• 100% Power

The following occurs:

- The selected RCS pressure input to NNI from RPS fails high
- All required actions are taken to stabilize the plant
- All other Pressure indications are normal

Current conditions:

• The connector for the failed RCS pressure input to NNI from RPS is damaged and unable to be disconnected

With these current plant conditions which of the following Technical Specifications will be entered?

- A. 3.3.5 Safety Features Actuation System (SFAS) Instrumentation
- B. 3.3.17 Post Accident Monitoring (PAM) Instrumentation
- C. 3.4.9 Pressurizer
- D. 3.4.11 Pressurizer Power Operated Relief Valve (PORV)

Answer: D

Explanation/Justification: KA based on PORV failing open being an accident in the vapor space

- A. Incorrect plausible since other RCS pressure inputs support SFAS functions
- B. Incorrect plausible since other indications are required for Post-Accident Monitoring
- **C.** Incorrect plausible since the pressurizer will be affected
- D. Correct This failure will cause the PORV to fail open requiring operator action to close the PORV block valve and remove power from the PORV block valve requiring entery into TS 3.4.11

Sys #	System	Category			KA Statement	
008	Pressurizer (PZR) Vapor Space Accident	Generic			Ability to recognize entry-level condition	system parameters that are is for Technical Specifications
K/A#	2.2.42	K/A Importance	3.9	Exam Level	RO	
Referen	ces provided to C	andidate None		Technical References:	TS 3.4.11, DB-OP-02513 step 3.1.1	
Questio	n Source: N	lew		Level Of Difficu	ulty: (1-5)	
Questio	n Cognitive Level:	High		10 CFR Part 55	Content:	41.7 / 41.10 / 43.2 / 43.3 / 45.3
Objectiv	/e: GOP-434					

 The plant has experienced an event as indicated by the Safety Parameters Display System (SPDS) plot.



Which of the following events does this SPDS plot display?

- A. Small break LOCA
- B. Large break LOCA
- C. Station Blackout
- D. Overcooling

Answer: A

Explanation/Justification: Diagnosing SBLOCA from computer indications- actual plot from simulator

- A. Correct RCS pressure will begin to stabilize when decreases to the point MU and HPI can keep up with the leak size
- B. Incorrect plausible since pressure has lowered but is stabilized above the maximum Low Pressure Injection discharge pressure
- C. Incorrect plausible Thot and Tcold are separated which is an indication of RCPs off but pressure is too low for the event to be a station blackout
- D. Incorrect plausible since steam generator pressures are low below the 960 psig determination for overcooling and Temperatures are trending left but is due to MU/HPI

Sys # 009	System Small Break LOCA	Category EA1 Ability to operate to a small break LOC	and monitor the	following as they apply	KA Statement Plant computer
K/A#	EA1.06	K/A Importance	3.0*	Exam Level	RO
References provided to Candidate None Technical References: Actual plot from simulator					

 Question Source:
 New

 Question Cognitive Level:

 Objective:
 GOP-313

High

Level Of Difficulty: (1-5) 10 CFR Part 55 Content:

41.7 / 45.5 / 45.6

- The Plant has experienced a LOCA
- Steam Generator 1 has isolated on a low steam pressure trip

Which of the following indicates the level at which Steam Generator 2 will be controlled and the basis for this setpoint?

- A. 124 inches to aid in the establishment of boiler condenser cooling
- B. 124 inches to ensure Auxiliary Feedwater Pump 2 is the controlling feed pump
- C. 130 inches to aid in the establishment of boiler condenser cooling
- D. 130 inches to ensure Auxiliary Feedwater Pump 2 is the controlling feed pump

Answer: C

Explanation/Justification: KA match based on the establishment of conditions to support establishment of reflux boiling

- A. Incorrect plausible since 124 inches is the normal high level setpoint without a low steam pressure trip and the reason is correct
- B. Incorrect plausible since 124 inches is the normal high level setpoint without a low steam pressure trip and AFW Pump 2 is associated with Steam Generator 2
- C. Correct the opposite train AFW pump is set to control at 130 inches with the associated train keeping its normal setpoint of 124 to prevent the pumps from fighting/hunting
- D. Plausible since 130 is correct AFW Pump 2 is associated with Steam Generator 2

Sys #	System	Category			KA Statement		
011	Large Break LOCA	EK1 Knowledge of the operational implications of the following concepts as they apply to the Large Break LOCA :			Natural circulation and cooling, including reflux boiling		
K/A#	EK1.01	K/A Importance	4.1	Exam Level	RO		
References provided to Candidate None				Technical References:	DB-OP-02000 TBD R21 pg58, SD-15 R4 pg 2-38		
Question Source: New				Level Of Difficu	ulty: (1-5)		
Questio	n Cognitive Level:	Low		10 CFR Part 55	Content:	41.8 / 41.10 / 45.3	
Objectiv	/e: GOP-304						

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

Per DB-OP-06903, Plant Cooldown, which of the following is one of the indications that natural circulation heat removal is established?

- A. RCS Δ T has stabilized at less than 50°F
- B. Incore thermocouples and RCS T_{cold} indication are coupled and are tracking
- C. RCS Thot and SG Tsat are coupled and are tracking
- D. Subcooling Margin is 20°

Answer: A

Explanation/Justification: KA match based on Loss of RCPs due to loss of offsite power causing natural circulation to be required

- A. Correct per DB-OP-06903, Plant Cooldown step 6.3
- $\textbf{B.} \quad \text{Incorrect-plausible since DB-OP-06903, Plant Cooldown step 6.3 stipulates RCS } \textbf{T}_{\text{hot}} \text{ not } \textbf{T}_{\text{cold}}$
- $\textbf{C.} \quad \text{Incorrect-plausible since DB-OP-06903, Plant Cooldown step 6.3 stipulates } T_{\text{cold}} \text{ not } T_{\text{hot}}$
- $\label{eq:Delta_based} \textbf{D.} \qquad \text{Incorrect} \text{plausible since } 20^\circ \text{ is the standard for determine adequate subcooling margin}$

Sys #	System	Category			KA Statemer	nt	
015/017	RCP Malfunctions	AK1 Knowledge of the concepts as they app of RC Flow):	Nowledge of the operational implications of the following epts as they apply to Reactor Coolant Pump Malfunctions (Loss C Flow):			ation in a nuclear reactor power plant	
K/A#	AK1.01	K/A Importance	4.4	Exam Level	RO		
References provided to Candidate None				Technical References:	DB-OP-06903 R47 step 6.3		
Question Source: New				Level Of Difficulty: (1-5)			
Question	Cognitive Level:	Low		10 CFR Part 55	Content:	41.8 / 41.10 / 45.3	
Objective	GOP-206						

- The plant is in MODE 5
- The RCS is at Reduced Inventory
- Loop 1 DH system is in operation

The following indications are observed:

- DH14B, DH Cooler 1 Outlet Flow Control Valve is full open
- DH1B, DH Pump 1 Discharge to RCS is throttled
- Annunciator LP INJ 1 FLOW LO is lit intermittently
- Annunciator RCS LVL LO/LO-LO is lit
- CTMT Normal Sump level indicates 2.5 Feet

Based on the current conditions, which of the following sections of DB-OP-02527, Loss of Decay Heat Removal, should be performed?

- A. Loss of Decay Heat Removal Pumps
- B. Loss of DHR Flowpath
- C. Loss of Instrument Air
- D. Loss of RCS Inventory during DHR Operation

Answer: D

Explanation/Justification: KA match based on CTMT sump level high with accompanying DHR alarms

- A. Incorrect plausible since intermittent low flow alarms is indicative of pump loss of suction
- B. Incorrect plausible since low flow alarm could be indicative of blockage in the flowpath. DH1B in throttle position could indicate valve closing but this is normal for reduced inventory operation
- C. Incorrect plausible since loss of air would cause discharge flow control valve DH14B to fail open potentially causing pump runout and or loss of suction. Loss of instrument air is not a section of the Loss of DHR procedure
- D. Correct Loss of RCS inventory in Containment would cause a CTMT sump level to be high (2.5 feet is top of scale). Loss of level would also cause a low level alarm.

Sys #	System	Category			KA Statement		
025 Loss of RHR AA2 Ability to determine System the Loss of Residual He		e and interpret the following as they apply to eat Removal System:		Increasing reactor building sump level			
K/A#	AA2.03	K/A Importance	3.6	Exam Level	RO		
References provided to Candidate None				Technical References:	DB-OP-02527 Step 2.3 Symptoms		
Question	Source: Ba	ank 159738		Level Of Difficu	lty: (1-5)		
Question	Cognitive Level:	High		10 CFR Part 55	Content: 43.5 / 45.13		
Objective :	:	GOP-127					

- Component Cooling Water (CCW) Pump 2 is in service
- Component Cooling Water (CCW) Pump 1 is in standby
- Service Water (SW) Pumps 1 and 2 are in service

The following occurs:

- Annunciator 11-2-B, CCW HX 2 OUTPUT TEMP HI comes into alarm
- SW1434, COMP COOLING WATER HX 2 Outlet is observed to be closed
- I&C reports the temperature transmitter to TIC1434 has failed sending a continuous close signal to SW1434

With SW1434 in this condition, what is the system response to an SFAS Level 2 actuation?

SW1434 _____.

- A. will not open due to the failed temperature signal
- B. fully opens due to the SFAS 2 actuation signal
- C. will control temperature at the SFAS 2 setpoint
- D. remains closed until OPEN pushbutton is depressed

Answer: B

Explanation/Justification: KA match based on condition causing automatic signal to override SW valve signal that caused loss of component cooling water cooling thus restoring cooling

A. Incorrect - plausible since there is a continuous close signal applied to the temperature controller

B. Correct – SFAS 2 vents air from SW1434 controls thus overriding the temperature controller signal. SW1434 fails open to its SFAS position on loss of air

C. Incorrect – plausible since it is a temperature control valve and various components have setpoints related to safety signals

D. Incorrect – plausible since this is the condition without the SFAS signal

Sys #	System	Category			KA Statement		
026	Loss of Component Cooling Water	AK3 Knowledge of th apply to the Loss of C	e reasons for t Component Co	he following responses as they oling Water:	The conditions that will initiate the automatic opening and closing of the SWS isolation valve to the CCWS coolers		
K/A#	AK3.01	K/A Importance	3.2*	Exam Level	RO		
Referen	nces provided to C	andidate None		Technical References:	OS-020 SH1		
Questic	on Source:	New		Level Of Diffic	ulty: (1-5)		
Questic	on Cognitive Level	: High		10 CFR Part 55	5 Content:	41.5,41.10 / 45.6 / 45.13	
Objecti	ve:	SYS-304					

Boron Equalization is in progress per DB-OP-06003, Pressurizer Operating Procedure

- RCS pressure 2180 psig and stable
- All Pressurizer Heater Banks are in the ON position
- PICRC2 SCR Heater Control is in Auto
- RC2, Pressurizer Spray Valve HIS RC2-1 Indication lights are off

Current conditions:

- RCS pressure is 2170 and lowering
- PICRC2 SCR Heater demand is 0%
- RC2, Pressurizer Spray Valve HIS RC2-1 Indication lights are off

With these current indications, which of the following is the cause of lowering RCS pressure?

- A. 4-4-E PZR HTR SOURCE FAULT
- B. 4-1-E PZR LO LVL HTR TRIP
- C. Selected RCS Pressure input failed high
- D. PICRC2 SCR Heater demand has failed

Answer: A

Explanation/Justification: Ability to diagnose the cause of the pressurizer pressure control malfunction as pressurizer heater source fault

- A. Correct per DB-OP-02004, Reactor Coolant Alarm Panel Indicators, 4-4-E the is an indication of pressurizer heater source breaker open or tripped which would cause RCS pressure to begin lowering since heaters and spray had been equalized to maintain a constant pressure
- B. Incorrect plausible since this would cause the pressurizer heaters to de-energize due to the low level interlock if in auto but they do not de-energize when in manual
- C. Incorrect plausible since the PORV would open causing pressure to decrease but the spray valve would also open
- D. Incorrect plausible this would imply SCR heaters have turned off except in auto they control 2155 +/- 10 psig so they would be expected to be at zero demand at 2170 and pressure was stable at a pressure where they would have zero demand

Sys #	System	Category			KA Statemer	nt
027	Pressurizer Pressure Control System Malfunction	AA1 Ability to operate and / or monitor the following as they apply t the Pressurizer Pressure Control Malfunctions:			PZR heaters,	sprays, and PORVs
K/A#	AA1.01	K/A Importance	4.0	Exam Level	RO	
Referen	ices provided to C	andidate None		Technical References:	DB-OP-02004	1 R10 page 35 & 36
Questic	on Source: N	lew		Level Of Difficu	ulty: (1-5)	
Questic	on Cognitive Level:	High		10 CFR Part 55	Content:	41.7 / 45.5 / 45.6
Objectiv	ve: SYS-104	0				

An Anticipated Transient Without Scram (ATWS) is in progress

- Attempts to shutdown the reactor from the control room have failed.
- An Operator has been dispatched to open Control Rod Drive Breakers locally.

The following occurs:

• Adequate Subcooling Margin is lost

With these plant conditions which of the following is correct concerning actions related to the Reactor Coolant Pumps (RCPs)?

- A. Trip all RCPs immediately per Specific Rule 2 because Specific Rule requirements are always applicable when conditions are met
- B. Trip RCPs once Emergency Boration has commenced per Specific Rule 1 because Specific Rule 1 has priority over Specific Rule 2
- C. Do not trip RCPs until the Reactor is shutdown because DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture accident mitigation is based on having the Reactor shutdown
- D. Do not trip RCPs because if the RC void fraction is greater than 70 percent when RCPs are tripped, the peak clad temperature can exceed the maximum temperature allowed by 10CFR50.46

Answer: C

Explanation/Justification: KA match based on knowing the reason for completing ATWS actions prior to continuing with EOP actions

A. Incorrect – plausible since this is correct once the reactor is shutdown

D. Incorrect – plausible this it is true if the reactor coolant void fraction is greater than about 70% when the RCPs are tripped and RCPs are immediately tripped on a loss of subcooling margin per Specific Rule 2, however this is not applicable during an ATWS event per DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture Bases and Deviation document

Sys #	System	Category				KA Statement		
029	ATWS	EK3 Knowl apply to the	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 Impor	tance	4.4	Exam Level	RO		
References provided to Candidate None				Technical References:	DB-OP-02000 R21 Bases and Deviation document page 16			
Questio	on Source:	New			Level Of Difficu	ılty: (1-5)		
Questio	on Cognitive Level	: н	ligh		10 CFR Part 55	Content:	41.5 / 41.10 / 45.6 / 45.13	
Objectiv	/e: GOP-302		-					

B. Incorrect – plausible since Emergency Boration will be commenced shutting down the reactor and Specific Rule 1 does have priority over Specific Rule 2.

C. Correct – per DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture Bases and Deviation document. In addition the last step in the immediate actions RNO for verifying the reactor is shutdown states "WHEN the Reactor is Shutdown THEN continue.

- A Steam Generator Tube Rupture has occurred
- A Loss of Offsite Power (LOOP) has occurred
- RCS pressure is 1500 psig
- T hot is 550°F

With these conditions which of the following describes the cooldown rate and target temperature per DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture Section 8 Steam Generator Tube Rupture?

- A. 50°F per hour to 520°F
- B. 50°F per hour to 500°F
- C. 100°F per hour to 500°F
- D. 100°F per hour to 520°F

Answer: A

Explanation/Justification: Knowledge of the cooldown requirements per the SGTR section of the EOP for SG isolation with natural circulation

- A. Correct per step 8.31 of the Steam Generator Tube Rupture section of DB-OP-02000 R28 cooldown to 520°F at 50°F per hour with natural circulation. A loss of offsite power causes a loss of forced circulation.
- B. Incorrect plausible since 50°F per hour is correct for natural circulation and 500°F would be the correct target for forced circulation
- C. Incorrect plausible since 100°F per hour and 500°F is correct for forced circulation
- D. Incorrect plausible since100°F per hour is correct for forced circulation and 520°F is correct for natural circulation

Sys #	System	Category			KA Statement		
038	Steam Gen. Tube Rupture	EK1 Knowledge of the operational implications of the following concepts as they apply to the SGTR:			Natural circulation		
K/A#	EK1.03	K/A Importance	3.9	Exam Level	RO		
References provided to Candidate None				Technical References:	DB-OP-02000 R28 step 8.31		
Questio	n Source: N	ew		Level Of Difficu	ulty: (1-5)		
Questio	n Cognitive Level:	High		10 CFR Part 55	Content:	41.8 / 41.10 / 45.3	
Objectiv	e: GOP-307						

- 10. What is the Steam Feed Rupture Control System (SFRCS) safety function that is addressed by the reverse DP across the Main Feedwater check valves?
- A. Restore feedwater flow on a low level in the Steam Generator
- B. Isolate the OTSG from a line break in the Main Feedwater system
- C. Promote natural circulation on a loss of Main Feedwater
- D. Prevent Steam Generator (SG) boiling dry and causing a tube rupture

Answer: B

Explanation/Justification: KA match based on Knowledge of the purpose and function of SFRCS which is a major system related to loss of Main Feedwater

- A. Incorrect plausible since this is an SFRCS safety function addressed by SG low level
- B. Correct Main Feedwater Check valve DP sense a differential pressure between the SG and Feedwater. The safety function of the SFRCS is to detect and isolate the affected steam generator from either main steam line break or a main feedwater line break. The other safety function of the SFRCS is to automatically start the AFPs in the event of a low level in the steam generator or loss of all four reactor coolant pumps and to supply AFW to respective steam generators

D. Incorrect – plausible since the SG would boil dry if AFW was not activated by SFRCS

Sys #	System	Category			KA Statement		
054	Loss of Main Feedwater	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:	SD-010 R6 page 2-1 & 2-9		
Questio	on Source: B	ank 159858		Level Of Difficu	ılty: (1-5)		
Questio	on Cognitive Level:	Low		10 CFR Part 55	Content: CFR: 41.7		
Objectiv	Ve: SYS523						

C. Incorrect – plausible since SFRCS does activate AFW which has a high level setpoint selected on SA Level 2 which is set to promote natural circulation

- 100% Power
- Letdown flow is 70 gpm
- MU83 Letdown Line Bypass is closed

The following occurs:

- "A" Bus Voltage is zero volts
- "B" Bus Voltage is zero volts

One minute later the following indications exist:

- "C1" Bus Voltage is zero volts
- "D1" Bus Voltage is zero volts
- Instrument Air Header Pressure lowers rapidly to zero.
- Assume **NO** Operator actions.

How will RCS Makeup flow and letdown flow respond to these conditions?

(1) Actual RCS Makeup flow ______.

- (2) Actual Letdown flow _____.
- A. (1) rises
 - (2) remains the same
- B. (1) rises
 - (2) lowers
- C. (1) lowers
 - (2) remains the same
- D. (1) lowers
 - (2) lowers

Answer: D

Explanation/Justification: Determining effect of air controlled valve MU6 loss of instrument air during a station blackout

A. Incorrect. This is plausible if the candidate assumes MU6 fails open on a loss of air and does not understand all Makeup Flow will be lost due to pump trips. If the candidate assumes letdown flow is not impacted then this choice is plausible.

B. Incorrect. This is plausible if the candidate assumes MU6 fails open on a loss of air. MU6 fails closed, so letdown flow lowers as Letdown flow is still through the Letdown orifice

C. Incorrect. Makeup Flow lowers because power is lost to both Makeup Pumps. If the candidate assumes letdown flow is not impacted then this choice is plausible.

D. Correct. MU6 must be open prior to the event to have 70 gpm letdown flow. MU6 fails closed, so letdown flow lowers. Letdown flow is still through the Letdown orifice, Makeup Flow lowers because power is lost to both Makeup Pumps.

Sys #	System	Category				KA Statement
055	Station Blackout	EA2 Ability to Station Blackc	determine out:	or interpr	et the following as they apply to a	Existing valve positioning on a loss of instrument air system
K/A#	EA2.01	K/A Importan	ice	3.4	Exam Level	RO
Referen	ices provided to	Candidate N	lone		Technical References:	DB-OP-02528 R22 Att17 pg 90,db-op-06006 r37 Pg 147, 148 and 183

 Question Source:
 Bank DB 2011 NRC Exam Q12

 Question Cognitive Level:
 High

 Objective:
 GOP128

43.5 / 45.13

- Safety injection has been manually aligned per DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture, Attachment 8, Place HPI/LPI/MU IN SERVICE
- Reactor Coolant Pressure is 1800 psig

The following occurs:

- Loss of Off-Site Power
- Both EDGs start and re-energize C1 and D1
- Reactor Coolant Pressure is 1550 psig

With these conditions which of the following identifies all the pumps which will need to be manually restarted to ensure alignment per Attachment 8, Place HPI/LPI/MU IN SERVICE?

- A. High Pressure Injection and Low Pressure Injection
- B. Makeup and Low Pressure Injection
- C. Low Pressure Injection
- D. Makeup

Answer: C

Explanation/Justification: Ability to determine status of injection following LOOP

- A. Incorrect plausible since HPI and LPI will trip on undervoltage and not auto start unless an SFAS signal exists but an SFAS level 2 would exist which would start HPI. LPI starts on SFAS 3 which does not exist.
- B. Incorrect plausible since Makeup will trip and then restart unless undervoltage AND SFAS level 3. LPI starts on SFAS level 3 which does not exist
- C. Correct LPI auto start signal is SFAS level 3 at 450 psig which does not exist so will be required to be restarted manually.
- D. Incorrect plausible since Makeup does not have an auto start signal but LPI and HPI do and Makeup will trip and then restart unless undervoltage AND SFAS level 3

Sys #	System	Category			KA Statement	
056	Loss of Off- site Power	AA1 Ability to operate and / or monitor the following as they apply to the Loss of Offsite Power:			Initiation (manual) of safety injection process	
K/A#	AA1.05	K/A Importance	3.8	Exam Level	RO	
References provided to Candidate None			Technical References:	TS page 3.3.5-4, DB-OP-02000 page 429, SD- 002 page 2-1		
Questic	on Source:	New		Level Of Difficu	ılty: (1-5)	
Questic	on Cognitive Level	: High		10 CFR Part 55	Content:	41.7 / 45.5 / 45.6
Objecti	ve:	SYS-106, 302	and 303			

13. Uninterruptable power supply distribution bus YAU is lost at 100% power.

Which of the following identifies the required action(s) per DB-OP-02541 Loss of YAU?

