1. The following plant conditions exist:

- RCS pressure = 1885 psig
- Quench Tank pressure = 5 psig
- A Pzr Safety valve starts leaking past its seat

The Safety Valve discharge flow will be ____(1)____ phase flow at ____(2)____?

A. (1) superheated
(2) 190°F

B. (1) superheated
(2) 228°F

C. (1) saturated
(2) 190°F

D. (1) saturated
(2) 228°F

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the operational implications (Thermodynamics and Flow characteristics) of steam passing from a leaking PORV (vapor space accident).

A. Incorrect: 1st part is incorrect because the flow from the safety valve will be a wet vapor (saturated). This can be seen on the Mollier diagram at the exit conditions of 1145 Btu/lbm and 20 psia. It is plausible because if they incorrectly interpret the Mollier diagram, they couldo end up in the superheated region. 2nd part is incorrect because the safety valve exit point will be in the wet vapor region of the Mollier diagram. With that, the temperature at that point will be the saturated temperature for 20 psia (228°F). It is plausible because if the QT pressure was 5 psia instead of 5 psig, it would be correct.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is correct. The safety valve exit point will be in the wet vapor region of the Mollier diagram. With that, the temperature at that point will be the saturated temperature for 20 psia (228°F).

C. Incorrect: 1st part is correct. Flow from the safety valve will be a wet vapor (saturated). 2nd part is incorrect but plausible (see A).

D. CORRECT: 1st part is correct (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
008	Pressurizer (PZR) Vapor Space Accident	AK1 Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident:	Thermodynamics and flow characteristics of open or leaking valves

K/A# AK1.01 **K/A Importance** 3.2 **Exam Level** RO

References provided to Candidate Steam Tables **Technical References:** Steam Tables

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.8 / 41.10 / 45.3

Objective: SYS-104-14K

2. Plant conditions:
   - Reactor has tripped
   - RCS pressure = 1580 psig rising
   - Containment pressure = 16.7 psia rising
   - DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE, Section 5.0, Lack of Adequate Subcooling Margin is in progress
   - Specific Rule 2, Actions for Loss of Subcooling Margin is complete
   - You have been directed to perform Specific Rule 4, Steam Generator Control

   Based on the above plant conditions, Specific Rule 4 directs you to maintain SG level at ________on the Startup Range.

A. Low Level Limits (LLL)

B. 40 inches

C. 49 inches

D. 124 inches

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of how SGs are used (levels maintained) during a small break LOCA.

A. Incorrect because without RCPs operating, you are directed to maintain 124 inches for natural circulation. It is plausible because if you had not secured RCPs (SFRCS not actuated) it would be correct.

B. Incorrect (see A). Plausible because when performing Rule 4 and SFRCS has not actuated with MFW available, this is the correct level. .

C. Incorrect (see A). Plausible because when performing Rule 4 and SFRCS has not actuated with MFW not available (using AFW), this is the correct level.

D. Correct– Specific Rule 4 requires maintaining 124 inches in Operable SGs when an SFRCS has occurred AND an SA2 has actuated OR SCM is not adequate. SFRCS will actuate on Loss of RCPs during implementation of Specific Rule 2.

Sys #	**System**	**Category**	**KA Statement**
009	Small Break LOCA	EK2 Knowledge of the interrelations between the small break LOCA and the following:	S/Gs

K/A# EK2.03 **K/A Importance** 3.0 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02000, SYS523

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 45.7

Objective: GOP 304

3. Current plant conditions:
   - A large break LOCA has occurred

   1. The reason that HPI injects into the RCS cold legs instead of the hot legs is because it ____(1)____.
   2. HPI injects into the RCS cold legs ____(2)____.

A. (1) induces less thermal stress on the welds where it taps into RCS piping
(2) between the steam generator and the reactor coolant pump

B. (1) induces less thermal stress on the welds where it taps into RCS piping
(2) between the reactor coolant pump and the reactor vessel

C. (1) is more likely to provide core cooling before exiting the RCS through the break
(2) between the steam generator and the reactor coolant pump

D. (1) is more likely to provide core cooling before exiting the RCS through the break
(2) between the reactor coolant pump and the reactor vessel

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of how SGs are used (levels maintained) during a small break LOCA.

A. Incorrect: 1st part is incorrect because each RCS loop has 2 separate cold legs and 1 hot leg. Injections into 2 locations ensures that on a single failure (loss of an HPI Train) and a break at the injection line of the operating HPI Pump, a flowpath to the core remains. It is plausible because it would be a smaller ΔT going through the cold leg as opposed to the hot leg. 2nd part is incorrect because HPI injects between the RCP and the reactor vessel. It is plausible because the lowest pressure location in the system is between the RCP and the OTSGs, which would allow maximum flowrate with forced circulation.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is correct. HPI injects between the reactor coolant pump and the reactor vessel.

C. Incorrect: 1st part is correct. On a single failure (loss of an HPI Train) and a break at the injection line of the operating HPI Pump, a flowpath to the core remains. 2nd part is incorrect but plausible (see A).

D. CORRECT: 1st part is correct (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
011	Large Break LOCA	EK3 Knowledge of the reasons for the following responses as they apply to the Large Break LOCA:	Injection into cold leg

K/A# EK3.05 **K/A Importance** 4.0* **Exam Level** RO

References provided to Candidate None **Technical References:** SYS 302, SD-038

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.5 / 41.10 / 45.6 / 45.13

Objective: SYS-302

4. The plant has been operating at 100% full power for an extended period of time when a loss of offsite power occurs.

   Complete the following statement regarding the establishment of natural circulation approximately three minutes after the TRIP.

   Indications that natural circulation has been established would be a Loop ΔT of____(1)____ with ____(2)____coupled with Tsat for SG pressure and tracking.

A. (1) 40°F
   (2) Tcold

B. (1) 40°F
   (2) Tave

C. (1) 60°F
   (2) Tcold

D. (1) 60°F
   (2) Tave

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor parameters and determine the establishment of natural circulation flow.

A. Correct - Per DB-OP-06903, Plant Cooldown, establishment of natural circulation is indicated by the following: Incore thermocouples and RCS Th indication are coupled and are tracking, RCS deltaT has stabilized at less than 50°F, RCS Tc and SG Tsat are coupled and are tracking. Trending towards these values indicates establishment in progress

B. Incorrect – 1st part is correct (see A). 2nd part is incorrect because Tave is not used as an indication for natural circulation. It is plausible because ICS is based on controlling Tave when at power.

C. Incorrect – 1st part is incorrect because Per DB-OP-06903, natural circulation has been established as indicated by RCS ΔT has been stabilized < 50°F. It is plausible because ΔT is driving head so you could easily think that the higher ΔT represents a higher flow. 2nd part is correct (see A).

D. Incorrect – 1st part is incorrect but plausible (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
015	Reactor Coolant Pump Malfunctions	AA1 Ability to operate and / or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow):	Development of natural circulation flow

K/A# AA1.21 **K/A Importance** 4.4 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-06903 step 6.3

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 45.5 / 45.6

Objective: GOP-206

5. Plant conditions:

- The plant is operating at 55% power.
- Makeup pump 1 is removed from service.
- Makeup pump 2 tripped.
- Letdown has been isolated.
- Annunciator 4-2-E, PZR LVL LO has JUST been received.
- PZR level is lowering by 1 inch every 3 minutes.

Assuming NO operator actions, and the current trend continues, select the approximate amount of time available for the pressurizer heaters to remain energized.

A. 480 minutes

B. 510 minutes

C. 522 minutes

D. 552 minutes

Answer: A

Explanation/Justification: This question matches the KA by requiring the ability to determine how long Pzr level can be maintained during a loss of coolant makeup.

A. Correct. . PZR LVL LO alarms when Pzr level = 200 inches. The Pzr heaters automatically cut off at 40 inches. 160 inches / inch per 3 minute = 480 minutes.

B. Incorrect. Incorrect because it will take 480 minutes for the Pzr heater to turn off by interlock. It is plausible because this calculation uses 210 inches as an alarm setpoint (220 being normal level with a high alarm setpoint at 226inches makes 210 inches plausible) and 40 inches as the heater interlock.

C. Incorrect. Incorrect because it will take 480 minutes for the Pzr heater to turn off by interlock. It is plausible because it uses 200 inches as the alarm setpoint (correct) and 26 inches as the heater interlock setpoint. This is incorrect but plausible because 26 inches is when the heaters are actually uncovered which is what the interlock protects against.

D. Incorrect. Incorrect because it will take 480 minutes for the Pzr heater to turn off by interlock. It is plausible using 210 inches as the alarm setpoint (see B) and 26 inches as the heater cutoff (see C)..

Sys #	System	Category	KA Statement
022	Loss of Reactor Coolant Makeup	AA2 Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup:	How long Pzr level can be maintained within limits

K/A# AA2.04 **K/A Importance** 2.9 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS 104, DB-OP-06902

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 43.5 / 45.13

Objective: SYS 104 5K

6. The following plant conditions exist

- The plant is in MODE 5
- The Reactor Coolant System is at a reduced inventory
- The running Decay Heat Pump trips due to an instantaneous overcurrent

Which of the following would require the standby Decay Heat Pump to be vented with pump suction aligned to the BWST prior to starting?

A. DH 21 and DH 23 are open with DH 11 and DH 12 closed

B. Suction pressure for the standby Decay Heat Pump is 25 psig

C. Reactor Coolant System temperature increases from 125°F to 160°F

D. Reactor Coolant System level is at 26 inches for nozzle dam installation

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Answer: D

Explanation/Justification: This question matches the KA by requiring the operator to recognize the conditions that require pump venting while in reduced RC inventory conditions.

A. Incorrect – plausible since below 48 inches direction is to close DH21 and DH23 if open prior to venting

B. Incorrect – plausible since suction pressure from the BWST is normally 30 psig when at tech spec required level

C. Incorrect – plausible since temperature rise may be in be in conjunction with steam voids

D. Correct – direction is given to vent from the BWST if RCS level is below 48 inches

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Sys #	System	Category	KA Statement
025	Loss of Residual Heat Removal System	Generic	Ability to perform specific system and integrated plant procedures during all modes of plant operation

K/A# 2.1.23 **K/A Importance** 4.3 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02527 Step 4.1.7, Attachment 2 step 4

Question Source: Bank 287050 **Level Of Difficulty: (1-5)**

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.2 / 45.6

Objective: GOP-127

7. The plant is at full power with all systems in normal alignment.

- Component Cooling Water Pump 1 is in standby
- Component Cooling Water Pump 2 is running

The following events occur in this order:

- 11-5-B, CCW PMP 2 FLOW LO, alarms and stays in alarm when acknowledged
- Component Cooling Water Pump 1 starts
- Train 1 Non-Essential Header Isolation Valves CC5095, CC5097, and CC2645 open
- No other Component Cooling Water components change status

Which of the following was the cause of this event?

A. Loss of Train 2 Service Water

B. Component Cooling Water Pump 2 breaker trip

C. Component Cooling Water Pump 2 sheared shaft

D. Component Cooling Water System leak in the Auxiliary Building Non-Essential Header

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Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to determine the cause of a CCW pump trip based on plant parameters.

A. Incorrect– Plausible since high temperatures used to start standby pump.

B. Incorrect –Plausible since a breaker trip will cause these actions due to low flow, but in addition the Train 2 Non-Essential Header Isolation valves will close. The stem states no additional CCW components changed status.

C. Correct – Since the breaker is not open for CCW Pump 2 (see distractor B), Train 2 CCW Non-Essential Header Isolation valves will not change status in addition to the stated status changes

D. Incorrect – Plausible since automatic actions to close valves would occur on low surge tank level

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Sys #	System	Category	KA Statement
026	Loss of Component Cooling Water	AA2 Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water:	The cause of possible CCW loss

K/A# AA2.02 **K/A Importance** 2.9 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02523 R11 pg 76, OS-21 SH1

Question Source: Bank 294035 **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 43.5 / 45.13

Objective: SYS-304

8. The plant is operating at 100% power all systems in normal alignment.
   - PRS RC2B Narrow Range Pressure Recorder is selected to RC Pressure Channel 1
   - RC Pressure Channel 1 slowly drifts to 2300 psig
   - All other RPS RCS pressure transmitters are 2155 psig and stable

   The indications of the RCS pressure control system are as follows:
   - The PZR PORV green light is LIT and red light is NOT LIT
   - The PZR spray valve green light is LIT; red and amber lights are NOT LIT
   - SCR heater bank 1 demand is ZERO

   Based on these indications, what is the current status of the RCS pressure control system?

A. PZR PORV, PZR spray valve, and SCR heater bank 1 are all functioning as designed.

B. The PZR spray valve and SCR heater bank 1 are functioning as designed; the PZR PORV is failed closed.

C. PZR PORV and PZR spray valve are functioning as designed; the SCR heater bank 1 is failed at ZERO demand.

D. The PZR PORV and SCR heater bank 1 are functioning as designed; the PZR spray valve is failed closed.

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor Pzr components and determine correct operation based on given parameters.

A. Incorrect. The PRZ spray valve should be open for the conditions in the stem. Heaters and PORV are functioning correctly.

B. Incorrect. The PRZ spray valve should be open and the PORV is not failed. Heaters are functioning correctly.

C. Incorrect. The PRZ spray valve should be open for the conditions in the stem. Heaters should be at zero demand. PORV is functioning correctly.

D. CORRECT:. IAW DB-OP-02513 Symptoms Step 2.3

Sys #	System	Category	KA Statement
027	Pressurizer Pressure Control System Malfunction	AA1 Ability to operate and / or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions:	Pzr heaters, sprays, and PORVs

K/A# AA1.01 **K/A Importance** 4.0 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02513, SYS104

Question Source: Bank 2011 NRC Exam Q8 **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45.5 / 45.6

Objective: SYS104

9. Plant conditions:
   - Reactor power = 100%
   - Both Main Feedwater pumps trip
   - The reactor failed to trip automatically.
   - The reactor trip pushbuttons were also unsuccessful shutting down the reactor.
   - DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE is entered

   Based on the above plant conditions, complete the following statement.

   In accordance with DB-OP-02000, the first action to de-energize the Control Rod Drive Mechanisms is to ____(1)____. CTRM actions to shutdown the reactor were not successful, local actions to shutdown the reactor are being directed. The CTRM operators will ____(2)____.

A. (1) Momentarily Deenergize E2 and F2, preferred because this method deenergizes the supply power to the CRDMs
   (2) Continue to Supplemental Actions, ensure actions for Specific Rules are performed.

B. (1) Momentarily Deenergize E2 and F2, preferred because this method deenergizes the supply power to the CRDMs
   (2) Stay in Immediate Actions, verify AFW flow to both SGs to ensure Primary to Secondary Heat Transfer is maintained.

C. (1) Rotate the Reactor Trip Test Key clockwise, preferred because this method will not de-energize other non-essential loads supplied by E2 AND F2
   (2) Continue to Supplemental Actions, ensure actions for Specific Rules are performed.

D. (1) Rotate the Reactor Trip Test Key clockwise, preferred because this method will not de-energize other non-essential loads supplied by E2 AND F2
   (2) Stay in Immediate Actions, verify AFW flow to both SGs to ensure Primary to Secondary Heat Transfer is maintained.

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the reasons for actions taken in the EOP for an ATWS.

A. Incorrect: 1st part is incorrect because the first alternate method for deenergizing the CRDMs is the Reactor Trip Test Key switch. This action is taken first to prevent losing loads (SPF Cooling, Ventilation). It is plausible because it previously was the preferred method and is a robust method for verifying the CRDMs are no longer energized. 2nd part is incorrect because the EOP mitigation strategies are based on the Reactor being shutdown. 3.3 RNO step 8 states to not continue in the procedure until the reactor is shutdown.

B. Incorrect; 1st part is incorrect but plausible (see A). 2nd part is correct. 3.3 RNO step 7 verifies that AFW is in service to ensure primary to secondary heat transfer.

C. Incorrect: 1st part is correct. Using this method will allow loads to remain in operation (SFP Cooling, Ventilation systems…). 2nd part is incorrect but plausible (see A).

D. CORRECT: 1st part is correct (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
029	Anticipated Transient Without Scram	EK3 Knowledge of the reasons for the following responses as the apply to the ATWS:	Actions contained in EOP for ATWS.

K/A# EK3.12	**K/A Importance**	4.4	**Exam Level**	RO	
References provided to Candidate	None		**Technical References:**	DBOPBASES, DB-OP-02000, DB-OP-01003	
Question Source:	New		**Level Of Difficulty: (1-5)**	3	
Question Cognitive Level:	Low		**10 CFR Part 55 Content:**	41.5 / 41.10 / 45.6 / 45.13	
Objective:	GOP302				

10. Initial Conditions:
    - OTSG Tube Rupture in progress
    - RCS temperature = 525°F
    - RCS pressure = 1235 psig
    - RCS cooldown in progress

    Current Conditions:
    - RCS Temperature = 500°F
    - RCS pressure = 1035 psig

    Based on the above change in plant conditions, complete the following statement:

    Subcooling Margin has ___(1)___ AND SG tube leakage rate has ___(2)___

A. (1) risen
   (2) risen

B. (1) risen
   (2) lowered

C. (1) lowered
   (2) risen

D. (1) lowered
   (2) lowered

Answer: B

Explanation/Justification: This question matches the KA by requiring knowledge of how the primary to secondary leak rate will change as RCS pressure lowers.

For the initial conditions: RCS pressure = 1235 psig (1250 psia/572ºF).
SCM =Tsat-Thot = 572ºF-525ºF = 47ºF., DP = 1250 psig – SG pressure (Psat for Tcold) = 1250 psig – 850 psig = 400 psid
For the final conditions: RCS pressure = 1035 psig (1050 psia/550ºF)
SCM = 550ºF-500ºF = 50ºF. DP = 1050 psig – 666 psig = 369 psid.

A. Incorrect - SCM has increased but the DP across the SG and therefore the leak rate has decreased. It is plausible because of many calculation errors possible with this problem.
B. CORRECT– SCM has increased but the leak rate has decreased.
C. Incorrect – SCM has increased but the leak rate has decreased. It is plausible because of many calculation errors possible with this problem.
D. Incorrect – SCM has increased but the leak rate has decreased. It is plausible because of many calculation errors possible with this problem.

Sys #	System	Category	KA Statement
038	Steam Generator Tube Rupture	EK1 Knowledge of the operational implications of the following concepts as they apply to the SGTR:	Leak rate vs. pressure drop

K/A# EK1.02 **K/A Importance** 3.2 **Exam Level** RO
References provided to Candidate None **Technical References:** Steam Tables, GOP 304
Question Source: Modified NRC DB 2005 Q#47 **Level Of Difficulty: (1-5)** 2
Question Cognitive Level: High **10 CFR Part 55 Content:** 41.8 / 41.10 / 45.3

Objective: GOP307

11. The plant is operating at 100% power.
The following occurs:

- A Main Steam Line Rupture occurs on #1 SG upstream of the MSIV
- The Reactor Trips
- SFRCS successfully isolates on SG #1 Low Pressure

Without operator action, which of the following will control SG # 2 Pressure?

A. TBVs – SG #2

B. AVVs – SG #2

C. TBVs and AVVs – SG #2

D. MSSVs – SG #2

Answer: D

Explanation/Justification: KA Match: Question matches the KA by requiring knowledge of the relationship between a steam line rupture and the MSIVs operation to isolate possible steam release flowpaths.

A. Incorrect, plausible since TBVs normally control SG Pressure post trip but SFRCS closes #2 SG MSIVs

B. Incorrect, plausible since AVVS normally control when the TBVs are not available with the MSIVs closed

C. Incorrect, plausible the control signal for Pressure control is fed to both TBVs and AVVs.

D. CORRECT: SFRCS Actuation prevents TBV and AVV operation

Sys #	System	Category	KA Statement
040	Steam Line Rupture: Excessive Heat Transfer	AK2 Knowledge of the interrelations between the Steam Line Rupture and the following:	Valves

K/A# AK2.01 **K/A Importance** 2.6 **Exam Level** RO

References provided to Candidate None **Technical References:** SD-012A, DB-OP-02000 Table 1 SFRCS

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45.7

Objective: SYS-523

12. Initial plant conditions:
    - Reactor power = 100%
    - MS107, AFPT Isolation Valve Breaker has tripped leaving the valve failed in the closed position

    Based on the above plant conditions, complete the following statements regarding TS 3.7.5, Emergency Feedwater?

    1. Currently, the LCO for TS 3.7.5____(1)____being met.
    2. The basis for the TS 3.7.5 requirement is the capability to remove decay heat for a loss of Main Feedwater ____(2)____ a loss of offsite power.

A. (1) is
(2) with

B. (1) is
(2) without

C. (1) is NOT
(2) with

D. (1) is NOT
(2) without

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the TS bases on meeting the LCO for the AFW system to mitigate a loss of Main Feedwater event.

A. Incorrect: 1st part is incorrect because the LCO is not being met because TS 3.7.5 Bases, each AFW pump must be operable with redundant steam supplies. It is plausible because even with a single failure you could still have 2 trains supplying flow. 2nd part is correct. TS 3.7.5 Bases states that the bases for the requirement is to remove decay heat for all events accompanied by a loss of offsite power and single failure.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because a loss of offsite power is assumed. It is plausible because with power available, the RCPs could still be operating which would contribute more heat for the AFW pumps to remove (it would be more conservative to assume that power were still available).

C. CORRECT: 1st part is correct. the LCO is not being met because TS 3.7.5 Bases, each AFW pump must be operable with redundant steam supplies. 2nd part is correct (see A).

D. Incorrect: 1st part is correct (see C). 2nd part is incorrect but plausible (see C).

Sys #	System	Category	KA Statement
054	Loss of Main Feedwater	Generic	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits

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K/A#	2.2.25	**K/A Importance**	3.2	**Exam Level**	RO
References provided to Candidate	None			**Technical References:**	TSB 3.7.5
Question Source:	New			**Level Of Difficulty: (1-5)**	3
Question Cognitive Level:	Low			**10 CFR Part 55 Content:**	41.5 / 41.7 / 43.2
Objective:	SYS 213				

13. The plant is operating at 100% power with all systems in normal alignment for this power level.

    A Tornado hits the Switchyard damaging all four offsite lines causing a loss of offsite power.

    Approximately 1 minute after the Reactor Trip, the following conditions are noted:

    - A Bus = zero volts
    - B Bus = zero volts
    - C1 Bus = zero volts
    - D1 Bus = zero volts
    - 1-3-H, D1 Bus Lockout
    - Breaker AD213, SBODG to D2 BUS TIE BREAKER tripped open due to a D2 Lockout.

    Which of the following strategies must be implemented to restore power to an essential 4160 volt bus?

A. Start EDG1 to restore power to Bus C1.

B. Start the SBODG to restore power to Bus C1.

C. Start the SBODG to restore power to Bus D1.

D. Start EDG 2 to restore power to Bus D1.

Answer:A

Explanation/Justification: K/A Match: This question matches the KA by requiring the ability to determine actions to restore power after a station blackout.

A. Correct – The SBODG is not available due to lockout on Bus D2 which causes AD213 being open. EDG2 is not available due to D1 being locked out. This leaves only EDG1 available to power Bus C1.
B. Incorrect – The SBODG is not available due to lockout on Bus D2 indicated by breaker AD213 being open. The SBODG flowpath requires D2 to supply to C1
C. Incorrect – The SBODG is not available due to lockout on Bus D2 indicated by breaker AD213 being open. The SBODG flowpath requires D2 to supply to D1
D. Incorrect - EDG2 is not available due to D1 being locked out.

Sys #	System	Category	KA Statement
055	Station Blackout	EA2 Ability to determine or interpret the following as they apply to a Station Blackout:	Actions necessary to restore power

K/A# EA2.03 **K/A Importance** 3.9 **Exam Level** RO
References provided to Candidate None **Technical References:** DB-OP-02000
Question Source: Bank 2013 NRC Exam Q13 **Level Of Difficulty: (1-5)** 3
Question Cognitive Level: High **10 CFR Part 55 Content:** 43.5 / 45.13
Objective: GOP I121

14. The plant was operating at 100% RTP with SFAS Channels 2, 3, and 4 sequencers operable. SFAS Channel 1 has been de-energized for maintenance.

