance and tagging lesson plan S-GE-LP-400
NMP-AD-003 Ver. 11 Equipment Clearance and Tagging

Learning Objective:
Given NMP-AD-003, "Equipment Clearance and Tagging", DEFINE the following terms: (S-GE-400.030.A.02)
• Alternate Boundary
• Alternate Release
• Clearance
• Caution Tag
• Danger Tag
• Operating Permit Tag

Comments: This meets the KA since the question asks for specific guidance from NMP-AD-003, Equipment Clearance and Tagging. It also asks about the use of a very different type of tag used in the plant for specific uses other than isolation or caution requirements.

TAG-SGELP400-T03-L01 03

70.

Which one of the following correctly lists **ONLY** NRC Performance Indicator (PI) Equipment that **requires** the Plant Managers approval prior to being removed from service for any reason other than surveillance tests IAW ACP-52.1, Guidelines for Scheduling of On-line Maintenance, if the PI is WHITE for that equipment?

A. 1B Charging Pump

B. 1A Containment Spray Pump

C. 1B Containment Cooler

D. 1A Hydrogen Recombiner

Technical Reference:
FNP-0-ACP-52.1 Ver. 45 GUIDELINES FOR SCHEDULING OF ON-LINE MAINTENANCE

Learning Objective:
Using plant procedures as a guide, evaluate a maintenance item for release and determine if it can be released and what actions are required. (OPS52303N01)

Comments: This meets the KA since the question tests the release of work while at power of a piece of equipment that is clearly identified as PI equipment and since a white PI exists, the approval authority is necessary information to know. This procedure has significantly changed several times over the last few years.

71.

Given the following:

- Unit 1 is at 100% power.
- Containment mini-purge supply and exhaust fans are running.

R-11, CTMT ATMOS, has come into alarm. It is reading 8000 cpm.

The following radiation monitors are trending up:

- R-12, CTMT GAS
- R-2, CTMT 155 FT
- R-7, SEAL TABLE

Which one of the following actions should the OATC take for this condition IAW annunciator response procedure FH1, RMS HI-RAD?

A. ✓ • Secure containment mini-purge.
• Check pressurizer level and VCT level stable.

B. • Secure containment mini-purge.
• Ensure ALL containment mini-purge dampers have automatically closed.

C. • Verify ARDA has auto started.
• Check pressurizer level and VCT level stable.

D. • Verify ARDA has auto started.
• Ensure ALL containment mini-purge dampers have automatically closed.

Technical Reference:
ARP-1.6 Ver. 58 FH1 and FH4

Learning Objective:
Describe how the rad monitoring system helps to protect the health and safety of plant workers and the public. (ESP52106D08)

Comments: This meets the KA since this asks for actions to be done by the control room operators and these actions are guided by procedure. Automatic actions of all the rad monitors are common misconceptions and actions to take are found in the ARP. This ARP has guidance that is both generic in nature and specific to this one radiation monitor.

72.

Which one of the following identifies the 10 CFR 20 annual limit for TEDE and also identifies the EIP-14.0, Personnel Movement, Relocation, Re-entry and Site Evacuation, emergency exposure limit for protecting valuable equipment?

A. • 2 rem
   • 10 rem

B. • 2 rem
   • 25 rem

C. • 5 rem
   • 10 rem

D. • 5 rem
   • 25 rem

Technical Reference: FNP-0-M-001 Ver. 18 Health Physics Manual,
EIP-14 Rev. 23

Learning Objective:
List FNP Admin Limits for various categories of dose (OPS30401A20).
Given a set of conditions perform a TEDE dose calculation and determine if exposure limits have been exceeded (OPS30401A18).

Comments: This meets the KA since this question tests radiation exposure limits for normal and abnormal situations and knowledge of the HP manual and 10 CFR 20 is needed and the emergency dose limits of EIP-14 are required knowledge for an RO since they may be called in to do a job during an emergency.

73.

Unit 1 has been shut down for a refueling outage.

A Continuous Fire Watch has been stationed in containment to monitor a welding job.

The Fire Watch reports a fire coming from the electrical welding machine. The Fire Brigade has been called to assemble and the plant emergency alarm siren has been sounded.

Which one of the following describes the fire suppression equipment that will be used to initially extinguish the fire and the personnel who are required to respond and their responsibilities?

The Fire Watch will initially use _____(1)_____ to try to extinguish the fire.

Personnel expected to respond are _____(2)_____

A. (1) a portable CO2 extinguisher

(2) 2 systems operators with fire suppression and 2 security personnel with emergency breathing equipment.

B. (1) a portable CO2 extinguisher

(2) 2 systems operators with fire suppression and 2 systems operators with emergency breathing equipment.

C. (1) a dry chemical extinguisher

(2) 2 systems operators with fire suppression and 2 security personnel with emergency breathing equipment.

D. (1) a dry chemical extinguisher

(2) 2 systems operators with fire suppression and 2 systems operators with emergency breathing equipment.

Technical Reference: AP-37 Ver. 16 Fire Brigade Organization
AP-39 version 16.0

Learning Objective:

List the fire brigade staffing responsibilities (OPS 40502L06).

SELECT the proper fire extinguisher based on the extinguishers name plate data (geometric shape/s or picture symbol/s) to extinguish a Class A, Class B or simulated Class C fire. (S-FIR103.001.A.06)

LIST three factors when considering whether or not to use a portable fire extinguisher in a plant fire situation. (S-FIR103.001.A.02)

Comments: This meets the KA at an RO level since the question asks about responsibilities and the organization of the fire brigade and the type of fire extinguisher used in containment.

74.

Both units are operating at 100% power.

The following conditions exist:

- Security personnel report that a bomb has just detonated at the Service Water Intake Structure (SWIS).
- **ALL** service water cooling to both units has been disabled.
- Security personnel have surrounded the SWIS.
- Several men are inside the SWIS and have bolted the doors from the inside.
- An Loss of power has occurred on the Unit 1 "B" Train emergency bus and the 1B Diesel Generator (DG) is powering the 1G emergency bus.

Which one of the following delineates the required actions for this condition IAW AOP-49.0, Security Threat, and AOP-49.2, Complete Loss of Service Water?

A. • Trip the Unit 1 reactor ONLY.

• Secure the 1B DG and place ALL DGs in the Mode 3 position.

B. • Trip the Unit 1 reactor ONLY.

• Secure the 1B DG when the lube oil temperature alarm cannot be maintained clear and place the 1B DG in the Mode 3 position.

C. • Trip BOTH reactors.

• Secure the 1B DG when the lube oil temperature alarm cannot be maintained clear and place the 1B DG in the Mode 3 position.

D. • Trip BOTH reactors.

• Secure the 1B DG and place ALL DGs in the Mode 3 position.

Technical Reference:AOP-49 Rev. 17, 49.2 Rev. 1, and AOP-10 Ver. 14, also lesson plan OPS-52521P

Learning Objective:
Describe the sequence of major actions associated with AOP-49.0, Security threat (OPS52521P04).

Evaluate plant conditions to determine if any system components need to be operated while performing AOP-49.0, Security Threat (OPS52521P05).

Evaluate plant conditions and determine if transition to another section of AOP-49.0, Security Threat or to another procedure is required (OPS52521P07).

Comments: This question tests the knowledge of the security procedures for a credible event at an RO level. The actions are high level actions of the AOP-49 and AOP-49.2. then an understanding of what to do with a complete loss of SW and what to do to protect the DGs in this event, as well as the safety of the plant.

75.

Given the following conditions on Unit 1 while at 100% power:

- A reactor trip and safety injection has occurred due to a steam line rupture.
- The crew was performing EEP-2, Faulted Steam Generator Isolation, when an ORANGE path was noted on the Critical Safety Function Status tree (CSFST) for Integrity.
- All other CSFSTs currently indicate GREEN.
- The crew is now working through FRP-P.1, Response to Imminent Pressurized Thermal Shock Conditions.

Which one of the following is a condition that would require or allow the control room team to transition out of FRP-P.1 before it is complete?

A. IF the Subcriticality CSFST indicates YELLOW.

B. IF the Integrity CSFST indicates GREEN.

C. IF the Containment CSFST indicates ORANGE.

D. IF the Core Cooling CSFST indicates ORANGE.

Technical Reference: SOP-0.8 Ver. 15 and CSF-0 Ref. 17

Learning Objective:
Apply the rules of usage for the ERP's and (FRPs) (OPS52301B09).

Comments: I had to modify this to make the distracters plausible. This meets the intent of the KA in that it tests the operating network/heirarchy for emergency procedures.

FNP BANK: INTRO ERP-52301B09 7

1.

Unit 1 has experienced a Safety Injection due to the 'A' PRZR Safety Valve opening. The following conditions exist:

- Tavg is 537°F.
- RCS Pressure is 1270 psig and rising.
- Subcooling is 40°F.
- AFW flow is 485 gpm.
- SG NR LVLS are:
  1A SG - 21%, 1B SG - 18%, 1C SG -19% and ALL SGWLs are rising.
- PRZR level is 90% and rising.
- 'A' PRZR Safety Valve position red and green indicating lights are both LIT.
- Containment pressure is 0 psig.
- PRT level is rising.
- PRT pressure is rising.
- EEP-1.0, Loss Of Reactor Or Secondary Coolant, has been entered and the crew is at the step to Check SI Termination criteria.