- A. Verify the Reactor has automatically tripped. Perform the remaining actions for DB-OP-02541 when directed by Supplemental Section 4.0 of DB-OP-02000
- B. Verify the Reactor has automatically tripped. Perform the remaining actions for DB-OP-02541 as necessary in parallel with the performance of DB-OP-02000, Supplemental Section 4.0
- C. Trip the Reactor. Perform the remaining actions for DB-OP-02541 when directed by Supplemental Section 4.0 of DB-OP-02000
- D. Trip the Reactor. Perform the remaining actions for DB-OP-02541 as necessary in parallel with the performance of DB-OP-02000, Supplemental Section 4.0

Answer: D

Explanation/Justification: KA match based on abnormal procedure actions directed in conjunction with EOP

- A. Incorrect plausible since a loss of YAU will cause a major plant transient but not a direct automatic trip. Attempting to keep the plant on line would place non-conservative and unwarranted burden on the operating crew so as soon as a loss of YAU is diagnosed the reactor is directed to be tripped. Most remaining abnormal procedure actions are not taken when entering DB-OP-02000 until supplemental section 4 step 4.19 directs performance
- **B.** Incorrect plausible since a loss of YAU will cause a major plant transient but not a direct automatic trip. Attempting to keep the plant on line would place non-conservative and unwarranted burden on the operating crew so as soon as a loss of YAU is diagnosed the reactor is directed to be tripped. and the second part is correct
- C. Incorrect plausible since the first part is correct and most remaining abnormal procedure actions are not taken when entering DB-OP-02000 until supplemental section 4 step 4.19 directs performance
- D. Correct DB-OP-02541, step 4.1 directs: Trip the Reactor. REFER TO Attachment 1, Guidance for DB-OP-02000 Supplemental Actions. GO TO DB-OP-02000, SFAS, SFRCS Trip, or SG Tube Rupture. Attachment 1 provides guidance for concurrent performance with DB-OP-02000

Sys #	System	Category			KA Statement		
057	Loss of Vital AC Inst. Bus	Generic			Knowledge of how abnormal operating procedures are used in conjunction with EOPs		
K/A#	2.4.8	K/A Importance	3.8	Exam Level	RO		
References provided to Candidate None				Technical References:	DB-OP-02541 R13 page 4 and 11		
Questic	on Source: N	lew		Level Of Diffic	ulty: (1-5)		
Questic	on Cognitive Level:	Low		10 CFR Part 55	Content: 41.10 / 43.5 / 45.13		
Objecti	ve: GOP-141						

- 100% Power
- Emergency Instrument Air Compressor (EIAC) is in lead
- Station Air Compressor 1 is in lag
- Station Air Compressor 2 breaker is racked out for maintenance inspection

The following occurs:

- (9-3-E) STA AIR HDR PRESS LO alarms
- (9-1-F) INSTR AIR HDR PRESS LO alarms
- PI 810, INSTRUMENT AIR HEADER PRESS indicates 85 psig and slowly lowering
- PI 811, STATION AIR HEADER PRESS indicates 85 psig and slowly lowering
- An Operator reports a rupture in Station Air Receiver 1
- Plant is stable

Per DB-OP-02528, Instrument Air System Malfunctions which of the following actions will mitigate this condition?

- A. Dedicate the EIAC to supply Instrument Air by closing SA234, IA/SA Crosstie Solenoid (SA6445) Inlet Isolation Valve
- B. Dedicate all Air Compressors to supply Instrument Air by closing SA18, Station Air Header Back Pressure Reg Valve (SA2008) Inlet Isolation Valve
- C. Notify Maintenance to immediately return Station Air Compressor 2 to service and verify all Air Compressors are running
- D. Trip the Reactor. Initiate and Isolate SFRCS DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture

Answer: A

Explanation/Justification: KA match by determining the cause is failure of SA6445 to automatically isolate at 95 psig and the effect will be the EIAC dedicated to Instrument air (normally supplies station and instrument air when in lead Α. Correct - SA6445 is verified automatically closed by procedure and response not obtained would be to manually isolate which would separate the rupture air receiver from Instrument air and allow Instrument air pressure to return to normal В. Incorrect - plausible because this is a directed action for Instrument and Station air continuing to lower. This assumes the leak is in the instrument air header and also SA2008 is downstream of the station air receiver so this would not isolate the leak. C. Incorrect - plausible since verifying all available Air Compressors are running is directed but SAC 2 would not be considered available if it was out of service and the procedure does not direct a return to service D. Incorrect - plausible since this is the direction for secondary plant upsets or when instrument air pressure lowers to 75 psig Sys # System Category **KA Statement** AA2 Ability to determine and interpret the following as they apply to 065 Loss of Inst Cause and effect of low-pressure instrument air Air the Loss of Instrument Air: alarm K/A# **K/A Importance** Exam Level AA2.01 2.9 RO DB-OP-02528 R22 step 4.1.4 **References provided to Candidate** Technical References: None **Question Source:** Level Of Difficulty: (1-5) New **Question Cognitive Level:** 10 CFR Part 55 Content: High 43.5 / 45.13 Objective: GOP-128

• 25% Power

The following occurs:

- 14-6-D ICS IN TRACK
- 8-5-A SWYD ACB 34560 TRIP
- 8-5-B SWYD ACB 34561 TRIP
- 16-3-D NEG SEQ CURRENT HI
- 16-5-B VOLTS/HZ HI
- J-Bus indicates 0 volts
- K-Bus indicates 0 volts
- All Reactor Coolant Pumps running

With these symptoms which of the following procedures will be implemented **NEXT**?

- A. DB-OP-02500 Turbine Trip
- B. DB-OP-02520 Load Rejection
- C. DB-OP-02526 Primary to Secondary Heat Transfer Upset
- D. DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture

Answer: B

-

Explanation/Justification: KA based on identifying a load rejection based on voltage indications and annunciator

- A. Incorrect plausible since breakers 34560 and 34561 are tripped and less than 40% power where turbine can trip without reactor trip and
- generator alarms are in but turbine would not trip on a load rejection and is not tripped as evidenced by RCPs running
- **B.** Correct symptoms per DB-OP-02520
- C. Incorrect plausible since multiple alarms are indicative of a plant transient

D. Incorrect – plausible since breakers 34560 and 34561 are tripped and the reactor would trip if above 40% power if turbine trips

Sys #	System	Category	Category			KA Statement		
077	Generator Voltage and Electric Grid Disturbances	AK2 Knowledge of the Electric Grid Disturbation	ne interrelations ances and the f	s between Generator Voltage and following:	Sensors, detectors, indicators			
K/A#	AK2.03	K/A Importance	3.0	Exam Level	RO			
Referen	ces provided to Ca	andidate		Technical References:	DB-OP-02520 R07 Page 4			
Questio	n Source: N	lew		Level Of Difficulty: (1-5)				
Question Cognitive Level: High				10 CFR Part 55 Content: 41.4, 41.5, 41.7, 41.10 /				
Objectiv	/e: GOP-120	C C						

- The plant has experienced a loss of all feedwater event
- MU/HPI/PORV cooling is in progress
- Subcooling margin is 10°F

The following occurs:

- Auxiliary Feedwater has been restored and both Steam Generators are at the correct levels
- Primary to secondary heat transfer does NOT exist

Which of the following actions will DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture direct to be performed **NEXT**?

- A. Bump start Reactor Coolant Pumps to induce Steam Generator heat transfer
- B. Raise Steam Generator levels to 220 inches to raise the secondary heat sink
- C. Lower Steam Generator pressures to establish a temperature differential
- D. Begin restoration from MU/HPI/PORV to prevent further inventory loss

Answer: C

Explanation/Justification: KA match based on overall mitigation strategy for inadequate heat transfer for establishing heat transfer to keep the facility within limitations of the license and the reason for each action

- A. Incorrect Plausible since bumping Reactor Coolant Pumps is a strategy (CHLA) to induce heat transfer directed by a Severe Accident Mitigation Guidelines. Severe Accident conditions do not exist
- B. Incorrect Plausible since this is the level for isolating a faulted Steam Generator
- C. Correct Lowering SG pressure will establish a temperature differential to ensure the SG will act as a heat sink for the RCS. RO since it involves a mitigation strategy
- D. Incorrect Plausible since closing the PORV will prevent further RCS inventory loss that could lead to RCS Hot Leg voids that would interrupt single phase natural circulation heat transfer. Closing the PORV would interrupt the current method of heat transfer

Sys #	System	Category			KA Statement	
BW/E04	Inadequate Heat Transfer - Loss of Secondary Heat Sink	EK3 Knowledge of the reasons for the following responses as they apply to the (Inadequate Heat Transfer):			RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated	
K/A#	EK3.4	K/A Importance	3.5	Exam Level	RO	
Reference	es provided to Ca	ndidate None		Technical References:	DB-OP-02000 R28	and TBD R21 Step 6.12
Question	Source: Ba	ank 168870		Level Of Difficu	ılty: (1-5)	
Question	Cognitive Level:	Low		10 CFR Part 55	Content:	41.5 / 41.10, 45.6, 45.13
Objective	: GOP-305					

17. Steam Generator 1 pressure is less than the Steam Feed Rupture Control System LOW PRESSURE trip setpoint.

Which of the following describes the effect on Steam Feed Rupture Control System components if Steam Generator 2 pressure also drops below the Steam Feed Rupture Control System low pressure trip setpoint without being blocked?

- A. Steam Feed Rupture Control System will isolate Steam Generator 2, realigning Auxiliary Feedwater to feed Steam Generator 1
- B. Steam Feed Rupture Control System will isolate Steam Generator 2, but will NOT realign to feed Steam Generator 1
- C. Steam Feed Rupture Control System will maintain the current Auxiliary Feedwater System alignment
- D. Steam Feed Rupture Control System will realign Auxiliary Feedwater 1 to Steam Generator 1 and Auxiliary Feedwater 2 to Steam Generator 2

Answer: C

Explanation/Justification: KA match based on relationship between steam rupture and emergency feedwater

- A. Incorrect plausible since realignment will occur if SG 1 low pressure trip resets
- **B.** Incorrect plausible since SFRCS acts to isolate either SG
- C. Correct SFRCS logic determines the 'first' steam generator with low pressure and isolates this steam generator only. The SFRCS assumes that the other steam generator ('second') is not affected
- D. Incorrect plausible assumes SFRCS restores to normal with AFW Train 1 to SG 1 and AFW Train 2 to SG 2 when both SGs are faulted

Sys # BW/E05	System Steam Line Rupture - Excessive Heat Transfer	Category EK2 Knowledge of the interrelations between the (Excessive Heat Transfer) and the following:			KA Statement 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# E	EK2.2	K/A Importance	4.2	Exam Level	RO		
Reference	s provided to Ca	ndidate None		Technical References:	SD-010 R6 for SFRCS	page 1-4	
Question S	Source: B	ank 166783		Level Of Difficu	ulty: (1-5)		
Question (Cognitive Level:	Low		10 CFR Part 55	Content: 4	1.7 / 45.7	
Objective:	SYS-523						

- The reactor automatically tripped from 95% power
- All automatic and operator actions have occurred
- The Unit Supervisor is directing trip recovery in accordance with DB-OP-06910, Trip Recovery
- Preparations are in progress to pull group 1 rods for RCS cooldown

Per DB-OP-06910, Trip Recovery which of the following describes why the Turbine Bypass Valves are placed in hand prior to resetting the Control Rod Drive breakers?

- A. Prevent an uncontrolled cooldown of the Reactor Coolant System
- B. Ensure the required Shutdown Margin is maintained
- C. Prevent Pressurizer level from rising off-scale high
- D. Ensure Steam Generator pressure remains below the Main Steam Safety Valve setpoints

Answer: A

Explanation/Justification: Knowledge of control components and automatic functions affected due to changing signals during post trip recovery

- A. Correct DB-OP-06910 R31, pg. 37, CAUTION 5.10.5 states the TBVs shall be placed in hand prior to resetting CRD to prevent removal of the +115 psi bias when the CRDs are reset. Without the TBVs in hand, the TBVs would open to lower steam pressure due to the 0 bias being inserted which would open and cause the RCS to cooldown
- **B.** Incorrect plausible since rod height is associated with shutdown margin
- C. Incorrect plausible since pressurizer level does change with RCS temperature change which will occur with a pressure setpoint change
- D. Incorrect plausible since pressure setpoint does change when resetting CRD breakers

Sys #	System	Category			KA Statement	
BW/E10	Reactor Trip - Stabilization - Recovery	EK2 Knowledge of the Stabilization) and the f	interrelations be following:	etween the (Post-Trip	Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	
K/A#	EK2.1	K/A Importance	3.5	Exam Level	RO	
Reference	es provided to Ca	Indidate None		Technical References:	DB-OP-06910 R31, pg. 40, CAUTION 5.10.5	
Question	n Source: B	ank 172549		Level Of Difficu	ulty: (1-5)	
Question	n Cognitive Level:	High		10 CFR Part 55	Content: 41.7 / 45.7	
Objective	e: GOP-207	-				

- 90% Power and stable
- Tave is 582°F
- Reactor Demand ICS Hand/Auto station is in HAND
- Rod Control Panel is in AUTO

The following occurs:

- The Reactor Operator places the Reactor Demand ICS Hand/Auto station in AUTO
- A failure sends a constant Reactor Neutron Error signal of (-) 4 percent
- The Reactor Operator returns the Reactor Demand ICS Hand/Auto station to HAND

Current conditions:

- Reactor Neutron Error meter indicates minus (-) 4 percent
- Tave is 583°F and rising

With these conditions and no Operator actions, how would Control Rod Group 7 Position indication respond?

- A. Stabilize at the position corresponding to Tave of 582°F
- B. Stabilize at current position
- C. Continuously lower
- D. Continuously rise

Answer: D

Explanation/Justification: Rod bank step counters for Westinghouse are comparable to group position indication for Davis-Besse

- A. Incorrect plausible since this is normal
- B. Incorrect plausible since Hand (manual) removes auto signals in most control systems
- C. Incorrect plausible since a negative signal normal corresponds with a lowering condition and a high temperature should be generating an insert signal
- D. Correct a negative signal is a withdraw signal whether in auto or manual

Sys #	System	Category			KA Statement			
001	Continuous Rod Withdrawal	AK2 Knowledge of th Withdrawal and the fo	K2 Knowledge of the interrelations between the Continuous Rod /ithdrawal and the following:			Rod bank step counters		
K/A#	AK2.01	K/A Importance	2.9	Exam Level	RO			
Reference	ces provided to C	andidate none		Technical References:	M-533-179-4			
Questio	n Source:	New		Level Of Diffici	ulty: (1-5)			
Questio	n Cognitive Level	: Low		10 CFR Part 55	6 Content:	41.7 / 45.7		
Objectiv	e: SYS-517							

- 20. Assuming source range is energized up to the time the following conditions are reached, which of the following sets of conditions will result in de-energizing the Source Range High Voltage Power Supply?
- A. NI-3 indicates 5 x10⁻¹⁰ amps NI-4 indicates 5 x10⁻⁹ amps
- B. NI-5 indicates 9% NI-6 indicates 10% NI-7 indicates 9% NI-8 indicates 11%
- C. NI-3 indicates 5 x10⁻¹¹ amps NI-4 indicates 5 x10⁻¹⁰ amps
- D. NI-5 indicates 11% NI-6 indicates 10% NI-7 indicates 9% NI-8 indicates 9%

Answer: B

Explanation/Justification: Davis-Besse high voltage removal is based on Intermediate and power range indications

- **A.** Incorrect –plausible since SR Nuclear Instruments de-energize when Both IRs > 1x10⁻⁹ amps. Contacts are closed in parallel which requires both to open to de-energize high voltage to SR instruments. HVCO energizes at 5x10⁻¹⁰ on the way down
- **B.** Correct two power ranges in parallel above 10% are required to remove high voltage
- **C.** Incorrect plausible since SR Nuclear Instruments de-energize when Both IRs > $1x10^{-9}$ amps. Contacts are closed in parallel which requires both to open to de-energize high voltage to SR instruments. HVCO energizes at $5x10^{-10}$ on the way down
- D. Incorrect plausible since two power ranges above 10% are required to remove high voltage but must be parallel

Sys #	System	Category			KA Statement	t		
032	Loss of Source Range NI	AA2 Ability to determ the loss of Source Ra	y to determine and interpret the following as they apply to Source Range Nuclear Instrumentation:			Expected values of source range indication when high voltage is automatically removed		
K/A#	AA2.03	K/A Importance	2.8	Exam Level	RO			
Referenc	es provided to	Candidate None		Technical References:	DB-OP-06912 R17 Note 4.30			
Question	Source:	Bank 161846		Level Of Difficu	ulty: (1-5)			
Question	Cognitive Lev	el: Low		10 CFR Part 55	Content:	43.5 / 45.13		
Objective	9:	SYS502						

- Plant startup in progress
- Reactor is stabilized at 1 x 10⁻⁸ amps

Per Technical Specifications, which one of the following would require opening CONTROL ROD drive trip breakers within 1 hour?

- A. One Source Range Instrument Inoperable
- B. Two Source Range Instruments Inoperable
- C. One Intermediate Range Instrument Inoperable
- D. Two Intermediate Range Instruments Inoperable

Answer: D

Explanation/Justification: KA match based knowledge of required NIs based on power level (and Mode)

- A. Incorrect Plausible since there are actions for source range Inoperable in mode 2 but not above 1 x 10⁻⁸ AMPs
- **B.** Incorrect Plausible since there are actions for source range Inoperable in mode 2 but not above 1 x 10⁻⁸ AMPs
- C. Incorrect Plausible since there is an action for one channel inoperable but only to restore or reduce power not open breakers
- D. Correct Technical 3.3.10 requires opening CRD trip breakers within one hour with two IR channels Inoperable

Svs #	System	Category			KA Statement	
033	Loss of Intermediate Range NI	Generic			Ability to recognize a entry level condition	system parameters that are s for Technical Specifications
K/A#	2.2.42	K/A Importance	3.9	Exam Level	RO	
Referen	ces provided to Ca	andidate None		Technical References:	TS 3.3.10	
Questio	n Source: N	ew		Level Of Difficu	ulty: (1-5)	
Questio	n Cognitive Level:	High		10 CFR Part 55	Content:	41.7/41.10/43.2/43.3/45.3
Objectiv	/e: GOP-210	-				

• 100% power

The following occurs:

• Steam Generator 2 Tube leak of 20 gpm

Current conditions:

- DB-OP-02543 Rapid Cooldown is in progress
- All Reactor Coolant Pumps are operating
- RCS pressure is 900 psig
- Thot is 450°F

With these conditions, the maximum rate of cooldown and depressurization will be limited by which of the following?

- A. Tube-to-shell stresses on Steam Generator 1
- B. Makeup capacity to the Pressurizer
- C. Minimum RCS pressure to provide NPSH for RCPs
- D. Maximum RCS pressure/temperature curve for RCS cooldown

Answer: C

Explanation/Justification: Knowledge of overall mitigation strategy for steam generator tube leakage

A. Incorrect – plausible if it is determined that the cooldown will be performed on SG 1 only due to incorrect assumption of SG 2 isolation

- B. Incorrect plausible since cooldown will cause contraction requiring additional makeup
- C. Correct Both Steam Generators are steamed using their respective TBV's if the condenser is available or the AVV's when the condenser is not available. The RCS is depressurized to the minimum requirements not to exceed the pressure temperature limits of the RCP Net Positive Suction Head curves in DB-PF-06703, Miscellaneous Operators Curves. This is in order to reduce the driving head of the tube leak.
- D. Plausible since this would limit temperature reduction based on pressure but pressure can be reduced faster than temperature so the cooldown and depressurization would not be limited by this curve

Sys #	System	Category			KA Statement	t
037	Steam Generator Tube Leak	AA1 Ability to operate / or monitor the following as they apply to the Steam Generator Tube leak			Maximum cont affected SG	trolled depressurization rate for the
K/A#	AA1.01	K/A Importance	3.7	Exam Level	RO	
References provided to Candidate None				Technical References:	DB-OP-02531 R20 SGTL Att 7 page 34	
Questio	n Source: N	ew		Level Of Difficu	ulty: (1-5)	
Questio	n Cognitive Level:	High		10 CFR Part 55	Content:	41.7/45.5/45.6
Objectiv	'e: GOP-131	-				

- 23. A radioactive release from the Main Station Vent was in progress with an atmospheric stability class of B, moderately unstable.
 - A weather front has moved through and Stability Class has changed to F, moderately stable.

Which of the following is correct concerning the effect of the change in stability class on offsite dose calculation?

The projected dose rate at the site boundary will (1) because the plume (2).

- A. (1) be lower
 - (2) is wider
- B. (1) be lower
 - (2) is narrower
- C. (1) be higher (2) is narrower
- D. (1) be higher (2) is wider

Answer: C

Explanation/Justification: KA match based on knowledge of the stability class required to perform offsite dose calculations

- A. Incorrect may select based on a more stable atmosphere resulting in a lower dose rate at the site boundary
- B. Incorrect may select based on a more stable atmosphere resulting in a lower dose rate at the site boundary
- C. Correct As atmospheric stability class becomes more stable (stability class shift from B to F) the radioactive plume experiences less dispersion
- and is thus more concentrated (narrower) resulting in a rise in projected dose rate at a discrete location for a given set of conditions
- **D.** Incorrect may select based on thinking that a more widespread plume is equivalent to higher dose rates

Sys #	System	Category			KA Statemer	nt
060	Accidental Gaseous Radwaste Release	AK1 Knowledge of the concepts as they ap	ne operational i ply to Accidenta	mplications of the following al Gaseous Radwaste Release:	Calculation of offsite doses due to a release from the power plant	
K/A#	AK1.04	K/A Importance	2.5*	Exam Level	RO	
Referen	ces provided to C	Candidate None		Technical References:	Lesson Plan OPSGOPI604 Rev 4 slide 23-25	
Questio	n Source:	Bank 173523		Level Of Difficu	ulty: (1-5)	
Questio	n Cognitive Leve	l: High		10 CFR Part 55	Content:	42.8/41.10/45.3
Objectiv	e: GOP-604	0				

24. Irradiated fuel movement in progress in the Spent Fuel Pool

RE8446, Fuel Handling Area Ventilation Monitor fails low RE8447, Fuel Handling Area Ventilation Monitor has been determined to be operating correctly

With these current conditions, per LCO 3.3.14 Fuel Handling Exhaust – High Radiation, which of the following actions, if any, are **REQUIRED**?