    If an SFAS Level 2 trip occurred in conjunction with a loss of offsite power, which of the following describes the response of HPI Pump 1 to these conditions?

    HPI Pump 1 __________

A. starts as soon as AC 101 closes.

B. starts five seconds after AC 101 closes.

C. starts 25 seconds after AC 101 closes.

D. does NOT start automatically.

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor automatic operation of the HPI system after a loss of power.

A. Incorrect: Incorrect because the HPI system unblock time is 5 seconds after power is restored. It is plausible because SFAS Channel 1 is deenergized.

B. CORRECT: The HPI system unblock time is 5 seconds after power is restored. This is when HPI pump 1 will start.

C. Incorrect: Incorrect because the HPI system unblock time is 5 seconds after power is restored. It is plausible because 25 seconds is when the block is removed for all block signals.

D. Incorrect: Incorrect because the HPI system unblock time is 5 seconds after power is restored. It is plausible because not all equipment is automatically loaded back onto the bus.

Sys #	**System**	**Category**	**KA Statement**
056	Loss of Offsite Power	AA1 Ability to operate and / or monitor the following as they apply to the Loss of Offsite Power:	HPI system

K/A# AA1.11 **K/A Importance** 3.7 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS506

Question Source: Bank 2009 NRC Q33 **Level Of Difficulty: (1-5)**

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45.5 / 45.6

Objective:

15. Current Conditions:

- The Reactor has tripped due to a spurious Turbine Trip
- DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE, Section 4 Supplemental Actions are in progress

The following occurs:

- NNI X AC is determined to be lost
- The remaining NNI instrument buses are energized

With these plant conditions which of the following actions will the Reactor Operator be directed to perform per DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE, Section 4 Supplemental Actions and why?

A. Initiate and Isolate SFRCS to prevent potential overcooling

B. Operate PZR Heater and Spray manually to maintain RCS pressure.

C. Lock both Makeup Pump Suctions on the BWST due to loss of Makeup Tank Level indications

D. Monitor and control letdown flow due to MU6 failure to 50% open

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Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the reasons for actions taken in the EOP for a loss of NNI and due to action directed in the EOP, reason given from EOP bases document

A. Correct – DB-OP-02000 step 4.5 response not obtained directs initiate and isolate SFRCS. Bases and Deviation Document for DB-OP-02000 identifies a potential Main Feedwater induced overcooling precursor since NNI signals provide input to the Main Feedwater Control Valves.

B. Incorrect – plausible since action is required for loss of NNI X DC

C. Incorrect – plausible since this is the action and reason for loss of NNI – Y

D. Incorrect – plausible since this is direction and reason for loss of NNI – Y AC in abnormal procedure

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Sys #	System	Category	KA Statement
057	Loss of Vital AC Instrument Bus	AK3 Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus:	Actions contained in EOP for loss of vital ac electrical instrument bus

K/A# AK3.01 **K/A Importance** 4.1 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02000, DB-OP-02532, DBOPBASES

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.5 / 41.10 / 45.6 / 45.13

Objective: GOP-303

16. The plant is operating at 100% power.
    - Charger DBC2P is aligned to Battery 2P
    - Charger DBC2N is aligned to Battery 2N

    The following conditions are observed:
    - Annunciator 1-6-G DC BUS 2 TRBL alarms
    - CHARGER DBC2N indicator II 6284 reads zero amps
    - BATTERY 2N indicator II 6290 reads 100 amps DISCHARGE

    Which of the following will eventually occur if NO operator actions are taken?

A. Power Operated Relief Valve (PORV) RC2A won't open if required

B. Battery Charger DBC2PN automatically charges Battery 2N

C. Reactor Protection System Channel 3 de-energizes

D. Main Feed Pump 1 Emergency Bearing Oil Pump won't start if required

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Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the operational implications of a loss of DC power.

A. Correct – With no operator action, battery 2N will continue to discharge and voltage will continue to lower on 125V DC Panel D2N until the RC2A solenoid coils will no longer function. RC2A is a D2N load. See DB-OP-02540 R08 Loss of D2N and DBN Attachment 1 (page 13)

B. Incorrect – Swing charger must be manually aligned. Plausible because this is a procedure-driven manual action. See DB-OP-02001 R36 Window 1-6-G step 3.7.3

C. Incorrect – Rectifier YRF4 will continue to supply 120V AC panel Y4 via Inverter YV4. See UFSAR R30 8.3.2.1.5 (page 8.3-46). Plausible because Y4 would be supplied from battery 2N during a concurrent loss of AC input. RPS Channel 3 supplied from Y4.

D. Incorrect – MFP 1 EBOP is DC MCC 1 load. Plausible because for a loss of either DBC1P or DBC1N, it could be correct.

Sys #	System	Category	KA Statement
058	Loss of DC Power	AK1 Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power:	Battery charger equipment and instrumentation

K/A# AK1.01 **K/A Importance** 2.8 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02540 R8 Attachment 1, Alarm 1-6-G,SD-007

Question Source: Bank NRC DB 2015 Q#13 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.8 / 41.10 / 45.3

Objective: GOP-137

17. Current Conditions:

- 100%Power
- Service Water Pump 1 & 2 in service
- Service Water Pump 3 is currently tagged out

The following occurs:

- Service Water Pump #1 trips and will not restart

Which plant equipment will require Technical Specification(s) to be entered immediately?

A. EDG

B. CCW

C. CACS

D. AFW

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge that the loss of the SWS train requires entry into the EDG TS which has a 1 hour action.

A. CORRECT: Tech Spec 3.7.8 SWS Loops has a NOTE that requires entry of LCO 3.8.1 for EDGs

B. Incorrect: because a CCW train is not required to be declared inoperable. Plausible because CCW is cooled by service water.

C. Incorrect: because the Containment Air Coolers are not required to be declared inoperable. It is plausible because Service Water is the cooling source.

D. Incorrect: Incorrect because the AFW pump is not required to be declared inoperable. Plausible since safety grade suction source is provided by Service Water

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Sys #	System	Category	KA Statement
062	Loss of Nuclear Service Water	Generic	Knowledge of less than or equal to one hour Technical Specification action statements for systems

K/A# 2.2.39 **K/A Importance** 3.9 **Exam Level** RO

References provided to Candidate None **Technical References:** TS 3.7.8, 3.81-

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 41.10 / 43.2 / 45.13

Objective: GOP-437

18. Current conditions:
    - Reactor power = 100%
    - Grid voltage is 323 KV
    - The SCC notifies the Control Room that Degraded Grid conditions exist
    - DB-OP-02546, Degraded Grid is entered

    1. The Reactor Coolant pumps will be operating with a ____(1)____ current flow.
    2. Currently, offsite power sources are considered____(2)____.

A. (1) lower
(2) INOPERABLE

B. (1) lower
(2) OPERABLE

C. (1) higher
(2) INOPERABLE

D. (1) higher
(2) OPERABLE

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the relationship between degraded grid conditions (low voltage) and loads (RCPs).

A. Incorrect: 1st part is incorrect because with a constant load, power stays the same (P=VI) so if voltage drops, current has to increase. It is plausible because the relationship between power, voltage and current is commonly misunderstood. 2nd part is correct. IAW DB-OP-02546, IAAT SCC or PJM notifies the CR that degraded grid conditions exist, THEN declare off-site sources inoperable. The lower limit for an Operable offsite line is >339.2KV.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because when notified that degraded conditions exist, offsite sources are considered inoperable. It is plausible because 323 KV value is close to the nominal 345 KV rating of the DB Switchyard.

C. CORRECT. 1st part is correct. As voltage lowers, current has to increase when power stays the same. 2nd part is correct (see A).

D. Incorrect: 1st part is correct (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
077	Generator Voltage and Electric Grid Disturbances	AK2 Knowledge of the interrelations between Generator Voltage and Electric Grid Disturbances and the following:	Pumps

K/A# AK2.05 **K/A Importance** 3.1 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02546

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.4/41.5/41.7/41/10/45.8

Objective: GOP 146

19. Plant conditions:
- Reactor power = 50%
- Generator Output is 420 MWe
- (15-1-F) HP COND PRESS HI alarms
- (15-2-F) LP COND PRESS HI alarms
- Mechanical Hogger has started and stabilized Condenser pressure at 5.7 in. HgA
- DB-OP-02518, High Condenser Pressure is entered

Based on the above plant conditions, which ONE of the following is the action directed by DB-OP-02518?

A. Reduce reactor power using DB-OP-06902, Power Operations to restore condenser pressure.

B. Reduce reactor power using DB-OP-02504, Rapid Shutdown to restore condenser pressure.

C. Trip the reactor and carry out the actions of DB-OP-02000, RPS, SFAS, SFRCS Trip, or SG Tube Rupture.

D. Trip the turbine and carry out the actions of DB-OP-02500, Turbine Trip.

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of response procedures for a loss of condenser vacuum.

A. Incorrect because you are directed to reduce power in an effort to restore vacuum using rapid power reduction. It is plausible because vacuum has stabilized so you could assume that power could be reduced in a more controlled manner.

B. CORRECT. DB-OP-02518 directs you to reduce power to maintain condenser pressure less than or equal to 5.0 inches HgA.

C. Incorrect because you do not meet the criteria to trip the reactor. It is plausible because if condenser pressure were > 7.5 inches HgA, it would be correct.

D. Incorrect because you do not meet the criteria to trip the turbine. It is plausible because if vacuum stayed the same and in reducing power, MWe lowered to < 280 MWe (assuming that power would have lowered to < 40% in the process) it could be correct.

Sys #	System	Category	KA Statement
051	Loss of Condenser Vacuum	Generic	Knowledge of annunciator alarms, indications, or response procedures.

K/A# 2.4.31 **K/A Importance** 4.2 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02518

Question Source: Modified 2005 NRC Exam Q57 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.13

Objective: GOP118

20. Plant conditions”
    - An electrical fire occurs in the ceiling area of the control room

    Based on the above plant conditions, complete the following statements.

1. Automatic Control Room Ventilation system shutdown will have occurred if____(1)____ temperature rises to 140°F.
2. When Control Room Ventilation system shuts down, the Supply Fan and Return Air Fan isolation dampers (suction and discharge) will____(2)____.

A. (1) CTRM Return Air Fan
(2) remain open

B. (1) CTRM Return Air Fan
(2) also close

C. (1) CTRM Supply Fan
(2) remain open

D. (1) CTRM Supply Fan
(2) also close

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor CR ventilation system components for proper operation in the event of a fire in the CR.

A. Incorrect: 1st part is correct. If the fan suction temperature reaches 135°F, the automatic shutdown will occur. 2nd part is incorrect because the fan isolation dampers (suction and discharge) close. It is plausible because the SFAS dampers will remain open for this shutdown.

B. CORRECT: 1st part is correct (see A). 2nd part is correct. The fan isolation dampers will close for this shutdown.

C. Incorrect: 1st part is incorrect because if supply fan discharge is 140°F, the isolation will not occur. It is plausible because if temperature reaches 165°F, it would be correct. 2nd part is incorrect but plausible (see A).

D. Incorrect: 1st part is incorrect but plausible (see C) 2nd part is correct (see B).

Sys #	System	Category	KA Statement
067	Plant Fire On Site	AA1 Ability to operate and/or monitor the following as they apply to Plant Fire on Site:	Plant and control room ventilation systems

K/A# AA1.05 **K/A Importance** 3.0 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS 606, OS32a

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 45.5 / 45.6

Objective: SYS606

21. DB-OP-02508, Control Room Evacuation, has been implemented. Supplementary Actions have been carried out to completion and all equipment has operated as designed.

Which of the following indicate how Steam Generator Pressure is being maintained?

A. Main Steam Safety Relief Valves controlling at setpoint

B. Atmospheric Vent Valves controlled by local operator

C. Atmospheric Vent Valves controlling in automatic

D. Turbine Bypass Valves controlling in automatic

Answer: B

Explanation/Justification: KA Match: KA is met by requiring knowledge of positioners (handwheel) used during a control room evacuation.

A. Incorrect – plausible since this is how pressure would be controlled until actions are taken

B. CORRECT – DB-OP-02508, Control Room Evacuation directs SFRC initiate and isolate prior to exiting the CTRM. Supplementary actions will direct local manual control of the AVVs

C. Incorrect – plausible since this is how pressure would be controlled normally following CTRM actions after an SFRCS actuation

D. Incorrect – plausible since this is how pressure would be controlled if SFRCS was not actuated

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Sys #	System	Category	KA Statement
068	Control Room Evacuation	AK2 Knowledge of the interrelations between the Control Room Evacuation and the following:	Controllers and positioners

K/A# AK2.03 **K/A Importance** 2.9 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02508, Att 8 page 2 of 2

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 45.7

Objective: GOP-108

22. The plant experienced a Loss of Coolant Accident (LOCA) inside Containment.

A 10 gpm non-isolable leak from the Containment Sump to the Auxiliary Building is discovered.

Containment pressure is 35 psia.

What will be the approximate leak rate when Containment pressure lowers to 20 psia?

A. 8.4 gpm

B. 7.6 gpm

C. 5.0 gpm

D. 2.5 gpm

Answer: C

Explanation/Justification: KA Match: Question matches the KA by requiring knowledge of the effect of containment pressure on containment leak rate.

A. Incorrect – see explanation of correct answer. For this distracter 50 and 35 were used for the dP values. F_2 = (10 x 5.916) / 7.071= 8.37. Plausible for gauge to absolute pressure relationship inversion.

B. Incorrect – This distracter based on using 35 and 20 for dP values. F_2 = (10 x 4.472) / 5.916 = 7.56. Plausible for candidate using values given as gauge pressures (containment pressure – zero).

C. Correct – dP for calculation is containment pressure – atmospheric pressure. dP_1 = 35 psia – 15 psia = 20 psi; dP_2 = 20 psia – 15 psia = 5 psi. Relationship is $(F_1 / \sqrt{dP_1}) = (F_2 / \sqrt{dP_2})$. $F_2 = (F_1 \times \sqrt{dP_2}) / \sqrt{dP_1}$. F_2 = (10 x 2.236) / 4.472 = 5.0

D. Incorrect – see explanation of correct answer. This distracter based on linear ratio of dPs (20 and 5) to leak rates. F_2 = (10 x 5) / 20 = 2.5. Plausible for candidate forgetting the square root in relationship.

Sys #	System	Category	KA Statement
069	Loss of Containment Integrity	AK1 Knowledge of the operational implications of the following concepts as they apply to Loss of Containment Integrity:	Effect of pressure on leak rate

K/A# AK1.01 **K/A Importance** 2.6 **Exam Level** RO

References provided to Candidate None **Technical References:** Thermodynamics

Question Source: Bank 2015 NRC Exam Q22 **Level Of Difficulty: (1-5)**

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.8 / 41.10 / 45.3

Objective: GOP-311

23. Initial conditions:
    - 100% power
    - Annunciator 2-1-A, LETDOWN RADIATION HI alarms

    Current Conditions:
    - Steam Generator tube rupture (SGTR) has developed
    - Rapid shutdown is in progress in accordance with DB-OP-02000
    - Steam Jet Air Ejector concentration of Xe-133 exceeds 6.5E-3 uCi/cc
    - Pressurizer level is 190 inches

    Per DB-OP-02000, Section 8 SGTR which of the following is correct?

A. Place the Vacuum Vent Filter in service to minimize off-site releases, per DB-OP-02531, Steam Generator Tube Leak.

B. Place the Mechanical Hogger in service and shutdown the Steam Jet Air Ejectors to minimize off-site releases per DB-OP-06231, Vacuum System.

C. Place a second Purification Demineralizer in service and increase Letdown flow to reduce Reactor Coolant System Activity per DB-OP-06006, Makeup and Purification System.

D. Place the Letdown filter in service to reduce Reactor Coolant System Activity per DB-OP-06006, Makeup and Purification System.

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of actions contained in the EOP for high coolant activity.

A. Correct – DB-OP-02000 section 8 for SGTR directs performance of DB-OP-02531, Attachment 4, Control of Secondary Contamination and Off Site Release for Steam Generator tube leaks

B. Incorrect – Plausible since the air ejector concentration is high but the Mechanical Hogger still discharges to the station vent

C. Incorrect – Plausible since this would capture RCS activity but Letdown is isolated for the SGTR

D. Incorrect – Plausible since this would capture RCS activity but Letdown is isolated for the SGTR

Sys #	System	Category	KA Statement
076	High Reactor Coolant Activity	AK3 Knowledge of the reasons for the following responses as they apply to the High Reactor Coolant Activity:	Actions contained in EOP for high reactor coolant activity

K/A# AK3.06 **K/A Importance** 3.2 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02000, step 8.8, DB-OP-02531 Att 4 pg1

Question Source: Modified 2005 NRC Exam Q61 **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5/41.10/45.6/45.13

Objective: GOP-131

24. The plant is operating at 100% power in a normal system alignment.

The following plant conditions are noted:

- Annunciator 14-2-D, ICS/NNI 118V AC PWR TRBL alarms
- Loss of blue light on all SASSed instrument's selector switches
- SCR Bank, RC PRESSURE CONTROL, Hand Auto Station Lights are Both ON.
- RCP Seal Injection total flow indication is lost
- A significant plant transient is in progress.

Based on the above plant conditions, which ONE of the following states:

(1) Which NNI Power Supply has been lost?

(2) ALL immediate actions required to respond to this condition?

A. (1) NNI X AC Power
(2) Trip the Reactor, Go To DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture

B. (1) NNI X AC Power
(2) Trip the Reactor, Initiate and Isolate SFRCS, Go To DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture

C. (1) NNI Y AC Power
(2) Trip the Reactor, Go To DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture

D. (1) NNI Y AC Power
(2) Trip the Reactor, Initiate and Isolate SFRCS, Go To DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture

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Answer: B

Explanation/Justification: KA Match: KA is matched by requiring the ability to determine procedure requirements based on plant conditions due to a loss of NNI-X

A. Incorrect: Plausible because This immediate action for a loss of NNI X AC Power with a significant Transient in Progress, but does not include required immediate action to initiate and isolate SFRCS.

B. CORRECT: This is the correct immediate action for a loss of NNI X AC Power with a significant Transient in Progress.

C. Incorrect: Plausible because this is immediate action for a loss of NNI X AC Power with a significant Transient in Progress, but does not include required immediate action to initiate and isolate SFRCS. In this case, NNI Y AC is lost, not NNI X AC.

D. Incorrect: Plausible because The immediate action for a loss of NNI X AC Power with a significant Transient in Progress. In this case, NNI Y AC is lost, not NNI X AC

Sys #	System	Category	KA Statement
BW A02	Loss of NNI-X	AA2 Ability to determine and interpret the following as they apply to (NNI-X):	Adherence to appropriate procedures and operation within the limitations in the facility*s license and amendments

K/A# AA2.2 **K/A Importance** 4.0 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02532,

Question Source: Bank 2011 NRC Exam Q58 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 43.5 / 45/13

Objective: GOP-132

25. The plant is operating at 100% power.
    - Auxiliary Feed Water (AFW) Pump 1 is out of service.

    The following alarms actuate:
    - 11-1-E CLNG TWR BASIN LVL LO
    - 15-1-F HP CNDSR PRESS HI annunciator
    - 15-2-F LP CNDSR PRESS HI annunciator
    - 15-3-F CNDSR PIT FLOODED annunciator

    After the control room operators take the prescribed actions to stabilize the plant, which of the following is correct?

    1. Feed Water is being supplied by __(1)__.
    2. Equipment issues due to local water level are being addressed per __(2)__.

A. (1) AFW Pump 2 only
(2) DB-OP-06272 Station Drainage and Discharge System

B. (1) AFW Pump 2 only
(2) DB-OP-02517 Circulating Water System Malfunctions

C. (1) AFW Pump 2 and the Motor Driven Feed Pump
(2) DB-OP-06272 Station Drainage and Discharge System

D. (1) AFW Pump 2 and the Motor Driven Feed Pump
(2) DB-OP-02517 Circulating Water System Malfunctions

Answer: B.

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of how flooding impacts the operation/function of safety systems (AFW)

A. Incorrect: 1st part is correct. Flooding is in progress in the Condenser Pit (Annunciator) so DB-OP-02517 Attachment 4.0 directs securing the MDFP. 2nd part is incorrect because DB-OP-02517 directs actions to address local equipment issues. It is plausible because DB-OP-06272 is provides guidance for normal station drains operation.

B. CORRECT: 1st part is correct (see A). 2nd part is correct. Leak isolation and flooding issues are addressed using DB-OP-02517 Attachment 3

C. Incorrect: 1st part is incorrect because DB-OP-02517 Attachment 4.0 directs securing the MDFP. It is plausible because if the Condenser Pit Flooded annunciator was not lit, it could be correct. 2nd part is incorrect but plausible (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
BW A07	Flooding	AK1 Knowledge of the operational implications of the following concepts as they apply to (Flooding):	Components, capacity, and function of emergency systems

K/A# AK1.1 **K/A Importance** 3.5 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02517

Question Source: Bank 2015 NRC Exam Q25 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.8 / 41.10 / 45.3

Objective: GOP117

26. Which of the following is the basis for TRIPPING all Reactor Coolant Pumps (RCPs) within 2 minutes due to lack of adequate subcooling margin?

A. To prevent two phase flow through the RCPs

B. To reduce the heat input to the RCS from the operating pumps

C. To keep a high void fraction from uncovering the core if pumps were stopped later

D. To increase High Pressure Injection flow by lowering RCS cold leg pressure

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Answer: C

Explanation/Justification: KA match based on knowledge of operation of primary coolant system in relation to inadequate subcooling margin

A. Incorrect. Plausible because two phase flow would occur with a lack of adequate subcooling margin (SCM) and two phase flow would damage the RCPs

B. Incorrect. Plausible because stopping the RCP would reduce heat input into the RCS and help to restore SCM

C. Correct. The RCPs are tripped immediately upon loss of adequate SCM to prevent possible core damage if a subsequent trip of the RCPs occurred during certain size small break LOCAs. If the RCS void fraction is greater than about 70 percent when RCPs are tripped, the peak clad temperature can exceed the maximum temperature allowed by 10CFR50.46. A manual trip of the RCPs before the RCS void fraction reaches 70 percent prevents this possibility.

D. Incorrect. Plausible because stopping the RCP would lower the RCP discharge pressure where HPI injects

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Sys #	System	Category	KA Statement
BW E03	Inadequate Subcooling Margin	EK2 Knowledge of the interrelations between (Inadequate Subcooling Margin) and the following:	Facility*s heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility

K/A# EK2.2 **K/A Importance** 4.3 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02000. Critical Task Bases Document

Question Source: Bank NRC DB 2011 Q#1 **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 45.7

Objective: GOP-304

27. Plant conditions are as follows:

- DB-OP-02000, RPS, SFAS, SFRCS Trip, or SG Tube Rupture, Section 10.0, Large LOCA Cooldown is in progress
- You are directed to perform Attachment 12, Establishing Long Term Boron Dilution

Long Term Boron Dilution is performed to prevent____(1)____ and must be initiated within a MAXIMUM of____(2)___ after the event began.

A. (1) boron from precipitating in core flow channels
(2) 240 minutes

B. (1) boron from precipitating in core flow channels
(2) 364 minutes

C. (1) excessive degradation of containment equipment
(2) 240 minutes

D. (1) excessive degradation of containment equipment
(2) 364 minutes

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the reasons for taking specific actions during a LOCA Cooldown dealing with the chemistry related aspects of the event.

A. CORRECT: 1st part is correct. The reason for diluting is that boron reaches its saturation limit and begins to precipitate (come out of solution) in high temperature area (fuel) and block flow channels. 2nd part is correct. This is a Time Critical Action requirement of 4 hour (240 minutes).

B. Incorrect: 1st part is correct (see A). 2nd part is incorrect because the TCA requirement is 4 hours. It I plausible because 364 minutes is the TCA to initiate DHR during a SGTR event.

C. Incorrect: 1st part is incorrect because the reason for long term boron dilution is to minimize boron precipitation in the coolant channels. It is plausible because Boron is an acid and will have a deterioration effect on containment equipment. 2nd part is correct (see A).