Which one of the following is the correct procedure flowpath to take for this condition?

A. Transition to ESP-1.1, SI Termination, since all SI Termination criteria are met.

B. Return to step 1 of EEP-1 since RCS pressure is rising.

C. Continue in EEP-1 and eventually transition to ESP-1.2, Post Loca Cooldown And Depressurization, since a LOCA is in progress.

D. Continue in EEP-1 and eventually transition to ESP-1.3, Transfer To Cold Leg Recirculation, since a LOCA is in progress.

SRO level 10 CFR 55.43(b) (5)
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.

Technical Reference: EEP-1, Revision 29

Learning Objective: 3. State the basis for all cautions, notes, and actions associated with EEP-1. (OPS52530B03)
8. Evaluate plant conditions and determine if transition to another section of EEP-1 or to another procedure is required. (OPS52530B08)

Comments: k/a match: This questions tests knowledge of two different notes in the EEP-1 procedure relating to the steam space break and the difference in the procedural actions for a steam space LOCA rather than for another type LOCA or a steam Generator Fault. The SRO only knowledge is the procedure flowpaths affected by the PRZR Safety stuck open, and the notes direct this procedure flowpath to differ from the flowpath of another type LOCA or SG fault.

NOTE for technical and operational validity:
Ran on simulator with 'A' PRZR Safety stuck open, and at 1030 psig closed the safety to 5% open, simulating a Safety lifting BELOW its normal setpoint, and then only partially reseating at a lower pressure. At this point, SI flow was greater than break flow, and RCS pressure started rising (with a known LOCA still in progress). The PRT had not ruptured yet, so adverse numbers were not in effect.

2.

A Large Break LOCA has occurred on Unit 1, and conditions are as follows:

- ECP-1.1, Loss Of Emergency Coolant Recirculation, is in progress due to the loss of recirculation capability.
- ALL RCPs are secured.
- Normal Charging has been established with suctions lined up from the RWST.
- RVLIS indicates 16% Upper Plenum Level.
- Core Exit T/Cs are stable.

Which one of the following describes the condition of core cooling, and what is required by ECP-1.1 due to these conditions?

Core Cooling is:_____

A. adequate. Go to procedure and step in effect.

B. NOT adequate. Increase RCS makeup flow to raise RVLIS level to > 72% UPPER PLENUM level.

C. adequate. Maintain at least the current RCS makeup flow rate.

D. NOT adequate. Increase RCS makeup flow to establish Core Exit T/Cs falling.

SRO level 10 CFR 55.43(b) (5)
This question tests the SRO knowledge of recalling what strategy or action is written into a plant procedure, including when the strategy or action is required.

Technical Reference: ECP-1.1 Rev. 27

Learning Objective: Evaluate plant conditions to determine if any system components need to be operated while performing ECP-1.1 and ECP-1.3 (OPS52532D06).

Comments: k/a match: Determining adequate core cooling in a LBLOCA is determined in ECP-1.1 (loss of recirc capability) as CETCs stable or falling and RVLIS level (different level requirements for RCPs running or not). This question requires an SRO to know these criteria and procedure flowpaths well past the entry conditions and initial steps of the major EEPs in the ERG network.

3.

Unit 1 is at 12% reactor power.

The following conditions exist:

- At 1000 the pressurizer level loop for LT-459 is placed in Test by I&C.
- At 1010, LT-460, PRZR LVL, fails LOW.

Which one of the following correctly states the TS BASIS for TS 3.3.1, Reactor Trip System (RTS) Instrumentation, for the Pressurizer Water Level Function for this power level and the results if the REQUIRED ACTION is taken?

(Assume constant power is maintained)

A.
- The Pressurizer Water Level Function is needed to protect against water relief through the pressurizer safeties.
- The reactor does **NOT** trip.

B.
- The Pressurizer Water Level Function is NOT needed since the transients that could raise the pressurizer water level will be slow and the operator will have sufficient time to take corrective actions.
- The reactor does **NOT** trip.

C.
- The Pressurizer Water Level Function is needed to protect against water relief through the pressurizer safeties.
- The reactor trips.

D.
- The Pressurizer Water Level Function is NOT needed since the transients that could raise the pressurizer water level will be slow and the operator will have sufficient time to take corrective actions.
- The reactor trips.

SRO level 10 CFR 55.43(b) (2)
The SRO knowledge of the TS BASIS for the LCO 3.3.1 Water Level Function 9 is required to answer this question in the first part and then the RA staement knowledge is required since what happens if the channel is placed in trip in this condition would cause on the RT system.

Technical Reference: TS 3.3.1 & BASIS Amendments 146 (U1), 137 (U2)
FNP-1-EEP-0.0, Revsion 36 (Reactor Trip setpoints)

Learning Objective: 2. Evaluate plant conditions to determine if entry into EEP-0/ESP-0.0 is required. (OPS52530A02)

6. Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the Reactor Protection System (OPS52201I10).
   - 3.3.1 Reactor Trip System (RTS) Instrumentation
   - 3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

Comments: k/a match: The K/A requires knowledge of Reactor Protection system setpoints, interlocks (P-7 automatically allows a reactor trip on hi pressurizer level >10% power and automatically defeats the Reactor trip on High Pressurizer Level below 10% power). P-7 is an interlock and and it has a setpoint and automatic actions associated with EOP entry conditions since the reactor trips in this instance.

4.

Unit 1 is currently at 100% power at 1600 on 10-01-08.

During a review of STP-1.0, Operations Daily and Shift Surveillance Requirements, the Shift Supervisor discovers that a 12 hour Channel Check surveillance on RCS Flow Loop 1A was missed and was last performed at 0015 on 10-01-08.

Which one of the following describes the **MAXIMUM** time allowed to declare LCO 3.3.1-1 (10), Reactor Coolant Flow - Low, **NOT** met, and the **MAXIMUM** time allowed to complete the missed surveillance?

Declaring LCO 3.3.1-1 (10) **NOT** met may be delayed until a maximum time of __(1)__, and the surveillance should be performed at the first reasonable opportunity no later than __(2)__.

A. (1) 1600 on 10-02-08

   (2) 0400 on 10-02-08

B. (1) 1600 on 10-02-08

   (2) 1600 on 10-02-08

C. (1) 0400 on 10-02-08

   (2) 0400 on 10-02-08

D. (1) 0400 on 10-02-08

   (2) 1600 on 10-02-08

SRO level 10 CFR 55.43(b) (2)
This question tests the SRO knowledge of utilizing the generic LCO requirements of Tech Specs in sections SR 3.0.1 through SR 3.0.4.

Technical Reference: TS 3.3.1. and SR 3.0.1-3.

Learning Objective: 6. Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the Reactor Protection System (OPS52201I10).

- 3.3.1 Reactor Trip System (RTS) Instrumentation
- 3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

Comments: k/a match: The RCS Flow non-nuclear instrument is a Tech Spec Required transmitter with Tech Spec surveillances required at the specified frequency to maintain operability. This question presents a situation where a required surveillance was discovered "missed" for greater than the frequency and beyond the 1.25 times the frequency (grace period). Applying Tech Specs properly for this non-nuclear instrumentation at an SRO only knowledge level is required to answer this question.

5.

Unit 1 is in **Mode 4** with conditions as follows:

- A Train RHR is in service in the cooldown alignment.
- B Train RHR is secured and in the cooldown alignment.
- B Train RHR pump room cooler will not start.
- Charging flow is increasing in auto.
- Pressurizer level has just started dropping.
- PG3, CTMT SUMP LVL HI-HI OR TRBL, is in alarm.
- The Health Physics Technician on the 105' CTMT reports that a lot of water is on the floor of the 105' coming from the area of the penetrations outside the Bio Shield.

Which one of the following correctly states the actions required by the event in progress per AOP-12, Residual Heat Removal System Malfunction, and what is the Tech Spec requirements?

A. • Isolate both trains of RHR.

• Enter LCO 3.5.3, ECCS shutdown.

B. • Isolate both trains of RHR.

• A Loss of Safety Function (LOSF) Evaluation is required to determine LCO applicability.

C. • Isolate 'A' train RHR.

• Enter LCO 3.5.3, ECCS shutdown.

D. • Isolate 'A' train RHR.

• A Loss of Safety Function (LOSF) Evaluation is required to determine LCO applicability.

SRO level 10 CFR 55.43(b) (2 & 5)
This question tests the SRO knowledge of recalling what strategy or action is written into a plant procedure, including when the strategy or action is required. The distractors require knowledge of proper use of support system operability affects and Loss of safety function evaluations which are both SRO only knowledge.