- A. Declare the associated Spent Fuel Pool Area Emergency Ventilation train INOPERABLE
- B. Stop fuel movement of irradiated assemblies in the Spent Fuel Pool building immediately
- C. Place OPERABLE Spent Fuel Pool Area Emergency Ventilation System train in Operation
- D. No action required since RE8447 and RE8446 are redundant only one channel is required

Answer: A

Explanation/Justification: KA match based on actions required with ARM RE8446 out of service

- A. Correct TS 3.3.14 Condition A required action
- B. Incorrect plausible since this is the action for not restoring the SFP Ventilation Train within the required completion time
- C. Incorrect plausible since this is the action for not restoring the SFP Ventilation Train within the required completion time if fuel movement is to
- continueD. Incorrect plausible since RE8446 and RE8447 are in series in the common flowpath

Svs #	System	Category			KA Statement
061	ARM System Alarms	AA2 Ability to determine and interpret the Area Radiation Monitoring (ARM)		et the following as they apply to I) System Alarms:	Required actions if alarm channel is out of service
K/A#	AA2.06	K/A Importance	3.2	Exam Level	RO
Referer	nces provided to Ca	andidate None		Technical References:	LCO 3.3.14
Questic	on Source: N	lew		Level Of Diffic	ulty: (1-5)
Questic	on Cognitive Level:	Low		10 CFR Part 5	5 Content: 43.5/45.13
Objecti	ve: GOP-433				

25. The plant is experiencing an unisolable steam leak in Containment.

Which of the following describes an action required of the Reactor Operator and the reason for the action?

- A. Open the Atmospheric Vent Valve on the affected Steam Generator to blow it down to atmosphere to ensure compliance with TNC 8.7.1 Steam Generator Pressure/Temperature Limitation
- B. Open the Atmospheric Vent Valve on the affected Steam Generator to blow it down to atmosphere to ensure compliance with LCO 3.6.1 Containment
- C. After blowing down the affected Steam Generator, close its Atmospheric Vent Valve to ensure compliance with LCO 3.6.1 Containment
- D. After blowing down the affected Steam Generator, close its Atmospheric Vent Valve to ensure compliance with TNC 8.7.1 Steam Generator Pressure/Temperature Limitation

Answer: C

Explanation/Justification: KA match based on guidance in EOP to restore containment integrity

- A. Incorrect Plausible because AVV is opened for steam leak in Containment and opening AVV would reduce SG pressure if TNC 8.7.1 was applicable.
- **B.** Incorrect Plausible because AVV is opened for steam leak in Containment and opening AVV limits containment pressure rise.
- **C.** Correct AVV must be closed following SG blowdown to isolate direct path from containment atmosphere through steam rupture to outside atmosphere via AVV. See DBOPBASES R21 step 7.26 (page 140).
- **D.** Incorrect Plausible because closing AVV after SG blowdown is correct action.

Sys #	System	Category			KA Statemer	nt	
069	Loss of CTMT Integrity	AK3 Knowledge of the reasons for the following responses as they apply to the Loss of Containment Integrity:			Guidance contained in EOP for loss of containment integrity		
K/A#	AK3.01	K/A Importance	3.8*	Exam Level	RO		
References provided to Candidate None				Technical References:	Bases and Deviation Document for DB-OP-02000 R20 Step 7.26 page 138		
Questio	n Source:	Bank DB 2015 NRC Exar	n Q18	Level Of Difficu	ılty: (1-5)		
Questio	n Cognitive Level	: Low		10 CFR Part 55	Content:	41.5/41.10/45.6/45.13	
Objectiv	/e: GOP-306						

26. During Inadequate Core Cooling, the operator is directed by DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture to lower SG Pressure in an attempt to induce Primary to Secondary Heat Transfer.

While reducing Steam Generator Pressure the operators are cautioned **NOT** to allow SG pressure to drop below 35 psig.

What is the reason for this caution?

35 psig in the SGs is the _____

- A. value used in DB-OP-02000 to determine if an Overcooling of the Reactor Coolant System is in progress
- B. setpoint for Steam Feed Rupture Control System actuation, which will isolate the atmospheric vent valves
- C. minimum pressure required to efficiently operate the Steam Jet Air Ejectors which are required to maintain Condenser Vacuum
- D. minimum steam pressure required to run an Auxiliary Feedpump Turbine at a speed that will adequately provide bearing lubrication

Answer: D

Explanation/Justification: KA match based on AFW pump addressed in inadequate core cooling section of EOP

- A. Incorrect. Plausible because DB-OP-02000 directs implementation of the Overcooling Section when SG Pressure is less than 960 psig, however Section 9 direction for Inadequate Core Cooling takes precedence over Section 7 Direction for Overcooling in accordance with DB-OP-02000, Bases and Deviation Document.
- B. Incorrect. Plausible because if Steam Generator Pressure is reduce below 620 psig, SFRCS will actuate on Low Steam Generator causing both Atmospheric Vent Valves (AVV) to close which would stop the pressure reduction. In this case, manual control of the AVV would be established to further lower as required.
- C. Incorrect. Plausible if the candidate assumes the steam is being dumped to the Condenser. Lowing steam generator pressure will cause Auxiliary Steam Pressure to be reduced if being supplied via the Main Steam Reducer. Air Ejectors become inefficient with low input steam
- D. Correct. RO question since it involves a mitigation strategy. Lower SG Pressure to less than 35 psig would result in a loss of feedwater to the Steam Generators.

Sve #	System	Category			KA Statement		
5 y5 π	System	Category			NA Statement		
074	Inadequate	EK2 Knowledge of the	interrelations betw	een the following and	AFW Pump		
-	Core Cooling	inadequate core coolir	ng	J			
K/A#	EK2.03	K/A Importance	4.0	Exam Level	RO		
Referen	ces provided to Ca	ndidate None		Technical References:	DB-OP-02000 Step 9.7 Caution		
Questio	n Source: Ba	ank DB 2011 NRC Exar	n Q73	Level Of Difficu	ılty: (1-5)		
Questio	n Cognitive Level:	Low		10 CFR Part 55	Content: 41.7/45.7		
Objectiv	/e: GOP-308						

- 27. Which ONE (1) of the following Emergency Diesel Generator protective features is BYPASSED on an Emergency (automatic) start of the Emergency Diesel Generator?
- Α. Overspeed
- Β. Fail to start
- C. Reverse power
- D. Generator bus differential

Answer: C

Explanation/Justification KA match based on EDG failure modes

- Α. Incorrect - plausible since this is a protective function that is not bypassed on a safety start
- Incorrect plausible since when starting, it causes the EDG to shut down if it has not exceeded 200 rpm in 7 seconds. The bypass function is for В. preventing an engine trip and this function indicates the EDG has tripped and actuates the 86-2 relay to lockout the EDG Correct – Reverse power is one of the protective functions bypassed on a safety start.

C.

D. Incorrect - plausible since this is a protective function that is not bypassed on a safety start

Sys #	System	Category			KA Statement	
BW/A05	Emergency Diesel Actuation	AA1 Ability to operate and/or monitor the following as they apply to the (Emergency Diesel Actuation):			Components, and fur systems, including in interlocks, failure more manual features	nctions of control and safety strumentation, signals, des, and automatic and
K/A#	AA1.1	K/A Importance	4.3	Exam Level	RO	
References provided to Candidate None				Technical References:	SD-003B R6 page 2-	19 and 2-20
Question	Source: Ba	ank 168179		Level Of Difficu	lty: (1-5)	
Question	Cognitive Level:	Low		10 CFR Part 55	Content:	41.7/45.5/45.6
Objective	: SYS-406					

- 28. The following plant conditions exist:
 - Mode 1 at 15% power

The following event occurs:

- RCP 1-1 is shutdown by the crew due to excessive vibrations
- No other operator actions are taken

Which one of the following represents the condition of the plant, once stabilized?

- A. Tave will be selected to Loop 1
- B. Loop 1 FW flow will be 2.4 times greater than Loop 2 FW flow
- C. Loop 2 FW flow will be 2.4 times greater than Loop 1 FW flow
- D. Tave will be selected to Loop 2

Answer: D

Explanation/Justification: KA match based on effect on RCS Tave control on loss of an RCP

- A. Incorrect In accordance with DB-OP-02515 R11, RCP and Motor Abnormal Attachment 1 for Stopping a RCP Step 5. SASS will align Tave to the loop with 2 RCPS in service.
- B. Incorrect Plausible because the normal response at 72% power when an RCP would be shutdown is for FW Flow to Loop with the highest RCS flow to be 2.4 time greater than the remaining loop. A trip from 15% with SG on Low Level limits negates flow control. The SG Will be on Level Control.
- C. Incorrect Plausible because the normal response at 72% power when an RCP would be shutdown is for FW Flow to Loop 2 to be 2.4 time greater. A trip from 15% with SG on Low Level limits negates flow control. The SG Will be on Level Control
- D. Correct In accordance with DB-OP-02515 R11, RCP and Motor Abnormal Attachment 1 for Stopping a RCP Step 5. SASS will align Tave to the loop with 2 RCPS in service.

Sys # System Category KA Statement 003 Reactor Coolant Pump K3 Knowledge of the effect that a loss or malfunction of the RCPS will have on the following: Pump RCS K/A# K3.01 K/A Importance None 3.7 Exam Level Technical References: RO DB-OP-02515 R12, RCP and Moto Attachment 1 for Stopping a RCP Question Source: Bank DB 2013 NRC Exam O29 Level Of Difficulty: (1-5)	
003 Reactor Coolant Pump K3 Knowledge of the effect that a loss or malfunction of the RCPS RCS K/A# K3.01 K/A Importance None 3.7 Exam Level Technical References: RO DB-OP-02515 R12, RCP and Moto Attachment 1 for Stopping a RCP Question Source: Bank DB 2013 NRC Exam O29 Level Of Difficulty: (1-5)	
K/A# K/A Importance 3.7 Exam Level RO References provided to Candidate None Technical References: DB-OP-02515 R12, RCP and Moto Attachment 1 for Stopping a RCP Question Source: Bank DB 2013 NRC Exam O29 Level Of Difficulty: (1-5)	
References provided to Candidate None Technical References: DB-OP-02515 R12, RCP and Moto Attachment 1 for Stopping a RCP Question Source: Bank DB 2013 NRC Exam O29 Level Of Difficulty: (1-5)	
Question Source: Bank DB 2013 NRC Exam O29 Level Of Difficulty: (1-5)	Abnormal
Question Cognitive Level:High10 CFR Part 55 Content:41.7/45.6	
Objective: GOP-115	

- 100% Power
- Pressurizer level indicates 218 inches and stable
- MUT level 86 inches and stable
- MUT pressure 15 psig

With these conditions, which of the following actions is **REQUIRED** to be performed next?

- A. Add inventory to the Makeup Tank to account for RCS leakage
- B. Add H2 to the Makeup Tank to maintain Makeup Pump NPSH
- C. Adjust Pressurizer level setpoint to 220 inches
- D. Verify Makeup Pump suctions automatically transferred to the BWST

Answer: B

Explanation/Justification: KA based on knowledge of NPSH requirements for makeup (charging) pumps based on tank pressure

- A. Incorrect plausible since pressurizer level is below normal level for 100% power it could be determined a loss of inventory is occurring
- B. Correct Minimum makeup tank pressure is 15 psig for proper makeup pump NPSH
- C. Incorrect plausible since 220 is the normal setpoint but there is no requirement to adjust the setpoint if indication does not equal exactly 220
- D. Incorrect plausible since there is an auto transfer signal at 86 inches and going to the BWST would provide adequate NPSH but at 86 inches the auto signal is from the BWST to the MUT

Sys #	System	Category			KA Statemer	nt
004	Chemical and Volume Control	K5 Knowledge of the concepts as the apply	Operational im to the CVCS:	nplications of the following	Relationship I for charging p	between VCT pressure and NPSH pumps
K/A#	K5.26	K/A Importance	3.1	Exam Level	RO	
Referen	ces provided to Ca	Indidate None		Technical References:	DB-OP-02002	2 R10 page 25
Questio	on Source: N	ew		Level Of Difficu	ulty: (1-5)	
Questio	on Cognitive Level:	High		10 CFR Part 55	Content:	41.5/45.7
Objectiv	/e: SYS-106	-				

- 30. Initial conditions:
 - Reactor trip due to loss of instrument air
 - DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture Immediate actions have been performed

The following is observed:

• An unexpected increase in neutron count rate

Which of the following CONTROL ROOM actions will be taken to mitigate this condition?

- A. Raise reactor coolant temperature
- B. Insert Group 8 Axial Power Shaping Rods
- C. Transfer Makeup Pump suction valves to the BWST position
- D. Add Boric Acid to the Makeup Tank per Attachment 13, controlling the MU System

Answer: C

Explanation/Justification: Match based on operation of the valves required to initiate emergency boration from the control room due to entering specific rule 1

- A. Incorrect plausible since raising temperature would add negative reactivity (specific rule 1 specifies stabilizing temperature)
- B. Incorrect plausible since group 8 rods do not insert on a reactor trip and will affect reactivity
- C. Correct correct per Specific Rule 1

D. Incorrect – plausible since this is one of the two methods to emergency borate but loss of instrument air causes the boric acid pumps to trip and level indications to fail which will prevent adding acid to the MUT using DB-OP-02000 attachment 13 as directed by specific rule 1.

Sys #	System	Category			KA Stateme	ent
004	Chemical and Volume Control	A4 Ability to manually	A4 Ability to manually operate and/or monitor in the Control Room:			borate valve
K/A#	A4.18	K/A Importance	4.3	Exam Level	RO	
Reference	ces provided to Ca	ndidate None		Technical References:	DB-OP-0200	00 Specific rule 1
Question	n Source: Ne	ew		Level Of Difficu	ulty: (1-5)	
Question	n Cognitive Level:	High		10 CFR Part 55	Content:	41.7 / 45.5 to 45.8
Objectiv	e: GOP-301					

- DH1517, DH Pump 1 Suction from RCS, Red Light ON
- DH2733, DH Pump 1 Suction from BWST, Green light ON
- Decay Heat Pump 1 ON

The following occurs:

- Inadvertent SFAS Level 3
- Decay Heat Pump 1 trips

Based on these conditions which of the following indicates the final position of DH1517 and DH2733?

- A. DH1517 OPEN DH2733 OPEN
- B. DH1517 OPEN DH2733 CLOSED
- C. DH1517 CLOSED DH2733 OPEN
- D. DH1517 CLOSED DH2733 CLOSED

Answer: C

Explanation/Justification: K/A match based on the interlock between ECCS and Decay Heat (RHR) suction valves

- A. Incorrect plausible since this would be correct if there was no interlock
- $\textbf{B.} \quad \text{Incorrect-plausible since this would be the status if there was no effect due to the event}$
- C. Correct SFAS 3 sends an open signal to DH2733 and DH1517 is interlocked to close when DH2733 opens
- D. Incorrect plausible since DH2733 is initially closed and some systems are designed for their pump suction valves closing to cause pump trips

Sys #	System	Category			KA Statement	
005	Residual Heat Removal	K1 Knowledge of the relationships between	physical conr the RHRS a	nections and/or cause-effect nd the following systems:	ECCS	
K/A#	K1.06	K/A Importance	3.5	Exam Level	RO	
Reference	ces provided to Ca	andidate None		Technical References:	OS-004 SH 2 CL	-3 , DB-OP-02000 Page 422
Question	n Source: N	lew		Level Of Difficu	ılty: (1-5)	
Question	n Cognitive Level:	Low		10 CFR Part 55	Content:	41.2 to 41.9 / 45.7 to 45.8
Objectiv	e:	GOP-309				

- 32. Current conditions:
 - A Pressurizer vapor space leak occurred approximately 10 hours ago
 - SFAS actuated on Low RCS Pressure; all safety systems responded as expected
 - BWST level is approaching 9 feet
 - RCS pressure is 925 psig; temperature is 400°F
 - Subcooling margin was never lost

Which one of the following actions must be verified as completed prior to swapping LPI Pump suctions to the CTMT sump?

- A. Block and stop HPI pumps
- B. Piggyback LPI to HPI pump suctions
- C. Close Core Flood Tank Isolation valves
- D. Perform HPI flow balancing

Answer: B

Explanation/Justification: KA match based on effect on HPI suction when BWST is lost

- A. Incorrect plausible since SCM exists but HPI can't be stopped due to high RCS pressure
- B. Correct OP2000 would have piggyback in operation established prior to transfer to emergency sump since HPI does not take suction from the emergency sump directly
- C. Incorrect plausible since this is performed after swapping to sump when LPI flow is greater than 1350 gpm per line
- D. Incorrect plausible since HPI flow balancing is directed in OP-02000 but only if the is only one HPI pump

Sys #	System	Category			KA Statement
006	Emergency Core Cooling	K6 Knowledge of the will have on the ECC	effect of a loss S:	s or malfunction on the following	BIT/borated water sources
K/A#	K6.01	K/A Importance	3.4	Exam Level	RO
References provided to Candidate None				Technical References:	DB-OP-02000 R28 step 13.15 RNO pg 224
Questic	on Source: B	ank 171359		Level Of Difficu	ulty: (1-5)
Questic	on Cognitive Level:	High		10 CFR Part 55	Content: 41.7 / 45.7
Objecti	ve: SYS-303				

- Safety Actuation Level 2 has actuated.
- Safety Actuation Monitoring (SAM) lights for HP 2A (HPI Line 2-1 Iso Valve) HP 2B (HPI Line 2-2 Iso Valve) and High Pressure Injection (HPI) Pump 1-2 are OFF.
- HP 2A, and HP 2B are closed.
- All other Safety Actuation Level 2 component SAM lights are LIT dim.

Which of the following explains why HPI Pump 1-2 has not automatically started?

- A. Safety Features Actuation System (SFAS) sequencer has not timed out
- B. SFAS Ch. 2 and 4 Low Reactor Coolant System Pressure bistables did not trip
- C. HP 2A and HP 2B are not open
- D. Associated SFAS output modules did not trip

Answer: D

Explanation/Justification: KA match based on monitoring SFAS indication to determine status of automatic operation of HPI pump

- A. Incorrect Sequencer did not activate because D1 Bus has remained energized. Plausible for SFAS loads always sequence misconception
- B. Incorrect HPI Pump 2 should start from trip of Channel 1 and 3 Low RC Pressure bistables. Plausible for incorrect model of logic and actuation channel boundaries
- C. Incorrect There is no interlock from discharge valve position to HPI pump start logic. Plausible because pump and discharge valves are controlled from the same output modules
- D. Correct Failure of the output modules to trip has also resulted in HP2A and HP2B remaining closed. All three components are controlled from the same output modules

Sys #	System	Category			KA Statement	
006	Emergency Core Cooling	A3 Ability to monitor automatic operation of the ECCS, including:			Pumps	
K/A#	A3.02	K/A Importance	4.1	Exam Level	RO	
Referen	ces provided to Ca	ndidate None		Technical References:	DB-OP-06405 R13 Attachment 2 page 74	
Questio	n Source: Ba	ank 167347		Level Of Difficu	ılty: (1-5)	
Questio	n Cognitive Level:	High		10 CFR Part 55	Content: 41.7 / 45.5	
Objectiv	/e: Sys-506					

- 100% Power
- RC2A, Pressurizer Power Operated Relief valve is leaking slowly
- Pressurizer Quench Tank level is 9.5 ft and lowering slowly
- Pressurizer Quench Tank temperature is 150°F and lowering slowly
- Pressurizer Quench Tank Circ Pump RED light is LIT

With these conditions which of the following describes why the Pressurizer Quench Tank Circ Pump is running and how it will be shut down?

The Pressurizer Quench Tank Circ Pump started due to high (1) and will be shutdown (2)

- A. 1) temperature
 - (2) manually
- B. (1) temperature(2) automatically
- C. (1) level (2) manually
- D. (1) level (2) automatically

Answer: A

Explanation/Justification: KA match based Pressurizer quench tank controls related to tank temperature

- A. Correct the quench tank pump automatically starts at about 150°F. The pump then will be required to be manually shutdown. The only auto shutdown function is related to an abnormal motor high temperature or closure of pump suction valves which only auto close due to an SFAS signal
- B. Incorrect plausible since (1) is correct and there are auto shutdown functions but only due to abnormal conditions
- C. Incorrect plausible since level is lowering (drain line auto opens at 9.5 ft), the drain line is from the recirc discharge line and pumps are routinely used to lower tank levels (2) is correct
- D. Incorrect – plausible since level is lowering, the drain line is from the recirc discharge line and pumps are routinely used to lower tank levels and there are auto shutdown function but only due to abnormal conditions

Sys # 007	Sys # System Category 007 Pressurizer Relief/Quenc A1 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS			KA Statement Monitoring quench tank temperature	
K/A# Reference	h Tank A1.03 es provided to Ca	controls including: K/A Importance ndidate None	2.6	Exam Level Technical References:	RO DB-OP-06004 R10 Attachment 3 and OS-001A SH 4 CL-9
Question Question	Source: Ne Cognitive Level:	ew Low		Level Of Difficu 10 CFR Part 55	ulty: (1-5) Content: 41.5 / 45.5
Objective	SYS-104				
- 100% Power
- Component Cooling Water (CCW) Pump 2 is in service

The following occurs:

- CCW Pump 2 shears its shaft
- CCW Pump 1 fails to auto start

One minute later the Reactor Operator starts CCW Pump 1 and stops CCW Pump 2

The following Annunciator alarms have been received and have **NOT** been acknowledged:

- Annunciator 11-4-B CCW PMP 1 FLOW LO
- Annunciator 11-5-B CCW PMP 2 FLOW LO
- Annunciator 6-5-B SEAL CCW FLOW LO
- Annunciator 2-3-A LETDOWN TEMP HI ALARMS

All automatic actions have completed and no other operator actions have been taken.

Based on these conditions, which of the following identifies the actions required to restore CCW system flow to its previous value?

- A. Open Reactor Coolant Pump Seal Cooling CCW Return Valves
- B. Close Loop 2 Non-Essential CCW Isolation valves
- C. Stop the standby CRD Cooling Booster Pump
- D. Restore Letdown

Answer: D

Explanation/Justification: KA match based on recognizing CCW valves to Letdown Coolers automatically close following a high temperature isolation of the letdown cooler

- A. Incorrect plausible since the low flow alarm is flashing and there is an automatic closure interlock due to high pressure
- **B.** Incorrect plausible since the valves would not auto close on a sheared shaft until CCW 2 pump breaker was opened

C. Incorrect – plausible since the booster pumps could start due to low flow during the valve swap but the low flow alarm is not flashing

D. Correct – CCW valves to Letdown Coolers automatically close following a high temperature isolation

Sys #	System	Category			KA Statemen	t
008	Component Cooling Water	A2 Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:			Effects of shut isolation valve	ting (automatically or otherwise) the s of the letdown cooler
K/A#	A2.08	K/A Importance	2.5*	Exam Level	RO	
Referenc	es provided to Ca	ndidate None	e	Technical References:	SD-048 R4 Pa	ige 2-26
Question	Source: N	ew		Level Of Difficu	ulty: (1-5)	
Question	Cognitive Level:	High		10 CFR Part 55	Content:	41.5 / 43.5 / 45.3 / 45.13
Objective	e: Sys-106	-				

- RCS pressure 885 psig
- Quench Tank pressure 35 psig

The following occurs:

• The Power Operated Relief Valve (PORV) starts leaking

For these conditions what will be the PORV downstream tailpipe temperature?