D. Incorrect but plausible (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
BW E08	LOCA Cooldown—Depressurization	EK3 Knowledge of the reasons for the following responses as they apply to (LOCA Cooldown):	Facility operating characteristics during transient conditions, including coolant chemistry and effects of temperature, pressure, and reactivity changes and operating limitations and the reasons for these operating characteristics.

K/A# EK3.1 **K/A Importance** 3.0 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02000, Bases and Deviation Document

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.5/41.10/45.6/45.13

Objective: GOP309

28. Initial conditions:
    - The plant is at 100% power.
    - Makeup Pump 1 is out of service for maintenance.

    The following occurs:
    - Reactor trip
    - D1 lockout

    Two minutes later, the following conditions exist:
    - CCW Pump 1 fails to start
    - Annunciator 6-6-C, SEAL INJ TOTAL FLOW, is in alarm
    - Annunciator 6-5-B, SEAL CCW FLOW LOW, is in alarm
    - Zero Makeup flow is indicated
    - PZR level is lowering
    - Seal Return temperatures are 180°F
    - DB-OP-02515, Reactor Coolant Pump and Motor Abnormal Operation is referenced

    Based on the above plant conditions, which of the following actions is directed by DB-OP-02515, RCP Pump and Motor Abnormal?

A. Trip all four Reactor Coolant Pumps

B. Close the Seal Return Isolation Valves: MU59A, MU59B, MU59C, and MU59D

C. Open MU32, Pressurizer Level Control, in HAND

D. Open MU19, RCP Seal Injection Flow Control, in HAND

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the actions for RCP trip when a loss of cooling water and seal injection occurs.

A. CORRECT: DB-OP-02515, Section 4.4 Supplementary Action requires tripping all four RCPs if CCW and Seal Injection to all RCPs is confirmed

B. Incorrect: These valves are not required to be closed. It is plausible because if Seal Return Temperatures were to rise above 200ºF; it would be correct.

C. Incorrect: This is not directed with no MU pumps operating. It is plausible because pressurizer level is lowering. .

D. Incorrect – This is not directed.. It is plausible because this valve will be manipulated; however it will be closed.

Sys #	System	Category	KA Statement
003	Reactor Coolant Pump	A4 Ability to manually operate and/or monitor in the control room:	RCP cooling water supplies

K/A# A4.08 **K/A Importance** 3.2 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02515

Question Source: Bank NRC DB 2008 Q#1 **Level Of Difficulty: (1-5)**

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45/5 to 45.8

Objective: GOP-115

29. The plant has been operating at 100% RTP for 7 months. The following conditions were noted:

Annunciator alarms:
- 2-2-B, MU TK LVL HI
- 4-2-E, PZR LVL LO

Control Room Indications:
- MU Pump 1 Red light ON
- MU Pump 1 indicates 43 amps and STEADY
- FI MU34, TRAIN 2 MAKEUP FLOW indicates 15 gpm
- FI 6435, TRAIN 1 MAKEUP FLOW, indicates 0 gpm

Which one of the following conditions would cause these symptoms to be observed?

A. MU Pump #1 sheared shaft

B. Leak on the Discharge of Makeup Pump 1

C. Leak DOWNSTREAM of MU32

D. Failure CLOSED of PZR LEVEL CONTROL, MU32

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the effect that a failed Pzr Level Control Valve will have on plant indications.

A. Incorrect: Incorrect because MU Pump amps are too high and Train 2 Makeup flow indicates 15 gpm. It is plausible because a sheared shaft would still have the MU Pump red light on with Pzr Level LO.

B. Incorrect: Incorrect because there would not be MU TK LVL HI for this leak. It is plausible because most of the other indications would be correct.

C. Incorrect: Incorrect because there would not be MU TK LVL HI for this leak. It is plausible because most of the other indications would be correct.

D. CORRECT: Failure of MU32 in the closed position would give the indications provided

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Sys #	System	Category	KA Statement
004	Chemical and Volume Control	K3 Knowledge of the effect that a loss or malfunction of the CVCS will have on the following:	PZR LCS

K/A# K3.05 **K/A Importance** 3.8 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS106

Question Source: Bank 2009 NRC Exam Q6 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45.6

Objective: SYS106

30. Complete the following statement regarding isolation of the Letdown Coolers.

____(1)____ will automatically close if ____(2)____ gets too high to protect Purification Demineralizer resin from damage.

A. (1) MU3, Letdown Stop
(2) Temperature in the Delay Coil

B. (1) MU3, Letdown Stop
(2) Temperature downstream of the Orifice Block Valve

C. (1) MU2B, Reactor Coolant Letdown Cooler Inlet Isolation valve
(2) Temperature in the Delay Coil

D. (1) MU2B, Reactor Coolant Letdown Cooler Inlet Isolation valve
(2) Temperature downstream of the Orifice Block Valve

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the purpose/function of letdown isolation valves.

A. Incorrect: 1st part is incorrect because the MU3 auto closure does not occur on high temperature in the letdown line. It is plausible because it is a containment isolation valve and will close on SFAS. 2nd part is correct. The temperature based isolation is measured in the delay coils.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because the temperature measurement is taken in the delay coils. It is plausible because temperature is measured downstream of the Orifice Block Valve: It does not input to any automatic function.

C. CORRECT: 1st part is correct. MU2B closes if temperature in the delay coil reaches 135ºF. 2nd part is correct. The reason for this function at 135ºF is to protect the demineralizer resin.

D. Incorrect: 1st part is correct (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
004	Chemical and Volume Control	Generic	Knowledge of the purpose and function of major system components and controls

K/A# 2.1.28 **K/A Importance** 4.1 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS106, OS02S

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7

Objective: SYS106

31. The following plant conditions exist:
    - A SBLOCA has occurred
    - DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG Tube Rupture is in progress
    - SCM is 30 degrees.
    - Attachment 8, Place HPI/LPI/MU in Service, is complete with DH63 and DH64 Open.

    Specific Rule 3 limits makeup flow to ________ per pump.

A. 250 gpm

B. 275 gpm

C. 400 gpm

D. 475 gpm

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of how the RHR system interfaces with safeguards (HPI) pumps.

A. Incorrect because IAW Specific Rule 3, when MU is piggybacked from LPI, limit MU flow to 275 gpm per pump. It is plausible because when not piggybacked, it could be correct.

B. CORRECT: Specific Rule 3 limits makeup flow to 275 gpm per pump when in piggybacked from LPI.

C. Incorrect because IAW Specific Rule 3, when MU is piggybacked from LPI, limit MU flow to 275 gpm per pump. It is plausible because 400 gpm is the limit through the HPI Test Flow line when performing HPI pump testing.

D. Incorrect because IAW Specific Rule 3, when MU is piggybacked from LPI, limit MU flow to 275 gpm per pump. It is plausible because this is the line limit from DB-OP-06011, High Pressure Injection System

Sys #	System	Category	KA Statement
005	Residual Heat Removal System	K1 Knowledge of the physical connections and/or cause-effect relationships between the RHRS and the following systems:	Safeguard pumps

K/A# K1.12 **K/A Importance** 3.1 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02000

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.2 to 41.9/45.7 to 45.8

Objective: SYS306

32. In the event of a LOCA, CS 1531, Containment Spray Automatic Control Valve 2 will open when SFAS ____(1)____actuates unless____(2)____is de-energized.

A. (1) Level 2
(2) E11C

B. (1) Level 2
(2) F11B

C. (1) Level 4
(2) E11C

D. (1) Level 4
(2) F11B

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the bus power supplies for ESFAS operated valves (containment spray valves).

A. Incorrect: 1st part is correct. CS Pump discharge valves open on SFAS Level 2. 2nd part is incorrect because CS1531 is powered from F11B. It is plausible because if it were CS 1530, it would be correct.

B. CORRECT: 1st part is correct (see A). 2nd part is correct. CS1531 is powered form F11B.

C. Incorrect: 1st part is incorrect because the CS Pump discharge valve opens on SFAS Level 2 actuation. It is plausible because the CS Pump starts on SFAS Level 4 actuation. 2nd part is incorrect but plausible (see A).

D. Incorrect – 1st part is .incorrect but plausible (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
006	Emergency Core Cooling	K2 Knowledge of bus power supplies to the following:	ESFAS-operated valves

K/A# K2.04 **K/A Importance** 3.6 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS306

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7

Objective: SYS306

33. Plant conditions:
    - The Quench Tank Recirc pump is operating due to high temperature in the tank

During recirculation, the cooled water coming into the Quench Tank is ____(1)____and when cooling is complete, the Recirc Pump will____(2)____.

A. (1) sprayed in the vapor space
   (2) automatically secure

B. (1) sprayed in the vapor space
   (2) have to be secured manually

C. (1) dispersed below the water line
   (2) automatically secure

D. (1) dispersed below the water line
   (2) have to be secured manually

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of design and interlocks associated with QT cooling.

A. Incorrect: 1st part is correct. Spraying in the vapor space helps to condense any steam that is present. 2nd part is incorrect because there is no auto stop of the recirc pump. It is plausible because it does start automatically.

B. CORRECT: 1st part is correct (see A). 2nd part is correct. QT recirc has to be secured manually.

C. Incorrect: 1st part is incorrect because the cooled water is sprayed into the QT vapor space. It is plausible because the PORV and Safety Valves enter the QT and discharge under the water line through a sparger. 2nd part is incorrect but plausible (see A).

D. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
007	Pressurizer Relief/Quench Tank	K4 Knowledge of PRTS design feature(s) and/or interlock(s) which provide for the following:	Quench tank cooling

K/A# K4.01 **K/A Importance** 2.6 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS104

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7

Objective: SYS104

34. With a leak into the CCW system from the letdown cooler, if pressure in Letdown Cooler 1 shell reaches 140 psig, CC1409, Letdown Cooler Inlet Valve will be____(1)____ and CC3953, CCW Containment Relief Valve will be____(2)____.

A. (1) Closed
(2) Closed

B. (1) Closed
(2) Open

C. (1) Open
(2) Closed

D. (1) Open
(2) Open

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to predict component positions (parameters) based on system parameters to prevent exceeding CCW pressure limits.

A. CORRECT: 1st part is correct. The letdown cooler inlet valves (CC1409 and CC 1410) will close if shell pressure reaches 135 psig. 2nd part is correct. The relief valve setpoint is 150 psig so it will be closed.

B. Incorrect: 1st part is correct (see A). 2nd part is incorrect because the relief valve setpoint is 150 psig. It is plausible because the interlock with the inlet valves is set at 135 psig.

C. Incorrect: 1st part is incorrect because they will receive a close signal at 135 psig. It is plausible because the RCP Seal Return interlock is set at 150 psig CCW pressure. 2nd part is correct (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is incorrect but plausible (see B). Keeping in mind that one setpoint is 135 psig and one is 150 psig, it is easy to get the setpoints mixed up such that the relief is lifting and the isolation has not occurred yet.

Sys #	System	Category	KA Statement
008	Component Cooling Water	A1 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCWS controls including:	CCW pressure

K/A# A1.03 **K/A Importance** 2.7 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS304

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 45.5

Objective: SYS304

35. Initial plant conditions:
    - Reactor power = 100%
    - A Main Feedwater Pump trips

    Current plant conditions:
    - Plant runback complete
    - RCS pressure = 2145 psig (This is the lowest that is has been during the transient)
    - Pzr liquid temperature = 647°F

    Based on CURRENT plant conditions, complete the following statements.

    1. Pressurizer Non-Essential Bank #3 Heaters are ____(1)____.

    2. The condition of the Pressurizer fluid is ______(2)____.

A. (1) ON
(2) saturated

B. (1) ON
(2) subcooled

C. (1) OFF
(2) saturated

D. (1) OFF
(2) subcooled

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of how the Pzr pressure control system works to main/restore Pzr pressure during a transient and in the process, determine the condition of the Pzr fluid.

A. Incorrect: 1st part is incorrect because Non-Essential Bank #3 heaters will not energize until pressure has lowered to 2120 psig. It is plausible because if pressure had lowered to less than 2135 psig Non-Essential Heater Bank #2 would be ON.. 2nd part is correct. Tsat for 2160 psia (2145 psig) is ~ 647°F.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because the liquid in the Pzr is at saturation temperature for 2145 psig. It is plausible because the plant transient will cause an insurge in the Pzr which will take some time to stabilize after the transient.

C. CORRECT: 1st part is correct. Non-Essential Bank #3 heaters will not energize until pressure has lowered to 2120 psig. 2nd part is correct (see A).

D. Incorrect: 1st part is correct (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
010	Pressurizer Pressure Control	K5 Knowledge of the operational implications of the following concepts as the apply to the PZR PCS:	Determination of condition of fluid in PZR, using steam tables

K/A# K5.01 **K/A Importance** 3.5 **Exam Level** RO

References provided to Candidate None **Technical References:** Steam Tables, SYS104

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 45.7

Objective: SYS104

36. Plant conditions:
    - Reactor power = 100%
    - RPS SHUTDOWN BYPASS INITIATED annunciator alarms.
    - RPS 1 Channel has failed such that the SD Bypass function is in effect.

    The above failure will have the following impact:

A. RPS Channel 1 will not trip due to being in Shutdown Bypass

B. RPS Channel 1 will trip due to High Flux

C. RPS Channel 1 will trip due to Low RCS Pressure

D. RPS Channel 1 will trip due to High RCS Pressure

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the effect that a malfunction of the RPS Shutdown Bypass circuit will have on RPS.

A. Incorrect: Plausible because Manual Bypass will prevent all RPS Parameters from causing an RPS channel to trip when in effect.

B. Incorrect: Plausible because the High Flux Low Setpoint is </= to 5% RTP, which would result in an RPS Hi Flux trip if the plant is at 100% RTP. Incorrect because the Hi Flux trip setpoint has to be adjusted by I&C to meet the shutdown bypass operations requirement.

C. Incorrect: Plausible because the RPS Low Pressure trip is required to be >/= to 1900 psig, and the Shutdown Bypass High Pressure trip is required to be </= to 1820 psig.

D. CORRECT: The RPS Shutdown Bypass Press Hi Bistable is inserted when SD Bypass is in effect. Normal RCS Pressure is 2155 psig, which is greater than the SD Bypass Trip setpoint of 1820 psig.

Sys #	System	Category	KA Statement
012	Reactor Protection	K6 Knowledge of the effect of a loss or malfunction of the following will have on the RPS:	Bypass-block circuits

K/A# K6.04 **K/A Importance** 3.3 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS504, SD044

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45.7

Objective: SYS504

37. The Reactor is operating at 100% power
As a result of a malfunction in SFAS Channel 1, RCS Pressure, SFAS Channel 1 has been tripped on Low and Low-Low RCS Pressure.

Subsequently, SFAS Channel 2 RCS Pressure transmitter fails to 0 psig.

Does SFAS Actuate? ______(1)____

Which procedure is the applicable response for this event? _____(2)____

A. (1) No, Only 5-1-C, SFAS RC PRESS LO TRIP, occurs
(2) DB-OP-02005, Primary Instrumentation Alarm Panel 5 Annunciators

B. (1) No, Only a single SFAS Channel Trips
(2) DB-OP-06405, SFAS System Operating Procedure

C. (1) Yes, SFAS Level 2 Actuation occurs
(2) DB-OP-06910, Trip Recovery

D. (1) Yes, SFAS Level 2 and 3 Actuation occurs
(2) DB-OP-02000, RPS, SFAS, SFRCS Trip, or SG Tube Rupture

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to determine the malfunction (Inadvertent ESFAS actuation) based on plant parameters and then used procedures to mitigate the consequences of the malfunction.

A. Incorrect: 1st part is incorrect, plausible since parameters are not channel dependent but SFRCS actuation occurs on channel 1 and 3 or 2 and 4. 2nd part is incorrect, but plausible due to the correct procedure for the specific annunciator provided in part 1.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect. It is plausible because the procedure will be used to reset SFAS.

C. Incorrect: 1st part is incorrect SFAS will actuate for level 2 and 3 2nd part is the incorrect, but plausible because Trip Recovery is the correct procedure for a Level 2 actuation.

D. CORRECT: 1st part is correct SFAS will actuate on Level 2 and 3. 2nd part is correct procedure.

Sys #	System	Category	KA Statement
013	Eng. Safety Features Actuation	A2 Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations;	Inadvertent ESFAS actuation

K/A# A2.06 **K/A Importance** 3.7 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS506, DB-OP-02512, DB-OP-02000

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5/43.5/45.3/45.13

Objective: SYS506

38. The plant is operating at 100% power.
    - Containment Air Cooler (CAC) fans 1 and 2 are operating in fast speed
    - A steam line break occurs inside containment
    - SFAS level 1 and 2 actuate

    Based on the above plant conditions, complete the following statement.

    Two minutes after the above event occurs, the CAC fans will operating in____(1)____speed with service water Outlet Temperature Control valve receiving a ____(2)____.

A. (1) slow
(2) signal to maintain 75°F

B. (1) slow
(2) full open signal

C. (1) fast
(2) signal to maintain 75°F

D. (1) fast
(2) full open signal

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor automatic operation of the Containment Air Coolers in the event of a safeguards actuation.

A. Incorrect: 1st part is correct. Upon an SFAS actuation, the CAC fans will trip, then start again in slow speed. 2nd part is incorrect because the SW valves receive a full open signal regardless of the temperature. It is plausible because this was previously the normal operation of the SW valves.

B. CORRECT: 1st part is correct (see A). 2nd part is correct. The CAC SW inlet CIVs will remain full open during this event.

C. Incorrect: 1st part is incorrect because the fans will be operating in slow speed. It is plausible because 1) they are already in fast speed and 2) it would seem logical that operating in fast speed would remove more heat (it would). 2nd part is incorrect but plausible (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
022	Containment Cooling	A3 Ability to monitor automatic operation of the CCS, including:	Initiation of safeguards mode of operation

K/A# A3.01 **K/A Importance** 4.1 **Exam Level** RO

References provided to Candidate None **Technical References:** SD 018, SYS306

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45.5

Objective: SYS306

39. Which of the following safety systems can be manually actuated from the Safety Features Actuation Panel by dedicated Actuate and Reset Switches without sending an actuation or reset signal to other SFAS components?

A. Low Pressure Injection

B. Emergency Diesel Generator

C. High Pressure Injection

D. Containment Spray

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor the Containment Spray system component reset switches.

A. Incorrect: The LPI system does not have dedicated Actuation and Reset switches that only operate the LPI system. It is plausible since Actuation and Reset switches exist on C5717 that do operate the LPI System and other systems.

B. Incorrect: The EDG system does not have dedicated Actuation and Reset switches that only operate the EDG system. It is plausible since Actuation and Reset switches exist on C5717 that do operate the EDG System and other systems.

C. Incorrect: The HPI system does not have dedicated Actuation and Reset switches that only operate the HPI system. It is plausible since Actuation and Reset switches exist on C5717 that do operate the HPI System and other systems.

D. CORRECT : Containment Spray has Actuation and Reset Switches that only operate the Containment Spray System on C5717.

Sys #	System	Category	KA Statement
026	Containment Spray System	A4 Ability to manually operate and/or monitor in the control room:	Containment spray pump reset switches

K/A# A4.05 **K/A Importance** 3.5 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-06910, DB-OP-06405

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 45.5 to 45.8

Objective: SYS306

40. With the reactor at 100% power, MS209, MS210 Main Steam Line Non-Return Valves (NRVs) switches will be in ____(1)____ and are designed to prevent both SGs from blowing down through a fault upstream of the NRV in the event that ____(2)____.

A. (1) OPEN
(2) the faulted SG MSIV fails to automatically close

B. (1) OPEN
(2) the Main Turbine fails to automatically trip

C. (1) AUTO
(2) the faulted SG MSIV fails to automatically close

D. (1) AUTO
(2) the Main Turbine fails to automatically trip

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of design features (Non Return Valves) that prevent reverse steam flow on a steam line break.

A. Incorrect: 1st part is incorrect because when at full power, the switch is in the AUTO position (air disengaged). It is plausible because at lower powers, it could be correct. 2nd part is incorrect because the design of the valve is to prevent reverse flow in the event that the turbine fails to trip (flow from the good SG flows through the steam chest and into the faulted SG's steam line. It is plausible because if the MSIV did fail to close, it would prevent flow but without the turbine failing to trip, it would not be needed and this is not the design purpose of the valve.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is correct. The valves are designed to prevent reverse flow from the other SG in the event that the turbine fails to trip.

C. Incorrect: 1st part is correct. At full power, the switches will be in the AUTO position. 2nd part is incorrect but plausible (see A).

D. CORRECT: 1st part is correct (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
039	Main and Reheat Steam System	K4 Knowledge of MRSS design feature(s) and/or interlock(s) which provide for the following:	Prevent reverse steam flow on steam line break

K/A# K4.06 **K/A Importance** 3.3 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS202, DB-OP-06902

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7

Objective: SYS202

41. Plant conditions:
- Reactor power = 60% slowly rising
- Personnel inside containment report a steam leak
- DB-OP-02525, Steam Leaks has been entered

In accordance with DB-OP-02525, the containment evacuation alarm is sounded, announcement to evacuate containment is made,…

A. then the reactor is tripped

B. and ONLY when ALL personnel have evacuated, the reactor is tripped

C. then a rapid unit shutdown is commenced in accordance with DB-OP-02504, Rapid Shutdown

D. and ONLY when all personnel have evacuated, a rapid unit shutdown is commenced in accordance with DB-OP-02504, Rapid Shutdown

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Answer: A

xplanation/Justification: KA Match: This question matches the KA by requiring knowledge of the response procedure directed from the Annunciator from a steam leak.

A. CORRECT: IAW DB-OP-02525, if the steam leak is inside containment, IAs direct you to sound the containment evacuation alarm, make the announcement and then trip the reactor.

B. Incorrect because you do not wait for containment evacuation. It is plausible because it would make sense to have personnel out of containment before placing a transient on the system which could cause the leak to become worse with personnel still in containment.

C. Incorrect a rapid shutdown is not performed. It is plausible because if personnel were not in containment, it could be correct.

D. Incorrect but plausible (see B & C).

Sys #	System	Category	KA Statement
039	Main and Reheat Steam System	Generic	Knowledge of annunciator alarms, indications, or response procedures.

K/A# 2.4.31 **K/A Importance** 4.2 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02525, DB-OP-0212

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.10 / 45.3

Objective: GOP125

42. The following plant conditions exist:

- The reactor is operating at 50% rated power.
- One main feedwater pump (MFP) is operating in AUTOMATIC.
- All Feedwater Control Valves are in AUTOMATIC.
- ICS is in full AUTOMATIC mode.

Which one of the following describes feedwater flow control by ICS following a manual reactor trip?

A. Places the MFP at a constant target speed and immediately controls the Feedwater Control Valves position based on feedwater flow error.

B. Places the MFP at a constant target speed and immediately controls the Feedwater Control Valves position based on SG level error.

C. Runs the MFP to a target speed which is then modified by SG feedwater flow error and positions Feedwater Control Valves to a target position until a 2.5 minute timer expires.

D. Runs the MFP to a target speed which is then modified by SG level error and positions Feedwater Control Valves to a target position until SGs are at low level limits or a 2.5 minute timer expires.

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the cause and effect relationship between ICS and the main feedwater system.

A. Incorrect – Rapid Feedwater Reduction will actuate. Feedwater Control valves will control on SG level error, not Feedwater flow error.

B. Incorrect – Rapid Feedwater Reduction will actuate. Feedwater Control valves will control on SG level error, but a timer operates to allow SG level to lower to low level limits

C. Incorrect – Rapid Feedwater Reduction will actuate. Feedwater Control valves will control on SG level error, not Feedwater flow error.

D. CORRECT – With full automatic ICS operation and SG not initially on low level limit control, a reactor trip will cause the MFP to go to target speed, the SU SG Level controls to target position until SG on Low Level Limit or 2.5 minute timer times out.

Sys #	System	Category	KA Statement
059	Main Feedwater	K1 Knowledge of the physical connections and/or cause-effect relationships between the MFW and the following systems:	ICS

K/A# K1.07 **K/A Importance** 3.2 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS512

Question Source: Bank 2013 NRC Exam Q44 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.2 to 41.9/45.7 to 45.8

Objective: SYS512

43. Initial plant conditions:

- An automatic ICS runback has occurred due to MFP 1 tripping
- While repairs are conducted to MFP 1, it is desired to raise reactor power in accordance with DB-OP-06902, Power Operations

In accordance with DB-OP-06902, power can be raised to a MAXIMUM of ____(1)____ with one MFP by____(2)____.