Technical Reference: FNP-1-AOP-12.0 Residual Heat Removal System Malfunction Revision 19.0,
FNP-0-SOP-0.13 Version 13.0, steps 3.1.10 & 4.0 & FIG. 2
TS 3.5.3, Amendment No. 170 (Unit 1), Amendment No. 163 (Unit 2)

Learning Objective: 6. Evaluate plant conditions to determine if any system components need to be operated while performing AOP-12.0. (OPS52520L06)

1. Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the Residual Heat Removal System (OPS52101K01).
   - 3.4.3, RCS Pressure and Temperature (P/T) Limits
   - 3.4.6, RCS Loops – MODE 4
   - 3.4.7, RCS Loops - MODE 5, Loops Filled
   - 3.4.8, RCS Loops - MODE 5, Loops Not Filled
   - 3.4.12, Low Temperature Overpressure Protection (LTOP) System
   - 3.4.14, RCS Pressure Isolation Valve (PIV) Leakage
   - 3.5.2, ECCS – Operating
   - 3.4.3, ECCS – Shutdown
   - 3.9.4, Residual Heat Removal (RHR) and Coolant Circulation - High Water Level
   - 3.9.5, Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level
   - TR 13.5.1, Emergency Core Cooling System (ECCS)

Comments: k/a match: This question provides indications for a leak from the RHR system into Containment. The applicant must correctly interpret a list of indications, and from the indications determine what is the course of action required to mitigate the conditions, and interpret what LCO requirements are in effect.

6.

A Unit 2 startup is in progress with plant conditions as follows:

- Reactor Power is 54%.
- 2A RCS temperature LOOP is in test for a Surveillance and the corresponding Tavg 412D, Tavg 2A RCS LOOP, output is failed high.
- The 2B RCS Loop Tcold RTD fails high at the same time.

Which one of the following is the correct pressurizer level response, with no operator action, and the Technical Specification required actions the SRO will direct?

A. ✓
- Pressurizer level will stabilize at approximately 50%.
- Enter LCO 3.0.3. Return the 2A RCS temperature LOOP to service and then enter LCO 3.3.1.

B.
- Pressurizer level will stabilize at approximately 36%.
- Enter LCO 3.3.1. Bypass the inoperable channel for up to 4 hours to complete the Surveillance.

C.
- Pressurizer level will stabilize at approximately 50%.
- Enter LCO 3.3.1. Bypass the inoperable channel for up to 4 hours to complete the Surveillance.

D.
- Pressurizer level will stabilize at approximately 36%.
- Enter LCO 3.0.3. Return the 2A RCS temperature LOOP to service and then enter LCO 3.3.1.

SRO level 10 CFR 55.43(b) (2)
This question tests the SRO knowledge of TS Beyond the RO level due to needing to have knowledge of actions below the double line of the LCOs & application of generic LCO requirement 3.0.3.

Technical Reference: FNP-2-AOP-100, Version 5.0,
TSs 3.3.1, 3.0.3, & 3.3.2, Amendment No. 146 (Unit 1), Amendment No. 137 (Unit 2)

Learning Objective: 4. Predict and explain the following instrument/equipment response expected when performing TAVG, ΔT, and PIMP System evolutions including the fail condition, alarms, trip setpoints (OPS52201J08):
- Thot RTD fails high
- Thot RTD fails low
- Tcold RTD fails high
- Tcold RTD fails low
- PT-446 failures
- PT-447 failures
- High TAVG Alarm
- TAVG Deviation Alarm
- Rod Insertion Limit Computer

- ΔT Deviation Alarm
- Steam Dump control
- Pressurizer Level Control

5. Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the TAVG, ΔT, and PIMP System (OPS52201J10):
   - 3.3.1 Reactor Trip Instrumentation
   - 3.3.2 Engineered Safety Features Actuation Instrumentation
   - 2.1.1 Reactor Core Safety Limits

Comments: k/a match: This question provides a failure of a Temp instrument which will affect the PRZR level setpoint. The given conditions require an evaluation to determine how this will affect the PRZR Level Control system. A PRZR Level Control Malfunction will be caused. This is RO required knowledge, and to test at the SRO level, Application of appropriate Tech Specs including 3.0.3 is added for a second part to the question and choices. Knowledge of actions below the double line in the LCOs (must know that there are no actions for 2 channels inoperable in 3.3.1, even though there is a two channel inoperable condition in 3.3.2) is required to determine that 3.0.3 is applicable for TS 3.3.1, and how to properly apply the note allowing bypassing the inoperable channel for 3.3.1.

NOTE: TS 3.3.2 Has been put in the stem intentionally and is not part of the evaluation required from memory. it has 4.e. condition D requiring 3.0.3 if 2 channels are inop, and 7.d. condition K which allows 2 channels inoperable without invoking 3.0.3. There was no desire nor need to add 3.3.2 and that much more complexity to a written test question.

Ran on simulator to ensure this is what happens. Verified correct. As long as the Temperature element fails gradually (over two minutes was tested), OPDT AND OTDT do not cause a reactor trip which would change the answer and put the plant in mode 3 where the TS is not applicable. If the TE failed instantly, the rate compensation part of the OTDT and OPDT calc caused the setpoint to lower faster than the Delta T due to TAVG changing so quickly and penalizing the setpoint.

7.

On night shift the Radside SO inadvertently lined up Demin Water to the SFP during a feed and bleed. SFP boron concentration was 2010 ppm when the feed and bleed was initiated. This evolution has been turned over to day shift.

At 0700 a fuel shuffle was started in the SFP room.

At 1500 Chemistry reports that the SFP boron concentration is 1855 ppm.

Concerning the SFP, which one of the following is the expected effect of the dilution and the actions required to be taken by the Fuel Handling Supervisor?

A. • Keff will be greater than 0.95.
   • Stop the movement of fuel.

B. • Keff will be greater than 0.95.
   • Restore SFP boron concentration IAW AOP-49.3, Spent Fuel Pool Emergency.

C. • Keff will be less than 0.95.
   • Stop the movement of fuel.

D. • Keff will be less than 0.95.
   • Restore SFP boron concentration IAW AOP-49.3, Spent Fuel Pool Emergency.

SRO level 10 CFR 55.43(b) (2)
This question tests the SRO knowledge of TS Bases and the FSAR concerning the design of the SFP and limits and effects of low boron concentration and and a dilution accident and then the actions required by the FH supervisor which is an SRO qualified person.

Technical Reference: TS 2.7.14 and Bases for 3.7.14
AOP-49.3, rev 2

Learning Objective: SRO objective:
Recall AND APPLY the information from the LCO BASES sections: BACKGROUND, APPLICABLE SAFETY ANALYSIS, ACTIONS, SURVEILLENCE REQUIREMENTS, for any Technical Specifications or TRM requirements associated with Spent Fuel Pool Cooling and Purification and Refueling Water Storage Tank Purification Systems and attendant equipment alignment, to include the following (OPS-62108L01): 10CFR55.43 (b) 2

Comments: KA is matched because knowing the basis predicts the impact of the condition, and using procedures is satisfied by TS action required for the condition. This is the guidance provided for this event at this facility.

SRO level because a technical specification entry must be made on given conditions and knowledge of the basis is required in accordance with technical specifications and the position of the person making the decisions is an SRO.

8.

Unit 1 was at 100% power. The following conditions exist:

- AOP-14.0, Secondary System Leakage, is in progress.
- Reactor power rose to 101.8% prior to a ramp down to 99.5% power.
- The Rover reports steam coming out the grating of the MSVR and cannot safely approach the leak in the MSVR to investigate further.

Which one of the following correctly describes when the reactor is tripped, and when the MSIVs are closed IAW AOP-14.0?

The reactor is tripped __(1)__, and the MSIVs are closed __(2)__.

A. (1) after reactor power is reduced to < 5%

(2) after completion of the immediate operator actions of EEP-0, Reactor Trip or Safety Injection.

B. (1) after reactor power is reduced to < 5%

(2) prior to transitioning to EEP-0, Reactor Trip or Safety Injection.

C. (1) immediately

(2) after completion of the immediate operator actions of EEP-0, Reactor Trip or Safety Injection.

D. (1) immediately

(2) prior to transitioning to EEP-0, Reactor Trip or Safety Injection.

SRO level 10 CFR 55.43(b) (5)
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.

Technical Reference: FNP-1-AOP-14.0, Rev. 6, FNP-1-EEP-0.0, Rev. 36

Learning Objective(s): 8. Evaluate plant conditions and determine if transition to another section of AOP-14.0 or to another procedure is required. (OPS52521O08)
2. Evaluate plant conditions to determine if entry into EEP-0/ESP-0.0 is required. (OPS52530A02)

Comments: k/a match: This k/a is strictly RO knowledge: entry conditions and immediate actions of EOPs, combined with the Main Steam and Reheat system. To answer this question, the applicant must know both that this main steam system leak is an entry condition for EEP-0 requiring a manual trip (Even though it does not approach or exceed any automatic setpoints), and that the normal sequence of immediate actions are not followed due to AOP-14 direction. This question provides an entry condition to EEP-0 from a failed open valve in the Main Steam System. Since it is from the AOP-14 procedure, the choices involve SRO only knowledge of the procedure flowpath of the AOP (past the entry conditions and there are no immediate actions in AOP-14), and knowledge of the need to enter EEP-0 and the order of the immediate actions of EEP-0.

9.

Unit 1 is at 28% power, and KK1, TURB COND VAC LO, annunciator has come into alarm. System Operators have been sent to investigate.

The following parameters are observed on the Integrated Plant Computer (IPC), PPC 14, CONDENSER DETAIL page:

POINT ID	DESCRIPTION	VALUE	UNITS
PT0214	CONDENSER A PRESSURE	2.421	PSIA
PT0215	CONDENSER B PRESSURE	2.383	PSIA

Which one of the following is required by procedures based on these IPC parameters while attempts continue to restore condenser vacuum?