- A. ≈ 212 °F
- B. ≈ 280 °F
- C. ≈ 320 °F
- D. ≈ 540 °F

Answer: C

=

Explanation/Justification: KA match based on knowledge of isenthalpic throttling process

- A. Incorrect Plausible because this would be the saturation temperature at atmospheric conditions
- B. Correct Plausible if the candidate does not realize that this would result in superheat, and thus stops at the saturation line on the mollier diagram.
- **C.** Incorrect Correct. IAW Steam tables and isenthalpic throttling process
- D. Incorrect Plausible if the candidate uses the RCS pressure to determine the downstream temperature.

Sys #	System	Category				KA Statement		
010	Pressurizer Pressure Control	K5 Knowledge of the operational implic concepts as the apply to the PZR PCS:			ations of the following	Constant enthalpy expansion through a valve		
K/A#	K5.02	K/A Impor	tance	2.6	Exam Level	RO		
References provided to Candidate		andidate	Steam table with mollier Technical I diagram		Technical References:	Steam table with mollier diagram		
Questio	n Source: B	ank 167902			Level Of Difficu	ılty: (1-5)		
Questio	n Cognitive Level:	F	ligh		10 CFR Part 55	Content: 41.5 / 45.7		
Objectiv	e: SYS-104		-					

- 37. DP-OP-06003, Pressurizer Operating Procedure, Section 4.5, Setting RC49 Pressurizer Minimum Flow Spray Valve, is in progress with the following conditions:
 - Plant is stable at normal operating pressure and temperature (NOP/NOT)
 - Pressurizer Heaters ESSEN BANK 1 ON
 - Pressurizer Heaters ESSEN BANK 2 ON
 - RC2, Pressurizer Spray Valve is CLOSED
 - RC49, Pressurizer Minimum Flow Spray Valve is CLOSED

The following occurs:

• Pressurizer Heaters ESSEN BANK 1 fails

Current conditions:

- T776, PRESSURIZER TEMP indicates 645 °F
- T774, RC PRZR SPRAY LINE TEMP indicates 220 °F
- Pressurizer level indicates 100 inches
- Pressurizer spray line bypass flow 0 GPM

Based on these current plant conditions which of the following is **REQUIRED** and why?

- A. Increase Pressurizer spray line bypass flow to 0.5 GPM to minimize boron stratification in the Pressurizer
- B. Lower pressurizer level to less than 85 inches to prevent over pressurization due to inadvertent High Pressure Injection actuation
- C. Enter TRM 8.4.2, Pressurizer for maximum spray water differential and take action to assure the pressurizer remains within the design criteria assumed for fatigue analysis
- D. Enter TS 3.4.9, Pressurizer for minimum essential pressurizer heaters operable and take action to ensure that the Reactor Coolant pressure can be maintained

Answer: C

Explanation/Justification: Meets the K/A by applying limit and precaution based on plant conditions and explaining the reason

A. Incorrect – plausible since raising flow does minimize boron stratification but the minimum procedure requirement is .75 GPM

B. Incorrect – plausible since this would be the correct if the RCS temperature was less than 500°F but RCS is at NOT/NOP

C. Correct – DB-OP-06003, Pressurizer procedure L&P 2.2.8 identifies TRM 8.4.2 limit of 410 °F maximum spray water temperature differential and TRM 8.4.2 identifies this as the limits for maintaining the pressurizer within design limits for fatigue criteria

D. Incorrect – plausible since this would be correct if the loss of heaters resulted in less than 85 kW essential heaters operable but there are two banks each with a capacity of 126kW

Sys #	System	Category			KA Statement	
010	Pressurizer Pressure Control	Generic			Ability to explai precautions	n and apply system limits and
K/A#	2.1.32	K/A Importance	3.8	Exam Level	RO	
References provided to Candidate None			Technical References:	DB-OP-06003, Pressurizer procedure L&P 2.2.		
Questio	n Source:	New		Level Of Difficu	ulty: (1-5)	
Questio	n Cognitive Level	: High		10 CFR Part 55	6 Content:	41.10 / 43.2 / 45.12
Objectiv	/e: SYS-104					

- 75% Power
- RCP 2-2 shutdown due to high vibration 48 hours ago.

The following occurs:

• RCP 1-1 trips

Which of the following describes the Reactor response and the basis for this response?

The Reactor will (_1_) to prevent exceeding the (_2_) limit.

- A. (1) trip
 - (2) Pressure-Temperature
- B. (1) trip(2) Departure from Nuclear Boiling Ratio
- C. (1) runback to 45% power (2) Pressure-Temperature
- D. (1) runback to 45% power(2) Departure from Nuclear Boiling Ratio

Answer: B

Explanation/Justification: KA based on knowledge of automatic trip setpoints and basis

- A. Incorrect plausible since RCS pressure and temperature is a limit on parameters which will be affected by this event but the reactor will trip on high flux to prevent exceeding DNB
- B. Correct The Reactor Protection System will trip at 55% Power with a single Reactor Coolant pump in each loop. The high flux trip is designed to protect against violation of DNBR
- C. Incorrect plausible since there is a runback to 45% power based on a 1-1 RCP combination if below the trip setpoint
- D. Incorrect plausible see previous explanations for incorrect answers

Sys #	System	Categor	у			KA Statement
012	Reactor Protection	K4 Knov provide f	K4 Knowledge of RPS design feature(s) and/or interlock(s) which provide for the following:			Automatic reactor trip when RPS setpoints are exceeded for each RPS function; basis for each
K/A#	K4.02	K/A Imp	ortance	3.9	Exam Level	RO
References provided to Candidate		None		Technical References:	TS 3.3.1 Table 3.3.1-1 page 2 and TS Bases 3.3.1 page B3.3.1-11	
Question Source: New				Level Of Difficu	ılty: (1-5)	
Questio	on Cognitive Level	l:	High		10 CFR Part 55	Content: 41.7
Objectiv	ve: SYS-504		-			

• 80% power

The following occurs:

• A Borated Water Storage Tank level transmitter fails low in Safety Features Actuation System (SFAS) Channel 1

What are the indications on the Safety Actuation Level 5 Output Module in each SFAS cabinet?

- A. A single 1/5 light is lit on Channels 1, 2, 3, and 4
- B. A single 1/5 light is lit on Channels 1 and 3 only
- C. A single 1/5 light is lit on Channel 1 only
- D. Two 1/5 lights are lit on Channel 1, a single 1/5 light is lit on Channels 2, 3, and 4

Answer: A

Explanation/Justification: KA based on knowledge of the loss of a sensor on indications on the Safety Features Actuation System

- A. Correct Each SFAS Channel receives and input condition for other 3 channels. 2 of 4 logic is then used to confirm a trip condition exists. A single trip will light a 1/5 light in all channels as each channel senses either its own or another channels trip condition
- **B.** Incorrect plausible if the candidate believes the logic of the SFAS is similar to the Steam Feed Rupture Control System where channels 1 and 3 are actuation channel 1 and Channels 2 and 4 are actuation channel 2
- C. Incorrect plausible if the candidate assumes train separation in SFAS prevents inputs from an SFAS channel being used or sensed by the remaining SFAS channels (also this is a condition for input testing)
- D. Incorrect plausible response for output module testing

Sys #	System	Category			KA Statement	
013	Engineered Safety Features Actuation	K6 Knowledge of the will have on the ESFA	δ Knowledge of the effect of a loss or malfunction on the following ill have on the ESFAS:			ors
K/A#	K6.01	K/A Importance	2.7*	Exam Level	RO	
Referer	nces provided to C	andidate None		Technical References:	SD 002, page 2-11	
Questic	on Source: E	3ank 166944		Level Of Difficu	ulty: (1-5)	
Questic	on Cognitive Level:	Low		10 CFR Part 55	Content:	41.7 / 45.5 to 45.8
Objecti	ve: SYS-506					

• 100% power

The following occurs:

- A Large Break Loss of Coolant Accident which physically damages the Containment Air Cooler ductwork
- Containment temperature is165°F and rising

Which of the following is designed to mitigate this condition to ensure post-accident Containment temperature and pressure will be maintained within the design limits?

- A. Redundant Containment Air Cooler
- B. Containment Recirculation Fans
- C. Containment Spray
- D. Dropout Registers

Answer: D

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Explanation/Justification: KA based on knowledge of design features providing for containment cooling after a LOCA destroys ventilation ducts

- A. Incorrect plausible since the air coolers are redundant but if temperature is continuing to rise CTMT is not being cooled
- B. Incorrect plausible since there are recirculation fans but they have no safety function or cooling medium
- C. Incorrect plausible since CTMT Spray would cool CTMT but not mitigate the damaged air cooler ductwork

D. Correct – In the event of a LOCA which physically damages the ductwork and containment temperature rises above 165°F, the fusible link dropout registers will fall out and Cooling Air Flow will be out all four sides of the Fan Discharge. Because of the extensive mixing action in containment the safety function of the CACs will still be fulfilled

Sys #	System	Category			KA Statement
022	Containment Cooling	K4 Knowledge of C0 provide for the follow	CS design featu ving:	re(s) and/or interlock(s) which	Containment cooling after LOCA destroys ventilation ducts
K/A#	K4.05	K/A Importance	2.6*	Exam Level	RO
References provided to Candidate None		Technical References: SD-022B 1.2.1 page 1-3		SD-022B 1.2.1 page 1-3	
Questic	on Source: N	lew		Level Of Difficu	ulty: (1-5)
Questic	on Cognitive Level:	Low		10 CFR Part 55	Content: 41.7
Objectiv	ve: SYS-306				

- 100% power
- Containment Air Coolers 1 and 2 are running in FAST speed

The following occurs:

• A Loss Of Offsite Power

Assuming NO operator actions, what will be the status of the Containment Air Coolers FIVE MINUTES after the Emergency Diesel Generators re-energize C1 and D1 buses?

Containment Air Coolers 1 and 2 will (1)

Containment Air Coolers 1 and 2 Service Water inlet valves will be (2)

- A. (1) NOT be running(2) CLOSED
- B. (1) NOT be running(2) OPEN
- C. (1) be running in FAST speed (2) CLOSED
- D. (1) be running in FAST speed (2) OPEN

Answer: A

Explanation/Justification: KA match on ability to determine correct position of valves in the Containment Cooling System

- A. Correct Containment Air Coolers stop when running in fast and only restart (in slow) if SFAS 2 signal present. The inlet valves will close due to the refill logic and not reopen unless the fan is running due to SFAS 2
- B. Incorrect plausible since the refill logic will reopen the inlet valves if the cooler was initially running in slow or an SFAS level 2 initiation exists
- C. Incorrect plausible since fans would be running if in slow speed initially or SFAS level 2 exists
- D. Incorrect plausible since refill logic will reopen the inlet valves and fans would be running if in slow speed initially or SFAS level 2 exists

Sys #	System	Category			KA Statement	
022	Containment Cooling	A4 Ability to manually o	operate and/or r	nonitor in the control room:	Valves in the CCS	
K/A#	A4.04	K/A Importance	3.1*	Exam Level	RO	
Referen	ces provided to Ca	ndidate None		Technical References:	OPS-SYS-I306.05	C1, DB-OP-06016 R34 2.2.15
Questio	n Source: Ba	ank 169144		Level Of Difficu	ulty: (1-5)	
Questio	n Cognitive Level:	Low		10 CFR Part 55	Content:	41.7 / 45.5 to 45.8
Objectiv	e: SYS-306					

• 100% Power

A loss of Component Cooling Water has occurred to RCP 2-1

• DB-OP-02515, Reactor Coolant Pump and Motor Abnormal has been implemented

The following motor stator temperatures are observed:

- RCP 1-1 T788 180°F
- RCP 1-2 T808 185°F
- RCP 2-1 T828 305°F
- RCP 2-2 T848 183°F

Per DB-OP-02515, Reactor Coolant Pump and Motor Abnormal which of the following actions are required?

- A. Trip Reactor and trip all 4 RCPs
- B. Trip RCP 2-1 immediately and verify runback to 72% power
- C. Reduce power to 72% and trip RCP 2-1
- D. Trip RCP 2-1 and verify the Reactor has tripped

Answer: C

Explanation/Justification: K/A match based on recognizing loss of all CCW will eventually cause all stator temperature to exceed limits

- A. Incorrect plausible since this would be the required action if CCW was lost to all RCPs
- B. Incorrect plausible since Stopping a Reactor Coolant Pump at 100% power will cause an Integrated Control System Runback to 72%, however real RCS Flow will reduce at a faster rate than can be attained by an ICS runback which would cause a reactor trip
- C. Correct per DB-OP-2515 anytime operational limit is exceeded perform attachment 1 for RCP shutdown which will have power reduced to 72% prior to stopping the pump
- D. Incorrect plausible since RCP 2-1 is currently exceeding its operating limit and tripping an RCP at 100% would cause a Reactor Protective System trip on Flux-Delta Flux-Flow

Sys #	System	Category			KA Stateme	nt
003	Reactor Coolant Pump System (RCPS)	A1 Ability to predict a prevent exceeding de RCPS controls inclue	nd/or monito esign limits) a ling:	r changes in parameters (to ssociated with operating the	RCP motor s	stator winding temperatures
K/A#	A1.03	K/A Importance	2.6	Exam Level	RO	
Referen	ces provided to C	Candidate None		Technical References:	DB-OP-0251	5 R12 step 4.6.1 and attachment 1
Questio	n Source:	New		Level Of Difficu	ulty: (1-5)	
Questio	n Cognitive Leve	l: High		10 CFR Part 55	Content:	41.5 / 45.5
Objectiv	/e: GOP-115	-				

- 43. A Large Break Loss of Coolant Accident has occurred
 - Attachment 7, Transferring LPI Suction to the Emergency Sump, is complete
 - ECCS flows and ECCS Pump amps are fluctuating
 - Containment Integrity is intact
 - Both Containment Air Coolers are running
 - The SRO implements Attachment 27, Mitigation of Containment Emergency Sump Degradation

All actions are taken as directed by Attachment 27, Mitigation of Containment Emergency Sump Degradation, and degraded conditions have not improved.

With these actions taken which of the following identifies the final conditions of the safety equipment that take a suction from the emergency sump?

- A. One train of Low Pressure Injection shutdown One train of Low Pressure Injection throttled to 1350 gpm
- B. One train of Low Pressure Injection aligned to Decay Heat One train of Low Pressure Injection throttled to 1350 gpm
- C. One Containment Spray Pump stopped One train of Low Pressure Injection throttled to 1350 gpm
- D. Both Containment Spray Pumps stopped Both trains of Low Pressure Injection throttled to 1350 gpm

Answer: D

Explanation/Justification: Overall mitigation strategy for degraded sump related to containment spray final condition

- A. Incorrect plausible due to redundant trains
- B. Incorrect plausible since it maintains both trains in operation remove one from emergency sump suction
- C. Incorrect plausible since only shutting down one Spray pump is first attempted
- D. Correct with containment integrity intact and one containment air cooler in service the overall strategy is to throttle both trains of LPI to no less than 1350 gpm then shutdown one CTMT Spray Pump followed by the second CTMT Spray Pump

Sys #	System	Category			KA Statement	
026	Containment Spray	A2 Ability to (a) predic operations on the CS3 procedures to correct, malfunctions or opera	t the impa S; and (b) I , control, of tions:	cts of the following malfunctions or based on those predictions, use r mitigate the consequences of those	Loss of containm recirculation mod sump screen, put exceeded cavitat cutoff (interlock)	ent spray pump suction when in le, possibly caused by clogged mp inlet high temperature ion, voiding, or sump level below limit
K/A#	A2.07	K/A Importance	3.6	Exam Level	RO	
Reference	ces provided to Ca	andidate None		Technical References:	DB-OP-02000 At	t 27 step 5,6 & 7
Question	n Source: N	ew		Level Of Difficu	ılty: (1-5)	
Question	n Cognitive Level:	High		10 CFR Part 55	Content:	41.5 / 43.5 / 45.3 / 45.13
Objectiv	e: GOP-309	-				

• 35% Power

The following occurs:

• 14-1-A MSR 1 HI LVL TURB TRIP alarms

Which of the following actions will be required to be performed **NEXT**?

- A. Verify the Reactor has tripped and Reactor power is lowering on the Intermediate Range
- B. Reduce Reactor power to within the capacity of the Turbine Bypass Valves
- C. Trip the Reactor, Initiate and Isolate SFRCS using the MANUAL ACTUATION switches
- D. Reduce Reactor power to within the capacity of the Atmospheric Vent Valves

Answer: B

Explanation/Justification: The Candidate must interpret the significance of a turbine trip at this power level that the reactor will not trip and will stabilize at a power level greater than the capacity of the turbine bypass valves

A. Incorrect – plausible since this would be the actions if greater than 40% power due to an automatic reactor trip

B. Correct – below 40% the reactor would not trip and power ICS would track the plant to low level limits and then power would have to be manually lowered to allow the atmospheric vent valves to close

C. Incorrect – plausible since this is would separate RCS cooling from a fault in the Main Steam system and is a common action for secondary faults

D. Incorrect – plausible since ICS would track the plant to low level limits and power would have to be manually lowered to allow the atmospheric vent valves to close but atmospheric vent valve capacity along with TBVs would not be exceeded

Sys #	System	Category			KA Statemen	t
039	Main and Reheat Steam	Generic			Ability to prior each annuncia	itize and interpret the significance of ator or alarm
K/A#	2.4.45	K/A Importance	4.1	Exam Level	RO	
Referen	ces provided to	Candidate None		Technical References:	DB-OP-02500 R13 Attachment 7 page 25	
Questic	on Source:	New		Level Of Difficu	ulty: (1-5)	
Questic	on Cognitive Leve	el: High		10 CFR Part 55	Content:	41.10 / 43.5 / 45.3 / 45.12
Objecti	ve: GOP-101	Ũ				

- DB-OP-06900, Plant Heatup is in progress
- RCS temperature is 130°F
- RCS Pressure is 245 psig
- Main Steam Isolation Valves (MSIVs) are closed
- MSIV Bypass valves are open
- Mechanical Hogger is in service
- Condenser pressure is 3.5 psia

Per DB-OP-06201, Main Steam System Operating Procedure Limits & Precautions, which of the following actions are to be performed **PRIOR** to opening the MSIVs for Main Steam System warmup?

- A. Verify Mode 4 Checklist is complete
- B. Raise RCS temperature to produce steam for valve lubrication
- C. Start 2 Reactor Coolant Pumps in RCS loop 2 to provide heat input
- D. Isolate two Turbine Bypass Valves on each line allow the steam lines to pressurize

Answer: B

Explanation/Justification: KA match based on predicting RCS temperature value required to operate the Main Steam Isolation valves under design conditions

A. Incorrect – plausible since this will be required prior to entering mode 4 but per procedure MSIVs are opened prior to mode 4 and the checklist does not have to be completed prior to opening the MSIVs.

B. Correct – Saturation conditions will allow steam to be present to provide lubrication to the MSIVs per note 4.27.6 of DB-OP-06900 Plant Heatup and Limit and Precaution 2.2.12 of DB-OP-06201 Main Steam System Operation Procedure

C. Incorrect – plausible since starting RCPs will be required to continue plant heatup but this is performed following drawing a vacuum in the Steam Generators and opening the MSIVs

D. Incorrect - plausible since this will be performed in mode 4 with MSIVs already open and RCPs producing heat

Sys #	System	Category			KA Statement	
039	Main and Reheat Steam	A1 Ability to predict a prevent exceeding de MRSS controls inclue	nd/or monitor o esign limits) as: ding:	changes in parameters (to sociated with operating the	Primary system temperature indications, and required values, during main steam system warm- up	
K/A#	A1.03	K/A Importance	2.6	Exam Level	RO	
References provided to Candidate None			Technical References:	DB-OP-06900 R61 note 4.27.6, DB-OP-06201 L&P 2.2.12		
Question Source: New				Level Of Difficulty: (1-5)		
Questio	n Cognitive Level:	High		10 CFR Part 55	Content: 41.5 / 45.5	
Objectiv	e: GOP-203	0				

- 100% power
- Motor Driven Feedwater Pump OOS
- Startup Feedwater Pump (SUFP) is available

The following occurs:

- Loss of both Main Feedwater Pumps
- Both Auxiliary Feedwater Pumps failed to start

Current conditions

- Problems initiating MU/HPI cooling have resulted in the Command SRO entering DB-OP-02000, Inadequate Core Cooling section
- Incore Thermocouple temperatures are 650°F
- RCS pressure is 840 psig
- SG 1 pressure is 760
- SG 2 pressure is 745
- SG 1 level is < 5 inches
- SG 2 level is < 5 inches
- SUFP is ready to be placed in service

With the above conditions which of the following describes the ability to feed the Steam Generators using the SUFP per DB-OP-02000 Attachment 5, Guidelines for Restoring Feedwater?

- A. One SG will be fed at a time at approximately 300 gpm flow
- B. Both SGs will be fed simultaneously at approximately 300 gpm flow
- C. SUFP via Main Feedwater line is unavailable due to high tube-to-shell ΔT
- D. SUFP via the Main Feedwater line is unavailable due to the SGs being dry

Answer: A

Explanation/Justification: KA match based on how a loss of FW affects the SGs ability to have level restored when dry with only SUFP available

A. Correct – DB-OP-02000, Attachment 5 specifies one generator at a time limited to 300 gpm

B. Incorrect – plausible since both steam generators can physically be fed at the same time but the procedure directs one at a time and 300 gpm is the limit for one SG due to SUFP capacity limit

C. Incorrect - plausible since there is a limit with tubes in tension but not with tubes in compression (tubes hotter than shell)

D. Incorrect – plausible since the generators are considered dry less than 16 inches and the Auxiliary Feedwater header is the preferred flowpath for a dry SG

Sys #	System	Category			KA Statement		
059	Main Feedwater	K3 Knowledge of the effect that a loss or malfunction of the MFW will have on the following:			S/GS		
K/A#	K3.03	K/A Importance	3.5	Exam Level	RO		
References provided to Candidate None				Technical References:	DB-OP-02000 R28 Att5 pg 287 & 288		
Questio	n Source:	Bank 172547		Level Of Difficu	ılty: (1-5)		
Questio	n Cognitive Level	l: High		10 CFR Part 55	Content: 41.7 / 45.6		
Objectiv	/e: GOP-305						

- Startup is in progress at 10% Power
- Steam Generator blowdowns are in service

Which of the following would automatically isolate the blowdown flowpath?

- A. Loss of All Reactor Coolant Pumps
- B. Manual SFRCS initiation only
- C. Steam Generator Low Level
- D. Steam Generator High Level

Answer: D

Explanation/Justification: KA based knowledge of automatic isolation of blowdown isolation valves due to an AFW initiate and Isolate signal from the Steam Feed Rupture Control System.