A. (1) 65%
(2) placing ICS in MANUAL

B. (1) 65%
(2) pulling an ICS fuse for the tripped MFW pump

C. (1) 72%
(2) placing ICS in MANUAL

D. (1) 72%
(2) pulling an ICS fuse for the tripped MFW pump

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor changes in the MFW system to prevent exceeding the maximum power allowed for operating with one MFW pump.

A. Incorrect: 1st part is correct. Power is limited to 65%. 2nd part is incorrect because IAW DB-OP-06902, the IC Feedwater Pump Tripped Relay fuse is pulled for the out of service pump. It is plausible because it would work.

B. CORRECT. 1st part is correct (see A). 2nd part is correct. IAW DB-OP-06902, the IC Feedwater Pump Tripped Relay fuse is pulled for the out of service pump.

C. Incorrect: 1st part is incorrect because power is limited to 65%. It is plausible because if it were asking about procedural limits with 1 RCP secured, it would be correct. 2nd part is incorrect but plausible (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
059	Main Feedwater	A1 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MFW controls including:	Power level restrictions for operation of MFW pumps and valves

K/A# A1.03 **K/A Importance** 2.7 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-06902

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.5 / 45.5

Objective: SYS207

44. Given the following conditions:

- The reactor was In Mode 3 at full RCS temperature and pressure.
- AFW flow was throttled to control flow to each SG.
- A loss of an Essential DC Distribution Panel occurs.
- AF6452, AFP 1 Level Control Valve has failed open.

Which Essential DC Distribution panel has lost power?

A. D1N

B. D1P

C. D2N

D. D2P

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the bus power supply for AFW system MOVs.

A. Incorrect because AF6452 is powered from D1P. It is plausible because if it were MDFP discharge valve 6459, it would be correct.

B. CORRECT: AF6452 is powered from D1P.

C. Incorrect because AF6452 is powered from D1P. It is plausible because D2N is also an essential distribution panel.

D. Incorrect because AF6452 is powered from D1P. It is plausible because if it were Modulating control valve AF6451, it would be correct.

Sys #	System	Category	KA Statement
061	Auxiliary/Emergency Feedwater	K2 Knowledge of bus power supplies to the following:	AFW system MOVs

K/A# K2.01 **K/A Importance** 3.2 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS213

Question Source: Bank 2009 NRC Exam Q46 **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7

Objective: SYS213

45. Initial plant conditions:
    - Reactor power = 100%
    - Both Main Feedwater Pumps trip
    - When AFW Pump 2 starts, AF6451, AFW Pump 2 Discharge Flow Control Valve closes completely

    Based on the above plant conditions AFW Pump 2 will be protected against dead head pressure by ________.

A. an orifice around the flow control valve

B. a relief valve upstream of the flow control valve

C. a recirculation line upstream of the flow control valve

D. an orifice within the body of the flow control valve

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the operational implications (effects) of an AFP discharge valve closing (whether the pump is deadheaded or not..

A. Incorrect: RO498 does not perform a required a function for the AFW Pump, plausible because RO498 provides flow around AF6451.

B. Incorrect: Plausible because other systems have a similar design, EFP is provided minimum flow by a relief valve.

C. CORRECT: Per DB-OP-06233,L&P 2.2.29 minumum recirc flow of 75gpm is required and provided by the recirc ine.

D. Incorrect: Plausible because other systems have a similar design where the FCV does not fully close to prevent deadhead.

Sys #	System	Category	KA Statement
061	Auxiliary/Emergency Feedwater	K5 Knowledge of the operational implications of the following concepts as the apply to the AFW:	Pump head effects when control valve is shut

K/A# K5.03 **K/A Importance** 2.6 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-06233, SD015

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 45.7

Objective: SYS213

46. The plant is in Mode 1, 100% power, in the normal electrical alignment.
Which one of the following would prevent Containment Spray Pump 1-1 from automatically starting on an SFAS level 4 actuation?

A. Transformer CE1-1 lockout

B. Loss of control power to C1 Bus

C. Loss of power to CS1530, CTMT Spray Auto Control Valve 1

D. Loss of power to SFAS Channel 1

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the effect that a malfunction of the AC distribution would have on a major system load (CS pump).

A. CORRECT: This would prevent CS pump 1 from starting.
B. Plausible since this would prevent 4160 VAC pumps from starting on an SFAS actuation but Containment Spray Pumps are 480VAC
C. Plausible since CS1530 has to be open for the Containment Spray Pump to start during normal operations
D. Plausible since SFAS Channel 1 is required to actuate to auto start Containment Spray Pump 1

Sys #	System	Category	KA Statement
062	AC Electrical Distribution	K3 Knowledge of the effect that a loss or malfunction of the AC distribution system will have on the following:	Major system loads

K/A# K3.01 **K/A Importance** 3.5 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS306

Question Source: Bank 2008 NRC Exam Q15 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45.6

Objective: SYS306

47. Plant conditions:
  - Startup is in progress
  - You are paralleling the Main Generator to the Grid in accordance with DB-OP-06301
  - You are ready to close Main Generator Output Breaker ACB34561

Based on the above plant conditions, complete the following statements.

1. Paralleling the Main Generator out of phase with the Grid can result in ____(1)____.

2. In order to prevent from occurring, DB-OP-06301 directs you close ACB34561 when the Synchroscope lights SL6017 A & B are ____(2)____.

A. (1) motoring of the generator, due to unequal frequencies
(2) OFF

B. (1) motoring of the generator, due to unequal frequencies
(2) BRIGHT

C. (1) excessive arcing within the generator output breaker, due to out-of-phase voltages
(2) OFF

D. (1) excessive arcing within the generator output breaker, due to out-of-phase voltages
(2) BRIGHT

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to predict the impact of paralleling the generator out of phase and properly use procedures to prevent this event from occurring.

A. Incorrect: 1st part is incorrect because this would not be the consequence of paralleling out of phase. It is plausible because it would be the consequence of paralleling with the Synchrocope rotating in the wrong direction when closing the breaker. 2nd part is correct, you are directed to close the breaker when the Synchroscope is just before 12 O'clock and the Synchroscope lights are OFF.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because you are directed to close the breaker when the Synchroscope is just before 12 O'clock and the Synchroscope lights are OFF. It is plausible because the lights will vary from off to bright as the Synchroscope rotates so you have to know the proper orientation of the lights and the Synchroscope.

C. CORRECT: 1st part is correct. IF the breaker were to close with the voltages out of phase, they would instantaneously try to lock in phase. This would cause excessive current and physical damage to the components. 2nd part is correct (see A).

D. Incorrect: 1st part is correct (see A). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
062	AC Electrical Distribution	A2 Ability to (a) predict the impacts of the following malfunctions or operations on the AC distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:	Consequence of paralleling out-of-phase/mismatch in volts

K/A# A2.15 **K/A Importance** 2.8 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS401, DB-OP-06301

Question Source: Modified GFES 191008 **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.5/43.5/45.3/45.13

Objective: SYS401

48. A loss of normal DC Control Power to C1 Bus has occurred.

In order to transfer DC Control Power for C1 Bus to Alternate without cross connecting the DC Supply busses D1P and D1N, _____________ is provided.

A. a mechanical knife switch

B. an electrical interlock

C. a removable jumper

D. diode protection

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the design feature associated with the DC electrical distribution system.

A. CORRECT A mechanical knife switch provides electrical isolation to prevent cross tying the DC busses

B. Incorrect Plausible if it is assumed that the electrical interlock in the control circuitry is designed to prevent the busses from cross connecting.

C. Incorrect Plausible if it is assumed that the physical separation is controlled via a jumper system.

D. Incorrect Plausible if the two busses are electrically separated by a diode which would prevent the systems from being fed from two sources.

Sys #	System	Category	KA Statement
063	DC Electrical Distribution	K4 Knowledge of DC electrical system design feature(s) and/or interlock(s) which provide for the following:	interlocks, permissives, bypasses and cross-ties

K/A# K4.02 **K/A Importance** 2.9 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS405, DB-OP-02537

Question Source: Bank Modified from OPS-SYS-405 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7

Objective: SYS409

49. The following plant conditions exist:
    - The Reactor is at 100% power.
    - Makeup pump 2 is running.

    A lockout of 4160 VAC D1 bus occurs.

    Assume no operator actions has been taken.

    Which of the following would indicate HIGHER than normal AMPs in this situation?

A. Battery 1P

B. Battery 2N

C. Charger DBC1P

D. Charger DBC2N

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor automatic operation of the battery charger by determining how meter indications would change.

A. Incorrect. Plausible if the candidate assumes Battery 1P is affected by the loss of D1 then the Battery would discharge at a higher rate.

B. CORRECT: With D1 Lockout the DCMCC2 Battery Chargers will Deenergize. 2N and 2P batteries will discharge to supply DCMCC2 Loads, which will cause higher than normal amps on 2N.

C. Incorrect. Plausible if the candidate assumes Battery Charger is affected by the loss of D1, and the battery charger remains available

D. Incorrect. Plausible if the candidate assumes Battery Charger is still available but the input power to the Battery Charger DBC2N is lost.

Sys #	System	Category	KA Statement
063	DC Electrical Distribution	A3 Ability to monitor automatic operation of the DC electrical system, including:	Meters, annunciators, dials, recorders, and indicating lights

K/A# A3.01 **K/A Importance** 2.7 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS409

Question Source: Modified Bank QUESTION # 166456 **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45.5

Objective: SYS409

50. Plant conditions:

- Emergency Diesel Generator (EDG) 2 starting Air Receiver 2-1 has developed a leak
- Its associated air compressor is operating
- Current Air Receiver 2-1 air pressure = 170 psig
- Air Receiver 2-2 air pressure = 235 psig

Based on the above plant conditions, complete the following statement.

1. With the current Air Receiver 2-1 pressure, there____(1)____sufficient capacity for one start attempt.
2. EDG 2 ____(2)____required to be declared INOPERABLE immediately.

A. (1) is
(2) is

B. (1) is
(2) is NOT

C. (1) is NOT
(2) is

D. (1) is NOT
(2) is NOT

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the effect that a loss/malfunction on the EDG air receivers will have on the system (reduced starting capacity).

A. Incorrect: 1st part is correct. With air receiver pressure > 139 psig, there is adequate supply for at least one start attempt. 2nd part is incorrect because only one air start side is required to be Operable for an EDG to remain Operable. It is plausible because TS previously required two Operable air starts per Operable EDG.

B. CORRECT: 1st part is correct (see A). 2nd part is correct. The EDG is OPERABLE because only one air start is impacted.

C. Incorrect: 1st part is incorrect because IAW TS 3.8.3 bases, with > 139 psig air pressure, enough air exists for at least one start attempt. It is plausible because normal receiver pressure is between 220 and 250 psig. 2nd part is incorrect but plausible (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
064	Emergency Diesel Generator	K6 Knowledge of the effect of a loss or malfunction of the following will have on the EDG system:	Air receivers

K/A# K6.07	**K/A Importance** 2.7	**Exam Level**	RO
References provided to Candidate	None	**Technical References:**	TS 3.8.3, TSB 3.8.3, SD-003B
Question Source:	New	**Level Of Difficulty: (1-5)**	3
Question Cognitive Level:	Low	**10 CFR Part 55 Content:**	41.7 / 45.7
Objective:	SYS406		

51. Plant conditions:
- A loss of offsite power has occurred
- EDG 1-1 is powering bus C1 and C2
- Offsite power has been restored
- You are to parallel Bus C1 with offsite power to remove EDG 1-1 from service

Based on the above plant conditions, which ONE of the following describes how this evolution is performed in accordance with DB-OP-06316.

Bus C2 is unloaded and disconnected from Bus C1, _____(1)_____ and then ____(2)____.

A. (1) Bus C1 (EDG 1-1) is paralleled to Bus Tie XFMR AC
(2) Bus C2 is re-energized through breaker AACC2.

B. (1) Bus C2 is re-energized through breaker AACC2.
(2) Bus C1 (EDG 1-1) is paralleled to Bus C2 through breaker AC110

C. (1) Bus C2 is paralleled to Bus C1 through breaker AC110
(2) Bus C1 (EDG 1-1) is paralleled to Bus Tie XFMR BD

D. (1) Bus C1 (EDG 1-1) is paralleled to Bus Tie XFMR AC
(2) Bus C2 is re-energized through (EDG 1-1) is paralleled to Bus Tie XFMR BD

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring the ability operate equipment in order to restore off site power to a bus being powered by an EDG.

A. Incorrect because bus C1 is not paralleled to Bus Tie XFMR AC. It is plausible because XFMR AC can connect to Bus C2.

B. CORRECT: This is the correct sequence as directed by DB-OP-06316.

C. Incorrect because Bus C2 is connected to XFMR AC after being disconnected from Bus C1 and before Bus C1 is paralleled to offsite power. It is plausible because C! and C2 were tied together before this evolution began.

D. Incorrect because 1) Bus C2 is connected to XFMR AC after being disconnected from Bus C1 and before Bus C1 is paralleled to offsite power and 2) Bus C1 will not be tied to XFMR BD.

Sys #	System	Category	KA Statement
064	Emergency Diesel Generator	A4 Ability to manually operate and/or monitor in the control room:	Establishing power from the ring bus (to relieve EDG)

K/A# A4.09 **K/A Importance** 3.2 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-06316

Question Source: New **Level Of Difficulty: (1-5)** 4

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 45.5 to 45.8

Objective: SYS404

52. Which of the following process radiation monitors have alarm limits that are specified in the Offsite Dose Calculation Manual? ____(1)____

The radioactive gaseous effluent monitoring channels have their alarm/trip setpoints set to ensure that for releases, the dose rate at the site boundary for Noble gas does not exceed ____(2)____mrem per year to the total body.

A. (1) RE1822A, Waste Gas System to Station Vent Radiation Element
(2) 500

B. (1) RE1822A, Waste Gas System to Station Vent Radiation Element
(2) 1500

C. (1) RE1003A, Vacuum System Rad Detector High Range Element
(2) 500

D. (1) RE1003A, Vacuum System Rad Detector High Range Element
(2) 1500

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of operational implications (PRM rad monitor alarms/isolations) of the relationship between rad monitor intensity (alarm) and exposure limits (at the site boundary).

A. CORRECT: 1st part is correct, RE1822A is set per Radiation Monitor Setpoint Manual to ensure ODCM requirements are met. 2nd part is correct, Alarm/trips are set to maintain the does at the site boundary for noble gasses < 500 mrem / year.

B. Incorrect: 1st part is correct see A part 1. 2nd part is incorrect, plausible because it would be correct value if question asked rate for I131, I133, or tritium to any organ vs Noble Gas to the total body.

C. Incorrect: 1st part is incorrect because RE1003A is set to detect SGTL. Plausible because RE1003A discharges to Station Vent, which has RE4598 set to ensure ODCM requirements. 2nd part is correct value, see A part 2.

D. Incorrect:1st part is incorrect see C part 1. 2nd part is incorrect see B part 2.

Sys #	System	Category	KA Statement
073	Process Radiation Monitoring	K5 Knowledge of the operational implications as they apply to concepts as they apply to the PRM system:	Relationship between radiation intensity and exposure limits

K/A# K5.03 **K/A Importance** 2.9 **Exam Level** RO

References provided to Candidate None **Technical References:** ODCM Section 3.3

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.5 / 45.7

Objective: SYS110

53. The plant is operating at 100% power.
    - SW Pump 1 & 2 are in service
    - CCW Pump 1 is in service
    - Service water header pressure control has been established on the primary side via CCW heat exchanger #3, IAW DB-OP-06261, Service Water System Operating Procedure
    - SW 1424 CCW Heat Exchanger 1 outlet temperature control valve is in auto and 50% OPEN
    - SW 37 CCW Heat Exchanger 3 Discharge Iso is throttled OPEN to achieve a SW Pump 1 header pressure of 115 psig.

    While in this configuration:
    - SW 37 CCW Heat Exchanger 3 Discharge Isolation is throttled OPEN to reduce SW Pump 1 header pressure to 95 psig

    Based on the above plant conditions, complete the following statement.

    SW 1424 will sense the change in ____(1)____temperature downstream of the CCW heat exchanger and will automatically throttle ____(2)____.

A. (1) CCW
(2) open

B. (1) CCW
(2) closed

C. (1) SW
(2) open

D. (1) SW
(2) closed

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to predict changes in parameters (valve position) to prevent exceeding temperatures.

A. CORRECT. 1st part is correct. SW-1424 monitors CCW temperature downstream of the HX. 2nd part is correct. Reducing SW pressure will reduce flow thru CCW 1 HX. The TCV will both throttle open to maintain a constant temperature.

B. Incorrect. 1st part is correct (see A). 2nd part is incorrect because the valve will throttle open. Plausible if candidate believes CCW temperature will lower.

C. Incorrect: 1st part is incorrect because SW-1424 monitors CCW temperature. It is plausible because it is designed to control SW flow through the HX. 2nd part is correct (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
076	Service Water System	A1 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including:	Reactor and turbine building closed cooling water temperatures

K/A# A1.02 K/A Importance 2.6 Exam Level RO

References provided to Candidate None Technical References: SD016, SYS305

Question Source: Modified 2011 NRC Exam Q53 Level Of Difficulty: (1-5) 2

Question Cognitive Level: High 10 CFR Part 55 Content: 41.5 / 45.5

54. Given that a gradual loss of Instrument Air occurs, at what pressure would Turbine Building non-essential header back-pressure control valve IA-2043 FIRST start to throttle (fail) closed?

A. 95 psig

B. 90 psig

C. 75 psig

D. 70 psig

Answer: B

Explanation/Justification: KA Match This question matches the KA by requiring the ability to monitor automatic operation of equipment supplied by IA as air pressure lowers.

A. Incorrect because IA-2043 will begin to close at 90 psig It is plausible because this is the setpoint for the IA Header Lo Pressure annunciator.

B. CORRECT IA-2043 will begin to close as IA pressure lowers past 90 psig.

C. Incorrect because IA-2043 will begin to close at 90 psig It is plausible because this is the pressure that requires a reactor trip.

D. Incorrect because IA-2043 will begin to close at 90 psig It is plausible because this is when IA-2043 is fully closed.

Sys #	System	Category	KA Statement
078	Instrument Air	A3 Ability to monitor automatic operation of the IAS, including:	Air pressure

K/A# A3.01 **K/A Importance** 3.1 **Exam Level** RO

References provided to Candidate None **Technical References:** SD001

Question Source: Modified 2009 NRC Exam Q54 **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 45.5

Objective: SYS602

55. The plant is in a refueling outage with Fuel Handling in progress. As a result of increased Source Range counts, the containment evacuation alarm ____(1)____.

    Per RA-EP-02864, Containment Evacuation, all personnel in containment are directed to evacuate containment and report to ____(2)____.

A. (1) will automatically actuate
   (2) radiation protection

B. (1) will automatically actuate
   (2) their supervisor

C. (1) must be manually actuated
   (2) radiation protection

D. (1) must be manually actuated
   (2) their supervisor

Answer: D

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to use procedures to control the consequences of a containment evacuation (how to egress) including recognition (the announcement).

A. Incorrect: 1st part is incorrect because the containment evacuation alarm is manually activated. The source range instruments are typically used to automatically actuate the evacuation alarm, but that function is not used at DB. 2nd part is incorrect, during refueling outage personnel are directed to report to their supervisor after evacuating containment. It is plausible because personnel will typically report to RP when they receive high radiation alarms.

B. Incorrect: 1st part is incorrect (see A part 1). 2nd part is correct. IAW RA-EP-02864 directs personnel to contact their supervisor.

C. Incorrect: 1st part incorrect, the CTMT evacuation must be manually actuated. 2nd part is incorrect but plausible (see A).

D. Correct: 1st part is correct, the evacuation alarm must be manually actuated. The 2nd part is correct, per RA-EP-02864 step 6.3.3, all personnel are to report to their supervisor after evacuating containment.

Sys #	System	Category	KA Statement
103	Containment	A2 Ability to (a) predict the impacts of the following malfunctions or operations on the containment system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:	Containment evacuation (including recognition of the alarm)

K/A# A2.04 **K/A Importance** 3.5 **Exam Level** RO

References provided to Candidate None **Technical References:** RA-EP-02864

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.5/43.5/45.3/45.13

Objective: GOP130

56. Plant conditions:

- Reactor power = 100%
- ICS is in full automatic mode
- CCW flow to the in-service letdown cooler is inadvertently raised

As a result of the cooler water entering the Purification Demineralizer, …

1. The resin's affinity for boron will ____(1)____.
2. Control rods will____(2)____ as a result of the change in boron concentration.

A. (1) lower
(2) insert

B. (1) lower
(2) withdraw

C. (1) rise
(2) insert

D. (1) rise
(2) withdraw

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of how a change in the CVCS system (temperature/boron) affects the CRD system (control rod movement due to reactivity changes).

A. Incorrect: 1st part is incorrect because as temperature of the resin lowers, its affinity will increase. It is plausible because it is a common misconception about resin affinity and temperature. 2nd part is correct. As a result of the malfunction, boron concentration in makeup water will be at a lower value. This will eventually result in positive reactivity and moderator temperature increase. ICS in response, will insert control rods to maintain at setpoint.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because control rods will insert to maintain Tave ~ setpoint. It is plausible because the temperature effects on boron concentration is a common misconception.

C. CORRECT: 1st part is correct. As resin temperature lowers, its affinity for boron will increase. 2nd part is correct (see A).

D. Incorrect: 1st part is correct (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
001	Control Rod Drive	K1 Knowledge of the physical connections and/or cause-effect relationships between the CRDS and the following systems:	CVCS

K/A# K1.02 **K/A Importance** 3.6 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS106

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.2 to 41.9 / 45.7 to 45.8

Objective: SYS106

57. Plant conditions:
    - 100% power.
    - Component Cooling Water (CCW) Pump 1 is operating.
    - A Loss of Offsite Power occurs.

    Assuming that NO operator actions have been taken, which of the following additional malfunctions will cause ZERO Makeup Pumps to be operating one minute after the Loss of Offsite Power?

A. Bus C1 locks out.

B. Containment Pressure rises to 18.0 psia.

C. Emergency Diesel Generator 2 does NOT start.

D. Safety Features Actuation System Channel 4 Sequencer does NOT actuate.

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the power supply to the charging pumps.

A. Incorrect. Since MU Pump 2 was previously running and is not affected by C1 lockout, it restarts. Plausible because bus lockout trips and locks out its associated MU Pump. See OS-00002 sheet 3 R33 CL-10.

B. Incorrect. Plausible for Containment pressure above 18.4 psia which would cause SFAS Level 3 start of LPI Pump 2 which would trip MU Pump 2 after auto-restart. See OS-00002 sheet 3 R33 CL-10

C. CORRECT: – MU Pump 2 was running prior to the LOP per normal alignment. Previously running MU Pump load sheds on bus UV, then restarts 2.5 seconds after its associated EDG breaker closes. Since EDG doesn't start, zero MU Pumps will be running. See OS-0002 sheet 4 R24 CL-15.

D. Incorrect. Plausible for misconception that MU Pump starts from Sequencer.

Sys #	**System**	**Category**	**KA Statement**
011	Pressurizer Level Control	K2 Knowledge of bus power supplies to the following:	Charging pumps

K/A# K2.01 **K/A Importance** 3.1 **Exam Level** RO

References provided to Candidate None **Technical References:** OS-0002 sheet 4 R24 CL-15

Question Source: Bank 2015 NRC Exam Q58 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7

Objective: SYS106

58. DB-MI-05254, Nuclear Instrumentation NI05 (RPS CH 2) Power Range Adjustment is in Progress.

- The Rod Control Panel and Reactor Demand are in Auto
- NI6 Indicates 99.8%
- NI7 Indicates 99.6%
- NI8 Indicates 99.4%

I&C has informed the Shift Manager they have completed calibration and are returning the Power Range Test Module rotary switch to the OPERATE position.

- Due to an error, NI5 gain is set incorrectly and NI5 currently reads 105%

When I&C returns the Power Range Test Module to OPERATE position, how will the regulating control rods respond?