Procedure names are as follows:

AOP-8.0, Partial Loss Of Condenser Vacuum
AOP-3.0, Turbine Trip Below P-9 Setpoint
AOP-17.0, Rapid Load Reduction

A. ✓
- Manually trip the Main Turbine per AOP-8.0 and perform AOP-3.0 in parallel with AOP-8.0.
- Reduce reactor power to 8%, and transfer Steam Dumps to STM PRESS mode.

B.
- Reduce load rapidly per AOP-8 and AOP-17.0 until either the Main Turbine is off-line or annunciator KK1 is clear.
- Reduce reactor power to 8%, and transfer Steam Dumps to STM PRESS mode.

C.
- Manually trip the Main Turbine per AOP-8.0 and perform AOP-3.0 in parallel with AOP-8.0.
- Stabilize reactor power,* and verify Steam Dumps are working properly in the Tavg mode.

D.
- Reduce Load rapidly per AOP-8 and AOP-17.0 until either the Main Turbine is off-line or annunciator KK1 is clear.
- Stabilize reactor power,* and verify Steam Dumps are working properly in the Tavg mode.

* Rx Power is not Required to be Reduced to Less than 8%

SRO level 10 CFR 55.43(b) (5)
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.

Technical Reference: SOP-18, Ver. 9, AOP-3, Ver. 15, AOP-8, Rev. 17, AOP-17, Rev. 17, UOP-1.2, Ver. 89, UOP-3.1, Ver. 96

Learning Objective: 4. Describe the sequence of major actions associated with AOP-8.0 (OPS52520H04).
5. Assess plant conditions to determine if any system components need to be operated while performing AOP-8.0 (OPS52520H06).
6. Analyze plant indications to determine the successful completion of any step in AOP-8.0 (OPS52520H07).
7. Assess plant conditions and determine if transition to another section of AOP-8.0 or to another procedure is required (OPS52520H08).

Comments: k/a match: there are no plant computer points that monitor specific valves, pressures, temperatures, or flows in the condenser air removal system. Condenser pressure does have computer points, and is a direct indication of the condenser air removal system operation. Condenser pressure is used to evaluate system or component status (determines whether the CARS is working correctly or not). These parameters are provided for evaluation in this question. Course of action on the SRO level is determined by the evaluation of the condenser vacuum, procedure selection based on the parameters, and knowledge of the procedure actions within the procedures.

10.

Unit 2 was at 100% power. Conditions are as follows:

- The 2B DG is tagged out for maintenance.
- The HVSYD feeds to 2A and 2B Startup Transformers have just become de-energized causing an LOSP and Reactor Trip.

Which one of the following is the correct Technical Specification that is required to be entered and the associated **MAXIMUM** time allowed to be in Mode 5?

A. Enter LCO 3.0.3 and be in Mode 5 in 31 hours.

B. Enter LCO 3.0.3 and be in Mode 5 in 37 hours.

C. Enter LCO 3.8.1, AC Sources—Operating, and be in Mode 5 in 30 hours.

D. Enter LCO 3.8.1, AC Sources—Operating, and be in Mode 5 in 36 hours.

SRO level 10 CFR 55.43(b) (2)
This question tests the SRO knowledge of TS requiring evaluation of operability of electrical sources and application of the generic Tech Specs (3.0.1 - 3.0.8, in this case 3.0.3).

Technical Reference: TS LCO 3.8.1 AC Sources—Operating,
Amendment No. 170 (Unit 1)
Amendment No. 163 (Unit 2)

Learning Objective: 1. Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the Intermediate and Low Voltage AC Distribution System (OPS52103B01).

- 3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation
- 3.8.1 AC Sources – Operating
- 3.8.2 AC Sources – Shutdown
- 3.8.9 Distribution Systems - Operating
- 3.8.10 Distribution Systems - Shutdown

Comments: k/a match: Question provides a loss of Off site and an operationally valid scenario in which one DG was tagged out for maintenance. Evaluating and applying Tech Specs is required.

11.

Unit 2 is at 100% power and the following events have occurred:

- At 1000, the 2A Inverter Manual Bypass Switch is placed in the BYPASS SOURCE TO LOAD position for maintenance.

Which one of the following is correct considering the OPERABILITY of the 2A Inverter and the 2A 120V Vital AC Panel?

At 1002, prior to any maintenance or further actions:

- the 2A Inverter is __(1)__, and
- the 2A 120V Vital AC Panel is __(2)__.

A. (1) **NOT** OPERABLE
(2) OPERABLE

B. (1) OPERABLE
(2) **NOT** OPERABLE

C. (1) OPERABLE
(2) OPERABLE

D. (1) **NOT** OPERABLE
(2) **NOT** OPERABLE

SRO level 10 CFR 55.43(b) (2)
This question requires knowledge of requirements for OPERABLE as defined in the basis for 2 Tech Specs: 3.8.7 & 3.8.9.

Technical Reference: TSs & TS Basis for 3.8.7 & 3.8.9 Amendment No. 146 (Unit 1), Amendment No. 137 (Unit 2), FNP-2-SOP-37.1 Version 39.0

Learning Objective: 1. Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the DC Distribution System (OPS52103C01).

- 3.8.4 DC Sources - Operating
- 3.8.5 DC Sources – Shutdown
- 3.8.6 Battery Cell Parameters
- 3.8.9 Distribution Systems – Operating
- 3.8.10 Distribution Systems - Shutdown

1. Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the 120 Volt AC Distribution System (OPS52103D01).

- 3.8.7- Inverters-Operating
- 3.8.8- Inverters- Shutdown
- 3.8.9- Distribution System -Operating
- 3.8.10- Distribution System –Shutdown

Comments: k/a match: The inverter maintenance activity requires placing the manual bypass switch in bypass, and thus makes the inverter inoperable. This degrades the redundancy and thus the reliability of the electrical system. This question tests at an SRO level requiring analysis of the effect of the maintenance activity of this degraded power source condition (classifying the inverter as a connection from the DC Battery source to the 120V Vital AC bus), as it relates to LCOs and operability as defined in the TS Basis. A degraded DC source is not required for this k/a based on the words: ..."such as" a degraded power source..., but the maintenance activity affecting LCOs is required and present in this question.

12.

Unit 1 is at 100% power, and conditions are as follows:

- 1A Auxiliary Building Battery has an equalizing charge in progress.
- LG3, 1A BATT RM EXH FAN FAULT, has come into alarm.
- The Rover is dispatched and reports that the flow indicator for 1A BATT RM EXH FAN reads low out of spec.
- Upon investigation, maintenance has determined that the 1A BATT RM EXH FAN has a seized bearing and cannot be returned to service.

Which one of the following describes the required actions IAW Annunciator Response Procedure LG3 and SOP-58.0, Auxiliary Building HVAC System, and the reason for this action?

A. ✓
- Secure the equalizing charge.
- Notify the Shift Chemist to begin taking air samples.

B.
- Secure the equalizing charge.
- Notify the ROVER to begin monitoring room temperature.

C.
- Declare the 1A Auxiliary Building Battery INOPERABLE.
- Notify the Shift Chemist to begin taking air samples.

D.
- Declare the 1A Auxiliary Building Battery INOPERABLE.
- Notify the ROVER to begin monitoring room temperature.

SRO level: 10 CFR 55.43(b) (5), RO IR of < 2.5
This question tests the SRO knowledge of procedure actions in an Annunciator response procedure and compensatory actions for which there are no immediate operator actions, for a loss of a Battery Exhaust fan. It is strictly an SRO job function to arrange for compensatory actions and know the limitations for what the actions allow.

Technical Reference: FNP-1-SOP-58.0 Ver. 66.0, FNP-1-ARP-3.1 Ver. 26
LG3 & LH3 version 26

Learning Objective: 4. Identify any special considerations such as safety hazards and plant condition changes that apply to the Auxiliary Building Ventilation System (OPS52107B04).

Comments: k/a match: This question provides a loss of ventilation fan during battery charging, and requires prediction of the impacts on the DC system (Battery) and requires knowledge of the procedure requirements for this condition to mitigate the consequences of the loss of the ventilation fan.

13.

Unit 2 is at 100% power, and the following conditions occurred:

- At **1001**: The crew entered AOP-6.0, Loss of Instrument Air, due to instrument air pressure at 70 psig and decreasing on PI-4004B, INST AIR PRESS.
- At **1002**: ALL FRVs, ALL Feedwater heater dump and drain valves, BOTH SGFP miniflow valves, FCV-122 and ALL Letdown valves begin to operate erratically.
- At **1003**: ALL SG NR levels are at 55% and decreasing.
- At **1005**: 2A SG NR level is at 30% and decreasing.
- At **1008**: Instrument Air is 0 psig with ALL available Air Compressors running.
- At **1015**: Backup Nitrogen is aligned to the PORVs.

Which one of the following is:

1) the earliest time that a manual reactor trip is required by AOP-6.0,
AND
2) the status of the PRZR PORV OPERABILITY at **1016**?

A. 1) 1005
2) OPERABLE

B. 1) 1002
2) OPERABLE

C. 1) 1005
2) **NOT** OPERABLE

D. 1) 1002
2) **NOT** OPERABLE

SRO level 10 CFR 55.43(b) (2 & 5)
The first part of the question requires recalling what strategy or action is written into a plant procedure, including when the strategy or action is required. The second part of this question requires knowledge of requirements for OPERABLE as listed in the basis for Tech Spec 3.4.11.