A. Incorrect- Plausible since this sends an actuation signal to Auxiliary Feedwater but not an isolation signal

B. Incorrect- Plausible since this sends an actuation signal to Auxiliary Feedwater but not an isolation signal

C. Incorrect- Plausible since this sends an actuation signal to Auxiliary Feedwater but not an isolation signal and this would mitigate a low level condition

D. Correct – High Steam Generator level causes auxiliary feedwater to actuate and sends an isolation signal to all components isolated by SFRCS

Sys #	System	Category			KA Statement
061	Auxiliary/Eme rgency Feedwater	K4 Knowledge of AFV provide for the following	V design featu ng:	ure(s) and/or interlock(s) which	Automatic blowdown/sample isolation
K/A#	K4.03	K/A Importance	2.7	Exam Level	RO
Reference	es provided to Ca	ndidate None		Technical References:	DB-OP-02000 R28 Table 1 Sheet 1 of 2, DB-OP- 06230 R18 page 14 and 20
Question	Ne Source: Ne	ew		Level Of Difficu	ılty: (1-5)
Question	Cognitive Level:	Low		10 CFR Part 55	Content: 41.7
Objective	e: SYS-523				

- 60% Power
- Component Cooling Water Pump 1 is in service
- Station Air Compressor 1 is in Lead

The following occurs:

• AACC2 is inadvertently tripped open by an Operator

With these conditions which of the following alarms will occur?

- A. 4-2-E PZR LVL LO
- B. 9-1-E STA AIR CMPSR 1 TRIP
- C. 11-1-F TPCW HI-LVL-TK LVL
- D. 13-4-C DEAR STRG TK 1 LVL

Answer: D

Explanation/Justification: KA match on requiring knowing C2 powers two condensate pumps

- A. Incorrect plausible since MUP 1 would trip off due to loss of power on C1 until EDG starts but MUP 2 is in service when CCW Pump 1 is running
- B. Incorrect plausible since SAC 2 is powered from D2 could assume SAC 1 is powered from C2 but it is powered from E3
- C. Incorrect plausible since C2 powers two of the three TPCW Pumps but required system flow can be maintained below 800 mwe with one TPCW Pump
- D. Correct C2 powers two of the three condensate pumps. With only one pump deaerator level will lower until the low level runback occurs at 4 feet

Sys #	System	Category	/			KA Statement
062	AC Electrical Distribution	K2 Knowl	ledge of bus p	ower supplies to the	e following:	Major system loads
K/A#	K2.01	K/A Impo	ortance	3.3	Exam Level	RO
Reference	es provided to Ca	ndidate	None		Technical References:	E-104A Section 5.1, DB-OP-06902 R53 step 7.8.3
Question	n Source: Ne	ew			Level Of Difficu	lty: (1-5)
Question	Cognitive Level:		High		10 CFR Part 55	Content: 41.7
Objective	e: GOP-205		-			

- 49. Which of the following combinations of loads can be aligned to a DCMCC 250 Volt bus?
 - 1. Reactor Coolant Backup Oil Lift Pumps
 - 2. Turning Gear Oil Pump
 - 3. Inverter YVA
 - 4. Emergency Lighting
 - 5. Essential Distribution panel D1P
- A. 1 and 2
- B. 2 and 3
- C. 3 and 4
- D. 4 and 5

Answer: C

Explanation/Justification: KA match based on knowledge of major loads powered from the 250 VDC bus versus AC and 125 VDC

- A. Incorrect Plausible since 1 is correct and the turbine does have a DC powered LO pump although this one is AC powered
- **B.** Incorrect plausible since the turbine does have a DC powered LO pump although this one is AC powered and 3 is correct
- C. Correct these loads are powered from the 250 VDC bus reference DB- OP-02537
- D. Incorrect Plausible since 4 is correct and D1P is DC powered but is 125 VDC

Sys #	System	Category			KA Statement
063	DC Electrical Distribution	K2 Knowledge of bus p	power supplies to the	e following:	Major DC loads
K/A#	K2.01	K/A Importance	2.9*	Exam Level	RO
Referenc	es provided to Ca	ndidate None		Technical References:	DB-OP-02537 R18 page 33 step A 9
Question	Source: Ba	ank 164095		Level Of Difficu	lty: (1-5)
Question	Cognitive Level:	Low		10 CFR Part 55	Content: 41.7
Objective	SYS-409				

- 100% Power
- The Station Blackout Diesel Generator (SBODG) was started from the Control Room for the monthly surveillance test

Which one of the following describes the response of the SBODG when AD301, SBODG Output Breaker, is closed to parallel the SBODG to Bus D2

- A. The Electronic Governor <u>AND</u> Voltage Regulator shifts from the Droop Mode to the Isochronous Mode
- B. The Electronic Governor shifts from the Isochronous Mode to the Droop Mode and the Voltage Regulator shifts from the Droop Mode to the Isochronous Mode
- C. The Electronic Governor shifts from the Droop Mode to the Isochronous Mode and the Voltage Regulator remains in the Isochronous Mode
- D. The Electronic Governor <u>AND</u> Voltage Regulator shifts from the Isochronous Mode to the Droop Mode

Answer: D

Explanation/Justification: Ability to determine method of load control when SBODG started from control room and breaker closed in

- A. Incorrect plausible since this is correct until breaker is closed
- B. Incorrect plausible since the electronic governor starts in isochronous and shifts from the Isochronous Mode to the Droop Mode when breaker is closed
- C. Incorrect plausible since the voltage regulator starts in isochronous and shifts from the Isochronous Mode to the Droop Mode when breaker is closed
- D. Correct per DV-OP-06334 Limit and Precaution 2.2.21.c

Sys #	System	Category			KA Statement	t
064	Emergency Diesel Generator	A3 Ability to monitor a including:	automatic opera	ation of the ED/G system,	Rpm controller open/breaker-o	r/megawatt load control (breaker- closed effects)
K/A#	A3.13	K/A Importance	3.0*	Exam Level	RO	
Referen	nces provided to C	andidate		Technical References:	DB-OP-06334	Limit and Precaution 2.2.21.c
Questic	on Source:	Bank 168683		Level Of Diffice	ulty: (1-5)	
Questic	on Cognitive Level	: Low		10 CFR Part 55	Content:	41.7 / 45.5
Objecti	ve: SYS-406					

- 51. Which of the following process radiation monitors will cause an automatic action to occur upon reaching its high alarm setpoint?
 - 1. RE4598AA, Station Vent Discharge
 - 2. RE5052A, Containment Purge Exhaust
 - 3. RE5403A, Fuel Handling Area Exhaust System
 - 4. RE5405A, Radwaste Area Exhaust
 - 5. RE8432, Service Water System Outlet Header
- A. 1, 2, & 4
- B. 1, 4, & 5
- C. 2, 3, & 4
- D. 2, 3, & 5

Answer: A

Explanation/Justification: KA based on effect of process radiation monitoring on the systems monitored

- A. Correct -RE4598, RE5052 and RE5405 will trip their respective ventilation fans and close their respective isolation dampers
- B. Incorrect RE8432 has no automatic function but is plausible since CCW does have an automatic function
- C. Incorrect –Fuel Handling Ventilation is not tripped by RE5403 but is plausible since it is tripped by RE8446/RE8447 and the other three ventilation systems all have automatic actions associated with their radiation monitors
- D. Incorrect Fuel Handling Ventilation is not tripped by RE5403 but is plausible since it is tripped by RE8446/RE8447 and the other ventilation systems also have automatic actions associated with their radiation monitors, RE8432 has no automatic function but is plausible since CCW RE1412 does have an automatic function

Sys #	System	Category			KA Statemen	nt
073	Process Radiation Monitoring	K1 Knowledge of the relationships betweer	physical conr the PRM sys	nections and/or cause-effect stem and the following systems:	Those system	is served by PRMs
K/A#	K1.01	K/A Importance	3.6	Exam Level	RO	
Referen	ces provided to C	andidate None		Technical References:	SD-017A 2-24, 2-25, 2-26 and 2-27	
Questio	n Source: E	Bank DB 2013 NRC Exa	m Q51	Level Of Difficu	ılty: (1-5)	
Questio	n Cognitive Level	Low		10 CFR Part 55	Content:	41.2 to 41.9 / 45.7 to 45.8
Objectiv	/e: SYS-508					

- 100% Power
- Service Water Pumps 1 and 2 are in service

The following occurs:

- Loss of Coolant Accident
- RCS pressure stabilizes at 1500 psig

10 minutes later a Loss of Offsite Power (LOOP) occurs.

Which of the following describes when Service Water Pump 2 will start?

- A. Immediately after the sequencer times out
- B. 15 seconds after the sequencer starts
- C. Immediately when Emergency Diesel Generator 2 output breaker closes
- D. 21 seconds after Emergency Diesel Generator 2 output breaker closes

Answer: B

Explanation/Justification: Knowledge of the effect of SFAS Level 2 (1600 psig) on Service Water pump start signal with LOOP

A. Incorrect – plausible since some SFAS modules are blocked until the sequencer times out

B. Correct –SFAS level 2 with a LOOP activates the sequencer which will start SW Pump at step 4

- C. Incorrect plausible since CCW pump starts immediately
- $\label{eq:D.D.D.D.D.D.} \textbf{Incorrect} \textbf{plausible since this is correct for LOOP with no SFAS}$

Sys #	System	Categor	у			KA Statement	
076	Service Water	K1 Knov relations	vledge of the ships betweer	physical connect the SWS and th	ions and/or cause- effect e following systems:	ESF	
K/A#	K1.16	K/A Imp	ortance	3.6	Exam Level	RO	
Referen	ces provided to	Candidate	None		Technical References:	Lesson Plan OPS	S-SYS-I506.04 page 4,15-16
Questio	on Source:	New			Level Of Difficu	ulty: (1-5)	
Questio	on Cognitive Leve	el:	High		10 CFR Part 55	5 Content:	41.2 to 41.9 / 45.7 to 45.8
Objectiv	/e: SYS-506		-				

53. The following plant conditions exist:

Plant is operating at 100% power.

Annunciator 9-1-F, INSTR AIR HDR PRESS LO alarms.

The Reactor Operator reports that Instrument Air pressure (using PI810) reads 72 psig and the secondary plant appears stable.

Which one of the following sets of actions is **required** to be performed?

- A. Manually trip the reactor and initiate AFW flow and isolation of both SG's.
- B. Start the standby Station Air Compressor and the Emergency Instrument Air Compressor, and perform a rapid shutdown per DB-OP-02504, Rapid Shutdown.
- C. Dispatch operators to locate the cause of excessive air demand and maintain reactor power at the present level.
- D. Rapidly lower power per DB-OP-02504, Rapid Shutdown, until Instrument Air pressure rises to approximately 90 psig.

Answer: A

Explanation/Justification: KA based on the knowledge that loss of air will cause the systems supplied to have the effect of requiring a plant trip

- A. Correct This Instrument Air Header Pressure (even with stable plant) requires tripping the reactor and initiating and isolating SFRCS which is an entry condition to the Emergency Operating Procedure DB-OP-02000.
- **B.** Incorrect Plausible because starting the Standby and EIAC could improve condition in the instrument air system and the plant is stable, however this pressure is below minimum for continued power operation.
- C. Incorrect This is Plausible because these actions are consistent with operator response to stable low air pressure of a dryer switching failure.

D. Incorrect – Plausible because continued operation is permitted with a stable low air pressure of 90 psig.

Sys #	System	Category			KA Statement	
078	Instrument Air	K3 Knowledge of the have on the following:	effect that a loss or	malfunction of the IAS will	Systems having pne	eumatic valves and controls
K/A#	K3.02	K/A Importance	3.4	Exam Level	RO	
Referen	ces provided to C	andidate None		Technical References:	DB-OP-02528 R22	Step 4.1.1
Questio	n Source: E	Bank DB 2013 NRC Exa	m Q64 (167463)	Level Of Difficu	ılty: (1-5)	
Questio	n Cognitive Level	: Low		10 CFR Part 55	Content:	41.7 / 45.6
Objectiv	/e: GOP-128					

- 50% power
- Containment temperature is 122°F
- Containment pressure is +10 inches H₂0 gauge

In accordance with Technical Specifications, which of the following states the status of Containment temperature and pressure?

Temperature is <u>(1)</u> specification Pressure is <u>(2)</u> specification

- A. (1) OUT of (2) OUT of
- B. (1) IN (2) IN
- C. (1) OUT of (2) IN
- D. (1) IN (2) OUT of

Answer: C

Explanation/Justification: Knowledge of Technical Specifications related to containment

- A. Incorrect plausible because (1) is correct and pressure range does contain a negative number
- B. Incorrect plausible because (2) is correct and temperature limit is in the 120 range
- C. Correct LCO 3.6.5 Containment average air temperature shall be ≤ 120°F. LCO 3.6.4 Containment pressure shall be ≥ -14 inches water gauge and ≤ +25 inches water gauge.
- D. Incorrect plausible temperature limit is in the 120 range and pressure range does contain a negative number

Sys #	System	Category			KA Statement	
103	Containment	Generic			Knowledge of cond facility license	litions and limitations in the
K/A#	2.2.38	K/A Importance	3.6	Exam Level	RO	
Referen	ces provided to Ca	andidate None		Technical References:	LCO 3.6.4 and LCO	O 3.6.5
Questio	n Source: B	ank 173597		Level Of Diffice	ulty: (1-5)	
Questio	n Cognitive Level:	Low		10 CFR Part 55	5 Content:	41.7 / 41.10 / 43.1 / 45.13
Objectiv	e: GOP-436					

• 100% Power

The following occurs:

- It is determined that an emergency Containment entry is required to evaluate a failed Containment Air Cooler
- O2 levels in Containment have been determined to be normal

Per DB OP-01101, Containment Entry, in addition to Post Shutdown/Trip Initial Containment Entries requirements, what additional measure is **<u>REQUIRED</u>**?

- A. One Neutron Survey Meter
- B. Verify Containment elevator de-energized
- C. Full Faced Respirator
- D. Stage Confined Space Entry Rescue Team

Answer: A

Explanation/Justification: The impact of entering containment at power and the procedural requirement related

A. Correct – per step 6.3.2 of DB-OP-01101

B. Incorrect – plausible since the radiation areas would be exposed as soon as the doors open but use is allowed if evaluated in advance

C. Incorrect – plausible since it could be required if airborne contamination exists but high airborne contamination is not identified and this requirement is not specific to an emergency entry

D. Incorrect – plausible since this would be required if containment was classified as a confined space or a confined space within containment required entry. CTMT is not considered a confined space and with O2 levels normal an SCBA, and thus a rescue team will not be required

Sys #	System	Category			KA Statement	
103	Containment	A2.05 Ability to (a) or operations on the predictions, use predictions of the consequences of the conseque) predict the im ne containment rocedures to co those malfuncti	pacts of the following malfunctions t system and (b) based on those prrect, control, or mitigate the ions or operations:	Emergency con	tainment entry
K/A#	A2.05	K/A Importance	2.9	Exam Level	RO	
Reference	es provided to Ca	ndidate None		Technical References:	DB-OP-01101 s	step 6.3.2
Question	n Source: N	ew		Level Of Difficu	lty: (1-5)	
Question	Cognitive Level:	Low		10 CFR Part 55	Content:	41.5 / 43.5 / 45.3 / 45.13
Objectiv	e:					

- RCS drain is in progress per DB-OP-06904, Shutdown Operations
- Cold leg temporary tygon tubing level indicators are in service
- RCS drain has been temporarily suspended at 250 inches to remove OTSG manways

The Operator monitoring Loop 2 temporary tygon tubing level indicator informs the Control Room he is going to perform a tour of Containment to support the Zone 3 Operator logging requirement.

Per DB-OP-06904, Shutdown Operations, which of the following is required to allow the Operator monitoring Loop 2 temporary tygon tubing level to make the Containment tour?

- A. RCS drain cannot recommence while the temporary tygon tubing level indicator is unmanned
- B. Walk down the temporary tygon tubing level indicator checking for loop seals, kinks, and pinches
- C. Verify temporary tygon tubing indicated level every 15 minutes to meet logging requirements
- D. Isolate the temporary tygon tubing level indicator from the RCS to prevent inadvertent draining

Answer: D

Explanation/Justification: Knowledge that the effect of a malfunctioning temporary tygon level indicator could causes inadvertent draining which requires it to be isolated when unmanned

A. Incorrect – plausible since temporary tygon level indicators can be used for level indication but are not required

B. Incorrect – plausible since this is performed before placing in service and this could also affect indication

C. Incorrect – plausible since levels are required to be logged every 15 minutes during drain down evolutions

D. Correct – correct per DB-OP-06904 R46 Limit and Precaution 2.2.11

Sys #	System	Category			KA Statement	
002	Reactor Coolant	K6 Knowledge of the RCS components:	e effect of a los	s or malfunction on the following	Reactor vessel level indication	
K/A#	K6.03	K/A Importance	3.1	Exam Level	RO	
Referen	nces provided to	o Candidate none		Technical References:	DB-OP-06904 L&P 2.2.11	
Questic	on Source:	New		Level Of Difficu	ılty: (1-5)	
Questic	on Cognitive Lev	vel: Low		10 CFR Part 55	Content: 41.7 / 45.7	
Objecti	ve:	GOP-208				

• 100% Power

The following occurs:

• 4-2-E PZR LVL LO

Current plant conditions:

•	Train 1 MU flow	0 gpm
•	Train 2 MU flow	212 gpm
•	Total Seal injection total flow	18 gpm
•	Letdown flow	68 gpm
•	Letdown temperature	95 °F
•	Makeup Press	2100 psig

No operator actions have been taken

With these current plant conditions, per DB-OP-02522 Small RCS Leaks, which of the following is the correct diagnosis and the required action to mitigate this event?

- A. Unisolable Reactor Coolant System leak. Commence reactor shutdown
- B. Letdown System leak. Close MU2B Letdown isolation
- C. Makeup System leak. Stop the running Makeup Pump
- D. Seal Injection line leak. Close MU19 Seal Injection Control Valve

Answer: C

Explanation/Justification: Determine change in charging flow due to a failure in pressurizer level control

- A. Incorrect plausible since there is evidence of an RCS leak and it may be determined that all readings are normal. The makeup injection lines tap into the high pressure injection lines which are isolable by virtue of downstream check valves in the HPI lines.
- B. Incorrect Plausible since leaks in the letdown line would cause pressurizer level to lower but temperatures and flows are normal and MU indications are not.
- C. Correct DB-OP-02522, attachment 4 RCS Leak Determination specifies less than 2200 psig as large MU system leaks and directs performance of attachment 6 which will direct stopping the makeup pumps
- D. Incorrect Plausible since seal injection flow is abnormal but leaks in the injection line would cause high flow and not low

Sys #	System	Category			KA Statemen	t
011	Pressurizer Level Control	A1 Ability to predict a prevent exceeding d LCS controls includir	and/or monitor o esign limits) as: ng:	changes in parameters (to sociated with operating the PZR	Charging and	letdown flows
K/A#	A1.02	K/A Importance	3.3	Exam Level	RO	
Referen	ces provided to Ca	andidate None		Technical References:	DB-OP-02528 attachment 6	6, attachment 4 page 28 and page 34
Questio	n Source: N	lew		Level Of Difficu	ulty: (1-5)	
Questio	n Cognitive Level:	High		10 CFR Part 55	Content:	41.5 / 45.5
Objectiv	/e: GOP-128					

- 58. The following plant conditions exist:
 - Reactor power is 100%
 - ICS is in full AUTOMATIC MODE
 - SELECTED turbine header pressure fails MID-SCALE.

Actual feedwater flow will (1) and actual turbine header pressure will (2).

- A. (1) lower (2) lower
- B. (1) lower (2) rise
- C. (1) rise (2) rise
- D. (1) rise (2) lower

Answer: A

Explanation/Justification: Automatic operation of ICS with Header pressure indication (midscale) different than actual pressure

A. Correct - The (failed) Header Pressure above setpoint (midscale 900) causes turbine valves to open to lower pressure to bring header pressure back to setpoint. The kicker circuit will act to lower Reactor and Feedwater overall to compensate for the perceived high pressure being due to lower turbine load

B. Incorrect – plausible since (1) is correct and midscale failure of 0-1200 would be 600 which would cause ICS to attempt to raise pressure but scale is 600-1200 so midscale is 900 psig.

- C. Incorrect plausible since this is the opposite of the correct answer
- D. Incorrect plausible since excessive feedwater flow (1) could cause pressure to lower (2)

Sys #	System	Category			KA Statement
016	Non-nuclear Instrumentati on	A3 Ability to monitor au	tomatic operation o	f the NNIS, including:	Relationship between meter readings and actual parameter value
K/A#	A3.02	K/A Importance	2.9*	Exam Level	RO
Reference	ces provided to Ca	ndidate None		Technical References:	ICS Dwg M-533-174-3, OPS-SYS-I515.03 pg 11
Question	n Source: Ba	ank 168976		Level Of Difficu	ılty: (1-5)
Question	n Cognitive Level:	High		10 CFR Part 55	Content: 41.7 / 45.5
Objectiv	e: SYS-515	-			

59. A loss of power to 120 VAC Essential Power Panel Y4 has just occurred.

With these plant conditions which of the following channels will be lost?

- A. Intermediate Range Nuclear Instrumentation 3
- B. Intermediate Range Nuclear Instrumentation 4
- C. Steam Feed Rupture Control System 3
- D. Steam Feed Rupture Control System 4

Answer: A

Explanation/Justification: KA based on the knowledge that IR 3 powered in RPS 4 and the power supply to RPS 4 is Y4

- A. Correct IR channel 3 is powered from Y4 via RPS Channel 4
- B. Incorrect plausible since Y4, RPS 4 and IR4 have the same numerical designation

C. Incorrect – Plausible since SFAS channel 3 and RPS channel 3 are powered from 120V essential AC but SFRCS channel 3 is non-essentially powered

D. Incorrect – Plausible since SFAS channel 4 and RPS channel 4 are powered from 120V essential AC but SFRCS channel 4 is non-essentially powered

Sys #	System	Category			KA Statement	
015	Nuclear Instrumentati on System	Knowledge of power supplies to the following:			NIs channels, components and interconnections	
K/A#	K2.01	K/A Importance	3.3	Exam Level	RO	
Reference	es provided to Ca	ndidate None		Technical References:	SD-044 page 2-3, E-	1040A Section 8 SH9
Questior	Source : Ne	ew		Level Of Difficu	ılty: (1-5)	2
Question	Cognitive Level:	Low		10 CFR Part 55	Content:	41.7
Objective	e: SYS-502					

- 60. The following plant conditions exist:
 - A reactor trip from 100% has occurred due to the trip of all four Reactor Coolant Pumps
 - Natural circulation cooldown using Auxiliary Feed Water is in progress
 - The decision is made to feed the Steam Generators with the Motor Driven Feedwater Pump (MDFP) in the Main Feed Water mode so that Auxiliary Feed Water can be stopped

Which of the following correctly states how Steam Generator levels will be controlled and the initial effect of the Auxiliary Feed Water to Main Feed Water transition on natural circulation?