A. No effect

B. Insert

C. Withdraw

D. Trip

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the effect that a malfunction of NIs (erroneous reading) will have on ICS (CR insertion).

A. Incorrect – Plausible if candidate does not know the controlling NI is high auctioneered.

B. CORRECT: – Correct answer – Highest NI will control rods and greater than or equal to 1% neutron error will insert rods.

C. Incorrect – Plausible if candidate assumes power must be raised to match indication (also opposite of correct answer).

D. Incorrect – Plausible since 105% is greater than the high power trip setpoint of 104.7% however only a single channel is affected and the reactor will not trip.

Sys #	System	Category	KA Statement
015	Nuclear Instrumentation System	K3 Knowledge of the effect that a loss or malfunction of the NIS will have on the following:	ICS

K/A# K3.04 **K/A Importance** 3.4 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS517

Question Source: Bank 2013 NRC Exam Q58 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45.6

Objective: SYS517

59. There are____(1)____Qualified In Core Thermocouples that can display up to a MAXIMUM of ____(2)____.

A. (1) 16
(2) 2300°F

B. (1) 16
(2) 920°F

C. (1) 36
(2) 2300°F

D. (1) 36
(2) 920°F

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the range of incore temperature monitors.

A. CORRECT: 1st part is correct. There are 16 Qualified incore thermocouples. 2nd part is correct. The maximum range on the incore thermocouple is 2300°F.

B. Incorrect: 1st part is correct (see A). 2nd part is incorrect because the maximum range on the incore thermocouple is 2300°F. It is plausible because the RTDs are rated for 920 °F .

C. Incorrect: 1st part is incorrect because there are 16 qualified incore thermocouples. It is plausible because if asking for standard thermocouples, it would be correct. 2nd part is correct (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
017	In-Core Temperature Monitor	K4 Knowledge of ITM system design feature(s) and/or interlock(s) which provide for the following:	Range of temperature indication

K/A# K4.03 **K/A Importance** 3.1 **Exam Level** RO

References provided to Candidate None **Technical References:** SD 043

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7

Objective: SYS503

60. . Plant conditions:
- Reactor is in Mode 1
- SFP LVL, 3-1-B alarms
- Spent Fuel Pool level = 23.2 ft slowly lowering
- DB-OP-02547, Spent Fuel Pool Cooling Malfunctions, Section 4.2, Loss of Spent Fuel Pool Inventory is entered
- Location of the leak is unknown

Based on the above plant conditions, complete the following statement.

In accordance with DB-OP-02547, you are FIRST directed to stop the pump in service on the Spent Fuel Pool ____(1)____.

A. Immediately

B. when spent fuel pool level lowers to 23 ft

C. when spent fuel pool level lowers to 22.4 ft

D. when spent fuel pool level lowers to 19 ft

Answer: D

.**Explanation/Justification:** KA Match: This question matches the KA by requiring the ability to monitor SFP level and determine when actions are taken and the design to prevent uncovering fuel assemblies

A. Incorrect because you will not secure pumps until SFP level lowers to 19 ft. It is plausible because if the leak were determined to be coming from the SFP cooling system, it would be correct.

B. Incorrect because you will not secure pumps until SFP level lowers to 19 ft. It is plausible because if you assume that this is the level above the fuel, that you would secure the SFP pumps prior to going below that level required by TS.

C. Incorrect because you will not secure pumps until SFP level lowers to 19 ft. It is plausible because this is the level at which you are actually 23 ft above the fuel (see B).

D. CORRECT: IAW DB-OP-02547, IAAT SFP level reaches 19 ft, you are directed to stop the pumps in service on the SFP.

Sys #	System	Category	KA Statement
033	Spent Fuel Pool Cooling	A1 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with Spent Fuel Pool Cooling System operating the controls including:	Spent Fuel Pool water level

K/A# A1.01 **K/A Importance** 2.7 **Exam Level** RO

References provided to Candidate None **Technical References:** DP-OP-02547, SD 24

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 45.5

Objective: SYS113

61. Plant conditions:
    - The plant is starting up after a forced outage towards the end of core life
    - The reactor is critical below the point of adding heat (POAH)
    - One Turbine Bypass Valve fails open

    Based on the above plant conditions, which ONE of the following is correct regarding how the plant will initially respond?

A. RCS temperature will not change since you are below the POAH and RCS temperature is being maintained by pump heat. Since temperature is not changing, power will remain constant.

B. RCS temperature will lower due to lowering SG pressure however, since you are below the POAH, this has no effect on core reactivity so power will remain constant.

C. RCS temperature will lower due to lowering SG pressure and the effect of the moderator temperature coefficient will cause reactor power to rise to the POAH.

D. RCS temperature will lower due to lowering SG pressure and the effect of the moderator temperature coefficient will cause reactor power to lower towards the source range.

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the effect that changing SG pressure/temperature has on reactivity.

A. Incorrect because reducing SG pressure/temperature will reduce RCS temperature. It is plausible because RCP heat is what has heated to RCS to hot standby (normal operating temperature).

B. Incorrect because any change in RCS temperature will cause power to change (unless the moderator temperature coefficient is 0). It is plausible because in discussing the concept of the POAH, it is common to think that RCS temperature will not effect power.

C. CORRECT: Reducing SG pressure/temperature lowers RCS temperature and since you towards the EOL, positive reactivity will be added causing power to increase towards the POAH.

D. Incorrect because the lowering RCS temperature will add positive reactivity due to the plant being at EOL. It is plausible because if it were after a refueling outage (BOL), it could and probably would be correct.

Sys #	System	Category	KA Statement
035	Steam Generator System	K5 Knowledge of operational implications of the following concepts as the apply to the SGS:	Effect of secondary parameters, pressure, and temperature on reactivity

K/A# K5.01 **K/A Importance** 3.4 **Exam Level** RO

References provided to Candidate None **Technical References:** Reactor Theory Fundamentals

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 45.7

Objective: SYS202

62. The plant was operating at 100% power. The reactor is manually tripped due to high vibration on the Main Generator.

The following events occur:

- All Turbine Bypass Valves open to control Steam Generator Pressure.
- SP13B1, Steam Line 1 Turbine Bypass Valve sticks full open.
- All other equipment functions as designed.

Based on the above plant conditions, answer the following questions.

1. How will the plant respond to this failure, assuming no operator actions?
2. What, if any, operator actions will be **required** to stabilize the plant without relying on the Main Steam Safety Valve operation?

A. (1) The unaffected Turbine Bypass Valves will modulate closed to control both SG pressures at the normal post trip setpoint of approximately 995 psig. This condition will not result in an SFRCS actuation.
(2) No Operator Action will be required to stabilize the plant.

B. (1) SFRCS will actuate on low SG1 Level, closing the Main Steam Isolation Valves, and starting Auxiliary Feedwater to restoring SG1 Level to 49 inches.
(2) No Operator Action will be required to stabilize the plant.

C. (1) SFRCS will actuate on low SG Pressure on SG1, closing both Main Steam Isolation Valves.
(2) The Operators will use the Atmospheric Vent Valves to control RCS Tave constant or slightly lowering.

D. (1) SFRCS will actuate on Steam to Feed Differential Pressure on SG1, isolating all Main and Auxiliary Feedwater to SG1.
(2) The Operators will open the Atmospheric Vent Valves on #1 SG to blowdown the affected SG.

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to predict the impact of the steam dumps (TBVs) malfunctioning and proper use of procedures to mitigate those impacts.

A. Incorrect – Plausible if the candidate concludes the steam flow rate due to one open TBV is less than the core decay heat rate post trip. This event will exceed the core decay heat rate even if all other TBVs are closed. If the steam flow was less than core decay heat, then this response would be accurate.

B. Incorrect – Plausible because the Steam Generator Level would be lowering with an open TBV, however the Main Feedwater System and AFW, if actuated, can maintain SG level at setpoint even with an open TBV. The MSIVs would not close on low SG Level.

C. CORRECT: – Without Operator Action, SG pressure in #1 SG would lower and cause an SFRCS Low SG Pressure on #1 SG at 630 psig. Once the MSIVs close, SG Pressure will rise causing the low pressure trip to reset allowing AFW flow to #1 SG. Operator action to control SG Pressure would be necessary to prevent Main Steam Safety Valves from opening.

D. Incorrect – Plausible because SFRCS will eventually actuate on Steam to Feed Differential Pressure once the MSIVs are closed in response to the low SG Pressure. The actions to blowdown the affected SG are actions taken in response to a Steam Line Break in accordance with DB-OP-02525, Steam Leaks, section 4.2, not an action taken in response to a TBV malfunction.

Sys #	System	Category	KA Statement

045	Main Turbine Generator	A2 Ability to (a) predict the impacts of the following malfunctions or operation on the MTG system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:	Steam dumps are not cycling properly at low load, or stick open at higher load (isolate and use atmospheric reliefs when necessary)

K/A# A2.08 **K/A Importance** 2.8 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02000

Question Source: Bank 2013 NRC Exam Q59 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 43.5 / 45.3 / 45.5

Objective: SYS1202

63. Plant conditions:
    - A plant startup is in progress in accordance with DB-OP-06901, Plant Startup
    - Reactor power = 18%
    - The Main Turbine has just been Synchronized to the grid but as DEHC starts to raise load to 50 MWe, the turbine trips

Based on the above plant conditions, complete the following statement regarding the Turbine Bypass valves.

The Turbine Bypass Valves had a ____(1)____bias signal inserted when Breaker 34561 was closed and when the plant stabilizes after the turbine trip, they will be maintaining SG pressure at ____(2)____.

A. (1) 0 psig
(2) 870 psig

B. (1) 0 psig
(2) 920 psig

C. (1) 50 psig
(2) 870 psig

D. (1) 50 psig
(2) 920 psig

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor automatic operation of the TBVs and how it relates to RCS temperature and Reactor Power.

A. CORRECT: 1st part is correct. When the turbine is started up, the TBVs are maintaining SG pressure at setpoint (870 psig). The 50 psig bias automatically goes in after the generator output breaker closes and load is raised to ~ 92 MWe. 2nd part is correct. When the turbine trips and the reactor does not, the TBVs will be maintaining SG pressure at setpoint (870 psig).

B. Incorrect: 1st part is correct (see A). 2nd part is incorrect because when the turbine trips and the reactor does not, the TBVs will be maintaining SG pressure at setpoint (870 psig). It is plausible because with the 50 psi bias inserted, it would open at 920 psig.

C. Incorrect 1st part is incorrect because the 50 psi bias will not be inserted until the turbine load is ~ 92 MWe. It is plausible because when the generator output breaker is closed, the turbine starts picking up load from the TBVs. 2nd part is correct (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
041	Steam Dump System (SDS) Turbine Bypass Control	A3 Ability to monitor automatic operation of the SDS, including:	RCS pressure, RCS temperature, and reactor power

K/A# A3.02 **K/A Importance** 3.3 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS515, DO-OP-06902, DB-OP-06301

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 45.5

Objective: SYS515

64. In addition to 9-4-A, Vacuum System Rad Hi, which of the following Area Rad Monitors would alarm during a SGTL? ____(1)____

The detector displayed below is currently reading approximately ____(2)____.

A. (1) RIM-8435, CNDS Polish Demin 1&2
(2) 50 mR/h

B. (1) RIM-8435, CNDS Polish Demin 1&2
(2) 30 mR/h

C. (1) RIM-8425, Equipment Hatch
(2) 50 mR/h

D. (1) RIM-8425, Equipment Hatch
(2) 30 mR/h

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor the ARM display in the Control Room.

A. Incorrect: 1st part is correct. The CNDS Polish Demin is an expected Area Rad Monitor to come in alarm due to a SGTL 2nd part is incorrect because the meter reading is ~ half way between 10 and 100 on a log scale which is ~ 31.6 mR/h. It is plausible because interpolation on a log scale is a common mistake and the location of the needle could be read as 50.

B. CORRECT: 1st part is correct (see A). 2nd part is correct. The meter reading is ~ half way between 10 and 100 on a log scale which is ~ 31.6 mR/h.

C. Incorrect: 1st part is incorrect because this Area Rad Monitor would not be expected during a SGTL. It is plausible due to the location of the FW lines and MS lines being in relatively close proximity to the Equipment Hatch. 2nd part is incorrect but plausible (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is correct (see B).

Sys #	**System**	**Category**	**KA Statement**
072	Area Radiation Monitoring	A4 Ability to manually operate and/or monitor in the control room:	Major components

K/A# A4.02 **K/A Importance** 2.5 **Exam Level** RO

References provided to Candidate None **Technical References:** SYS508

Question Source:	New	**Level Of Difficulty: (1-5)**	2
Question Cognitive Level:	Low	**10 CFR Part 55 Content:**	41.7 / 45.5 to 45.8
Objective:	SYS508		

65. Plant conditions:
- The plant has been tripped.
- Control Room evacuated due to a serious fire in the Control Room.
- DB-OP-02519, Serious Control Room Fire, has been initiated and is in progress.
- Makeup Pump 1 has been started locally.
- The Shift Manager has directed you as the Primary Side Reactor Operator to establish makeup flow by throttling open MU6420, Normal Make-Up Flow Controller Bypass.

In this situation, MU6420 must be throttled to maintain a ___________.

A. minimum of 2260 psig discharge pressure for NPSH concerns due to high flow

B. minimum of 2260 psig discharge pressure for pump overcurrent concerns due to high flow

C. maximum of 2260 psig discharge pressure to ensure adequate flow for pump cooling

D. maximum of 2260 psig discharge pressure to ensure adequate flow for RCS makeup

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Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of tasks performed outside of the control room during a fire.

A. CORRECT: IAW DB-OP-02519, a caution in attachment 3 states that the minimum makeup Pump 1 discharge pressure is 2260 psig a indicated on PI MU25A. This will limit flow to < 250 gpm. A stated in SD 048, 250 gpm maximum is a NPSH requirement.

B. Incorrect because the intent of the step/note is to maintain adequate NPSH. It is plausible because a runout condition could result in pump overcurrent.

C. Incorrect because you are to maintain 2260 psig MINIMUM, not MAXIMUM. It is plausible because the pump does require a minimum flow to maintain pump cooling.

D. Incorrect because you are to maintain 2260 psig MINIMUM, not MAXIMUM. It is plausible because throttling down (raising pressure) does reduce makeup flow.

Sys #	System	Category	KA Statement
086	Fire Protection	Generic	Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects

K/A# 2.4.34 **K/A Importance** 4.2 **Exam Level** RO

References provided to Candidate None **Technical References:** SD 048, DB-OP 02519

Question Source: Bank 2008 NRC Exam Q63 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 45.7 / 45.8

Objective: GOP119

66. In accordance with NOP-OP-1002, Conduct of Operations, which ONE of the following valves are specified as being allowed to use “Two Handed Operations” during an event when its use is not specifically stated in the procedure in progress?

A. MU6422 and MU6421, Makeup Isolation Valves

B. HP2A and HP2B, HPI Injection Valves

C. DH1A, DH1B, Low Pressure Injection Isolation Valves

D. AF6451, AF6452, AFW Level Control Valves

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of DB Conduct of Operations requirements.

A. Incorrect. The Makeup isolation valves are not the list in NOP-OP-1002 for two handed operations. It is plausible because these valves may be used for injection during an RCS leak.

B. CORRECT: These valves are specifically stated in NOP-OP-1002 as being able to use two handed operations on.

C. Incorrect. The Makeup isolation valves are not the list in NOP-OP-1002 for two handed operations. It is plausible because these valves will be used during certain events for injection into the RCS.

D. Incorrect. The Makeup isolation valves are not the list in NOP-OP-1002 for two handed operations. It is plausible because if it were the Main and Startup control valve, it would be correct.

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Knowledge of conduct of operations requirements

K/A# 2.1.1 **K/A Importance** 3.8 **Exam Level** RO

References provided to Candidate None **Technical References:** NOP-OP-1002

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.10 / 45.13

Objective: GOP501

67. In accordance with NOP-OP-1002, Conduct of Operations, Night Orders are valid for a MAXIMUM of ________.

A. 14 days

B. one month

C. one quarter

D. one fuel cycle

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the administrative requirements for the duration of night orders.

A. CORRECT: 1st part is correct. IAW NOP-OP-1002, Night Orders are for short-term communication only and are only valid for 14 days.

B. Incorrect because IAW NOP-OP-1002, Night Orders are for short-term communication only and are only valid for 14 days. It is plausible because in NOP-OP-1002, it does discuss that material deficiency tags hall be audited monthly.

C. Incorrect because IAW NOP-OP-1002, Night Orders are for short-term communication only and are only valid for 14 days. It is plausible because Standing Orders are reviewed on a Quarterly basis.

D. Incorrect because IAW NOP-OP-1002, Night Orders are for short-term communication only and are only valid for 14 days. It is plausible because if it were Standing Orders, it would be correct.

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, Operations memos, etc.

K/A# 2.1.15 **K/A Importance** 2.7 **Exam Level** RO

References provided to Candidate None **Technical References:** NOP-OP-1002

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.10 / 45.12

Objective: GOP528

68. Complete the following statements regarding operational effects of core age on reactivity.

1. As the core ages, fuel depletion over core life will normally be compensated by ____(1)____.

2. At the end of the fuel cycle, DB-OP-06902, Power Operations has an attachment to____(2)____.

A. (1) lowering the RCS Boron concentration
(2) operate at reduced Tave which will allow power to remain near its rated value

B. (1) lowering the RCS Boron concentration
(2) operate at reduced power which will allow Tave to remain at setpoint

C. (1) withdrawing Control Rods
(2) operate at reduced Tave which will allow power to remain near its rated value

D. (1) withdrawing Control Rods
(2) operate at reduced power which will allow Tave to remain at setpoint

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Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to use the Operations at Power procedure to compensate for fuel depletion at EOL by operating at reduced Tave conditions.

A. CORRECT: 1st part is correct. Day to day operations will require Boron dilutions to maintain required Control Rod operating band. 2nd part is correct. DB-OP-06902 has a provision (Attachment 17) for operating at reduced Tave at the end of core life.

B. Incorrect: 1st part is correct (see A). 2nd part is incorrect because there is no provision in DB-OP-06902 for operating at reduced power to maintain Tave. It is plausible because it would work.

C. Incorrect: 1st part is incorrect because as fuel depletes Control Rods are maintained in an operating band by daily boron dilutions It is plausible because as fuel depletes rods will withdraw to maintain Tave. 2nd part is correct (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.

K/A# 2.1.43 **K/A Importance** 4.1 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-06902

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.10 / 43.6 / 45.6

Objective: GOP205

69. Initial conditions:

- The plant is at 2135 psig and 525 ºF.
- No Tech Spec required equipment is INOPERABLE.

AC101, EDG1 Output Breaker, is racked out to the Test Position to support maintenance.

In accordance with Technical Specification 3.8.1, AC Sources - Operating, which one of the following lists the **MINIMUM required** action(s) that must be performed within one hour?

A. Test start EDG 2 ONLY.

B. Verify correct breaker alignment and indicated power availability for the offsite circuit supplying A Bus ONLY.

C. Verify correct breaker alignment and indicated power availability for each offsite circuit.

D. Test start EDG 2 and verify correct breaker alignment and indicated power availability for each offsite circuit.

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to analyze effects of maintenance utilizing an electrical breaker on related LCOs.

A. Incorrect –Plausible because the #2 EDG will be started, but starting the opposite train EDG is only required within 24 hours

B. Incorrect – Verification of breaker status within one hour is required on each operable off-site circuit, not just those supplying A Bus. Plausible because A bus is the normal feed to C1 which is fed by EDG 1

C. CORRECT: In accordance with T.S. 3.8.1 Condition B with a completion time of 1 hour.

D. Incorrect – Verification of breaker status within one hour is required, but starting the opposite train EDG is only required within 24 hours.

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations

K/A# 2.2.36 **K/A Importance** 3.1 **Exam Level** RO

References provided to Candidate None **Technical References:** TS 3.8.1

Question Source: Bank 2013 NRC Exam Q68 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.10 / 43.2 / 45.13

Objective: SYS406

70. In addition to documenting, increased monitoring and compensatory actions, which ONE of the following satisfies the minimum requirement(s) for a Control Room annunciator that is out of service (will not alarm) in accordance with NOP-OP-1002, Conduct of Operations?

A. Documented on the RO Turnover Sheet.

B. A Deficiency tag on the annunciator panel mimic AND documented on the RO Turnover Sheet.

C. Submit a Document Change Request to alter the affected annunciator panel response procedure.

D. Submit a Document Change Request to alter the affected annunciator panel response procedure AND a deficiency tag on the annunciator panel mimic.

Answer: B

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the process used to track/label inoperable annunciators in the control room.

A. Incorrect because for a minimum, the alarm shall also be carried on the RO turnover sheet. It is plausible because it is a requirement.

B. CORRECT: NOP-OP-1002, Conduct of Operations, minimum requirements are met.

C. Incorrect: because a DCR is not required to alter the ARP, but is plausible because a DCR would be required for degraded equipment that will be left as is (degraded).

D. Incorrect: DCR not required, but plausible (see C). Deficiency tag on annunciator response panel is a requirement per NOP-OP-1002.

Sys #	**System**	**Category**	**KA Statement**
N/A	N/A	Generic	Knowledge of the process used to track inoperable alarms

K/A# 2.2.43 **K/A Importance** 3.0 **Exam Level** RO

References provided to Candidate None **Technical References:** NOP-OP-1002

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.13

Objective: GOP501

71. A Large Break LOCA has occurred. Borated Water Storage Tank level is 30 feet and lowering.

Step 10.2 of DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture directs performing Attachment 7, Section 1, Actions to Close Breakers for DH7A, DH7B, DH9A, DH9B, and HP31.

A review of local area Radiation Monitors in the vicinity of the Motor Control Centers indicates a peak dose rate of 34 REM/hr along the expected travel route to perform the required actions.

A Radiation Protection Technician is not IMMEDIATELY available to provide RP Coverage for this task.

Based on these conditions, what direction will you give the equipment operator and what is the basis for this direction?

As the Reactor Operator, you will _________(1)_______ this task to an Equipment Operator because ___________(2)__________.

A. (1) NOT assign
(2) the dose rate exceeds the Locked High Radiation Area dose rate and Equipment Operators do not carry Locked High Radiation Area Keys.

B. (1) NOT assign
(2) the dose rate exceeds the Very High Radiation Area criteria and entry is not allowed without Radiation Protection coverage.

C. (1) assign
(2) the task is required to complete the mitigation strategy for a LOCA and the total dose received will be within allowed limitations for post accident response.

D. (1) assign
(2) the task is required to complete the mitigation strategy for a LOCA. Since the dose limitations for post accident response will be exceeded, prior approval of the Emergency Director is required.

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of radiological safety principles (reducing dose).

A. Incorrect – Assignment of the task is required to enable establishing Containment Emergency Sump as a suction source for the ECCS Pumps and therefore must be assigned.

B. Incorrect - Assignment of the task is required to enable establishing Containment Emergency Sump as a suction source for the ECCS Pumps and therefore must be assigned.

C. CORRECT: Restoring power as directed by Attachment 7 Section 1 is a required mitigation strategy to enable establishing Containment Emergency Sump as a suction source for the ECCS Pumps. As noted in the procedure warning, the total dose received is expected to be less than 2 Rem and based on time motion studies and worst-case dose rates, RP coverage is not required.

D. Incorrect – While the action is part of the required mitigation strategy, the excepted dose will be within the allowed dose and not require pre-approval to exceed exposure limits

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

K/A# 2.3.12 **K/A Importance** 3.2 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02000

Question Source: Bank 2013 NRC Exam Q73 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.12 / 45.9 / 45.10

Objective: GOP309

72. Plant Conditions:
- Reactor power = 100%
- A SG tube leak = 45 gpm occurs

Based on the above plant conditions, complete the following statements.

1. Entry into ____(1)____is required.
2. If the reactor inadvertently trips during the shutdown, the major concern is____(2)____.