Technical Reference: FNP-2-AOP-6.0, Ver.26.0,
TS and BASIS 3.4.11, Pressurizer PORVs.
Amendment No. 170 (Unit 1), Amendment No. 163 (Unit 2)

Learning Objective: 7. Evaluate plant conditions and determine if transition to another section of AOP-6.0 or to another procedure is required (OPS52520F08).

Comments: k/a match: This question provides a loss of instrument air and a time line with a combination of indications. A judgement of when to trip the reactor if instrument air pressure is decreasing is required in accordance with the applicable procedure. This first part is not an entry condition nor is it an immediate action. A second part is added to the question which is also at the SRO only level which deals with the definition of OPERABILITY of the PORVs from TS Basis.

14.

The Unit 2 Control Room Crew is stationed at the Hot Shutdown Panel, and AOP-28.0, Control Room Inaccessibility, is in progress at the step to "Borate the RCS to the hot standby boron concentration".

Which one of the following describes how boration flow will be verified per AOP-28.0, and to which procedure transition is made after AOP-28.0 is complete?

A. • FI-113, MAKEUP FLOW TO CHG/VCT BA (in East Stairwell).
   • EEP-0, Reactor Trip Or Safety Injection.

B. • FI -110A, BORIC ACID EMERG BORATE (100 ft, AUX BLDG charging pump hallway).
   • UOP-2.3, Shutdown Of Unit Following Reactor Trip.

C. • FI -110A, BORIC ACID EMERG BORATE (100 ft, AUX BLDG charging pump hallway).
   • EEP-0, Reactor Trip Or Safety Injection.

D. • FI -113 , MAKEUP FLOW TO CHG/VCT BA (in East Stairwell).
   • UOP-2.3, Shutdown Of Unit Following Reactor Trip.

SRO level 10 CFR 55.43(b) (5)
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.

Technical Reference: FNP-2-AOP-28.0 Ver. 14, FNP-2-AOP-28.2 Ver. 25

Learning Objective: 7. Analyze plant indications to determine the successful completion of any step in AOP-28.0. (OPS52521B07)
8. Evaluate plant conditions and determine if transition to another section of AOP-28.0 or to another procedure is required. (OPS52521B08)

Comments: k/a match: The question provides a Control Room evacuation condition and emergency borate flowpath required to be established outside of the control room. It requires knowledge of which flowpath is used in this procedure, what indication is used to verify flow, and where it is located. This knowledge is required in order to determine and interpret local boric acid flow during a control room evacuation. The question has a third part to ensure it tests at the SRO level. Knowledge of the procedure transition out of AOP-28.0 is required.

15.

Unit 2 has operated at 100% power for 6 months, and conditions are as follows:

- Earlier in the shift, 2A SGFP tripped.
- Reactor power was rapidly reduced to 50%, and is being maintained at that level.
- The results of an RCS activity sample taken 3 hours after the load reduction were:
  - Gross (beta-gamma) specific activity is $175/\overline{E}$ µCi/gm.
  - Dose-equivalent I-131 specific activity (DEI) is 140 µCi/gm.

Which one of the following TS ACTIONS would allow the **longest** power operation and still satisfy Technical Specifications requirements, and what is the basis for the requirement?

REFERENCE PROVIDED

A. • Be in Mode 3 with T_{avg} <500°F within the following 6 hours.
   • Prevent release of activity in the event of a Steam Generator Tube Rupture.

B. • Be in Mode 3 with T_{avg} <500°F within the following 6 hours.
   • Allow time to obtain and analyze Reactor Coolant Samples and monitor for iodine spiking values to return to normal.

C. • Decrease power below 43% within 4 hours and restore DEI to $\leq$ 0.5 µCi/gm in 48 hours.
   • Allow time to obtain and analyze Reactor Coolant Samples and monitor for iodine spiking values to return to normal.

D. • Decrease power below 43% within 4 hours and restore DEI to $\leq$ 0.5 µCi/gm in 48 hours.
   • Prevent release of activity in the event of a Steam Generator Tube Rupture.

SRO level: 10 CFR 55.43(b) (2)
This question tests the SRO knowledge of TS beyond the RO required knowledge by requiring the application of TS actions below the double line of the LCOs of > 1 hr. TSs, and application of the SR limit to determine if the LCO is met for one of the Conditions. The LCO is NOT met for 2 conditions, and the applicant must correctly determine the most limiting one. TS Basis knowledge is also tested by this question.

Technical Reference: TS 3.4.16, RCS Specific Activity
Amendment No. 170 (Unit 1), Amendment No. 163 (Unit 2)

Learning Objective: 7. Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the Gross Failed Fuel Detector (OPS52106E10).
- Technical Specification 3.4.16, RCS Specific Activity

Comments: k/a match: The limits for RCS Specific Activity are found in TS 3.4.16. Knowledge of how to apply and explain these limits is tested by requiring TS application from the values given to compare to the limit of CONDITIONS A.1, A.2, & B, & C while also requiring the use of SR 3.4.16.1. Applying the limits is required to determine the correct most limiting ACTION that is applicable in the TS, and identifying the correct TS Basis is required to explain the limits.

16. Unit 1 is shutdown, Mode 6, in a refueling outage. Given the following conditions:

- Refueling has been completed.
- Containment airlock doors are both open.
- The Equipment Hatch is open.
- A Maintenance Closure Response Team (MCRT) is available in the maintenance break area.
- The Fuel Handling Coordinator is inside containment.
- The Fuel Handling Supervisor is in the control room.

The Fuel Handling Coordinator requests permission to start core alterations.

Which one of the following describes if core alterations may proceed, and if not, what additional requirements must be met to continue the core alterations?

The core alterations may _____.

A. proceed without the Fuel Handling Supervisor inside containment as long as one containment airlock door is closed.

B. proceed without the Fuel Handling Supervisor inside containment as long as the equipment hatch is closed with 4 bolts in place.

C. **NOT** proceed until after the Fuel Handling Supervisor arrives inside containment and the equipment hatch is closed with 4 bolts in place.

D. **NOT** proceed until after the Fuel Handling Supervisor arrives inside containment and at least one containment airlock door is closed.

SRO level RO importance rating of < 2.5. 10 CFR 55.43(b) (7)
Knowledge of required plant conditions for fuel handling and the SRO duties and responsibilities of who is required to be in containment to move fuel during a refueling outage.

Technical Reference: UOP-4.1 Version 42, FHP-0.0 Version 10,

Learning Objective: 3. Identify the requirements including documentation, alignment and actions required to verify containment penetrations and interior components are aligned correctly for the following conditions (OPS40503A03):

- Containment Integrity Refueling Verification
- Containment Integrity Mid Loop Verification
- Containment Closure

Comments: FNP BANK: UOP4.1-40503B03 02

k/a match: This question provides some plant conditions and a need for establishing the proper configuration of the containment system prior to work in containment (core alterations during refueling). Some, but not all, of the conditions must be corrected by appropriate procedures in order for refueling to commence.

NOTE: The choices have **3 NOT**s and only one proceed since there is no other way to say proceed than to proceed. If there are any additional requirements to meet other than proceed, it is a "NOT proceed", and then the requirements to be met prior to proceeding are listed.

17.

Unit 1 has experienced a Reactor Trip and Safety Injection. While in EEP-0, Reactor Trip or Safety Injection, transition was made to ECP-1.2, LOCA Outside Containment.

Which ONE of the following parameters is used to determine if the break is isolated in accordance with ECP-1.2, and the procedure that will be entered when the leak is isolated?

A. • RCS pressure increasing.
   • ECP-1.1, Loss Of Emergency Coolant Recirculation.

B. • RCS pressure increasing.
   • EEP-1, Loss Of Reactor Or Secondary Coolant.

C. • Pressurizer level increasing.
   • EEP-1, Loss Of Reactor Or Secondary Coolant.

D. • Pressurizer level increasing.
   • ECP-1.1, Loss Of Emergency Coolant Recirculation.

SRO level 10 CFR 55.43(b) (5)
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.

Technical Reference: FNP-1-ECP-1.2 Revision 7

Learning Objective:
7. Evaluate plant indications to determine the successful completion of any step in ECP-1.2 (OPS52532E07).
8. Evaluate plant conditions and determine if transition to another section of ECP-1.2 or to another procedure is required (OPS52532E08).

Comments: k/a match: This question provides a situation in EEP-0, with an SI in progress, during which a diagnoses of a LOCA outside of CTMT has been made. Knowledge of how to make the operational judgement of determining if the break is isolated based on, instrument interpretation is required to answer the question. SRO only knowledge is also tested by requiring the proper procedure flowpath selection.

18.

Unit 1 is performing a natural circulation cooldown in accordance with ESP-0.2, Natural Circulation Cooldown to Prevent Reactor Vessel Head Steam Voiding. The following conditions exist:

- RCS cold leg - 510°F.
- RCS pressure - 1850 psig.
- 1A and 1B CRDM fans are running.
- RCPs 1A, 1B, and 1C are tripped and cannot be restarted.
- CST level is 8.0 ft.
- AFW flow is 400 gpm
- RCS cooldown rate is 5°F/hr.

Which one of the following is the correct response IAW ESP-0.2?