Level will be controlled with <u>(1)</u> AND Natural circulation flow <u>(2)</u>

- A. (1) Steam Generator Startup Control valves(2) remains the same
- B. (1) Steam Generator Startup Control valves(2) lowers
- C. (1) MDFP Target Rock Controllers (2) remains the same
- D. (1) MDFP Target Rock controllers (2) lowers

Answer: B

Explanation/Justification: Knowledge of AFW having higher thermal center than MFW in the SG, the effect of switching between the two and the difference in level control between AFW and MFW

A. Incorrect – (1) plausible since this is correct (2) core heat input remains unchanged

B. Correct – (1) normal MFW level control is the startup control valves (2) MFW produces a lower thermal center since the MFW nozzles are well below the AFW nozzles

- C. Incorrect -plausible since (1) this controls SG level in the AFW mode (2) core heat input remains unchanged
- D. Incorrect plausible since (1) this controls SG level in the AFW mode (2) is correct

Sys #	System	Categor	.y			KA Statement	
035	Steam Generator	K1 Know relations	K1 Knowledge of the physical connections and/or cause-effect relationships between the S/Gs and the following systems:			MFW/AFW Syst	tems
K/A#	K1.01	K/A Imp	ortance	4.2	Exam Level	RO	
References provided to Candidate None		None	Technical References: OS-008 SH1 and OS-12A SH1 and 2		d OS-12A SH1 and 2		
Questio	on Source:	New			Level Of Difficu	ulty: (1-5)	
Questio	on Cognitive Leve	l:	Low		10 CFR Part 55	Content:	41.2 to 41.9 / 45.7 to 45.8
Objectiv	ve:						

- The plant was operating at 100% power
- A Reactor trip has occurred
- Turbine Bypass Valves are in HAND with zero demand.

Which of the following describes how Steam Generator pressures are controlled with no operator actions being taken?

The Turbine Bypass Valve(s)______.

- A. will maintain Turbine Header pressure at 920 psig
- B. will maintain Steam Generator pressures at 1025 psig
- C. will maintain Turbine Header pressure at 995 psig
- D. will remain closed and Main Steam Safety Valves will maintain SG pressure at 1050 psig

Answer: B

Explanation/Justification: KA based knowledge of pressure control when TBVs in manual

- A. Incorrect plausible since this is the setpoint if the 50 psi bias is placed in effect
- B. Correct TBVs are set to lift at 1025 psi
- C. Incorrect plausible since this is the setpoint if TBVs were in automatic
- D. Incorrect plausible since the main steam safeties would lift if TBVs did not open

Sys #	System	Category			KA Statement	
041	Steam Dump/Turbin e Bypass Control	A4 Ability to manually	operate and/or mc	nitor in the control room:	Pressure mode	
K/A#	A4.04	K/A Importance	2.7*	Exam Level	RO	
Reference	ces provided to Ca	ndidate None		Technical References:	M-533-174-3	
Question	n Source: Ba	ank 162628		Level Of Difficu	ulty: (1-5)	
Question	n Cognitive Level:	High		10 CFR Part 55	Content:	41.7 / 45.5 to 45.8
Objectiv	e: SYS-515	Ũ				

• 100% Power

The following occurs:

- 13-2-B CNDS PMP DISCH HDR PRESS
- 13-4-C DEAR STRG TK 1 LVL
- 13-4-D DEAR STRG TK 2 LVL
- FI578 CONDENSATE TOTAL PUMP FLOW indicates Zero

Current conditions:

- IL2796 PRESS REG Red light is OFF
- CD578 RECIRC TO LP CONDENSER Red light is ON
- All 3 Condensate Pumps are ON
- PI569 Condensate Header Pressure indicates 340 psig

Per DB-OP-02013, Condensate Feedwater Alarm Panel 13 Annunciators, which of the following actions will mitigate this condition?

- A. OPEN CD2796 from the Control Room using PIC2796, Condensate Pump Runout Protection Controller
- B. OPEN CD2796 locally using the manual valve operator
- C. CLOSE CD578 from the Control Room using HIS578, Recirc to LP Condenser CD578
- D. CLOSE CD578 locally using the manual valve operator

Answer: B

Explanation/Justification: Determining correct component to operate and recognizing control room is indication only requiring local operation

- A. Incorrect plausible since position indication is available in the control room but PIC2796 is local
- B. Correct Indications are CD2796 is not open resulting in high discharge pressure. Per alarm procedure DB-OP-02013 for 13-2-B open CD2796 locally
- C. Incorrect plausible since this would be an action directed for low discharge pressure but not zero flow
- D. Incorrect plausible since numerous components in control room are indication only and this would be an action directed for low discharge pressure but not zero flow

Sys #	System	Category			KA Statement	
056	Condensate	Generic			Ability to locate and operate components, including local controls	
K/A#	2.1.30	K/A Importance	4.4	Exam Level	RO	
Referen	ces provided to C	andidate None		Technical References:	DB-OP-02013 page 17 & 18	
Questio	on Source:	New		Level Of Diffice	ulty: (1-5)	
Questio	on Cognitive Level:	High		10 CFR Part 55	Content: 41.7 / 45.7	
Objectiv	ve:	-				

- Preparations are in progress to perform a Waste Gas Decay Tank release
- WG 1819, WASTE GAS TO STATION HEADER VENT is Closed
- WG 1820, WASTE GAS TO STATION HEADER VENT is Closed

The following occurs:

• 7-2-C WST GAS DECAY TKS TRBL alarm

With these conditions which of the following could be the reason for this alarm?

- A. Waste Gas Decay Tank High Pressure
- B. Waste Gas Decay Tank High Oxygen Concentration
- C. Waste Gas Decay Tank High Hydrogen Concentration
- D. Waste Gas Absolute Filter DP

Answer: A

Explanation/Justification: Design feature for monitoring waste release tanks. RO based on control room alarm

- A. Correct Per DB-OP-02007 7-2-C and there are 3 WGDTs of which 2 remain in service
- B. Incorrect plausible since the Waste Gas Surge Tank and the Clean Waste Monitor Tanks are monitored for Oxygen and there is an alarm for this but not 7-2-C
- C. Incorrect plausible since the Waste Gas Surge Tank and the Clean Waste Monitor Tanks are monitored for Hydrogen and there is an alarm for this but not 7-2-C
- D. Incorrect plausible since preparations are in progress to perform a release and there is an alarm for this but not 7-2-C

Sys #	System	Category			KA Statement
071	Waste Gas Disposal	K4 Knowledge of for the following:	design feature(s)	and/or interlock(s) which provide	Sampling and monitoring of waste gas release tanks
K/A#	K4.06	K/A Importance	2.7*	Exam Level	RO
References provided to Candidate None			Technical References: DB-OP-02007 7-2-C		
Question Source: New				Level Of Difficu	ılty: (1-5)
Questio	n Cognitive Level:	Low		10 CFR Part 55	Content: 41.7
Objectiv	/e: SYS-110				

- 64. Which of the following incore conditions meets the **MINIMUM** requirements for confirming superheated conditions exist per DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture?
- A. With only ONE channel available, two (2) working incore detectors display a NEG MARGIN light
- B. With BOTH channels available, three (3) working incore detectors display a NEG MARGIN light
- C. With BOTH channels available, four (4) working incore detectors display a NEG MARGIN light
- D. With only ONE channel available, five (5) working incore detectors display a NEG MARGIN light

Answer: D

Explanation/Justification: Based on knowledge of the requirements for determining superheating exists

- A. Incorrect plausible since Bases and Deviation Document for DB-OP-02000 R21 Step 5.13 specifies, three or more with only one channel would be correct
- B. Incorrect plausible since Bases and Deviation Document for DB-OP-02000 R21 Step 5.13 specifies five or more with two channels would be correct.
- C. Incorrect plausible since Bases and Deviation Document for DB-OP-02000 R21 Step 5.13 specifies five or more with two channels would be correct
- D. Correct -. Bases and Deviation Document for DB-OP-02000 R21 Step 5.13 specifies, three or more with only one channel would be correct

Sys #	System	Category			KA Statement	
017	In-Core Temperature Monitor System (ITM)	K5 Knowledge of the operational implications of the following concepts as they apply to the ITM system:			Indication of superhe	eating
K/A#	K5.03	K/A Importance	3.7	Exam Level	RO	
References provided to Candidate None			Technical References:	Bases and Deviation Document for DB-OP-020 R21 Step 5.13		
Question	n Source: Ba	ank #171451		Level Of Difficu	lty: (1-5)	2
Question	n Cognitive Level:	Low		10 CFR Part 55	Content:	41.5 / 45.7
Objectiv	e: GOP-308					

• 50% RTP

The following occurs:

- HP CNDSR PRESS HI (15-1-F)
- LP CNDSR PRESS HI (15-2-F)

Current conditions:

- DB-OP-02518, High Condenser Pressure is being implemented
- Power is reduced to Low Level Limits
- Condenser pressure is 7.5 in HgA and rising slowly

With these current conditions which of the following is correct per DB-OP-02518, High Condenser Pressure?

- A. Trip the reactor and go to DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture
- B. Trip the turbine and refer to DB-OP-02500, Turbine Trip
- C. Trip the turbine and refer to DB-OP-02520, Load Rejection
- D. Continue with the plant shutdown using DB-OP-02504, Rapid Shutdown

Answer: B

Explanation/Justification: The effect of a malfunction on condenser availability. RO knowledge based on action if automatic action not occurring (turbine trip at 7.5 in Hga) and Abnormal procedure entry conditions

- A. Incorrect Plausible since this would be the routing above 40% power
- B. Correct Recognize that tripping the turbine is required and that ARTS TG Trip is bypassed thus selecting the correct response not obtained step
- C. Incorrect Plausible since tripping the turbine would reject its load
- D. Incorrect Plausible since continued shutdown will reduce load on the condenser

Sys #	System	Category			KA Statement		
055	Condenser Air Removal System (CARS)	K3 Knowledge of the effect that a loss or malfunction of CARS will have on the following:			Main Condense	r	
K/A#	K3.01	K/A Importance	2.5	Exam Level	RO		
Referen	ces provided to Ca	andidate		Technical References:	OP-02518 R6 page 8 step 4.4		
Questio	n Source: B	ank 168691		Level Of Difficu	ulty: (1-5)		
Question Cognitive Level: High				10 CFR Part 55	Content:	41.7 / 45.6	
Objectiv	/e: SYS-118	-					

- RCS Temperature 190°F
- The Plant has been at this temperature since January 1st

Reactor Operators stand the following watches in the first quarter:

- RO1 Four complete 12 hour shifts as ATCA Operator and One complete 12 hour shift as BOP Operator
- RO2 Four complete 12 hour shifts as ATCA Operator and 8 hours of the 5th 12 hour shift as ATCA Operator
- RO3 Five complete 12 hour shifts as BOP Operator
- RO4 Five complete 12 hour shifts as ATCA Operator

With these plant conditions, which Reactor Operators maintain watchstanding proficiency for the following quarter per DBBP-TRAN-0014, License Requirements for Licensed Individuals?

(References provided)

- A. RO1, RO2, RO3 & RO4
- B. RO2, RO3 & RO4 ONLY
- C. RO3 & RO4 ONLY
- D. RO4 ONLY

Answer: D

Explanation/Justification: Determine requirements to maintain proficiency to support shift staffing requirements

- A. Incorrect plausible since (1), (3) and (4) meet the requirements in modes 1-4 and (2) is 56 hours which is minimum requirement but must be complete shifts
- B. Incorrect plausible since (1) could be eliminated due to two different watch stations
- **C.** Incorrect plausible since (3) and (4) meet the requirements in modes 1-4
- D. Correct Per DB-TRAN-0014 5.9.1.b This 56-hour proficiency watch requirement may be completed with a combination of complete 8-hour and 12-hour shifts. Watches shall not be truncated (cut short) when the minimum quarterly requirement of 56 hours is satisfied.

Sys #	System	Category		KA Statement
N/A	N/A	Generic		Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.
K/A#	2.1.5	K/A Importance 2.9*	Exam Level	RO
Referenc	es provided to Ca	andidate DB-TRAN-0014	Technical References:	DB-TRAN-0014 5.9.1.a & b
Question	Source: N	ew	Level Of Difficu	ulty: (1-5)
Question	Cognitive Level:	High	10 CFR Part 55	Content: 41.10 / 43.5 / 45.12
Objective	GOP-501	-		

- Mode 3
- A heatup is in progress following a mid-cycle outage

At time 2330 RCS temperature is 390°F

At time 0000 RCS temperature is 400°F

At time 0030 RCS temperature is 420°F

At time 0100 RCS temperature is 450°F

Which of the following RCS heatup rates should be entered in the Unit Log for time 0100?

- A. 30°F/hour
- B. 40°F/hour
- C. 50°F/hour
- D. 60°F/hour

Answer: D

Explanation/Justification: Ability to perform procedure step for calculating and logging cooldown rate

- A. Incorrect plausible since the difference between the most recent two readings is 30 degrees
- **B.** Incorrect plausible since 60 degrees over 90 minutes averages to 40 degrees per hour

C. Incorrect - plausible since 0000 to 0100 is 50 degrees

D. Correct - heatup rate is logged every 30 minutes and temperature has increased 30 degrees in the previous 30 minutes which would be 60 degrees per hour

Sys #	System	Category			KA Statement		
N/A	N/A	Generic			Ability to perfore plant procedure operation	rm specific system and integrated es during all modes of plant	
K/A#	2.1.23	K/A Importance	4.3	Exam Level	RO		
Referen	ces provided to	Candidate		Technical References:	DB-OP-06900 L&P 2.1.9		
Question Source: Bank 173048				Level Of Difficulty: (1-5)			
Question Cognitive Level: High		10 CFR Part 55 Content: 41.10 / 43.5 / 43		41.10 / 43.5 / 45.2 / 45.6			
Objectiv	/e: GOP-20;	3					

• Mode 6

With this plant condition which of the following parameters have limits per Technical Requirements Manual 8.4.1 Reactor Coolant System Chemistry?

- A. Hydrogen and Fluoride
- B. Chloride and Fluoride
- C. Dissolved Oxygen and Chloride
- D. Dissolved Oxygen and Hydrogen

Answer: B

Explanation/Justification: KA based on requiring knowledge of primary chemistry limits

- A. Incorrect plausible since Hydrogen (not TRM 8.4.1) is monitored and Fluoride is correct
- B. Correct per TRM Table 8.4.1-1 Chloride and Fluoride at all times (Oxygen is N/A ≤ 250°F)
- C. Incorrect plausible since Dissolved Oxygen would be correct above 250°F (Mode 5 is below 200°F) and Chloride is correct
- D. Incorrect plausible because these are chemical parameters monitored in the RCS Dissolved Oxygen would be correct above 250°F and Hydrogen is not TRM 8.4.1

Sys #	System	Category			KA Statement	
N/A	N/A	Generic			Knowledge of primat chemistry limits	y and secondary plant
K/A#	2.1.34	K/A Importance	2.7	Exam Level	RO	
References provided to Candidate				Technical References:	TRM Table 8.4.1-1	
Question Source: New				Level Of Difficulty: (1-5)		
Question Cognitive Level: Low				10 CFR Part 55 Content: 41.10 / 43.5 / 45.1		41.10 / 43.5 / 45.12
Objectiv	/e: GOP-434	4				

69. A component is being tracked in the Unit Log as out of normal alignment per the Short Term Configuration process.

If the component will not be restored to its Normal Configuration within $(\underline{1})$ hours, what action $(\underline{2})$ is required to be taken?

- A. (1) 12
 - (2) A clearance shall be hung using NOP-OP-1001, Clearance/Tagging Program
- B. (1) 12
 - (2) An Operations Information Tag shall be hung using NOP-OP-1014, Plant Status Control
- C. (1) 24
 - (2) A clearance shall be hung using NOP-OP-1001, Clearance/Tagging Program
- D. (1) 24
 - (2) An Operations Information Tag shall be hung using NOP-OP-1014, Plant Status Control

Answer: C

Explanation/Justification: Knowledge of plant status/configuration control requirements

- A. Incorrect plausible since 12 hours is the length of a shift and a multiple of the correct answer and (2) is correct
- **B.** Incorrect plausible since 12 hours is the length of a shift and a multiple of the correct answer and NOP-OP-1014 directs the use of Operations Information Tags
- C. Correct per NOP-OP-1014, Plant Status Control, If a component will not be restored to its Normal Configuration within 24 hours, then a Clearance is hung IAW NOP-OP-1001, Clearance/Tagging Program
- D. Incorrect plausible since (1) is correct and NOP-OP-1014 directs the use of Operations Information Tags

Sys #	System	Category			KA Statement		
N/A	N/A	Generic			Knowledge of the p equipment configur	rocess for controlling ation or status	
K/A#	2.2.14	K/A Importance	3.9	Exam Level	RO		
References provided to Candidate None				Technical References:	DB-OP-1014 Note 4.6		
Questio	n Source:	New		Level Of Difficu	ulty: (1-5)		
Question Cognitive Level: Low				10 CFR Part 55 Content: 41.10 /43.3 / 45.13			
Objectiv	/e: GOP-50	5					

- RCS Temperature is 270°F
- High Pressure Injection is disabled
- Low Pressure Injection Train 2 is in service as Decay Heat Train 2

Which of the following is the correct OPERATIONAL MODE for these conditions?

- A. Hot Shutdown
- B. Cold Shutdown
- C. Hot Standby
- D. Startup

Answer: A

Explanation/Justification: Ability to determine TS mode of operation

- A. Correct per TS Definition Table 1.1-1.
- B. Incorrect per TS Definition Table 1.1-1.
- **C.** Incorrect per TS Definition Table 1.1-1.
- **D.** Incorrect per TS Definition Table 1.1-1.

Sys #	System	Category			KA Statement	
N/A	N/A	Generic		Ability to determine Technical Specification Mod of Operation		e Technical Specification Mode
K/A#	2.2.35	K/A Importance	3.6	Exam Level	RO	
References provided to Candidate None			Technical References:	cal References: TS Table 1.1-1		
Question Source: New				Level Of Difficulty: (1-5)		
Question Cognitive Level: Low			10 CFR Part 55 Content:		41.7 / 41.10 / 43.2 / 45.13	
Objectiv	ve: GOP-41	0				
71. Current conditions:

• 50% power

The following occurs:

• The Reactor Operator selects the GROSS mode on RE609, Main Steam Line 1 Radiation Monitor

Which of the following describes how displayed count rate will be affected?

Displayed count rate will _____.

- A. rise due to the extended band of isotopes the RE would detect
- B. rise due to the detector saturating in the elevated radiation field
- C. lower due to lower detector sensitivity to N-16 gammas
- D. lower since GROSS mode only indicates when the reactor is shutdown

Answer: A

Explanation/Justification: Ability to recognize difference in operation of radiation monitor between using in Gross mode (used when shutdown) versus using in Analyze mode (used at power)

A. Correct – in the analyze mode the detector is calibrated for N16 gammas. The Gross mode allows a greater band of isotopes to be detected

B. Incorrect – plausible since the detector could saturate but this would cause the count rate to lower

- C. Incorrect plausible since N16 gammas are what the analyze mode is calibrated for
- D. Incorrect plausible since this is when the detector is procedurally placed in the GROSS mode

Sys #	System	Category			KA Statement	
N/A	N/A	Generic			Ability to use radiation moni as fixed radiation monitors a survey instruments, personr equipment, etc	toring systems, such and alarms, portable ael monitoring
K/A#	2.3.5	K/A Importance	2.9	Exam Level	RO	
Reference	es provided to Ca	andidate None		Technical References:	Bases and Deviation Docum R21 page 36 of 518	nent for DB-OP-02000
Question	Source: B	ank 168137		Level Of Difficu	ılty: (1-5)	
Question	Cognitive Level:	Low		10 CFR Part 55	Content: 41.11	/ 41.12 / 43.4 / 45.9
Objective	: SYS-508					

72. During a design bases Loss of Coolant Accident, the operator is directed to restore power to DH7A, DH7B, DH9A, DH9B, and HP31, following the designed pathways, to prepare for ECCS suction transfer to the Emergency Sump.

Which of the following describes the Radiological consequences of performing this task?

- A. Since the task is completed prior to transfer of ECCS Pump suctions to the Emergency Sump, elevated dose rates are not expected in the Auxiliary Building.
- B. Elevated dose rates are expected in the ECCS Pump Rooms but no other high radiation areas will exist in the Auxiliary Building.
- C. High dose rates are expected in the Auxiliary Building, but due to short time required to perform this task prior approval is not required.
- D. Extremely High does rates in the Auxiliary Building are expected. Authorization for this emergency exposure is required to protect equipment important to the health and safety of the public.

<u>Answer:</u>C

Explanation/Justification: Knowledge of radiological issues related to the emergency procedure

- A. Incorrect Plausible because the task is completed prior to sump transfer. Sump transfer will raise dose rates in the auxiliary building.
- **B.** Incorrect Plausible because the ECCS Pump rooms are low in the Auxiliary Building adjacent to Containment and the Containment isolation for the Emergency Sump. This area will experience elevated dose rates, but other areas in the Auxiliary Building will as well.
- C. Correct DB-OP-02000 Attachment 7 and Bases and Deviation Document for DB-OP-02000 for Dose Assessment and Attachment 7. Following the prescribe path will ensure the worst case projected dose remains acceptable
- D. Incorrect Plausible because there will be high radiation levels in the Auxiliary Building. Following the prescribe path will ensure the worst case projected dose remains acceptable. Prior approval is not required.