A. (1) DB-OP-02531, Steam Generator Tube Leak
(2) MSSV's lifting resulting in a direct release path to the atmosphere

B. (1) DB-OP-02531, Steam Generator Tube Leak
(2) the hydraulic shock of the control rods dropping causing the leak to become worse

C. (1) DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE
(2) MSSV's lifting resulting in a direct release path to the atmosphere

D. (1) DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE
(2) the hydraulic shock of the control rods dropping causing the leak to become worse

---

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of radiation hazards while perform abnormal procedures.

A. CORRECT: 1st part is correct. A SGTL = 45 gpm requires entry into DB-OP-02531. 2nd part is correct. The concern with tripping the reactor with a SG tube leak is that the MSSVs lift creating a direct release path to the environment.

B. Incorrect: 1st part is correct (see A). 2nd part is incorrect because the concern stated in DB-OP-02531 is that a lifting MSSV will cause an inadvertent release to the atmosphere. It is plausible because it could happen

C. Incorrect: 1st part is incorrect because entry criteria into DB-OP-02000 is not met. It is plausible because if the leak rate were 5gpm higher, it would be correct. 2nd part is correct (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is incorrect but plausible (see B).

Sys #	**System**	**Category**	**KA Statement**
N/A	N/A	Generic	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities

K/A# 2.3.14 **K/A Importance** 3.4 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02531, DB-OP-02000

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.12 / 43.4 / 45.10

Objective: GOP131

73. Plant conditions:
- A fire has ignited in the Control Room
- DB-OP-02519, Serious Control Room Fire, has been initiated

In accordance with DB-OP-02519, if the Primary Side Reactor Operator has completed their actions prior to evacuating the Control Room, the operating RCP configuration will be ________.

A. 0/0

B. 0/1

C. 1/1

D. 0/2

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the “Serious Control Room Fire” procedure.

A. CORRECT: In accordance with DB-OP-02519, the primary side RO will trip all B bus source breakers (de-energizing RCPs 1-2 and 2-1) and trip RCPs 1-1 and 2-2 leaving no RCPs operating.

B. Incorrect because no RCPs will be operating. It is plausible to think that the RCP that has biggest impact on PZR spray would be left operating for pressure control.

C. Incorrect no RCPs would be operating. It is plausible because per the procedure, you are directed to trip two RCPs.

D. Incorrect no RCPs would be operating. It is plausible because per the procedure, you are directed to trip two RCPs.

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Knowledge of “fire in the plant” procedures

K/A# 2.4.27 **K/A Importance** 3.4 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02519, SYS105

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.13

Objective: GOP119

74. The following conditions are observed with the plant at 100% power and equilibrium conditions established:
   - All previously LIT CTRM annunciator windows are OFF with no alarms LIT at all.
   - Computer point Q007, ANNUN SYS TRBL, is in alarm.
   - All primary plant parameters remain stable.

   Which ONE of the following actions is required for the given conditions?

A. Trip the RX and go to DB-OP-02000.

B. Implement DB-OP-02521, Loss of AC Bus Power Sources.

C. Carry out the actions of DB-OP-02007, Attachment 7-5-A, ANNUN SYS TBRL.

D. Tech. Spec. 3.0.3 must be invoked and a plant S/D must be initiated within one hour.

Answer: C

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the response of the operator for a loss of control room annunciators.

A. Incorrect: No immediate or supplemental actions exist that require tripping the reactor. Plausible because the ability to monitor plant conditions is significantly degraded and tripping the reactor is a common action to place the plant in a known safe condition.

B. Incorrect: Entry conditions for Loss of AC Power Sources are not met and the Abnormal will not address a loss of annunciators. Plausible because the power supplies for station annunciators are YBU and YAR, which are both AC sources.

C. CORRECT: DB-OP-02007 provides guidance for necessary action during a loss of station annunciators.

D. Incorrect: Invoking LCO 3.0.3 is not required due to the failure of the station annunciators. It is plausible due to the need to verify no tech spec equipment is degraded and the loss of annunciator alarms to alert the CTRM operators of degraded conditions.

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Knowledge of operator response to loss of all annunciators

K/A# 2.4.32 **K/A Importance** 3.6 **Exam Level** RO

References provided to Candidate None **Technical References:** NOP-OP-0112, Alarm 7-5-A, DB-OP-02521

Question Source: Bank 162968 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.13

Objective:

75. Plant conditions:
- Offsite power has been lost
- SG 1 has a 450 gpm tube rupture

Event:
- The crew has progressed to the point where SG 1 can be isolated
- SG 1 level 49 inches
- RCS pressure is 1000 psig

When isolating SG 1 in accordance with DB-OP-02000, the crew should anticipate that SG 1 pressure will ____________ due to _____________.

A. rise; continued RCS heat input to SG 1 with no steam release flowpath

B. rise; SG 1 immediately going water solid from the tube rupture

C. lower; loss of RCS natural circulation flow in SG 1

D. lower; RCS water from tube rupture quenching some of the steam in SG 1

Answer: A

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to recognize plant conditions to predict response to operator actions.

A. CORRECT: The isolated SG pressure will rise with no steam release path.

B. Plausible since the SGTR still exists, but the SG pressure will be the same as the RCS pressure and therefore the level should stop going up

C. Plausible since the RCS is being cooled by natural circulation, however, SG 1 will pressurize until the SG becomes a heat source and the RCS cools down SG 1

D. Plausible since because of the tube rupture, however, the RCS water and SG water are approximately the same pressure/temperature and quenching would not occur

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Sys #	System	Category	KA Statement
N/A	N/A	Generic	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material

K/A# 2.4.47 **K/A Importance** 4.2 **Exam Level** RO

References provided to Candidate None **Technical References:** DB-OP-02000

Question Source: Bank 2008 NRC Exam Q75 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.12

Objective: GOP-307

76. A Large Break Loss of Coolant Accident has occurred.

Once ECCS suctions are transferred to the Emergency Sump, the following indications are noted:

- LPI Train 1 & 2 Flows – BOTH 3900 gpm and stable
- Containment Spray Train 1 Flow – 2000 gpm and stable
- Containment Spray Train 2 Flow – flow fluctuating between 1000 gpm and top of scale
- LPI Train 1 & 2 motor amps – BOTH 60 amps and stable
- Containment Spray Train 1 motor amps 180 amps and stable
- Containment Spray Train 2 motor amps fluctuating between 80 amps and top of scale.
- CS1531 CTMT Spray Train 2 Disch is full OPEN
- DH1A and DH1B LPI injection valves are full OPEN

Which ONE of the following DB-OP-02000 attachments, require implementation and what actions will be taken to mitigate these conditions?

A. Perform Attachment 7, Transferring LPI Suctions to the Emergency Sump, throttle LPI Injection valves DH1A and DH1B.

B. Perform Attachment 7, Transferring LPI Suctions to the Emergency Sump, throttle CS1531 CTMT Spray Train 2 Disch.

C. Perform Attachment 27, Mitigation of Containment Emergency Sump Degradation, throttle LPI Injection valves DH1A and DH1B

D. Perform Attachment 27, Mitigation of Containment Emergency Sump Degradation, throttle CS1531 CTMT Spray Train 2 Disch.

Answer: B

SRO ONLY: NUREG 1021, ES-401, Attachment 2

E. Assessment of Facility Conditions and Selection of Appropriate Procedures during Normal, Abnormal, and Emergency Situations [10 CFR 55.43(b)(5)] This 10 CFR 55.43 topic involves both (1) assessing plant conditions (normal, abnormal, or emergency) and then (2) selecting a procedure or section of a procedure to mitigate or recover, or with which to proceed. One area of SRO-level knowledge (with respect to selecting a procedure) is knowledge of the content of the procedure versus knowledge of the procedure's overall mitigative strategy or purpose.

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to evaluate plant performance and make operational judgements (procedure selection) based on those parameters.

A. Incorrect : 1st part is incorrect. 2nd part is incorrect, these are the correct action if both trains are impacted.

B. Correct: 1st part is SRO since it requires the SRO to select which attachment is to be used. DB-OP-02000 Attachment 7 directs verifying CTMT Spray Discharge Valves are positioned to the Throttle position following transfer of ECCS Pump Suctions to the Emergency Sump. Part 2 Actions are correct IAW Attachment 7.

C. Incorrect: 1st part is incorrect. Since only one train is affected. 2nd part is incorrect but these are the correct actions for both trains being affected.

D. Incorrect: 1st part is incorrect. Since only one train is affected. 2nd part is correct.

011	Large Break LOCA	Generic	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation

K/A# 2.1.7 **K/A Importance** 4.7 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-02000, Attachment 7 USAR Section 6.2.2.2.2 Containment Spray System

Question Source: Bank NRC DB 2013 Q#88 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 43.5 / 45.12 / 45.13

Objective: GOP-309

77. Initial Conditions:

- RCS drain has commenced for refueling outage
- The plant is in reduced inventory
- Decay Heat Removal loop 1 is in Operation
- Decay Heat Removal loop 2 is in Standby

The following occurs:

- CTMT Normal Sump Level is rising
- DH Pump 1 motor amps becomes erratic
- DH Pump 1 discharge pressure becomes erratic
- DH Pump 1 flow becomes erratic
- DB-OP-02527 Loss of Decay Heat Removal is entered

Based on the above plant conditions, complete the following statements.

In accordance with DB-OP-02527, …

1. The next action related to the Decay Heat Removal Pumps will be to ____(1)______.

2. Containment evacuation____(2)____required.

A. (1) start DH Pump 2
(2) is

B. (1) stop DH Pump 1
(2) is

C. (1) start DH Pump 2
(2) is NOT

D. (1) stop DH Pump 1
(2) is NOT

Answer: B

SRO ONLY: NUREG 1021, ES-401, Attachment 2

E. Assessment of Facility Conditions and Selection of Appropriate Procedures during Normal, Abnormal, and Emergency Situations [10 CFR 55.43(b)(5)] This 10 CFR 55.43 topic involves both (1) assessing plant conditions (normal, abnormal, or emergency) and then (2) selecting a procedure or section of a procedure to mitigate or recover, or with which to proceed. One area of SRO-level knowledge (with respect to selecting a procedure) is knowledge of the content of the procedure versus knowledge of the procedure's overall mitigative strategy or purpose.

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to determine actions for a loss of decay heat removal based on increasing sump level.

A. Incorrect: 1st part is incorrect, the standby decay heat pump is not started prior to securing the pump that is cavitating. 1st part is plausible because starting a standby DH pump first could maintain DH removal. 2nd part is correct because with reduced RCS inventory (RCS draining), containment evacuation is required

B. CORRECT: 1st part is correct the cavitating decay heat pump will be secured prior to starting the standby pump. 2nd part is correct (see A).

C. Incorrect: 1st part is incorrect (see A) 2nd part is incorrect because the containment evacuation alarm is required. Plausible because there is no mention of elevated dose rates in containment.

D. Incorrect: 1st part is correct (see B). 2nd part is incorrect (see C).

Sys #	System	Category	KA Statement
025	Loss of Residual Heat Removal System	A2 Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System:	Increasing reactor building sump level

K/A# AA2.03 **K/A Importance** 3.8 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-02527, DB-OOP-06903

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 43.5 / 45.13

Objective: GOP127

78. Initial plant conditions:
   - DB-OP-02531, Steam Generator Tube Leak has been entered due to 40 gpm leak on SG 1
   - Power is being reduced in accordance with DB-OP-02504, Rapid Shutdown

   Current plant conditions:
   - Reactor power = 60%
   - Pzr Level = 98 inches lowering
   - SG 1 tube leak has increased to 80 gpm rising

   Based on the above plant conditions, which ONE of the following correctly states the proper actions and progression through DB-OP-02000, RPS, SFAS, SFRCS Trip, or SG Tube Rupture.

A. Trip the reactor, perform ALL Immediate Actions, perform supplemental actions until directed to GO TO Section 8.0, Steam Generator Tube Rupture

B. Trip the reactor, enter the Immediate Action section of DB-OP-02000, then GO TO Section 8.0, Steam Generator Tube Rupture

C. Enter the Immediate Action section of DB-OP-02000, trip the reactor then GO TO Section 8.0, Steam Generator Tube Rupture

D. Enter the Immediate Action section of DB-OP-02000, then GO TO Section 8.0, Steam Generator Tube Rupture without tripping the reactor

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Answer: A

SRO ONLY: NUREG 1021, ES-401, Attachment 2

E. Assessment of Facility Conditions and Selection of Appropriate Procedures during Normal, Abnormal, and Emergency Situations [10 CFR 55.43(b)(5)] This 10 CFR 55.43 topic involves both (1) assessing plant conditions (normal, abnormal, or emergency) and then (2) selecting a procedure or section of a procedure to mitigate or recover, or with which to proceed. One area of SRO-level knowledge (with respect to selecting a procedure) is knowledge of the content of the procedure versus knowledge of the procedure's overall mitigative strategy or purpose.

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to know when to apply immediate actions from memory (IMAs for RCS Leak) when a SGTR exists.

A. CORRECT: 1st part is correct. Tripping the reactor when Pzr level < 100" is an immediate action for DB-OP-02522 which does apply. After tripping the reactor DB-OP-02000 is entered and IAs are completed before transferring to Supplemental Actions (section 4). In section 4, when asked about indications of a SGTR, it directs you to Section 8 for SGTR.

B. Incorrect because Section 4.0, Supplemental Actions were not performed. It is plausible because if the reactor were not tripped, it could be correct.

C. Incorrect because Section 4.0, Supplemental Actions were not performed. It is plausible because there are conditions where you transfer to Section 8 from the immediate actions.

D. Incorrect because with Pzr level < 100", you are required to trip the reactor. It is plausible because if Pzr level were > 100", it would be correct.

Sys #	System	Category	KA Statement
038	Steam Generator Tube Rupture	Generic	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls

K/A#	2.4.49	**K/A Importance**	4.4	**Exam Level**	SRO
References provided to Candidate	None			**Technical References:**	DB-OP-02000, DB-OP-02522, DB-OP-02531
Question Source:	New			**Level Of Difficulty: (1-5)**	3
Question Cognitive Level:	High			**10 CFR Part 55 Content:**	41.10 / 43.2 / 45.6

Objective: GOP-307

79. Initial Conditions:
- 100% Power
- Component Cooling Water (CCW) Train 1 is in service
- Component Cooling Water (CCW) Train 2 is in standby
- Loss of Offsite Power occurs
- Reactor trips

Based on the above plant conditions, complete the following statements.

1. When EDG 2 breaker (AD101) closes into Bus D1, CCW Pump 2 is designed to start ____(1)____.

2. If CCW Pump 2 does not start automatically but does start manually, the Unit Supervisor will ____(2)____.

A. (1) immediately
(2) not declare CCW Train 2 INOPERABLE

B. (1) immediately
(2) declare CCW Train 2 INOPERABLE

C. (1) after a 10 second time delay
(2) not declare CCW Train 2 INOPERABLE

D. (1) after a 10 second time delay
(2) declare CCW Train 2 INOPERABLE

Answer: D

SRO ONLY: NUREG 1021, ES-401, Attachment 2
B. Facility Operating Limitations in the Technical Specifications and Their Bases [10 CFR 55.43(b)(2)]
Some examples of SRO exam items for this topic the following: · application of required actions (TS Section 3) and surveillance requirements (SR) (TS Section 4) in accordance with rules of application requirements (TS, Section 1) · application of generic limiting condition for operation (LCO) requirements (LCO 3.0.1 through 3.0.7; SR 4.0.1 through 4.0.4). · knowledge of TS bases that are required to analyze TS-required actions and terminology same items listed above for the Technical Requirements Manual (TRM) and Offsite Dose Calculation Manual (ODCM)

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to determine the operability status of CCW pumps during a loss of offsite power.

A. Incorrect: 1st part is incorrect because the CCW pump in STBY is designed to start 10 seconds after its associated EDG output breaker closes. It is plausible because if it were CCW Pump 1, it would be correct. 2nd part is incorrect because the Bases for the CCW system (TSB 3.7.7) requires the CCW pump to be operable in order for the CCW Train to be operable. SR 3.7.7.3 requires the CCW pump to start automatically on actual or simulated actuation signals so the CCW pump would be inoperable. It is plausible because the TSB requires the CCW pump/train to fulfill its safety function which it is..

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is correct. If the autostart feature does not work on the CCW pump, it constitutes a failed surveillance which makes it inoperable.

C. Incorrect: 1st part is correct. The CCW pump in STBY is designed to start 10 seconds after the EDG output breaker closes. 2nd part is incorrect but plausible (see A).

D. CORRECT: 1st part is correct (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
056	Loss of Offsite Power	A2 Ability to determine and interpret the following as they apply to the Loss of Offsite Power:	Operational status of CCW pump

K/A#	AA2.06	**K/A Importance**	3.6	**Exam Level**	SRO
References provided to Candidate	None			**Technical References:**	TS 3.7.7, TSB 3.7.7, SYS304

Question Source:	New	**Level Of Difficulty: (1-5)**	3
Question Cognitive Level:	Low	**10 CFR Part 55 Content:**	43.5 / 45.13
Objective:	SYS304		

80. Initial conditions:
    - Plant is at 100% Power
    - Emergency Diesel Generator (EDG) 1 is paralleled to the grid during testing
    - A Grid Disturbance causes EDG 1 to overload and 4160 V Essential Bus C1 to isolate via AC110 opening

    Current Conditions
    - Reactor tripped
    - EDG 1 is Locked out

    Based on the above plant conditions, answer the following questions.

    (1) As the Shift Manager, what additional permission if any is required prior to authorizing a reset of the EDG 1 Lockout?

    AND

    (2) How will the plant respond when the Lockout is reset?

A. (1) Manager Site Maintenance OR Manager Site Operations permission required
(2) EDG 1 will auto start and output breaker AC 101 will automatically CLOSE

B. (1) Manager Site Maintenance OR Manager Site Operations permission required
(2) EDG 1 will auto start and output breaker AC 101 will remain OPEN

C. (1) No additional permission required
(2) EDG 1 will auto start and output breaker AC 101 will automatically CLOSE

D. (1) No additional permission required
(2) EDG 1 will auto start and output breaker AC 101 will remain OPEN

Answer: C

SRO ONLY: NUREG 1021, ES-401, Attachment 2

The SRO-only test item is required to be tied to one of the 10 CFR 55.43(b) items. However, if a licensee desires to evaluate a knowledge/ability that is not tied to one of the 10 CFR 55.43(b) items, then the licensee can classify the knowledge/ability as "*unique to the SRO position*" provided that there is documented evidence that ties the knowledge/ability to the licensee's SRO job position duties in accordance with the systematic approach to training (SAT).

· **Justification**: A question that is not tied to one of the 10 CFR 55.43(b) items can still be classified as "SRO-only" provided the licensee has documented evidence to prove that the knowledge/ability is "*unique to the SRO position*" at the site. An example of documented evidence includes:

The question is linked to a learning objective that is specifically labeled in the lesson plan as being SRO-only (e.g., some licensee lesson plans have columns in the margin that differentiate AO, RO, and SRO learning objectives) [NUREG 1021, ES-401, Section D.2.d]

AND/OR A question is linked to a task that is labeled as an SRO-only task, and the task is NOT listed in the RO task list.

This is SRO since this is knowledge of an Administrative procedure specifying the implementation of a procedure directing requirements for resetting on electrical lockout.

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of local operator tasks (in this case who can authorize the performance of those tasks) and what happens when the task is performed.

A. Incorrect – plausible since (1) both would be required for an unexpected electrical bus, transformer, or main generator lockout (2) is correct

B. Incorrect – plausible since (1 both would be required for an unexpected electrical bus, transformer, or main generator lockout (2) EDG 1 output breaker will not close if the bus is locked out

C. Correct – Part 1 is SRO Knowledge (1) NOP-OP-1002, Conduct of Operations gives specific permission for the Shift Manager to reset an EDG lockout (2) EDG 1 will automatically start due to an undervoltage signal once the lockout is reset and AC101 will auto close to energize C1

D. Incorrect – plausible since (1) is correct (2) plausible since EDG 1 output breaker will not close if C1 is locked out

Sys #	System	Category	KA Statement
077	Generator Voltage and Electric Grid Disturbances	Generic	Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects

K/A# 2.4.35 **K/A Importance** 4.0 **Exam Level** SRO

References provided to Candidate None **Technical References:** NOP-OP-1002, step 4.12.2.2 and DB-OP 02521 Attachment 3 Caution 6.0

Question Source: New

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.13

Objective: GOP501, 121

81. Initial plant conditions:
- Reactor power = 100%
- A loss of ALL feedwater occurs
- Reactor trips
- DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE is entered

Current plant conditions:
- DB-OP-02000, Section 6.0, LACK OF HEAT TRANSFER is in progress
- The Standby Makeup Pump failed to start
- RCS Thot = 580°F rising
- RCS pressure = 2300 psig rising

Based on the above plant conditions, complete the following statement.

The crew will ____(1)____ where the next action taken will be to reduce operating RCPs to one RCP____(2)____.

A. (1) remain in Section 6.0
(2) total

B. (1) remain in Section 6.0
(2) per loop

C. (1) GO TO Attachment 4, Initiate MU/HPI Cooling
(2) total

D. (1) GO TO Attachment 4, Initiate MU/HPI Cooling
(2) per loop

Answer: C

SRO ONLY: NUREG 1021, ES-401, Attachment 2

E. Assessment of Facility Conditions and Selection of Appropriate Procedures during Normal, Abnormal, and Emergency Situations [10 CFR 55.43(b)(5)] This 10 CFR 55.43 topic involves both (1) assessing plant conditions (normal, abnormal, or emergency) and then (2) selecting a procedure or section of a procedure to mitigate or recover, or with which to proceed. One area of SRO-level knowledge (with respect to selecting a procedure) is knowledge of the content of the procedure versus knowledge of the procedure's overall mitigative strategy or purpose.

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to interpret plant conditions and determine the appropriate procedure to address those conditions.

A. Incorrect: 1st part is incorrect because only having one MU Pump operating meets criteria to GO TO Attachment 4. It is plausible because the criteria based on RCS Thot (600°F) has not been met. 2nd part is correct. The next action in this section is to reduce operating RCPs to one total.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because you are directed to reduce RCPs to one operating total. It is plausible because one per loop would give you better forced circulation if feedwater were returned to either SG.

C. CORRECT: 1st part is correct. Only having one MU Pump operating meets criteria to GO TO Attachment 4. 2nd part is correct (see A).

D. Incorrect: 1st part is correct (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement

BW E04	Inadequate Heat Transfer—Loss of Secondary Heat Sink	EA2 Ability to determine and interpret the following as they apply to the (Inadequate Heat Transfer):	Facility conditions and selection of appropriate procedures during abnormal and emergency operations

K/A# EA2.1 **K/A Importance** 4.4 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-02000

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 43.5 / 45.13

Objective: GOP-305

82. Initial plant conditions:
- 100% Power
- APIs indicate Control Rod 5-2 has dropped into the core

Based on plant conditions, complete the following statements.

1. ____(1)____.would provide a more definitive indication of a dropped rod compared to another possible CRD malfunction.

2. The Shift Manager will ensure the following permission is obtained prior to recovering the dropped rod ____(2)____.

A. (1) CRD ASYMMETRIC ROD (5-2-E)
(2) Reactor Engineering Supervisor

B. (1) CRD ASYMMETRIC ROD (5-2-E)
(2) Duty Plant Manager

C. (1) CRD SAFETY RODS NOT WITHDRAWN (5-3-E)
(2) Reactor Engineering Supervisor

D. (1) CRD SAFETY RODS NOT WITHDRAWN (5-3-E)
(2) Duty Plant Manager

Answer: B

SRO ONLY: NUREG 1021, ES-401, Attachment 2

The SRO-only test item is required to be tied to one of the 10 CFR 55.43(b) items. However, if a licensee desires to evaluate a knowledge/ability that is not tied to one of the 10 CFR 55.43(b) items, then the licensee can classify the knowledge/ability as "*unique to the SRO position*" provided that there is documented evidence that ties the knowledge/ability to the licensee's SRO job position duties in accordance with the systematic approach to training (SAT).

• **Justification**: A question that is not tied to one of the 10 CFR 55.43(b) items can still be classified as "SRO-only" provided the licensee has documented evidence to prove that the knowledge/ability is "*unique to the SRO position*" at the site. An example of documented evidence includes:

The question is linked to a learning objective that is specifically labeled in the lesson plan as being SRO-only (e.g., some licensee lesson plans have columns in the margin that differentiate AO, RO, and SRO learning objectives) [NUREG 1021, ES-401, Section D.2.d]
AND/OR A question is linked to a task that is labeled as an SRO-only task, and the task is NOT listed in the RO task list.