Procedure names are as follows:

ESP-0.2, Natural Circulation Cooldown to Prevent Reactor Vessel Head Steam Voiding
ESP-0.3, Natural Circulation Cooldown With Allowance For Reactor Vessel Head Steam Voiding (With RVLIS)

A. Continue with ESP-0.2 and increase the cooldown rate to a maximum of <25°F/hr.

B. Continue with ESP-0.2 and increase the cooldown rate to a maximum of <100°F in any 60 minute period.

C. Transition to ESP-0.3 and then increase the cooldown rate to a maximum of <25°F/hr.

D. Transition to ESP-0.3 and then increase the cooldown rate to a maximum of <100°F in any 60 minute period.

SRO level 10 CFR 55.43(b) (5)
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.

Technical Reference: ESP-0.2 Rev. 18, ESP-0.3 Rev. 12

Learning Objective: Evaluate plant conditions and determine if transition to another section of ESP-0.2/0.3/0.4 or to another procedure is required (OPS52531C08).

Comments: k/a match: This question provides a scenario in the natural circ procedure. Indications exist which must be properly diagnosed and a selection of the appropriate procedure is required. The proper procedure selection is the Natural Circ Cooldown procedure WITH voidiing allowed, since it will speed up the cooldown and depressurization and cause voiding.

A discriminatory question would be difficult to write for choosing between ESP-0.2 (without voiding), ESP-0.3, Nat Circ cooldown w/ allowance for voiding with RVLIS & ESP-0.4, Nat Circ cooldown w/ allowance for voiding without RVLIS, since the names of the procedures are given with the procedure numbers and would potentially make the choice of procedure obvious to an incompentent applicant. The question was instead written to require diagnosing the need to speed up the cooldown and depressurization which would cause voiding, and to know what procedure flowpath and cooldown rate limits (procedure strategies) are required for the situation of the natural circ cooldown with voiding.

19.

The Unit 1 Shift Supervisor (U1 SS) is preparing to leave the control room for a plant tour of approximately 30 minutes. The following conditions exist:

- Three Shift Support Supervisors (SSS) are on shift and qualified as follows:
  - One SSS qualified Substitute Shift Supervisor and assigned as SSS-Plant.
  - One SSS with an in-active SRO license and assigned Fire Brigade Leader.
  - One SSS qualified Substitute Shift Supervisor and assigned as STA.

Which ONE of the following is correct concerning the person the Unit 1 SS may turn over the Control Room command function to prior to leaving the control room, and the minimum turnover that is required when the Unit 1 SS returns to the Control Room IAW AP-16, Conduct of Operation- Operations Group?

- The U1 SS may leave if he turns over the Control Room command function to the _____ .
- The minimum turnover that is required is _____ during the SS's absence.

A. ✓
- SSS-Plant
- a brief on all the actions and administrative functions which have occurred

B.
- SSS-Plant
- a review of the plant logs, a control board walkdown and a brief on any evolutions that have occurred

C.
- STA
- a review of the plant logs, a control board walkdown and a brief on any evolutions that have occurred

D.
- STA
- a brief on all actions and administrative functions which have occurred

SRO level: This question tests knowledge of turnover practices that are unique to the SRO position. The specific items tested in this question are performed during and after shift turnover by the SROs, but NOT by the ROs.

Technical Reference: AP-16 Version 44

Learning Objective: 15. Identify the required items to be performed by the off-going and on-coming individuals to complete a shift turnover (OPS40502H15)

Comments: k/a match: This question requires knowledge of turnover practices, specifically the sequence of the SRO unique turnover reviews. There are 3 parts to the turnover, and this question contains items from all 3 of the parts, and requires knowledge of when each of the activities are required during and after turnover.

20.

Unit 1 is in MODE 3 preparing to do an initial startup after a core reload IAW UOP-1.2, Startup of Unit from Hot Standby to Minimum Load, and STP-101, Zero Power Reactor Physics Testing.

The following conditions exist:

- The current RCS boron sample is 1540 ppm.
- Both Shutdown banks have been withdrawn.
- All RCPs are running and the RCS is at normal operating pressure and temperature.
- FT-168, TOTAL MAKEUP FLOW TO CHG/VCT, has failed LOW.

The crew is at the step in UOP-1.2 to dilute the RCS to the Hot Shutdown boron concentration.
The crew is also preparing to conduct a brief for an infrequently performed test or evolution (IPTE).

Which one of the following is the correct method used for diluting per SOP-2.3, CVCS Reactor Makeup Control System, and which one of the following is the correct person to conduct the IPTE brief IAW STP-101 and NMP-AD-006, Infrequently Performed Tests and Evolutions?

A. • Perform a Manual Makeup to the charging pump suction. Verify the dilution automatically stops when batch integrator setpoint is reached.
   • Shift Supervisor.

B. • Perform a Manual Makeup to the charging pump suction. Verify the dilution automatically stops when batch integrator setpoint is reached.
   • Engineering Support Manager.

C. • Verify a RMW pump running; open RMW to Blender, FCV114B; Open MKUP TO CHC PUMP SUCTION, FCV113B; estimate the flow by VCT level rise; and calculate time for dilution, manually secure dilution when complete.
   • Shift Supervisor.

D. • Verify a RMW pump running; open RMW to Blender, FCV114B; Open MKUP TO CHC PUMP SUCTION, FCV113B; estimate the flow by VCT level rise; and calculate time for dilution, manually secure dilution when complete.
   • Engineering Support Manager.

SRO level 10 CFR 55.43(b) (5)
The second part of this question requires recalling who is the person responsible to give an IPTE brief. It has been added since the first part directly meets the KA concerning operating the controls associated with reactivity and is RO knowledge.

The second part is SRO knowledge since conducting a IPTE brief, when the brief is to be conducted and who is qualified to give that brief is an SRO only job function. This is defined in NMP-0-AD-006 and is further limited by the STP-101 to just two people.

Technical Reference: FNP-1-UOP-1.2 Version 89, FNP-1-SOP-2.3 Version 44

NMP-0-AD-006 version 3 and STP-101 version12.0

Learning Objective: 11. Discuss the operation and alignment of each major component including precautions and limitations of operation, and applicable procedures, associated with the Reactor Makeup and Chemical Addition System including (OPS-40301G11)

- Boric Acid Transfer Pumps
- Reactor Makeup Water Pumps
- Makeup to Charging Pump Suction Header, FCV-113B
- Makeup to VCT, FCV-114A
- Makeup Mode Selector and Control Switches
- Boric Acid Batch Integrator, FIS-113
- Total Flow Batch Integrator, FIS-168
- Boric Acid Makeup Flow Controller, FK-113
- Primary Water Makeup Flow Controller, FK-168

Comments: k/a match: UOP-1.2 is the procedure that controls a reator startup and STP-101 controls the dilution to criticality . UOP-1.2 directs a dilution prior to the rx startup which will affect reactivity, and SOP-2.3 gives guidance for this task. This question requires knowledge of the dilution procedure and manipulation of specific controls which will affect reactivity for a condition in which the normal method of dilution does not work.

The question also requires knowledge of NMP-AD-006 and STP-101 to decide who will give the IPTE briefing. This is an SRO function and knowledge to make sure the proper administrative requirements are met.

21.

At 0500, to complete draining a system on an outage tag order, an MOV that performs a safety function to automatically open during a safety injection has to be manually closed due to power being Tagged out to the MOV.

At 1900, the work is complete and the following conditions exist:

- The system has been filled, vented, and Tagged in.
- The MOV is closed per the System Checklist.
- The Tagout has restored power to the MOV and the GREEN valve position light is lit.

Which one of the following correctly states the OPERABILITY of the MOV, and the reason for the determination?

A. The MOV is OPERABLE since no internal valve work was performed.

B. The MOV is OPERABLE since power has been restored, and a safety injection signal will automatically open the valve.

C. The MOV is **NOT** OPERABLE since it has not been time stroked in the open direction.

D. The MOV is **NOT** OPERABLE since the valve was manually operated and has not been electrically stroked one full cycle.

SRO level: 10 CFR 55.43(b) (2)
This question tests the SRO knowledge of TS beyond the RO required knowledge by requiring knowledge that manually stroking an MOV makes the MOV inoperable, and requires knowledge of the actions required to clear the LCO and return the MOV to OPERABLE. Both are SRO only functions, since they require OPERABILITY determinations.

Technical Reference: FNP-0-SOP-0.0 Version 118.0

Learning Objective: 6. Access plant conditions to determine the ability of plant equipment and structures to meet their intended, designated function (OPS52302A06).

Comments: k/a match: This question presents a maintenance activity which affects the operability of an MOV. Proper evaluation of the operability of the MOV after it has power restored and proper indication is verified is required to answer this question. Also Knowledge of the post-maintenance testing required to return the valve to operable is required to answer this question. There is no degraded power source in this question to preclude overlap with other questions on this exam. The words "**such as** [degraded power sources]" are used in this k/a to allow other types of maintenance affecting LCOs to meet this k/a, with degraded power sources used only as one example of a maintenance activity.

22.