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
Referenc	es provided to C	andidate		Technical References:	Bases and Deviation Document for DB-OP-02000 R21 page 480 for attachment 7 Transferring LPI Suction to the Emergency Sump
Question	Source: E	Bank 173978		Level Of Difficu	ulty: (1-5)
Question	Cognitive Level:	Low		10 CFR Part 55	Content: 41.12 / 45.9 / 45.10
Objective	: GOP-311				

- 73. Which of the following actions, if any, will occur in response to a High Radiation Alarm occurring on RE1412 or RE1413, Component Cooling Water Radiation Monitors?
- A. No Automatic Actions Radiation Elements RE1412 and RE1413 provide no automatic functions, indication only
- B. CC1412, CCW SURGE TANK THREE WAY VENT VALVE will automatically transfer from the atmospheric vent position to the Miscellaneous Waste Drain Tank vent position
- C. CC1411 A, CCW TO CTMT MOTOR OPERATED ISO and CC1411 B, CCW TO CTMT MOTOR OPERATED ISO Valves close to isolate the Containment CCW Header from the Component Cooling Water System
- D. CC1495, CCW TO AUXILIARY BUILDING NON-ESSENTIALS INLET will close to isolate the Auxiliary Building Non-Essential CCW Header from the Component Cooling Water System

Answer: B

Explanation/Justification: KA Match based on knowledge of how a contamination hazard is contained due to the potential posed by CCW surge tank being normally vented to atmosphere

- A. Incorrect plausible since many plant radiation elements provide no automatic functions indication only
- B. Correct If the CCW System becomes contaminated, the venting of the CCW Surge Tank that occurs at 5 psig would release radioactive material to the environment. The automatic action aligns the vent to the Miscellaneous Radwaste System for processing
- C. Incorrect plausible since Rising Radiation Levels in the Component Cooling Water System are indicative of a leak of radioactive material into the CCW System from a system operating at a higher pressure that CCW. An automatic action to isolate CCW from the affected system would stop radioactive material from entering the CCW System while preserving remaining CCW System Functions. Several loads on the Containment Header operate at higher pressures than the CCW system including Letdown Coolers and Reactor Coolant Pump Thermal Barrier Coolers. In addition, CC1411A and CC1411B valves do have an automatic close feature on CCW Surge Tank Level and SFAS Actuation
- D. Incorrect Plausible since Rising Radiation Levels in the Component Cooling Water System are indicative of a leak of radioactive material into the CCW System from a system operating at a higher pressure that CCW. An automatic action to isolate CCW from the affected system would stop radioactive material from entering the CCW System while preserving remaining CCW System Functions. Several loads on the Auxiliary Building Non-essential Header operate at higher pressures than the CCW system including RCP Seal Return Cooler and Spent Fuel Pool Heat Exchangers. In addition, CC1495 has an automatic close feature on CCW Surge Tank Level

Sys #	System	Category			KA Statement	
N/A	N/A	Generic			Knowledge of radiation that may arise during emergency conditions	on or contamination hazards normal, abnormal, or s or activities
K/A# 2	.3.14	K/A Importance	3.4	Exam Level	RO	
References	provided to Ca	ndidate None		Technical References:	OS-021 SH 1 CL-5	
Question S	ource: Ba	ank 173958		Level Of Difficu	ılty: (1-5)	
Question C	ognitive Level:	Low		10 CFR Part 55	Content:	41.12 / 43.4 / 45.10
Objective:	SYS-304					

- 74. The Plant was operating at 100% power when the following occurred:
 - The reactor has TRIPPED
 - SG 2 has ISOLATED by a valid SFRCS LOW PRESSURE trip and indicates 0 psig
 - A main steam safety valve on SG 1 is leaking
 - RCS cooldown rate due to the leakage is 45°F per hour

Which of the following is the correct mitigating strategy for this condition?

- A. Initiate Makeup/HPI cooling
- B. Continue Cooldown with AFW feeding BOTH SG's
- C. Continue Cooldown with AFW feeding SG 1
- D. Isolate AFW to BOTH SG's

Answer: C

Explanation/Justification: Overall mitigation strategy for cooldown with the only one steam generator available leaking steam but not exceeding the cooldown limit

A. Incorrect – plausible because MU/HPI Cooling would be used if SG 1 is isolated and neither SG is available. Faulted S/Gs are normally isolated if only one is affected

B. Incorrect – plausible because depending on the leak location it is viable that both SGs could be used for cooldown using the trickle feed method

C. Correct – Since the cooldown rate is less than 100 degrees per hour the procedure will direct control of the non –isolated SG to continue the cooldown

D. Incorrect – plausible since both SGs have an unisolable steam leak the decision to isolate both SGs and cooldown with MU/HPI Cooling could be made

Sys #	System	Category			KA Statement
N/A	N/A	Generic			Knowledge of EOP mitigation strategies
K/A#	2.4.6	K/A Importance	3.7	Exam Level	RO
Referen	ices provided to	Candidate		Technical References:	DB-OP-02000 R28 Section 7 step 7.28 and Bases and Deviation Document for DB-OP-02000 R21 for step 7.28
Questic	on Source:	Bank 166361		Level Of Difficu	ulty: (1-5)
Questic	on Cognitive Lev	el: High		10 CFR Part 55	5 Content: 41.10 / 43.5 / 45.13
Objecti	ve: GOP-306	6			

- 75. Per DB-OP-02529, Fire Procedure, which of the following would require activating the Fire Brigade?
- A. 4160V Transformer XAC deluge actuation with the transformer energized
- B. A single Fire Detection Zone alarm and a simultaneous start of a Fire Pump
- C. Multiple fire alarms received in ANY single room
- D. Multiple fire alarms received in ANY single Fire Detection Zone

Answer: B

Explanation/Justification: Knowledge of procedural requirement for activation of the fire brigade

- A. Incorrect plausible since, per DB-OP-02529, Fire Procedure, step 4.1.1 this is criteria with a Main Transformer deluge actuation but not the 4160V essential transformers
- B. Correct DB-OP-02529, Fire Procedure, step 4.1.4 direct activating the fire brigade IF a single Fire Detection Zone or Fire Suppression Area alarm is received AND a simultaneous start of a Fire Pump occurs
- C. Incorrect plausible since, per DB-OP-02529, Fire Procedure, step 4.1.3 this is the criteria IF multiple alarms are received in adjacent rooms or Fire Detection Zones

D. Incorrect – plausible since, per DB-OP-02529, Fire Procedure, step 4.1.3 this is the criteria IF multiple alarms are received in adjacent rooms or Fire Detection Zones

Sys #	System	Category			KA Statement	
N/A	N/A	Generic			Knowledge of "fire ir	the plant" procedures
K/A#	2.4.27	K/A Importance	3.4	Exam Level	RO	
Referen	ces provided to	o Candidate None		Technical References:	DB-OP-02529 R08,	, step 4.1.4
Questio	on Source:	New		Level Of Difficu	ulty: (1-5)	
Questio	on Cognitive Lev	vel: Low		10 CFR Part 55	Content:	41.10 / 43.5 / 45.13
Objectiv	e: GOP-12	29				

- 76. Initial conditions:
 - Loss of Offsite Power has occurred
 - Bus A locks out

Current conditions:

- Offsite power becomes available to Bus A
- The Duty Electrician notifies the Shift Manager there is no reason for Bus A lockout and the lockout should be able to be reset

Concurrence from which of the following positions, as identified in NOP-OP-1002, Conduct of Operations, would allow the Shift Manager to authorize resetting Bus A lockout?

- A. Operations Superintendent and Electrical Superintendent
- B. Electrical Superintendent and SCC Transmission System Operator
- C. SCC Transmission System Operator and Manager Site Maintenance
- D. Manager Site Maintenance and Manager Site Operations

Answer: D

Explanation/Justification: NUREG-1021, R10, Section ES-401 Attachment 2 step C. This is SRO since this is an administrative process for the Shift Manger for resetting an electrical lockout that requires the Shift Manager to obtain proper concurrence. Meets the K/A by requiring the SRO to know the administrative actions required to restore power via a locked out electrical bus following a station blackout

- A. Incorrect plausible since Operations management concurrence is required and the electrical superintendent would be the senior electrical maintenance position
- B. Incorrect plausible electrical superintendent would be the senior electrical maintenance position and NOP-OP-1002, step 4.12.2 states the SCC Transmission System Operator shall be consulted for unexpected switchyard and main generator lockouts

C. Incorrect – plausible OP-OP-1002, step 4.12.2 states the SCC Transmission System Operator shall be consulted for unexpected switchyard and main generator lockouts and the Manager Site Maintenance is correct

D. Correct – NOP-OP-1002, step 4.12.2 states In the event an unexpected electrical bus, transformer, or generator lockout occurs, the SM shall have the concurrence of at least two other people who are knowledgeable in the station electrical system that conditions are proper to reset the lockout and energize the affected equipment and that there are no electrical faults or over current relays activated. The two other persons should be the: Duty Operations Manager or Manager, Site Operations AND Duty Maintenance Manager or Manager, Site Maintenance.

		ie menneger er menneger			,	
Sys #	System	Category			KA Statement	
000055	Station Blackout	EA2 Ability to determir Station Blackout:	ne or interpret the fo	llowing as they apply to a	Actions necessary to	o restore power
K/A#	EA2.03	K/A Importance	4.7	Exam Level	SRO	
References provided to Candidate None			Technical References:	NOP-OP-1002 R10, step 4.12.2		
Question	n Source: Ne	ew		Level Of Difficu	lty: (1-5)	
Question	Cognitive Level:	Low		10 CFR Part 55	Content:	CFR 43.5 / 45.13
Objective	e:	GOP-500				

- 100% Power
- Makeup Pump 1 is out of service
- Makeup Pump 2 has tripped
- Seal Return is 1.5 gpm per pump
- DB-OP-02512, Makeup and Purification System Malfunctions is entered
- MU2B, Letdown Isolation is closed

Maintenance reports the following:

- Makeup Pump 2 motor is seized
- Makeup Pump 1 will be returned to service in 3 hours

With Pressurizer level currently at 200 inches which of the following is the required Command SRO direction?

- A. Trip the Reactor, Stop ALL RCPs and <u>GO TO</u> DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture
- B. Lower power to 72% per DB-OP-02504, Rapid Shutdown and trip one RCP to reduce seal return flow
- C. Lower power to low level limits per DB-OP-02504, Rapid Shutdown, trip the Reactor and <u>GO</u> <u>TO</u> DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture
- D. Commence lowering Reactor power to low level limits per DB-OP-02504, Rapid Shutdown. Maintain low level limits and place Makeup Pump 1 in service when made available in 3 hours

Answer: C

Expl	anation/Justification:	NUREG-1021, R10 of the contents of D Meets the K/A by re trip limit to determin	, Section ES-401 B-OP-02512, Ma equiring the cand le if the reactor w	Attachment 2, step II. E SRO sin akeup and Purification System Ma idate to calculate how long press vill be required to be tripped prior	ice it requires a Ilfunctions vers urizer level can to the given tim	a decision point based on knowledge sus the overall mitigating strategy. In be maintained above the 160 inch the for Makeup pump return to service.
А.	Incorrect – plausible s	ince this is the require	d action if all CC	W is lost concurrent with the loss	of makeup (se	al injection)
В.	Incorrect – plausible s trip	ince reducing seal retu	urn flow would le	ngthen the time before getting to	the 160 inches	in the pressurizer requiring a reactor
C.	Correct - Without mak	eup the reactor will be	e required to be t	ripped at 160 inches. With the pre	essurizer volum	ne 24 gallons per inch and level
	lowering at 1 inch eve	v 4 minutes due to 6 o	apm seal return.	Pressurizer level will reach 160 ir	nches in 2 hour	rs and 40 minutes
D.	Incorrect - plausible s	nce the direction woul	Id be to commen	ce a rapid shutdown and Makeup	Pump 1 would	d be returned to service at about 155
	inches in the pressuriz	er (180 min / 1 inch/4	min = 45 inches	. 200 - 45 = 155 inches) but the p	rocedure will d	irect tripping the reactor at 160 inches
Svs #	Svstem	Category			KA Stateme	nt
Sys # 0000	System Loss of Rx Coolant Makeup	Category AA2 Ability to determ the Loss of Reactor of	nine and interpret Coolant Makeup:	t the following as they apply to	KA Stateme How long PZ limits	nt 'R level can be maintained within
Sys # 0000 K/A#	System Loss of Rx Coolant Makeup	Category AA2 Ability to determ the Loss of Reactor (K/A Importance	nine and interpret Coolant Makeup: 3.8	t the following as they apply to Exam Level	KA Stateme How long PZ limits	nt 'R level can be maintained within
Sys a 0000 K/A# Refe	 System Loss of Rx Coolant Makeup AA2.04 rences provided to Ca 	Category AA2 Ability to determ the Loss of Reactor (K/A Importance ndidate None	nine and interpret Coolant Makeup: 3.8	t the following as they apply to Exam Level Technical References:	KA Stateme How long PZ limits SRO DB-OP-0251	nt R level can be maintained within 2 R14 step 4.1.3, Att. 9 page 3 of 4
Sys a 0000 K/A# Refe	System Loss of Rx Coolant Makeup AA2.04 rences provided to Ca tion Source: N	Category AA2 Ability to determ the Loss of Reactor (K/A Importance ndidate None	nine and interpret Coolant Makeup: 3.8	t the following as they apply to Exam Level Technical References: Level Of Difficu	KA Stateme How long PZ limits SRO DB-OP-0251 Ilty: (1-5)	nt R level can be maintained within 2 R14 step 4.1.3, Att. 9 page 3 of 4
Sys a 0000 K/A# Refe Ques	System Loss of Rx Coolant Makeup AA2.04 rences provided to Ca tion Source: N tion Cognitive Level:	Category AA2 Ability to determ the Loss of Reactor of K/A Importance ndidate None ew High	nine and interpret Coolant Makeup: 3.8	t the following as they apply to Exam Level Technical References: Level Of Difficu 10 CFR Part 55	KA Stateme How long PZ limits SRO DB-OP-0251 lity: (1-5) Content:	nt /R level can be maintained within /2 R14 step 4.1.3, Att. 9 page 3 of 4 CFR 43.5/ 45.13

- 78. The following event occurs:
 - The Reactor trips during a rapid shutdown due to a SGTR on SG 1.

Current conditions:

- A SG 2 steam leak is causing a plant cooldown of 5 °F per minute
- SG 1 level is 145 inches and rising
- SG 1 pressure is 980 psig and lowering
- SG 2 pressure is 700 psig and lowering
- RCS temperature (Tcold) is 500 and lowering

(1) Determine the correct Section of DB-OP-02000, RPS, SFAS, SFRCS Trip, or SG Tube Rupture to be entered **NEXT** and (2) whether PTS requirements must be invoked per Specific Rule 5, Pressurized Thermal Shock Requirements

- A. (1) Section 7, Overcooling
 - (2) Requirements to invoke PTS are **MET**
- B. (1) Section 7, Overcooling(2) Requirements to invoke PTS are **NOT MET**
- C. (1) Section 8, Steam Generator Tube Rupture(2) Requirements to invoke PTS are **MET**
- D. (1) Section 8, Steam Generator Tube Rupture(2) Requirements to invoke PTS are **NOT MET**

Answer: B

Expla A. B. C. D.	Incorrect – (1) Section greater than 100 °F pe Correct – (1) DB-OP-(4, Supplemental Action requirements are 360 Incorrect – (1) and (2) Incorrect – (1) is incorrect	NUREG 1021 R10, S determine which mal logic to determine if t of 7 is correct however th er hour. Cooldown is gre 20000 TBD hierarchy st ons, determines the order F Tcold AND Cooldowr are incorrect as descril rect as described in ans	Section ES-401 Atta function to address he requirements to be logic for invoking eater than 100 °F pe ates that Specific R er of mitigation hiera or greater than 100 ° bed in answer expla-	achment 2, step II. E. SRO sind first and which routing to sele invoke PTS is met and selecti (2) PTS, based on the param er hour, but ,Tcold is above 36 ules have a higher priority tha archy, Section 7 selected befor F per hour but Tcold is above anation for answer B (1) and an answer B and (2) is correct as	the SRO must know the priority requirements to ct. Meets the K/A by assessing the parameters and ing the proper procedure section for mitigation. eters provided, is 360°F Tcold AND Cooldown 0°F as stated so PTS is not required to be invoked in symptom and attachment DB-OP-02000 Section re Section 8. (2) correct because invoking 360°F as stated. Inswer A (2) is described in answer A
Sys #	System	Category			KA Statement
00004	40 Steam Line Rupture	Generic			Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.
K/A#	2.4.21	K/A Importance	4.6	Exam Level	SRO
Refer	ences provided to Ca	andidate None		Technical References:	DB-OP-01003 R14 Operations Procedure Use Instructions pg 9-10, DB-OP-02000 R28, Section 4 pages 20 & 21 and Specific Rule 5 page 248
Questio	on Source: N	ew		Level Of Difficulty: (1	-5)
Questio	on Cognitive Level:	High		10 CFR Part 55 Conte	cFR: 41.7 / 43.5 / 45.12
Objecti	ve: GOP-303, 5	519,			

- The plant has experienced a Loss of ALL Feedwater
- Motor Driven Feed Pump (MDFP) restoration from maintenance is in progress

Current conditions:

- DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture Section 6, Lack of Heat Transfer is in progress
- Makeup Pumps 1 & 2 are in service
- RCS Thot is 600°F
- The Equipment Operator reports the MDFP will be ready in 5 minutes.

Select which of the following is correct per DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture for the current conditions.

- A. Remain in Section 6: Lack of Heat Transfer
- B. Go to Attachment 4: Initiate MU/HPI Cooling
- C. Go to Attachment 5: Guidelines for restoring Feedwater
- D. Go to Attachment 8: Place HPI/LPI/MU in service

Answer: B

Expla A. B. C. D.	nation/Justification: Incorrect – plausible b feedwater flow will be Correct – Specific Rul Incorrect – plausible s specific rule 4 Incorrect – plausible s and specific rule 4 and	NUREG 1021 R10, S procedure section or to start feedwater is r supplying at least one ecause Step 6.1 states come available once the e 4 and Section 6 step 6 ince attachment 5 guide ince attachment 8 is a p d would be finally directed	ection ES-401 attachment. M not considered e steam genera if feedwater is a MDFP is start 6.6 directs go t es restoring fee prerequisite to a ed as a verify s	Attachment 2, step II. E. SRO du leets the K/A by requiring the cano <u>available</u> by DB-OP-02000, step 6 ator available from an OPERATING fe ted but specific rule 4 has priority a o attachment 4 if 600 °F Thot is rea edwater would already be in progre attachment 4. Attachment 8 should step in attachment 4	e to requiring the S didate to determine 5.1, carryover step eedwater pump go and the 600 °F Tho ached. ess in parallel with d already be in pro	SRO to select the proper e that, although the MDFP is ready o unless pump is operating and to step 6.7 and restore flow and at is reached. section 6 per step 6.2 and ogress or completed per step 6.2
Sys # 00005	4 Loss of Main Feedwater	Category Generic			KA Statement Ability to determ of safety related	ine operability and/or availability equipment.
Sys # 00005 K/A#	System 4 Loss of Main Feedwater 2.2.37	Category Generic K/A Importance	4.6	Exam Level	KA Statement Ability to determ of safety related SRO	ine operability and/or availability equipment.
Sys # 00005 K/A# Refere	System 4 Loss of Main Feedwater 2.2.37 ences provided to Ca	Category Generic K/A Importance Indidate None	4.6	Exam Level Technical References:	KA Statement Ability to determ of safety related SRO DB-OP-01003 R Instructions pg 9 6 step 6.6 pages 4.1 page 245	ine operability and/or availability equipment. 14 Operations Procedure Use -10. DB-OP-02000 R28, Section s 58-59 and specific rule 4 step
Sys # 00005 K/A# Refere	System 4 Loss of Main Feedwater 2.2.37 ences provided to Ca tion Source: N	Category Generic K/A Importance Indidate None	4.6	Exam Level Technical References: Level Of Difficu	KA Statement Ability to determ of safety related SRO DB-OP-01003 R Instructions pg 9 6 step 6.6 pages 4.1 page 245 Ilty: (1-5)	ine operability and/or availability equipment. 14 Operations Procedure Use 0-10. DB-OP-02000 R28, Section 58-59 and specific rule 4 step
Sys # 00005 K/A# Reference Quest	System 4 Loss of Main Feedwater 2.2.37 ences provided to Ca tion Source: N tion Cognitive Level:	Category Generic K/A Importance andidate None ew High	4.6	Exam Level Technical References: Level Of Difficu 10 CFR Part 55	KA Statement Ability to determ of safety related SRO DB-OP-01003 R Instructions pg 9 6 step 6.6 pages 4.1 page 245 Ilty: (1-5) Content:	ine operability and/or availability equipment. 14 Operations Procedure Use 0-10. DB-OP-02000 R28, Section 5 58-59 and specific rule 4 step CFR: 41.7 / 43.5 / 45.12

- The Reactor tripped due to a loss of Off-site power
- Both Essential 4160 Volt AC Bus Power Sources C1 and D1 are de-energized
- DB-OP-02521 Loss of AC Bus Power Sources Attachment 5: Selective Battery Load Shedding is in progress
- D1P has been depleted and D2P has been placed in service

The following occurs:

• The Reactor Operator reports D2P is indicating 90 VDC

With the reported indications, per DB-OP-02521 Loss of AC Bus Power Sources which of the following is correct?

- A. Remain on D2P until Y2 is lost to maintain source range indication available
- B. Transition to placing D1N and Y3 in service, source range indication will be available
- C. Remain on D2P until Y2 is lost to maintain intermediate range indication available
- D. Transition to placing D1N and Y3 in service, intermediate range indication will be available

Answer: D

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II. E. SRO because it requires knowledge of the content of the procedure of a decision point (105 VDC) and to determine selection for the next required course of action. Meets the K/A by identifying that source range indication will be lost when D2P load is lost.

A. Incorrect – plausible since the decision point is if either D2P bus voltage reaches 105 VDC <u>OR</u> Y2 is lost. Since 105 VDC is reached transitioning is required. When transitioning to the next DC panel all source range indication will be lost but IR indication will be available

B. Incorrect- Plausible since first part is correct but source range indication will be lost since no source range is powered from Y3.

C. Incorrect – plausible since the decision point is if either D2P bus voltage reaches 105 VDC <u>OR</u> Y2 is lost. When transitioning to the next DC panel, all source range indication will be lost

D. Correct – Transitioning to D1N is correct and Y3 powers an intermediate range channel

Sys # 000058	System Loss of DC Power	Category AA2 Ability to detern the Loss of DC Pow	nine and interpr er:	et the following as they apply to	KA Stateme DC loads los monitor plar	ent st; impact on ability to operate and nt systems
K/A#	AA2.03	K/A Importance	3.9	Exam Level	SRO	21 P24 Attachment 15, page 122 first
Reference	es provided to Ca	andidate None		Technical References:	bullet and A	ttachment 16 page124 step 2
Question	n Source: N	lew		Level Of Difficu	ulty: (1-5)	
Question	Cognitive Level:	Low		10 CFR Part 55	Content:	CFR: 43.5 / 45.13
Objectiv	e: GOP-121					

81. Current conditions:

- 100% Power
- Component Cooling Water Pump 1 is in service
- Makeup Pump 2 is in service
- Service Water Pump 2 is OOS

The following occurs:

- Service Water Pump 1 trips
- DB-OP-02511 Loss of Service Water Pumps/Systems is being implemented

With these conditions, which of the following will be performed NEXT?