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to prioritize/intepret alarms (in this case, determine which section of the abnormal procedure has priority AND the power limit imposed by that section).

A. Incorrect: 1st part is correct. The Asymmetric Rod alarm will be present for a dropped group 5 rod due to expected position of group 5 at 100% RTP is 100% withdrawn. Rod 5-2 is > 6.5% of average. 2nd part is incorrect because Reactor Engineering permission is not required. It is plausible because they will be consulted.

B. CORRECT: 1st part is correct (see A). 2nd part is correct. The Shift Manager directs dropped rod recovery with the administrative requirement of duty plant manager permission required. SRO knowledge to recognition of administrative requirement for rod recovery per the Abnormal procedure.

C. Incorrect: 1st part is incorrect because CRD Safety Rods Not Withdrawn is based on a Safety Group rod position not indicating withdrawn, Group 5 is a Regulating Group. It is plausible because Group 5 is 100% withdrawn during normal 100% ops like Safety Groups and if it were Rod 2-5 this alarm could be illuminated. 2nd part is incorrect but plausible (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
003	Dropped Control Rod	Generic	Ability to prioritize and interpret the significance of each annunciator or alarm

K/A# 2.4.45 **K/A Importance** 4.3 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-02516 DB-OP-02005

Question Source: Modified NRC DB 2009 Q#82 **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.3 / 45.12

Objective: GOP116

83. The Plant is operating at 100% power with all systems in normal alignment. Movement of Spent Fuel within the Spent Fuel Pool is in progress, to support Dry Fuel Storage.

An earthquake (>OBE) occurs resulting in the following plant conditions:

- All Control Room Annunciators are Lost
- **NO** RPS, SFAS or SFRCS Trip actuations occur
- The Plant remains at 100% power and is stable
- Computer systems remain **AVAILABLE**
- Damage to a Spent Fuel Assembly in the Spent Fuel Pool occurs
- Spent Fuel Area Radiation Monitor RE 8426 HIGH Alarm is in
- Spent Fuel Area Radiation Monitor RE 8427 ALERT alarm is in
- Fuel Handling Area Radiation Monitor RE 8417 ALERT alarm is in
- Fuel Handling Area Radiation Monitor RE 8418 is not in alarm
- Fuel Handling Exhaust Radiation Monitor RE 8446 is not in alarm
- Fuel Handling Exhaust Radiation Monitor RE 8447 is not in alarm

Based on the above plant conditions, complete the following statements.

1. The Fuel Handling Area Exhaust Air System will____(1)____.

2. The highest Emergency Plan Classification is a(n)____(2)____.

(Reference RA-EP-01500, Emergency Classification EAL Tables)

A. (1) have automatically tripped
(2) Unusual Event

B. (1) have automatically tripped
(2) Alert

C. (1) still be operating
(2) Unusual Event

D. (1) still be operating
(2) Alert

Answer: D

SRO ONLY: NUREG 1021, ES-401, Attachment 2

F. Procedures and Limitations Involved in Initial Core Loading, Alterations in Core Configuration, Control Rod Programming, and Determination of Various Internal and External Effects on Core Reactivity [10 CFR 55.43(b)(6)] Some examples of SRO exam items for this topic include the following: • evaluation of core conditions and emergency classifications based on core conditions • administrative requirements associated with low-power physics testing processes • administrative requirements associated with refueling activities, such as approvals required to amend core loading sheets or administrative controls of potential dilution paths and/or activities • administrative controls associated with the installation of neutron sources • knowledge of TS bases for reactivity controls

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to determine the magnitude of a potential radioactive release due to a fuel handling accident by determining the event classification.

A. Incorrect. 1st part is incorrect because the SFP exhaust fan is not interlocked with the Area radiation monitors listed. It is plausible because they measure spent fuel pool area radiation. 2nd part is incorrect because the criteria has been met to declare an Alert, an earthquake > OBE would be a UE

B. Incorrect. 1st part is incorrect but plausible (see A). 2nd part is correct. RA2.2, and monitor in HIGH alarm (RE8246) meets the criteria to declare an Alert.

C. Incorrect: 1st part is correct. The SFP exhaust will still be operating since RE 8446/8447 are not in alarm 2nd part is incorrect but plausible (see A).

D. CORRECT. 1st part is correct (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
036	Fuel-Handling Incidents	A2 Ability to determine and interpret the following as they apply to the Fuel Handling Incidents:	Magnitude of potential radioactive release

K/A# AA2.03 **K/A Importance** 4.2 **Exam Level** SRO

References provided to Candidate **RA-EP-01500 or WALLBARD** **Technical References:** RA-EP-01500, SD 017B

Question Source: Modified 2011 NRC Exam Q98 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 43.5 / 45.13

Objective: GOP603

84. Initial plant conditions:
    - A small break LOCA has occurred
    - Bus C1 is locked out
    - DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE, Section 9.0, Inadequate Core Cooling is in progress

    Current plant conditions:
    - BWST has decreased to 9 ft
    - DH-63, Decay Heat Pump 2 Discharge to HPI Pump 2 Suction (Piggyback Valve) does not open
    - Attachment 7, Transferring LPI Suction To The Emergency Sump is complete
    - You have determined that you are in Region 3 of Figure 2, ICC

    (Reference: DB-OP-02000 Figure 2)

    Based on the above plant conditions, complete the following statements.

    1. HPI Pump injection____(1)____available to the RCS.

    2. Based on placement in Figure 2, you are to____(2)____Section 9.0.

A. (1) is
(2) return to the beginning of

B. (1) is
(2) continue in

C. (1) is NOT
(2) return to the beginning of

D. (1) is NOT
(2) continue in

Answer: D

SRO ONLY: NUREG 1021, ES-401, Attachment 2

E. Assessment of Facility Conditions and Selection of Appropriate Procedures during Normal, Abnormal, and Emergency Situations [10 CFR 55.43(b)(5)] This 10 CFR 55.43 topic involves both (1) assessing plant conditions (normal, abnormal, or emergency) and then (2) selecting a procedure or section of a procedure to mitigate or recover, or with which to proceed. One area of SRO-level knowledge (with respect to selecting a procedure) is knowledge of the content of the procedure versus knowledge of the procedure's overall mitigative strategy or purpose.

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to determine the availability of an HPI pump.

A. Incorrect: 1st part is incorrect because when Attachment 7 is complete with DH63 closed, there is no suction to the HPI pumps. It is plausible because Attachment is to swap LPI suction so you could assume that the HPI suction supply from the RWST is still available. 2nd part is incorrect because you are directed to GO TO Step 9.14 which is the next step in the procedure. It is plausible because if you were in Region 2, it would be correct.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is correct. If in Region 3 of the curve, you are directed to GO TO Step 9.14.

C. Incorrect: 1st part is correct. With a C1 Lockout and DH63 closed and Attachment 7 complete, you no longer have a suction supply to the operating HPI pump. 2nd part is incorrect but plausible (see A).

D. CORRECT: 1st part is correct (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
074	Inadequate Core Cooling	Generic	Ability to determine operability and/or availability of safety related equipment

K/A# 2.2.37 **K/A Importance** 4.6 **Exam Level** SRO

References provided to Candidate DB-OP-02000 Figure 2 **Technical References:** DB-OP-02000, os3, os4

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.7 / 43.5 / 45.12

Objective: GOP308

85. Plant conditions:

- Reactor power = 100%
- SFAS Channel 1 Load Sequencer is declared INOPERABLE

In accordance with TS 3.8.1, AC Sources (Operating), …

1. The inoperable load sequencer ____(1)____.
2. With one Load Sequencer inoperable/ removed from service, the Unit Supervisor will____(2)____.

A. (1) must be removed immediately
(2) not declare EDG 1 INOPERABLE

B. (1) must be removed immediately
(2) declare EDG 1 INOPERABLE

C. (1) must be removed from service within one hour from the time of inoperability
(2) not declare EDG 1 INOPERABLE

D. (1) must be removed from service within one hour from the time of inoperability
(2) declare EDG 1 INOPERABLE

Answer: C

SRO ONLY: NUREG 1021, ES-401, Attachment 2

B. Facility Operating Limitations in the Technical Specifications and Their Bases [10 CFR 55.43(b)(2)] Some examples of SRO exam items for this topic the following: • application of required actions (TS Section 3) and surveillance requirements (SR) (TS Section 4) in accordance with rules of application requirements (TS, Section 1) • application of generic limiting condition for operation (LCO) requirements (LCO 3.0.1 through 3.0.7; SR 4.0.1 through 4.0.4). • knowledge of TS bases that are required to analyze TS-required actions and terminology • same items listed above for the Technical Requirements Manual (TRM) and Offsite Dose Calculation Manual (ODCM)

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to determine operability of the EDG actuating/loading circuitry and adhere to associated procedure requirements (TS 3.8.1).

A. Incorrect: 1st part is incorrect because TS 3.8.1.G gives you 1 hour to remove the inoperable load sequencer. It is plausible because the sequencer doesn't work so it would make sense to remove it immediately. 2nd part is correct. IAW TS 3.8.1, Condition H: The EDG is declared inoperable if TWO load sequencers inoperable, only One sequencer is INOP in this case.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because IAW TS 3.8.1, Condition H: The EDG is declared inoperable if TWO load sequencers inoperable. It is plausible because IAW TSB 3.8.1, 2 sequencers are required to be operable.

C. CORRECT 1st part is correct. TS 3.8.1.G directs you to remove the inoperable load sequencer within one hour. 2nd part is correct (see A).

D. Incorrect : 1st part is correct (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
BW A05	Emergency Diesel Actuation	A2 Ability to determine and interpret the following as they apply to the (Emergency Diesel Actuation):	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments

K/A# AA2.2 **K/A Importance** 3.8 **Exam Level** SRO

References provided to Candidate None **Technical References:** TS 3.8.1, TSB 3.8.1

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low

10 CFR Part 55 Content: 43.5 / 45.13

Objective: GOP438

86. Plant conditions:
Time = 0800:
- Reactor power = 100%

- 6-2-A, 1-1 SEAL RET TEMP HI in alarm
  - RCP 1-1 Seal Return Temperature = 190°F

- 6-3-A, 1-1 SEAL RET FLOW HIGH in alarm
  - RCP 1-1 Seal Return Flow = 1.8 gpm

- DB-OP-02515, REACTOR COOLANT PUMP AND MOTOR ABNORMAL OPERATION has been entered

- Power is being reduced

Time = 0830:
- RCP 1-1 Seal Return Temperature = 210°F
- RCP 1-1 Seal Return Flow = 1.9 gpm

Based on plant conditions at Time = 0830,

RCP 1-1 will be secured using ____(1)____ due to Seal Return____(2)____exceeding its limit.

A. (1) Attachment 1 of DB-OP-02515, Reactor Coolant Pump Shutdown
(2) Temperature

B. (1) Attachment 1 of DB-OP-02515, Reactor Coolant Pump Shutdown
(2)) Flow

C. (1) DB-OP-06005, Reactor Coolant Pump Operating Procedure
(2)) Flow

D. (1) DB-OP-06005, Reactor Coolant Pump Operating Procedure
(2)) Temperature

Answer: A

SRO ONLY: NUREG 1021, ES-401, Attachment 2

E. Assessment of Facility Conditions and Selection of Appropriate Procedures during Normal, Abnormal, and Emergency Situations [10 CFR 55.43(b)(5)] This 10 CFR 55.43 topic involves both (1) assessing plant conditions (normal, abnormal, or emergency) and then (2) selecting a procedure or section of a procedure to mitigate or recover, or with which to proceed. One area of SRO-level knowledge (with respect to selecting a procedure) is knowledge of the content of the procedure versus knowledge of the procedure's overall mitigative strategy or purpose.

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to predict the impacts of seal failure (which parameter exceeding limit) and select a procedure to address the issue.

A. CORRECT: 1st part is correct. With seal return temperature > 200ºF, you are directed to perform Attachment 1 to secure the RCP. 2nd part is correct. With temperature > (200ºF). you are directed to secure the RCP.

B. Incorrect: 1st part is correct (see A). 2nd part is incorrect because seal return flow is not high enough to direct securing the RCP. It is plausible because if it were .1 gpm higher, it would be correct.

C. Incorrect: 1st part is incorrect because when seal return temperature is > 200ºF, you are directed to perform Attachment 1 to secure the RCP. It is plausible because if the decision was made to secure the RCP prior to limits being exceeded, it could be correct. 2nd part is correct (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
003	Reactor Coolant Pump	A2 Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:	Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP

K/A# A2.02 **K/A Importance** 3.9 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-02515

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 43.5 / 45.3 / 45.13

Objective: GOP115

87. The plant is in Mode 5.

DB-PF-03071, CCW Train 1 valve testing is in progress.

CC1328, CCW to CRD Booster Pump Suction isolation valve testing is in progress.

If CC1328 Stroke Time exceeds the maximum allowed times (open and closed), can the plant proceed to Mode 4 before this condition is corrected?

A. Yes – The Control Rod Drive system is not required to be energized until entry into Mode 2 is desired.

B. Yes- The Stroke Time data is for trending purposes only and isolation is not required to maintain system integrity and operability.

C. No – The failure to meet the Stroke Time renders the valve Inoperable per Tech Specs, entry into the higher Mode is not permitted.

D. No – The failure to meet the stroke time renders the CRD Booster Pump Inoperable, entry into the higher Mode is not permitted.

Answer: C

SRO ONLY: NUREG 1021, ES-401, Attachment 2

B. Facility Operating Limitations in the Technical Specifications and Their Bases [10 CFR 55.43(b)(2)]

Some examples of SRO exam items for this topic the following:

• application of required actions (TS Section 3) and surveillance requirements (SR) (TS Section 4) in accordance with rules of application requirements (TS, Section 1)• application of generic limiting condition for operation (LCO) requirements (LCO 3.0.1 through 3.0.7; SR 4.0.1 through 4.0.4).• knowledge of TS bases that are required to analyze TS-required actions and terminology• same items listed above for the Technical Requirements Manual (TRM) and Offsite Dose Calculation Manual (ODCM)

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of surveillance procedures for the CCW system. SROs are required to undertand the impact of component operation on Tech Spec operability and the ability to change plant modes.

A. Incorrect. The failure to meet the required stroke times constitutes a failure to meet Surveillance Requirements for CCW, which is required for Modes 1-4. Plausible because the supported component (CRD) is not required to be energized for Mode 4 entry.

B. Incorrect: The failure to meet the required stroke times constitutes a failure to meet Surveillance Requirements for CCW, which is required for Modes 1-4. Plausible because some stroke time data and other data collection is for trending purposes and would not require declaring the system Inoperable due to being out of expected stroke time.

C. CORRECT Failure to meet the stroke time will require CCW to be declared Inoperable per LCO 3.7.7. LCO 3.7.7 Required Action A.1 requires entry into LCO 3.8.1 Condition B for the affected EDG. LCO 3.8.1 has a note that states LCO 3.0.4.b is not applicable to EDGs, which means entry into Mode 4 is not permitted.

D. Incorrect: See A for why incorrect. Plausible because with the stroke time out of range it is possible that the valve could be placed in the required safety function position (closed) and the affected equipment would then become Inoperable or Unavailable.

Sys #	System	Category	KA Statement
008	Component Cooling Water	Generic	Knowledge of surveillance procedures

K/A# 2.2.12 **K/A Importance** 4.1 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-PF-3076, TSB 3.7.7, TS 3.7.7, TS LCO 3.0.4

Question Source: New **Level Of Difficulty: (1-5)** 4

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.10 / 45.13

Objective: GOP410

88. Initial plant conditions:
- PORV opened and will not close
- PORV block valve will not close
- Reactor trips on low RCS pressure
- DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE is entered
- Subcooling Margin = 0ºF

Current plant conditions
- DB-OP-02000, Section 5.0, Lack Of Adequate Subcooling Margin is in progress
- Both SGs are available for heat removal
- Subcooling Margin = 7ºF

Based on current plant conditions, complete the following statements.

1. ____(1)____ will be used to determine subcooling margin.

2. Section 5.0 directs you to GO TO Section____(2)____.

A. (1) Thot
(2) Section 11, RCS Saturated with SG Removing Heat Cooldown

B. (1) Thot
(2) Section 13, RCS Subcooled with SG Removing Heat Cooldown

C. (1) Incore Thermocouples
(2) Section 11, RCS Saturated with SG Removing Heat Cooldown

D. (1) Incore Thermocouples
(2) Section 13, RCS Subcooled with SG Removing Heat Cooldown

Answer: C

SRO ONLY: NUREG 1021, ES-401, Attachment 2

E. Assessment of Facility Conditions and Selection of Appropriate Procedures during Normal, Abnormal, and Emergency Situations [10 CFR 55.43(b)(5)] This 10 CFR 55.43 topic involves both (1) assessing plant conditions (normal, abnormal, or emergency) and then (2) selecting a procedure or section of a procedure to mitigate or recover, or with which to proceed. One area of SRO-level knowledge (with respect to selecting a procedure) is knowledge of the content of the procedure versus knowledge of the procedure's overall mitigative strategy or purpose.

Explanation/Justification: KA Match. This question matches the KA by requiring the ability to select the correct procedure to mitigate a failed open PORV.

A. Incorrect, 1st part is incorrect because IAW DB-OP-02000, "Adequate" subcoolign margin exists when it is at least 20ºF (you do not have it). In Section 4.1 states that when adequate SCM does not exist, use Incore Thermocouples to determine SCM. It is plausible because if adequate SCM did exist, it would be correct. 2nd part is correct. Without "Adequate" SCM, the RCS is considered saturated so you are directed to GO TO Section 11.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because you do not meet the criteria for being "Subcooled". It is plausible because if SCM were 20ºF or higher, it would be correct.

C. CORRECT: 1st part is correct. IAW DB-OP-02000, "Adequate" subcoolign margin exists when it is at least 20ºF (you do not have it). In Section 4.1 states that when adequate SCM does not exist, use Incore Thermocouples to determine SCM. 2nd part is correct (see A).

D. Incorrect: 1st part is correct (see C). 2nd part is incorrect but plausible (see B).

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Sys #	System	Category	KA Statement
010	Pressurizer Pressure Control	A2 Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:	PORV failures

K/A# A2.03 **K/A Importance** 4.2 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-02000

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 43.5 / 45.3 / 45.13

Objective: GOP304

89. With the plant in Mode 1, the MINIMUM level in the Emergency Diesel Generator Fuel Oil Day Tank that will maintain operability is ____(1)____gallons which will ensure the EDG is able to operate at **Full Load** for a MINIMUM of ____(2)____ hours.

A. (1) 2600
(2) 20

B. (1) 2600
(2) 24

C. (1) 4000
(2) 20

D. (1) 4000
(2) 24

Answer: C

SRO ONLY: NUREG 1021, ES-401, Attachment 2

B. Facility Operating Limitations in the Technical Specifications and Their Bases [10 CFR 55.43(b)(2)] Some examples of SRO exam items for this topic the following: • application of required actions (TS Section 3) and surveillance requirements (SR) (TS Section 4) in accordance with rules of application requirements (TS, Section 1) • application of generic limiting condition for operation (LCO) requirements (LCO 3.0.1 through 3.0.7; SR 4.0.1 through 4.0.4). knowledge of TS bases that are required to analyze TS-required actions and terminology • same items listed above for the Technical Requirements Manual (TRM) and Offsite Dose Calculation Manual (ODCM)

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to recognize system parameters that are TS entry conditions.

A. Incorrect: 1st part is incorrect because the minimum level for operability is 4000 gallons. It is plausible because SR 3.8.1.3 requires the EDG to be started and operated with load between 2340 and 2600 kW. 2nd part is correct. The minimum level in the Day Tank is designed to operate the EDG loaded for 20 hours.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because the day tank is only designed to operate the EDG for 20 hours. It is plausible because by name a “day tank” would imply 24 hours.

C. CORRECT: 1st part is correct. The minimum Day Tank level is 4000 gallons. 2nd part is correct (see A).

D. Incorrect: 1st part is correct (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
064	Emergency Diesel Generator	Generic	Ability to recognize system parameters that are entry level conditions for Technical Specifications

K/A# 2.2.42 **K/A Importance** 4.6 **Exam Level** SRO

References provided to Candidate None **Technical References:** TS 3.8.1, TS 3.8.1 BASES, TS 3.8.2, TS 3.8.3 SD003B

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7/41.10/43.2/43.3/45.3

Objective: SYS406

90. Initial conditions:
- Instrument Air Receiver 1-1 is isolated & unavailable
- Instrument Air Dryers 1 & 2 are in service
- Instrument Air Pressure 110 psig

The following occurs:
- 9-4-F INSTR AIR DRYER TRBL Alarm
- Lowering Instrument Air Pressure

Current Conditions:
- Instrument Air Pressure stable at 93 psig
- Instrument Air Dryer 1 & 2 are bypassed
- DB-OP-02528, Instrument Air System Malfunction is entered

With these current plant conditions which of the following procedure sections or attachments will the Command SRO select to be performed **NEXT**?

A. DB-OP-02528, Instrument Air System Malfunctions Procedure, Section 4.4, Stable Low Instrument Air Header Pressure

B. DB-OP-06251, Station and Instrument Air System Operating Procedure, Attachment 10, Instrument Air System Manual Blow Down List

C. DB-OP-06251, Station and Instrument Air System Operating Procedure, Section 3.12, Startup of Instrument Air Dryers 3 & 4

D. DB-OP-02528, Instrument Air System Malfunctions Procedure, Attachment 17, Instrument Air Isolation Valves/Equipment Affected List

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Answer: A

SRO ONLY: NUREG 1021, ES-401, Attachment 2

E. Assessment of Facility Conditions and Selection of Appropriate Procedures during Normal, Abnormal, and Emergency Situations [10 CFR 55.43(b)(5)] This 10 CFR 55.43 topic involves both (1) assessing plant conditions (normal, abnormal, or emergency) and then (2) selecting a procedure or section of a procedure to mitigate or recover, or with which to proceed. One area of SRO-level knowledge (with respect to selecting a procedure) is knowledge of the content of the procedure versus knowledge of the procedure's overall mitigative strategy or purpose.

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to use procedures to mitigate the consequences of an air dryer/filter malfunction.

A. CORRECT: With IA pressure stable below 95 psig, DB-OP-02528 directs you to section 4.4, Stable Low Instrument Air Header Pressure.

B. Incorrect because you will be directed to perform section 4.4. It is plausible because if pressure were still lowering, DB-OP-02528, step 4.2.2 RNO directs you to DB-OP-06251 attachment 10.

C. Incorrect because you will be directed to perform DB-OP-02528, section 4.4. It is plausible because this could be correct if IA Dryers 3 & 4 were available. IAW DB-OP-06251, L&P 2.2.19, with Instrument Air Receiver isolated, Air Dryers 3 & 4 are removed from service.

D. Incorrect because you will be directed to perform DB-OP-02528, section 4. It is plausible because Attachment 17 will be directed after the leak is located and isolated.

Sys #	System	Category	KA Statement
078	Instrument Air	A2 Ability to (a) predict the impacts of the following malfunctions or operations on the IAS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:	Air dryer and filter malfunctions

K/A# A2.01 **K/A Importance** 2.9 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-02528, DB-OP-06251,

Question Source: New

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 43.5 / 45.3 / 45.13

Objective: GOP-128

91. Initial plant Conditions:
- Following a plant power reduction 100% to 70%, a Group 7 Control Rod has been determined to be misaligned from the Group average.
- DB-OP-02516, CRD Malfunctions for Misaligned Control Rods has been entered

Based on current plant conditions, complete the following statements.

1. In order for DB-OP-02516 to be applicable, the criteria is that a control rod indicates greater than ___(1)___from the group average position
2. DB-OP-02516, directs reducing power using ___(2)___.