Unit 2 has been in Mode 6 for 3 weeks, and the following conditions exist:

- Fuel movement is in progress.
- SFP and Refueling Cavity Levels are 152' and dropping.
- FH2, SFP LVL HI-LO, is in alarm.
- EC5, RCS LVL HI-LO, is in alarm.
- PG3, CTMT SUMP LVL HI-HI OR TRBL, is in alarm.
- Both CTMT Sump Pumps are running and Sump levels are rising.
- Leakage around the Reactor Cavity Seal has been reported from Containment.
- Carriage at Pit lamp is ON in SFP room.
- A used Fuel assembly is in the SFP side upender in the lowered position.

Which ONE of the following describes the correct responses to these conditions per AOP-30.0, Refueling Accident?

A. • Close fuel transfer tube gate valve and leave the fuel assembly in its current location.
   • Line up to fill the RCS from the boration flowpath IAW AOP-12.0, Residual Heat Removal System Malfunction.

B. • Close fuel transfer tube gate valve and leave the fuel assembly in its current location.
   • Line up to fill the reactor cavity from the RWST IAW SOP-7, Residual Heat Removal System.

C. • Place fuel assembly in the SFP racks, then close the gate valve.
   • Line up to fill the RCS from the boration flowpath IAW AOP-12.0, Residual Heat Removal System Malfunction.

D. • Place fuel assembly in the SFP racks, then close the gate valve.
   • Line up to fill the refueling cavity from the RWST IAW SOP-7, Residual Heat Removal System.

SRO level 10 CFR 55.43 (b) (5 & 6)
This question requires recalling what strategy or action is written into a plant procedure, including when the strategy or action is required. It also requires the SRO to know his unique responsibilities for radiological safety principles pertaining to his duties during fuel handling,

Technical Reference: FNP-1-AOP-30.0 Version 14, ARP-3.3 PG3, ARP-1.6 FH4 & FH5, AOP-12 Revision 18.0

Learning Objective: 3. Determine the appropriate action for given conditions during performance of UOP-4.1, [CONTROLLING PROCEDURE FOR REFUELING] (OPS40503B03).

Comments: k/a match: During fuel handling, the Refueling Supervisor (SRO in charge of fuel handling) has the sole responsibility for evaluating placement of fuel during a fuel handling accident. This evaluation is necessary to place the fuel in the event dependent location that will most likely preclude a high dose rate for the protection of personnel specifically mitigating potentially high dose rate conditions during a fuel handling accident OR leak which reduces the shielding above the high dose irradiated fuel.

23.

Unit 1 is operating at 100% power, and the following conditions exist:

- A release of the Waste Monitor Tank is planned.
- R-18, Liquid Radwaste Effluent Monitor is inoperable.

Which ONE of the following correctly states the required ODCM ACTIONS that the SRO who approves the release must ensure are completed?

A. R-18 must be returned to service.

B. Release rate calculations and sample results that show activity of the release liquid is $<1x10^{-7}$ microcuries per milliliter must be verified.

C. Two separate samples must be analyzed, two independent qualified members of facility staff must verify discharge valve lineup and release rate calculations.

D. The tank must be recirculated for two volumes and a Senior Reactor Operator must verify release rate calculations and discharge valve lineup.

SRO level 10 CFR 55.43(b) (2)
RO importance rating of < 2.5. Evaluating and applying ODCM requirements for inoperable equipment/instrumentation which must be met prior to a environmental release is an SRO only Job Function.

Technical Reference: ODCM, Version 22

Learning Objective: Identify and apply the following Technical Specifications or TRM requirements, including the bases and attendant equipment, associated with the Liquid and Solid Waste System (OPS52106A01).

- Technical Specification 5.5.1, Offsite Dose Calculation Manual (ODCM)

Comments: FNP BANK: LIQ SD WAST-40303A11 08
k/a match: The SRO must approve a release if ODCM actions are required to be met prior to the release, even though for a normal release the Chemistry Department approves the release after an SRO review of the permit. This question provides a scenario in which the release cannot be allowed until ODCM actions are accomplished as determined by the SRO, and the applicant must recall what completed actions allow approving the release.

24.

Unit 1 is in Mode 3 after a manual reactor trip due to a LOSP and loss of CCW. EEP-0, Reactor Trip or Safety Injection, and AOP-9, Loss of Component Cooling Water, are in progress. Conditions are as follows:

- 1F 4160V bus is de-energized and investigation is in progress.
- 1G 4160V bus is energized by 1B DG.
- B Train CCW is the "on service" Train.
- 1B CCW pump is Tagged Out for maintenance.
- 1A CCW pump tripped on overcurrent.
- 1C CHG PUMP is running.

Which one of the following actions are required by AOP-9.0 for these conditions, and the effect during the alignment of firewater to the 1B charging pump?

A. • Secure 1C CHG pump.

• RCP number 1 seal outlet temperature may rise to greater than 235°F.

B. • Secure 1C CHG pump.

• An engineering evaluation must be performed prior to reinitiating Seal Injection or CCW to the thermal barriers.

C. • Maintain 1C CHG pump running.

• 1C CHG pump may be damaged.

D. • Maintain 1C CHG pump running.

• 1C CHG pump CCW oil cooler piping will be chemically contaminated.

25.

A Site Area Emergency has been declared at midnight on January 1, 2008.

- The TSC has not yet been staffed.
- The Shift Manager is acting as the Emergency Director and has directed a team of two Maintenance personnel to work in a hazardous area of the Rad Side Aux Building.
- Each person performing the work is expected to receive 5500 mrem TEDE.
- The Health Physics (HP) Supervisor is standing by to assist.

Which one of the following correctly describes the type of entry that is required and the position that must approve each team member to receive the 5500 mrem TEDE IAW EIP-14.0, Personnel Movement, Relocation, Re-entry and Site Evacuation?

A.	Relocation	Shift Manager
B.	Relocation	HP Supervisor
C.	Re-entry	Shift Manager
D.	Re-entry	HP Supervisor

SRO level 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.

Technical Reference: EIP-14.0, Ver. 23

Learning Objective: • Using plant procedures/references, determine the appropriate actions that are to be performed by the SM/ED during a NOUE, Alert, Site Area, or General Emergency including the consequences of inadequate actions. (OPS53002C02)

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.

Reference Provided

PCB-1-VOL2-CRV18B

UNIT 1 VOLUME II CURVE 18B
Diesel Generator Fuel Oil Storage
Tank Capacity (Level vs. Gallons)
Rev. 4 July 16, 1993
QSY52T501, Q1Y52T502, QSY52T503
Q2Y52T503, QSY52T504

Approved:
[signature] 7-16-93
Technical Manager Date

LEVEL (for EPB Level calibration)		ACTUAL GALLONS	USEABLE GALLONS (For Tech Spec compliance)
Inches	EPB, %	(Note 1)	(Notes 1 and 2)
143"		40551	36667
142"		40513	36629
141"		40443	36559
140"		40352	36468
139"		40245	36361
138"		40123	36239
137"		39989	36105
136"	100.0%	39843	35959
135"	99.2%	39686	35802
134"	98.3%	39519	35635
133"	97.5%	39344	35460
132"	96.7%	39159	35275
131"	95.8%	38967	35083
130"	95.0%	38767	34883
129"	94.2%	38559	34675
128"	93.3%	38345	34461
127"	92.5%	38123	34239
126"	91.7%	37896	34012
125"	90.8%	37662	33778
124"	90.0%	37422	33538
123"	89.2%	37177	33293
122"	88.3%	36926	33042
121"	87.5%	36670	32786
120"	86.7%	36409	32525
119"	85.8%	36143	32259
118"	85.0%	35872	31988
117"	84.2%	35597	31713
116"	83.3%	35318	31434
115"	82.5%	35034	31150
114"	81.7%	34746	30862
113"	80.8%	34454	30570
112"	80.0%	34159	30275
111"	79.2%	33859	29975
110"	78.3%	33557	29673
109"	77.5%	33250	29366
108"	76.7%	32941	29057
107"	75.8%	32628	28744
106"	75.0%	32312	28428

Note 1: Instrument inaccuracies are not reflected.

Note 2: Definition of Useable: gauranteed available fuel oil for supply to the diesel.

Note 3: WHEN using EPB indication, THEN Tech Spec minimum is 71%, which includes 25,000 useable gallons plus 4.5% instrument inaccuracies, rounded to the whole number. (reference letter NDS-92-1024)

Note 4: IF using dipstick measurements, THEN instrument inaccuracies do not apply, and the Tech. Spec minimum is 25,000 useable gallons.