A. (1) 5%
(2) DB-OP-02504, Rapid Shutdown

B. (1) 5%
(2) DB-OP-06902, Power Operations

C. (1) 6.5%
(2) DB-OP-02504, Rapid Shutdown

D. (1) 6.5%
(2) DB-OP-06902, Power Operations

Answer: C

SRO ONLY: NUREG 1021, ES-401, Attachment 2

E. Assessment of Facility Conditions and Selection of Appropriate Procedures during Normal, Abnormal, and Emergency Situations [10 CFR 55.43(b)(5)] This 10 CFR 55.43 topic involves both (1) assessing plant conditions (normal, abnormal, or emergency) and then (2) selecting a procedure or section of a procedure to mitigate or recover, or with which to proceed. One area of SRO-level knowledge (with respect to selecting a procedure) is knowledge of the content of the procedure versus knowledge of the procedure's overall mitigative strategy or purpose.

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to use procedures to mitigate the consequences of a misaligned rod.

A. Incorrect: 1st part is incorrect because the control rod must be misaligned > 6.5%. It is plausible because entry is also required if a group of regulating rods is > 5% from its required sequence or overlap position. 2nd part is correct. Power reduction is performed using DB-OP-02504.

B. Incorrect: 1st part is incorrect but plausible (see A). 2nd part is incorrect because you are directed to use DB-OP-02504. It is plausible because 1) you have two hours to reduce power 10%, it could be done in a more controlled manner using DB-OP-06902 and 2) DB-OP-06902 is used later in the procedure to raise power after the rod is aligned.

C. CORRECT: 1st part is correct. Entry criteria (symptom) is that API or RPI or both indicate a Control Rod more than 6.5% from the group average position. 2nd part is correct (see A).

D. Incorrect: 1st part is correct (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
014	Rod Position Indication	A2 Ability to (a) predict the impacts of the following malfunctions or operations on the RPIS; and (b) based on those on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:	Misaligned rod

K/A# A2.04 **K/A Importance** 3.9 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-02516 TS 3.1.4

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.5 / 43.5 / 45.3 / 45.13

Objective: GOP-116

92. Initial plant conditions:
    - Refueling operations in progress in accordance with DB-OP-00030, Fuel Handling Operations is in progress
    - A Spent Fuel Assembly has been removed from the Core in preparation for placement in a Refueling Canal Rack
    - Main FH Bridge Operator reports assembly at full up in mast over the Refueling Canal Rack

    Current conditions:
    - 3-1-A, REFUELING CANAL LVL alarms in the Control Room
    - 4-3-A CTMT NORM SUMP LVL HI alarms in the Control Room
    - A Permanent Canal Seal Plate Access Port Cover failure is reported
    - Main FH Bridge Operator reports level is 22 ft (599') and lowering

    Based on the above plant indications, complete the following statements.

    1. Specific instructions to address this event will be performed using____(1)____.

    2. In accordance with the procedure stated in question 1, if the mast has not been lowered, it directs the area should be evacuated____(2)____.

A. (1) DB-OP-00030, Fuel Handling Operations, Attachment 1, Operator Actions for Falling Refueling Canal Level.
(2) immediately

B. (1) DB-OP-00030, Fuel Handling Operations, Attachment 1, Operator Actions for Falling Refueling Canal Level.
(2) if level lowers to 19 ft

C. (1) DB-OP-02547, Spent Fuel Pool Cooling Malfunctions, Section 2, Loss of Spent Fuel Pool Inventory.
(2) immediately

D. (1) DB-OP-02547, Spent Fuel Pool Cooling Malfunctions, Section 2, Loss of Spent Fuel Pool Inventory.
(2) if level lowers to 19 ft

Answer: B

SRO ONLY: NUREG 1021, ES-401, Attachment 2

E. Assessment of Facility Conditions and Selection of Appropriate Procedures during Normal, Abnormal, and Emergency Situations [10 CFR 55.43(b)(5)] This 10 CFR 55.43 topic involves both (1) assessing plant conditions (normal, abnormal, or emergency) and then (2) selecting a procedure or section of a procedure to mitigate or recover, or with which to proceed. One area of SRO-level knowledge (with respect to selecting a procedure) is knowledge of the content of the procedure versus knowledge of the procedure's overall mitigative strategy or purpose.

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to monitor changes in spent fuel pool water level and fuel handling equipment to direct actions per procedure.

A. Incorrect: 1st part is correct, DB-OP-00030, 6.4.17 states that if a failure of the Permanent Canal Seal Plate Access Port Cover failure occurs, THEN perform Attachment 1. 2nd part is incorrect because Attachment 1 states that if water level falls to 19 ft with a loaded mast that has not been lowered, evacuation is required. It is plausible because 22 feet is below the normal level and TS required level (23').

B. CORRECT: 1st part is correct (see A). 2nd part is correct. Attachment 1 states that if water level falls to 19 ft with a loaded mast that has not been lowered, evacuation is required.

C. Incorrect: 1st part is incorrect because while DB-OP-02547 addresses lowering SFP level, it states that if the Fuel Transfer Tube Isolation is open to perform actions in DB-OP-00030. It is plausible because it could be entered for a lowering SFP level. 2nd part is incorrect but plausible (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is correct (see B).

Sys #	System	Category	KA Statement
034	Fuel-Handling Equipment	A1 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Fuel Handling System controls including:	Water level in the refueling canal

K/A# A1.02 **K/A Importance** 3.7 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-00030, DB-OP-02547, TS 3.7.14

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.5 / 45.5

Objective: OPS-FHT

93. Plant conditions:
    - The plant is in Mode 5, an RCS fill and vent is in progress
    - The CTMT Vent Header is aligned to the Waste Gas Surge Tank
    - Both Waste Gas System Oxygen Monitors have been declared Nonfunctional

    Based on the above plant conditions, complete the following statements.

1. Oxygen in the waste gas system is monitored to ensure that oxygen is maintained ____(1)____to prevent an explosive mixture from forming.

2. With both oxygen Monitors declared nonfunctional, the addition____(2)____.

A. (1) $\leq$ 2% by volume when the hydrogen concentration exceeds 4% by volume
(2) may continue if a grab sample is obtained

B. (1) $\leq$ 2% by volume when the hydrogen concentration exceeds 4% by volume
(2) must be stopped

C. (1) $\leq$ 4% by volume when the hydrogen concentration exceeds 2% by volume
(2) may continue if a grab sample is obtained

D. (1) $\leq$ 4% by volume when the hydrogen concentration exceeds 2% by volume
(2) must be stopped

Answer: A

SRO ONLY: NUREG 1021, ES-401, Attachment 2
B. Facility Operating Limitations in the Technical Specifications and Their Bases [10 CFR 55.43(b)(2)] Some examples of SRO exam items for this topic the following: • application of required actions (TS Section 3) and surveillance requirements (SR) (TS Section 4) in accordance with rules of application requirements (TS, Section 1) • application of generic limiting condition for operation (LCO) requirements (LCO 3.0.1 through 3.0.7; SR 4.0.1 through 4.0.4). • knowledge of TS bases that are required to analyze TS-required actions and terminology • same items listed above for the Technical Requirements Manual (TRM) and Offsite Dose Calculation Manual (ODCM)

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to explain / apply limits and precautions for the waste gas system (O2 limits) and detector operability.

A. CORRECT: 1st part is correct. The limits on Oxygen are $\leq$ 2% when Hydrogen exceeds 4% by volume. 2nd part is correct. IAW TRM 8.3.6, additions may continue if another method is implemented (such as grab samples).

B. Incorrect: 1st part is correct (see A). 2nd part is incorrect because the additional may continue if a grab sample is taken. It is plausible because you are currently unsure what the Oxygen concentration is.

C. Incorrect: 1st part is incorrect because Oxygen is limited to 2%, not 4%. It is plausible because if it were Hydrogen, it could be correct. 2nd part correct (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is incorrect but plausible (see B).

Sys #	System	Category	KA Statement
071	Waste Gas Disposal	Generic	Ability to explain and apply system limits and precautions

K/A# 2.1.32 **K/A Importance** 4.0 **Exam Level** SRO

References provided to Candidate None **Technical References:** TRM 8.3.6, TRM 8.7.5

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.10 / 43.2 / 45.12

Objective: SYS110, GOP437

94. Initial plant conditions:
    - Reactor power = 100%
    - Core age = 200 EFPD.
    - Rod Height is 290 Rod Index.
    - Reactor Coolant Pump (RCP) 1-1 develops an oil leak and must be shutdown.

    Current conditions:
    - Reactor power = 72%
    - RCP 1-1 stopped
    - Axial Power Imbalance is (-)10%.
    - Rod Height is 260 Rod Index.

    Which of the following actions, if any, are the FIRST required to comply with Technical Specifications requirements?

    References provided

A. No Action is required

B. Verify F_Q and $F^N_{\Delta H}$ are within limits by using the Incore Detector System to obtain a power distribution map within 2 hours

C. Reduce THERMAL POWER to ≤ 40% RTP within 2 hours

D. Reduce THERMAL POWER to less than or equal to the THERMAL POWER allowed by the regulating rod group insertion limits within 4 hours

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Answer: B

SRO ONLY: NUREG 1021, ES-401, Attachment 2

B. Facility Operating Limitations in the Technical Specifications and Their Bases [10 CFR 55.43(b)(2)] Some examples of SRO exam items for this topic the following: • application of required actions (TS Section 3) and surveillance requirements (SR) (TS Section 4) in accordance with rules of application requirements (TS, Section 1) • application of generic limiting condition for operation (LCO) requirements (LCO 3.0.1 through 3.0.7; SR 4.0.1 through 4.0.4). knowledge of TS bases that are required to analyze TS-required actions and terminology • same items listed above for the Technical Requirements Manual (TRM) and Offsite Dose Calculation Manual (ODCM)

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to use / interpret reference materials.

A. Incorrect – Plausible if the candidate uses the more typical COLR Figure 2a curve, 0 to 300 +10 EFPD, Four RC Pumps--2817 MWt RTP Davis-Besse 1, Cycle 19, instead of the correct three pump curve Figure 2c.

B. CORRECT: The plant is in the restricted region for 3 RCPs of Figure 2c. TS 3.2.1, Regulating Rod Insertion Limits Condition A requires performance of SR 3.2.5.1 within 2 hours.

C. Incorrect – This is the required action if TS 3.2.3, Axial Power Imbalance is not met which is possible for a rapid power reduction. In this case, Axial power imbalance is within the limits of TS 3.2.3 and therefore, not applicable

D. Incorrect – This is the required action if TS 3.2.1 Condition A is not met which would be required 4 hours from the initiating event .

Sys #	System	Category			KA Statement
N/A	N/A	Generic			Ability to interpret reference materials, such as graphs, curves, tables, etc.
K/A# 2.1.25		**K/A Importance**	4.2	**Exam Level**	SRO
References provided to Candidate		TS Section 3.2 and COLR Core Operating Limit Report Figures 2a, 2b, 2c, 2d, 3, 4a,.4b, 4c, 4d, 4e, 4f, 4g, 4h, Tables 4, 5, 6,		Technical References:	LCO 3.2.1; COLR Figure 2c, LCO 3.2.1 Action A and SR 3.2.5.1

Question Source:	Bank 2015 NRC Exam Q 95	**Level Of Difficulty: (1-5)**	3
Question Cognitive Level:	High	**10 CFR Part 55 Content:**	41.10 / 43.5 / 45.12

Objective: GOP432

95. The plant is in Mode 6 with Fuel Handling in progress.

Fuel Handling will be suspended for approximately 30 hours.

All Fuel Handling Surveillances will be maintained current.

Which one of the following requirements must be observed during the suspension?

A. A qualified individual must be assigned to monitor Refueling Canal Level and notify the Control Room of any lowering Refueling Canal Level.

B. A dedicated Reactor Operator must be assigned to monitor the reactivity of the core (neutron count rate).

C. At least one Emergency Ventilation System Fan must be in service on the Spent Fuel Pool.

D. The gate between the Spent Fuel Pool and the Transfer Pool shall be installed and the gate valves on the transfer tubes closed as far as possible without damaging the transfer equipment cable.

Answer: D

SRO ONLY: NUREG 1021, ES-401, Attachment 2

F. Procedures and Limitations Involved in Initial Core Loading, Alterations in Core Configuration, Control Rod Programming, and Determination of Various Internal and External Effects on Core Reactivity [10 CFR 55.43(b)(6)] Some examples of SRO exam items for this topic include the following: evaluation of core conditions and emergency classifications based on core conditions administrative requirements associated with low-power physics testing processes administrative requirements associated with refueling activities, such as approvals required to amend core loading sheets or administrative controls of potential dilution paths and/or activities administrative controls associated with the installation of neutron sources knowledge of TS bases for reactivity controls

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of refueling administrative requirements.

A. Incorrect – Lowering of Refueling Canal level requires suspension of the Fuel Handling activities. Suspending fuel handling activities does not require continuous monitoring of refueling canal level.

B. Incorrect – A dedicated individual is only required to be assigned to monitor the reactivity of the core (neutron count rate) during fuel handling activities that add positive reactivity to the reactor core.

C. Incorrect – This action would be required if the SFP Ventilation system was not in service.

D. Correct – This is a required action when suspending fuel handling operations for greater than 24 hours. SRO ONLY in that it requires knowledge of administrative requirements associated with refueling activities.

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Knowledge of refueling administrative requirements

K/A# 2.1.40 **K/A Importance** 3.9 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-00030

Question Source: Bank 2013 NRC Exam Q94 **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.13

Objective: OPS-FHT

96. Per NOBP-OP-0007, Conduct of Infrequently Performed Tests or Evolutions (IPTE), which of the following individuals, by position, is responsible for ensuring the test is terminated if termination criterion is met?

A. Shift Manager

B. Unit Supervisor

C. Operations Manager

D. Lead Test Performer

Answer: A

SRO ONLY: NUREG 1021, ES-401, Attachment 2

C. Facility Licensee Procedures Required To Obtain Authority for Design and Operating Changes in the Facility [10 CFR 55.43(b)(3)] Some examples of SRO exam items for this topic include the following: screening and evaluation processes under 10 CFR 50.59, "Changes, Tests and Experiments" • administrative processes for temporary modifications administrative processes for disabling annunciators administrative processes for the installation of temporary instrumentation processes for changing the plant or plant procedures

Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the process for conducting infrequent tests.

A. CORRECT: NOBP-OP-0007 Conduct of Infrequently Performed Tests or Evolutions specifically names the Shift Manager as responsible

B. Incorrect because the SM is responsible for ensuring the test is terminated. It is plausible since the Unit Supervisor is the Command SRO and has many responsibilities that are delegated from the SM.

C. Incorrect because the SM is responsible for ensuring the test is terminated. It is plausible since one of the Operations Managers responsibilities is defined as - "Reviews NOBP-OP-0007-01, IPTE Worksheet in its entirety specifically ensuring test termination criteria is valid.

D. Incorrect because the SM is responsible for ensuring the test is terminated. It is plausible since Lead Test Performer will be responsible for supervising the test

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Sys #	System	Category	KA Statement
N/A	N/A	Generic	Knowledge of the process for conducting special or infrequent tests

K/A# 2.2.7 **K/A Importance** 3.6 **Exam Level** SRO

References provided to Candidate None **Technical References:** NOBP-OP-0007

Question Source: New **Level Of Difficulty: (1-5)** 2

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.10 / 43.3 / 45.13

Objective: GOP516

97. Plant conditions:
    - Plant Startup is being performed
    - DB-OP-06912, Approach to Criticality is in progress
    - The reactor is in Mode 3
    - A TS LCO will not be met if in Mode 2

    Based on the above plant conditions, entry into Mode 2 is allowed ____(1)____ and Mode 2 will be declared____(2)____.

A. (1) if the associated actions allowed continued operation for an unlimited period of time
(2) prior to the withdrawal of Control Rod Group 5.

B. (1) if the associated actions allowed continued operation for an unlimited period of time
(2) after Control Rods have been withdrawn above the ECP Lower Limit

C. (1) if it is estimated that the LCO can be reestablished prior to the requirement for a reduction in mode
(2) prior to the withdrawal of Control Rod Group 5.

D. (1) if it is estimated that the LCO can be reestablished prior to the requirement for a reduction in mode
(2) after Control Rods have been withdrawn above the ECP Lower Limit

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Answer: A

SRO ONLY: NUREG 1021, ES-401, Attachment 2
B. Facility Operating Limitations in the Technical Specifications and Their Bases [10 CFR 55.43(b)(2)] Some examples of SRO exam items for this topic the following: application of required actions (TS Section 3) and surveillance requirements (SR) (TS Section 4) in accordance with rules of application requirements (TS, Section 1) application of generic limiting condition for operation (LCO) requirements (LCO 3.0.1 through 3.0.7; SR 4.0.1 through 4.0.4). knowledge of TS bases that are required to analyze TS-required actions and terminology same items listed above for the Technical Requirements Manual (TRM) and Offsite Dose Calculation Manual (ODCM)

Explanation/Justification: KA Match: This question matches the KA by requiring the ability to understand how the TS Mode of operation is defined as well as how it is declared during plant startup.

A. CORRECT: 1st part is correct. LCO 3.0.4 states that when an LCO is not met, entry into a mode shall only be made when the associated actions to be entered permit continued operation in the mode of applicability for an unlimited time. 2nd part is correct. IAW DB-OP-06912, Mode 2 is declared prior to withdrawing Control Rod Group 5.

B. Incorrect: 1st part is correct (see A). 2nd part is incorrect because Mode 2 declaration is made prior to withdrawing CR Gp 5. It is plausible because this is more accurate as to what would meet the TS definition of Mode 2 (Keff > 0.99).

C. Incorrect: 1st part is incorrect because this is not allowed by TS 3.0.4. It is plausible because if this were to occur, no TS Violation would occur (other than TS 3.0.4). 2nd part is correct (see A).

D. Incorrect: 1st part is incorrect but plausible (see C). 2nd part is incorrect but plausible (see C).

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Ability to determine Technical Specification Mode of Operation

K/A# 2.2.35 **K/A Importance** 4.5 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-06912, TS

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: Low **10 CFR Part 55 Content:** 41.7 / 41.1 / 43.2 / 45.13

Objective: GOP201

98. A release of the Miscellaneous Waste Monitor Tank (MWMT) to the collection box is in progress.

System Engineering notifies the Shift Manager that an error has been discovered in DB-MI-03439, Channel Functional Test of 10A-ISF3611, Dilution Pump Discharge Flow.

The acceptance criteria of DB-MI-03439 were NOT met when the test was last performed.

If the Shift Manager desires to continue the release process, what action is required per the ODCM?

A. The release is not permitted until Radiation Protection reapproves the release, stop the release and declare F201 inoperable.

B. The release may continue if F201 is declared inoperable and Collection Box flowrate is estimated once per four hours.

C. The release is not permitted until Chemistry can perform grab samples at Collection Box.

D. The release may continue if the release rate is reduced by a factor of 10 and a Condition Report is written.

Answer: B

SRO only white paper item A Page 3 – ODCM is listed in TS Section 5.5 and Page 3 item B 4th bullet.

Explanation/Justification: K/A Match: The SRO is responsible for authorizing release permits and know the requirements if equipment becomes unavailable.

A. Incorrect: The Shift Manager can approve continuation of the release. Plausible because if the release was a CTMT Purge the and required flow were <50,000, then RP approval would be correct.

B. Correct. Storm sewer FE is not required for this discharge flowpath. Independent actions are correct.

C. Incorrect. The rad effluent monitors are not impacted so no grab samples would be required. Plausible because at times grab samples are required per the ODCM.

D. Incorrect. Flow estimates using pump curves, motor amps, and or NPSH are required. Plausible because reducing the release flow rate would be conservative to ensure dilution flow is adequate.

Sys #	**System**	**Category**	**KA Statement**
N/A	N/A	Generic	Ability to approve release permits.

K/A# 2.3.6 **K/A Importance** 3.8 **Exam Level** SRO

References provided to Candidate None **Technical References:** ODCM Rev. 27 Table 2-1 pages 19 and 20

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High - Application **10 CFR Part 55 Content:** 10 CFR: 55.43(b)(1 or 2)

Objective:

99. The plant was operating at 100% power.
A Steam Line Break occurred.
The stress induced from the break causes a Steam Generator Tube to fail.

The following plant conditions now exist:

- RCS Temperature is 522°F
- RCS Pressure is 835 psig

Based on the above plant conditions, which of the following actions of DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE, will the crew perform?

A. Section 5.0, Lack of Adequate Subcooling Margin

B. Section 7.0, Overcooling

C. Section 8.0, Steam Generator Tube Rupture

D. Section 9.0, Inadequate Core Cooling.

Answer: A

SRO ONLY: NUREG 1021, ES-401, Attachment 2

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Explanation/Justification: KA Match: This question matches the KA by requiring knowledge of the bases for emergency procedure hierarchy. All listed procedures are applicable, the SRO is required to assess the highest priority actions.

A. Correct. Because this is the highest priority symptom with an inadequate subcooling margin, only 3 degrees SCM exist.

B. Incorrect Plausible since this was the initiating event, the Main Steam break would be mitigated by routing to the subsection for Overcooling, if SCM existed (>20 deg SCM) this would be correct section.

C. Incorrect: Plausible since this procedure is used to mitigate the release to the environment which has a high priority in the emergency procedure network. This symptom will eventually become the priority as the SCM is restored and the overcooling is terminated.

D. Incorrect. Plausible since multiple events have occurred and this section addresses multiple events, additionally this section could be selected based on an incorrect determination of SCM vs RCS being saturated and going into Region 2 of Figure 2.

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations

K/A# 2.4.23 **K/A Importance** 4.4 **Exam Level** SRO

References provided to Candidate None **Technical References:** DB-OP-02000 TBD pg 7

Question Source: New **Level Of Difficulty: (1-5)** 3

Question Cognitive Level: High **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.13

Objective: GOP308

100 The crew identified a 45 gpm tube leak in Steam Generator 2.

- An Unusual event was declared per EAL SU5.1 and notifications to the State of Ohio and counties were completed.
- DB-OP-02504, Rapid Shutdown was used to commence a shutdown of the plant.
- During the shutdown, a RPS trip was generated, the reactor failed to automatically trip, however manual reactor trip was successful.
- Reactor Coolant System (RCS) temperature is 350 °F.
- RCS pressure is 980 psig.

The tube leak has risen to 300 gpm in Steam Generator 2.

As the Emergency Director, re-evaluate the events and determine what, if any, change to the Emergency Classification is required.

(Reference RA-EP-01500, Emergency Classification EAL Tables)

A. No change required

B. Upgrade to SA6, Alert

C. Upgrade to FA1, Alert

D. Upgrade to FS1, Site Area Emergency

Answer: C

SRO ONLY: NUREG 1021 ES-401

Meets the requirements of the SRO only guidance of ES-401 Attachment 2 per section II E page 21 third bullet. SRO is required to have knowledge of the Emergency Plan and position responsibilities for the Emergency Director. This is a SRO position function only.

Explanation/Justification: K/A Match: The knowledge of declaration and escalation criteria for emergency classifications is required by the SRO position.

A. Incorrect because the correct classification has upgraded to an Alert. It is plausible because this EAL still applies, but threshold has been met due to potential loss of RCS on fission product matrix.

B. Incorrect because the correct classification for the described RPS failure is Unusual Event. It is plausible if the candidate incorrectly determines the ATWS described meets the SA6 threshold. Previous EAL for this failure under NEI5 was Alert.

C. CORRECT: IAW EAL FA1 due to the Potential Loss of RCS for Fission Product Matrix. (loss or potential loss of FC or RCS).

D. Incorrect because the correct classification has upgraded to an Alert. It is plausible if the candidate considers the tube rupture and ECCS actuation as a Loss of RCS and a Potential Loss of the RCS barrier as conditions for a Site Area emergency. Incorrect as they are the same barrier.

Sys #	System	Category	KA Statement
N/A	N/A	Generic	Knowledge of the emergency action level thresholds and classifications

K/A# 2.4.41 **K/A Importance** 4.6 **Exam Level** SRO

References provided to Candidate **EP WALLBOARD or RA-EP-1500** **Technical References:** RA-EP-1500

Question Source: Modified 2011 NRC Exam Q100 **Level Of Difficulty: (1-5)** 3

Question Cognitive L evel: High **10 CFR Part 55 Content:** 41.10 / 43.5 / 45.11

Objective: GOP602