Reference Provided

UNIT 1 VOLUME II CURVE 18B
Diesel Generator Fuel Oil Storage
Tank Capacity (Level vs. Gallons)
Rev. 4 July 16, 1993
QSY52T501, Q1Y52T502, QSY52T503
Q2Y52T503, QSY52T504

LEVEL (for EPB Level calibration)		ACTUAL GALLONS	USEABLE GALLONS (For Tech Spec compliance)	
Inches	EPB, %	(Note 1)	(Notes 1 and 2)	
105"	74.2%	31994	28110	
104"	73.3%	31672	27788	
103"	72.5%	31348	27464	
102"	71.7%	31021	27137	
101.2"	**71.0%**	**30786**	**26902**	– EPB Tech Spec minimum, Note 3
101"	70.8%	30691	26807	
100"	70.0%	30359	26475	
99"	69.2%	30025	26141	
98"	68.3%	29688	25804	
97"	67.5%	29350	25466	
96"	**66.7%**	**29009**	**25125**	(Note 4)
95"	65.8%	28666	24782	
94"	65.0%	28321	24437	
93"	64.2%	27975	24091	
92"	63.3%	27627	23743	
91"	62.5%	27277	23393	
90"	61.7%	26926	23042	
89"	60.8%	26573	22689	
88"	60.0%	26219	22335	
87"	59.2%	25864	21980	
86"	58.3%	25507	21623	
85"	57.5%	25149	21265	
84"	56.7%	24790	20906	
83"	55.8%	24431	20547	
82"	55.0%	24070	20186	
81"	54.2%	23709	19825	
80"	53.3%	23346	19462	
79"	52.5%	22984	19100	
78"	51.7%	22620	18736	
77"	50.8%	22256	18372	
76"	50.0%	21892	18008	
75"	49.2%	21527	17643	
74"	48.3%	21163	17279	
73"	47.5%	20797	16913	
72"	46.7%	20432	16548	
71"	45.8%	20119	16235	
70"	45.0%	19754	15870	

Note 1: Instrument inaccuracies are not reflected.

Note 2: Definition of Useable: gauranteed available fuel oil for supply to the diesel.

Note 3: WHEN using EPB indication, THEN Tech Spec minimum is 71%, which includes 25,000 useable gallons plus 4.5% instrument inaccuracies, rounded to the whole number. (reference letter NDS–92–1024)

Note 4: IF using dipstick measurements, THEN instrument inaccuracies do not apply, and the Tech. Spec minimum is 25,000 useable gallons.

Reference Provided

UNIT 1 VOLUME II CURVE 18B
Diesel Generator Fuel Oil Storage
Tank Capacity (Level vs. Gallons)
Rev. 4 July 16, 1993
QSY52T501, Q1Y52T502, QSY52T503
Q2Y52T503, QSY52T504

LEVEL (for EPB Level calibration)		ACTUAL GALLONS	USEABLE GALLONS (For Tech Spec compliance)
Inches	EPB, %	(Note 1)	(Notes 1 and 2)
69"	44.2%	19389	15505
68"	43.3%	19024	15140
67"	42.5%	18659	14775
66"	41.7%	18295	14411
65"	40.8%	17931	14047
64"	40.0%	17568	13684
63"	39.2%	17205	13321
62"	38.3%	16843	12959
61"	37.5%	16481	12597
60"	36.7%	16121	12237
59"	35.8%	15761	11877
58"	35.0%	15402	11518
57"	34.2%	15044	11160
56"	33.3%	14688	10804
55"	32.5%	14332	10448
54"	31.7%	13978	10094
53"	30.8%	13625	9741
52"	30.0%	13274	9390
51"	29.2%	12924	9040
50"	28.3%	12576	8692
45"	24.2%	10863	6979
40"	20.0%	9204	5320
35"	15.8%	7610	3726
30"	11.7%	6097	2213
25"	7.5%	4679	795
20"	2.5%	3374	0
17"	0.0%	2656	0
15"		2207	0
10"		1208	0
5"		428	0

Note 1: Instrument inaccuracies are not reflected.

Note 2: Definition of Useable: gauranteed available fuel oil for supply to the diesel.

Note 3: WHEN using EPB indication, THEN Tech Spec minimum is 71%, which includes 25,000 useable gallons plus 4.5% instrument inaccuracies, rounded to the whole number. (reference letter NDS-92-1024)

Note 4: IF using dipstick measurements, THEN instrument inaccuracies do not apply, and the Tech. Spec minimum is 25,000 useable gallons.

ATTACHMENT C

DIESEL GENERATOR FUEL OIL CONSUMPTION

NOTE: The information in the table below provides the run time that can be expected under three different diesel operating configurations assuming maximum loading and minimum initial storage tank level. This can be used to assess replenishment requirements.

Diesels Running	Storage Tanks Available	Load	Run Time	*Consumption Rate
2 Large, 1 Small	4 (init. level 68%)	Max	5 1/4 days	807 gal/hr
3 Large, 1 Small	4 (init. level 68%)	Max	3 3/4 days	1104 gal/hr
3 Large, 2 Small	5 (init. level 68%)	Max	4 days	1317 gal/hr

* Consumption rates compute to an average per diesel of 297 gal/hr for 1-2A, 1B, and 2B Diesels (Large Diesels) and 213 gal/hr for 1C and 2C Diesels (Small Diesels) under maximum load. {CR 2000-044 and REA 98-1637}

Reference Provided

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}) ≥ 500°F.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. DOSE EQUIVALENT I-131 > 0.5 µCi/gm.	----------Note---------- LCO 3.0.4c is applicable. ----------		
	A.1	Verify DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.16-1.	Once per 4 hours
	AND		
	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
C. Required Action and associated Completion Time of Condition A not met. OR DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.16-1.	C.1 Be in MODE 3 with T_{avg} < 500°F.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	Verify reactor coolant gross specific activity ≤ 100/Ē µCi/gm.	7 days
SR 3.4.16.2	----------NOTE---------- Only required to be performed in MODE 1. --- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 0.5 µCi/gm.	14 days AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period

SURVIELLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.16.3	----------NOTE---------- Not required to be performed until 31 days after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. ---------- Determine $\bar{E}$ from a sample taken in MODE 1 after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours.	184 days

Reference Provided

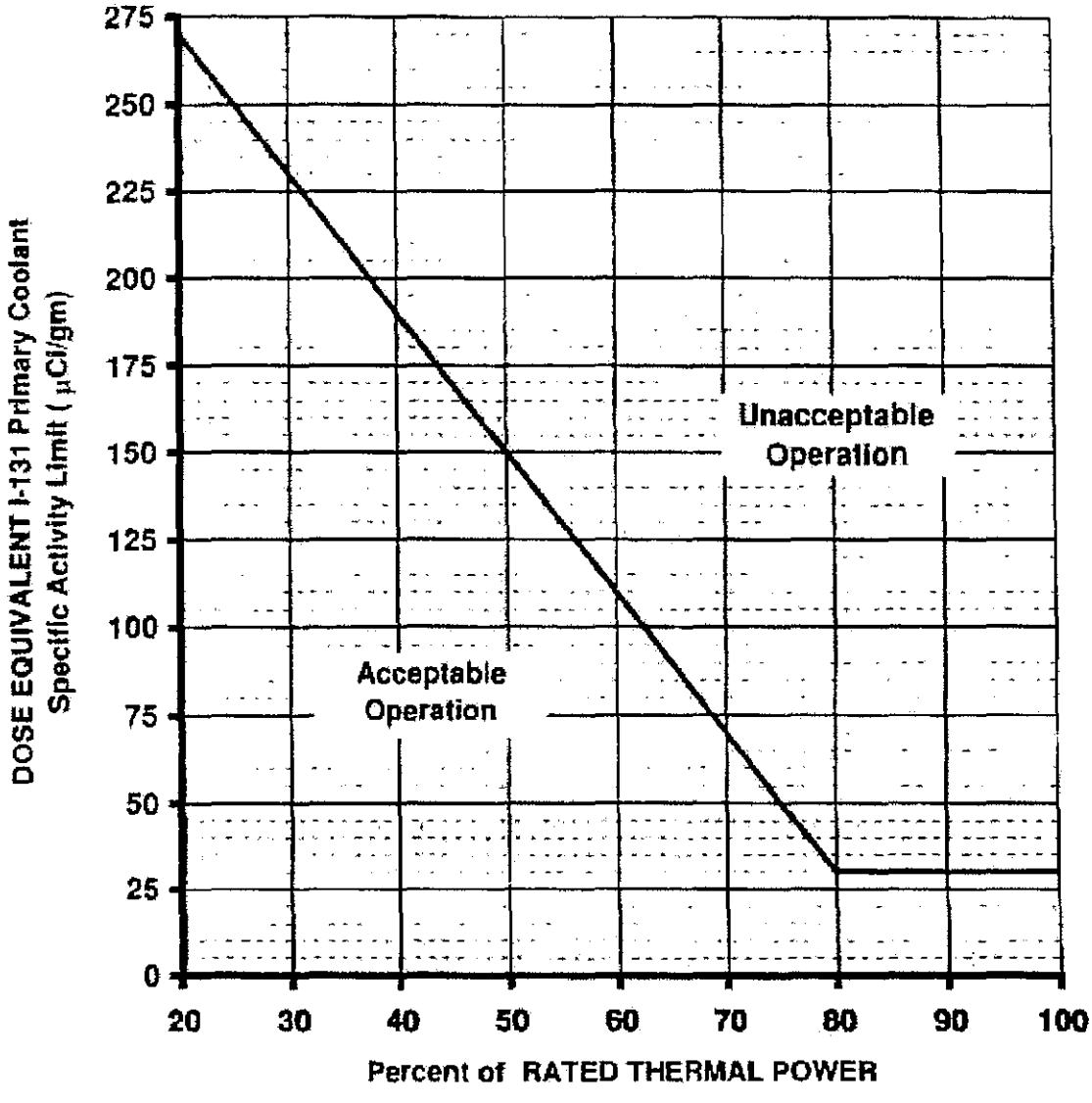


Figure 3.4.16-1

DOSE EQUIVALENT I-131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER with the Primary Coolant Specific Activity > 0.5 μCi/gm DOSE EQUIVALENT I-131.