- A. Attachment 5, Aligning Backup Service Water Pump to SW Loop 1
- B. Attachment 10, Circulating Water Supplying Secondary loads
- C. Attachment 19, Isolation of Containment Air Cooler Supplied by SW Loop1
- D. Attempt to start Service Water Pump 1 per DB-OP-06261, Service Water System Operating Procedure

Answer: C

- A. Incorrect Plausible since SWP 2 is OOS SWP3 will be in service as 2 and unavailable requiring the backup service water pump to be placed in service as 1 if SWP1 does not restart
- B. Incorrect plausible since this attachment would be performed if circulating water was supplying secondary loads but the normal lineup is for secondaries to be aligned opposite of the running CCW pump which is supplying primary loads. Train 2 will be supplying secondaries and not Circ Water in this condition
- C. Correct Service Water to containment air coolers will be required to be isolated prior to starting a service water pump due to design issues involving the pressure surge with containment air cooler piping in containment
- D. Incorrect plausible since direction is to attempt to restart the previously running pump if no targets are present but only after attachment 19 is completed

Sys #	System	Category Generic			KA Statement	nd execute procedure steps
	Nuclear Svc Water					
K/A#	2.1.20	K/A Importance	4.6	Exam Level	SRO	
Referenc	es provided to Ca	ndidate None		Technical References:	DB-OP-02511 R16,	step 4.1.1
Question	Nource: No	ew		Level Of Difficu	ılty: (1-5)	
Question	Cognitive Level:	High		10 CFR Part 55	Content:	CFR: 41.10 / 43.5 / 45.12
Objective	e: GOP-111					

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II. E. requires the SRO to assess plant conditions and requiring knowledge of the next step/procedure/attachment requirement within the correct section of the loss of service water procedure.

- 100% Power
- LT15-3 NNI-Y Post Accident Monitoring Pressurizer Level Transmitter has just been determined to be Inoperable and an Equipment Operator has been assigned to open its equalizing valve
- LT15-1, NNI-X Post Accident Monitoring Pressurizer Level Transmitter, is the selected Pressurizer Level Control Instrument

The following occurs:

• An Operator inadvertently opens the equalizing valve for LT15-1 and reports the valve is stuck in the open position.

What is the effect on Control Room Pressurizer Level indication and what is the LCO action for this INOPERABLE transmitter?

The control room indicated level (1) The LCO action is to enter TS 3.3.17 (2)

References provided

- A. (1) rises
 (2) Condition C Restore one channel to Operable status within 7 days
- B. (1) rises(2) Condition E Be in MODE 3 within 6 hours
- C. (1) lowers
 (2) Condition C Restore one channel to Operable status within 7 days
- D. (1) lowers

Question Cognitive Level:

(2) Condition E - Be in MODE 3 within 6 hours

High

Answer: A

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.B SRO based on selecting the correct TS Condition requirement. Meets the K/A by requiring knowledge of the effect of Operator actions on control room indication Correct - Opening the equalizing valve will cause a zero D/P and an offscale high indication. TS 3.3.17 Condition C is correct for two channels A. Inoperable B. Incorrect - plausible since Table 3.3.17-1 lists Condition E in the CONDITIONS column for function 9 on table 3.3.17-1, Post Accident Monitoring Instrumentation but is only required to be entered as referenced in condition D.1 C. Incorrect - Plausible since opening the equalizing valve will cause a zero D/P and candidate may assume zero D/P equates to zero level Incorrect - See C for (1) and B for (2) D. Sys # System Category **KA Statement** 000028 Pressurizer Generic Ability to interpret control room indications to Level Control verify the status and operation of a system, and Malfunction understand how operator actions and directives affect plant and system conditions. K/A# K/A Importance Exam Level SRO 2.2.44 4.4 LCO 3.3.17 page 2 & 4 **References provided to Candidate Technical References:** LCO 3.3.17, pages 1 through 4. TS Bases B 3.3.17 pages-1 through 12 **Question Source:** Level Of Difficulty: (1-5) New

10 CFR Part 55 Content:

CFR: 41.5 / 43.5 / 45.12

Objective: GOP-113 & 433

83. An event has occurred which leaves rod index in the Unacceptable region at 230 Rod Index.

Core Operating Limits Report shows rods entering the:

- Restricted region at 240 rod index
- Acceptable region at 255 rod index

Reactor Operators Guidance:

• 2 Gallons boric acid per rod index

With power remaining constant:

(1) How much acid is **REQUIRED** to be added to meet <u>shutdown margin requirements</u>? AND

- (2) What is the Technical Specification basis for this addition?
- A. (1) 20 gallons
 - (2) regulating rods may be inserted too far to provide sufficient negative reactivity insertion following a reactor trip

B. (1) 50 gallons

- (2) regulating rods may be inserted too far to provide sufficient negative reactivity insertion following a reactor trip
- C. (1) 20 gallons
 - (2) precludes long term depletion with abnormal group insertions or configurations and limits the potential for an adverse xenon redistribution
- D. (1) 50 gallons
 - (2) precludes long term depletion with abnormal group insertions or configurations and limits the potential for an adverse xenon redistribution

<u>Answer: A</u>						
Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.B. SRO knowledge based on restricted region requirement for SDM is listed in the 2 hour action statement and Tech Spec Bases.						
A. Correct – (1) 20 gallons will move rods to the restricted region. SDM is met in the restricted region (2) correct per TS bases 3.2.1.D.1						
B. Incorrect - plausible	since (1) 50 gallons will	place rods in t	he acceptable region which is not r	equired to meet	SDM (2) is correct	
C. Incorrect - plausible	since (1) 20 gallons is c	orrect and (2)	is bases for going from restricted to	acceptable reg	ion	
D. Incorrect – plausible	since (1) 50 gallons will	place rods in t	he acceptable region and (2) is bas	ses for going fro	m restricted to acceptable region	
Sys # System	Category			KA Statemen	t	
000024 Emergency Boration	AA2 Ability to determ the Emergency Bora	ine and interp	ret the following as they apply to	Amount of bor	ron to add to achieve required SDM	
K/A# AA2.05	K/A Importance	3.9	Exam Level	SRO		
References provided to C	andidate None		Technical References:	TS Bases 3.2.	.1 D.1	
Question Source:	New		Level Of Difficu	ılty: (1-5)		
Question Cognitive Leve	l: Low		10 CFR Part 55	Content:	CFR: 43.5 / 45.13	
Objective: GOP-431						

- 84. Which of the following events will require a notification of the Ottawa County Sheriff per NOP-OP-1015, Event Notifications?
- A. Work related injury resulting in In-Patient hospitalization
- B. Plant Shutdown Required by Technical Specification
- C. Cooling Tower top light malfunction
- D. Turbine trip at 100% power

Answer: D

Question Cognitive Level:

GOP-433, 510

Objective:

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.B. Notifications are SRO duties. Meets the KA by identifying notification requirements

- A. Incorrect plausible since this would result in an OSHA notification
- **B.** Incorrect plausible since this would require an NRC notification

High

C. Incorrect – plausible since this would require a FAA notification

D. Co Ott	rrect – a turbine t awa County She	rip a 100% power would c riff per NOP-OP-1015, Eve	ause the Main Stea ent Notifications	m Safeties and Atmospheric	Vent Valves to list which require notification of the
Sys #	System	Category			KA Statement
BW/A04	Turbine Trip	Generic			Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.
K/A#	2.4.30	K/A Importance	4.1	Exam Level	SRO
Reference	es provided to	Candidate None		Technical References:	NOP-OP-1015 R02 Attachment 2 page 29 of 43
Question	Source:	New		Level Of Difficu	ulty: (1-5)

10 CFR Part 55 Content:

CFR: 41.10 / 43.5 / 45.11

• 100% Power

The following occurs:

- (L070) CIRC WTR PMP HOUSE SUMP LVL computer alarm comes in
- An Operator reports water level rapidly rising in the Circulating Water Pump House
- The Command SRO implements Section 3.3, Circulating Water System Leak/Rupture of DB-OP-02517, Circulating Water System Malfunctions
- The source of the rupture cannot be determined

Per DB-OP-02517, Circulating Water System Malfunctions, select which procedure will be entered **NEXT**:

- A. RA-EP-02830 Flooding
- B. RA-EP-02880 Internal Flooding
- C. DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture
- D. DB-OP-02504 Rapid Shutdown

Answer: C

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II. E SRO based on requiring procedure selection and knowledge of procedure content. Reactor trip is directed within the procedure due to unknown location. Meets K/A by requiring procedure selection based on facility conditions.

- A. Incorrect plausible since flooding is occurring but this procedure used when lake levels have exceeded 574' and weather conditions are favorable for flooding
- **B.** Incorrect plausible since flooding is occurring internally in the plant and this procedure will eventually be referred to for guidance but is not referred by DB-OP-02517
- C. Correct DB-OP-02517 R6 Step 4.3.1 states IF flooding of major equipment is in progress or imminent OR the rupture cannot be located to trip the reactor and initiate AND isolate SFRCS
- D. Incorrect plausible because it is usual for procedures to direct power reduction prior to tripping

Sys #	System	Category			KA Statemen	t
BW/A07	Flooding	AA2 Ability to determine the (Flooding):	ne and interpr	et the following as they apply to	Facility condit procedures du operations.	ions and selection of appropriate uring abnormal and emergency
K/A#	AA2.1	K/A Importance	3.6	Exam Level	SRO	
Referenc	es provided to Ca	ndidate None		Technical References:	DB-OP-02517	7 R6 Step 4.3.1
Question	Source: Ne	ew		Level Of Difficu	ulty: (1-5)	
Question	Cognitive Level:	Low		10 CFR Part 55	Content:	CFR: 43.5 / 45.13
Objective	e: GOP-117					

86. Current conditions:

- 3 RCP Operation is in progress
- RCS Cooldown is in progress
- RPS channels 1 through 4 are in Shutdown Bypass
- Safety Rod group 1 has been withdrawn to provide trippable reactivity during the cooldown

The following occurs:

• I&C reports RPS channels 1 and 2 High Flux - High Setpoint has been set to 80.6% for 3 RCP Operations RPS Channels 3 and 4 are currently set for 104.9%

Based on these conditions, which of the following identifies the impact on RPS and the procedure action which will mitigate this condition?

- A. RPS channels 3 and 4 are Inoperable ONLY Place one RPS Channel (3 or 4) in Trip and the other RPS Channel (3 or 4) in Bypass per DB-OP-06403, Reactor Protection System (RPS) and Nuclear Instrumentation (NI) Operating Procedure
- B. RPS channels 3 and 4 are Inoperable ONLY Set RPS channels 3 and 4 High Flux - High Setpoints to 80.6% Power per DB-MI-03019 and 03020, RPS Channels 3 and 4 Power/Imbalance/Flow Trip Setpoint Verification and Overpower Trip Setpoint Adjustment/Verification
- C. RPS channels 1 through 4 are Inoperable
 Set RPS channels 1 through 4 High Flux High Setpoints to 4.5% Power per DB-MI-03017 (03018, 03019, 03020), RPS Channel 1 (2, 3, 4) Power/Imbalance/Flow Trip Setpoint
 Verification and Overpower Trip Setpoint Adjustment/Verification
- D. RPS channels 1 through 4 are Inoperable.Continue the cooldown to Mode 4 per DB-OP-06903, Plant Cooldown

Answer: C

Expla	anation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II. B. SRO based on requiring TS knowledge below the double line consisting of operability requirements listed in the instrumentation table. The KA match is that all 4 channels are incorrectly bypassed since none are set to $\leq 5\%$ RTP as required by Technical Specifications with CRD trip breaker closed and the CRD system canable of rod withdrawal
Α.	Incorrect – Plausible since these are actions to be taken if only two RPS channels are Inoperable
в.	Incorrect – Plausible since 3 RCP operation requires the high flux setpoints to be set for ≤80.6% in modes 3 with CRD trip breaker closed, the CRD system capable of rod withdrawal and not in shutdown bypass operation
C.	Correct – For this condition RPS must be in Shutdown Bypass to bypass the RPS low pressure trips. TS table 3.3.1-1 Function 1.b. requires the high flux setpoints to be set for ≤ 5% RTP when in Shutdown Bypass Operation with CRD trip breaker closed, the CRD system capable of rod withdrawal. DB-OP-06403, Reactor Protection System (RPS) and Nuclear Instrumentation (NI) Operating Procedure will have the setpoints set at 4.5% when going to shutdown bypass. RPS was incorrectly bypassed prior to reducing these setpoints
D.	Incorrect – Plausible since all the RPS Instrumentation trips except for the low power trip are not applicable below mode 3 so cooling down to

012	Reactor Protection	A2 Ability to (a) predi operations on the RF procedures to correc malfunctions or opera	ict the impacts PS; and (b) bas t, control, or m ations:	of the following malfunctions or ed on those predictions, use itigate the consequences of those	Incorrect chan	nel bypassing
K/A#	A2.03	K/A Importance	3.7	Exam Level	SRO	
Referer	nces provided to	Candidate None		Technical References:	DB-OP-06403 Function 1.b	R21, step 3.3.2, TS table 3.3.1-1
Questio	on Source:	New		Level Of Difficu	ılty: (1-5)	
Questic	on Cognitive Leve	el: High		10 CFR Part 55	Content:	CFR:41.5 / 43.5 / 45.3 / 45.5
Objecti	ve:	GOP-433, SY	S-1504			

- A Large Break LOCA has occurred
- A Valid SFAS Incident Level 4 has actuated

Current conditions:

- CTMT pressure is now less than 18.7 PSIA
- The Shift Manager approves stopping the CTMT Spray Pumps
- (1) Whose concurrence is required? AND
- (2) What procedure directs the required concurrence and actions for stopping the CTMT Spray pumps?
- A. (1) Technical Support Center(2) DB-OP-06910 Trip Recovery
- B. (1) Technical Support Center(2) DB-OP-06013 Containment Spray System
- C. (1) Operations Support Center (2) DB-OP-06910 Trip Recovery
- D. (1) Operations Support Center(2) DB-OP-06013 Containment Spray System

Answer: A

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II. E SRO based on requiring procedure selection and content involving ERO concurrence. K/A match – when CTMT Spray can safely be secured based on proper concurrence
 A. Correct – DB-OP-06910, Trip Recovery, Section 6.0, Recovery from SFAS Initiation, Step 6.1 states Technical Support Center concurrence

required and provides the actions for stopping the CTMT Spray pumps
 B. Incorrect – (1) is correct (2) is plausible since the Containment Spray procedure provides direction for CTMT Spray Pump Operations including SFAS actuation but not for stopping of the CTMT Spray Pumps following an SFAS actuation

C. Incorrect – plausible since the Operations Support Center is a part of the Emergency Response Organization which also works with the Control Room staff. (2) is correct

D. Incorrect –plausible as explained in B for (2) and C for (1)

Sys #	System	Category				KA Statement	
026	Containment Spray	A2 Ability to operations of procedures malfunctions	(a) predict on the CSS to correct, s or operat	ict the impacts of the following malfunctions or Safe securing of containment spray where st, control, or mitigate the consequences of those ations:		f containment spray when it can	
K/A#	A2.08	K/A Importa	ance	3.7*	Exam Level	SRO	
Reference	es provided to Ca	ididate None		Technical References:		DB-OP-06910 R30 page 45 step 6.1	
Question	Source: Ne	ew			Level Of Difficu	ılty: (1-5)	
Question	Cognitive Level:	Lo	w		10 CFR Part 55	Content:	CFR41.5 / 43.5 / 45.3 /45.13
Objective):	GOP	-207				

88. Current conditions:

- 100% power
- The Motor Driven Feed Pump (MDFP) Quarterly Test is being performed
- The EO has just closed FW6397, MDFP to Auxiliary Feed Line 2 Isolation

The following occurs:

 MS106A, Main Steam Line 2 to AFPT 1 Isolation cycles closed and will not reopen electrically or manually

Based on these Plant conditions what is the Operability status of the following:

(1) MDFP (2) AFW Train 1

- A. (1) MDFP Operable(2) AFW Train 1 Operable
- B. (1) MDFP Inoperable(2) AFW Train 1 Operable
- C. (1) MDFP Operable (2) AFW Train 1 Inoperable
- D. (1) MDFP Inoperable(2) AFW Train 1 Inoperable

Answer: D

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.B SRO based on requires knowledge of TS Bases to determine requirements for Operability. K/A match based on Tech Spec bases knowledge required to determine Operability of Emergency Feedwater. SR 3.7.5.1 allows for out of correct position for manual valves in the MDFP Train when less than or equal to 40% power

A. Incorrect – plausible since the MDFP can still supply SG 1 and also is a manual start system and would be operable if ≤ 40% power. MS106A is a redundant steam supply from the opposite steam generator

B. Incorrect – plausible since MDFP Inoperable is correct and MS106A is a redundant steam supply.

C. Incorrect – plausible since the MDFP can still supply SG 1 and also is a manual start system and would be operable if ≤ 40% power. AFW Train 1 Inoperable is correct

D. Correct – Per TS Bases 3.7.5, the MDFP and associated flow paths to the AFW System are required to be OPERABLE and capable of supplying flow to both steam generators. TS Bases 3.7.5 also requires that each of the two AFW pumps be OPERABLE with redundant steam supplies from each of the main steam lines upstream of the MSIVs and each capable of supplying EFW flow to both of the steam generators. Allowance for manual valves out of position is only valid at less than 40% power per SR 3.7.5.1

Sys #	System	Category			KA Statement	
061	Aux/Emergency Feedwater	Generic			Knowledge of the bases conditions for operations	in Tech Specifications for limiting s and safety limits
K/A#	2.2.25	K/A Importance	4.2	Exam Level	SRO	
Referen	ces provided to Ca	Indidate None		Technical References:	Tech Spec Bases B	3.7.5 page B3.7.5-3
Questio	n Source: N	ew		Level Of Difficu	ılty: (1-5)	CFR: 41.5 / 41.7 / 43.2
Questio	n Cognitive Level:	High		10 CFR Part 55	Content:	CFR: 41.5 / 41.7 / 43.2
Objectiv	e: GOP-437					

- 100% power
- 120VAC Instrument Bus Y1 has been transferred to Constant Voltage Transformer XY1.

The following occurs:

- During maintenance activities in the Low Voltage Switchgear Room, D1P01, DCMCC1 feeder to bus D1P breaker OPENS and bus D1P is de-energized.
- All systems function as designed.

Based on these Plant conditions what is the Operability status of the following:

(1) Inverter YV1

- (2) Essential 120VAC Instrument Bus Y1
- A. (1) Inverter YV1 is Operable(2) Y1 is Operable
- B. (1) Inverter YV1 is Operable(2) Y1 is Inoperable
- C. (1) Inverter YV1 is Inoperable (2) Y1 is Operable
- D. (1) Inverter YV1 is Inoperable(2) Y1 is Inoperable

Answer: C

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.B. SRO based on requires knowledge of TS Bases to determine requirements for Operability. K/A match based on maintenance activities causing power source loss requiring evaluation of Tech Spec limiting condition of Operations

- A. Incorrect. Part 1 is incorrect. Part 2 is correct. See correct answer explanation
- B. Incorrect. Both parts are incorrect. See correct answer explanation

Correct. IAW TS Bases 3.8.7 and 3.8.9 The inverter is inoperable if the battery is unavailable even if the rectifier AC source is available and the bus is operable as long as it is energized. Opening of this breaker results in the D1P bus de-energizing which results in loss of battery supply to YV1. However YV1 will remain energized from the rectifier and the Y1 bus will remain energized from the constant voltage transformer.
 Incorrect. Part 1 is correct. Part 2 is incorrect. See correct answer explanation

				-	
Sys #	System	Category			KA Statement
063	DC Electrical Distribution	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	4.2	Exam Level	SRO
Referen	ces provided to Ca	Indidate None		Technical References:	TS Bases B.3.8.7 and 3.8.9 pages B 3.8.7-2 and B 3.8.9-2
Questio	n Source: Ba	ank DB 2013 NRC Exam	(178904) Q78	Level Of Difficu	ulty: (1-5)
Questio	n Cognitive Level:	High		10 CFR Part 55	Content: CFR: 41.10 / 43.2 / 45.13
Objectiv	e: GOP-438				

- Plant is a 100% Power
- Emergency Diesel Generator (EDG) 1 is paralleled to the grid during testing

The following occurs:

- Loss of Offsite Power (LOOP)
- EDG 2 trips

Which of the following correctly states the correct response to the LOOP and the procedure which will be entered **NEXT**?

- EDG 1 will remain loaded until an undervoltage condition occurs and isolates the essential bus
 GO TO DB-OP-02000, RPS, SFAS, SFRCS Trip OR SG Tube Rupture
- EDG 1 will remain loaded until an undervoltage condition occurs and isolates the essential bus GO TO DB-OP-02521, Loss of AC Bus Power Sources
- C. EDG 1 output breaker AC 101, will open immediately due to 13.8 Kv Bus Undervoltage Relay GO TO DB-OP-02000, RPS, SFAS, SFRCS Trip OR SG Tube Rupture
- D. EDG 1 output breaker, AC 101, will open immediately due to 13.8 Kv Bus Undervoltage Relay GO TO DB-OP-02521, Loss of AC Bus Power Sources

Answer: A

Expla	anation/Justification:	NUREG-1021, Revis knowing Loss of all A based on requiring k	ion 10, Section ES-40' C is not one of the abr nowledge of the effect	I Attachment 2, step II.E. S normal procedures that wo of a LOOP while EDG is lo	RO based on pro- uld take precedend aded during testin	cedural priority determination by ce over DB-OP-02000. K/A match g and the correct procedure to
Α.	Correct – Per limit and breaker, AC 101, will op occurs and isolates the	precaution 2.2.16 of D pen. If a LOOP occurs,	B-OP-06316, EDG Op with no SFAS, the ED	erating Procedure, If an SF G may overload reaching 3	FAS Level 2 with n 3300 to 3500 KW,	o LOOP, the EDG output until an undervoltage condition
В.	Incorrect – Plausible si OP-02000 Specific Ru in parallel with the rem	ince DB-OP-02521 will le 6 directs entry into the ainder of the actions ir	be the procedure to di his AB if the initial atten DB-OP-02000. There	rect recovery of a 4160V e npts to start the EDG(s) ha are some abnormal proced	ssential bus in the ve failed. At this p dures that will take	event the SBODG cannot. DB- oint, DB-OP-02521 is performed precedence over DB-OP-02000
C.	Incorrect – Plausible s	ince if an SFAS Level 2	2 with no LOOP, the ED	DG output breaker, AC 101	will open. 13.8 bu	is is de-energized on LOOP
D.	Incorrect – Plausible s	ince if an SFAS Level 2	2 with no LOOP, the EI	DG output breaker, AC 101	will open and DB	-OP-02521 will be the procedure
0						
Sys 7	F System	Category			KA Statement	
064	Emergency Diesel Generator	A2 Ability to (a) predic operations on the ED, use procedures to con those malfunctions or	t the impacts of the fol G system; and (b) bas rect, control, or mitigat operations:	lowing malfunctions or ed on those predictions, e the consequences of	Consequences on nonoperability te	f not shedding loads during st
K/A#	A2.17	K/A Importance	2.6*	Exam Level	SRO	
Refe	rences provided to Ca	ndidate None	-	Technical References:	DB-OP-06316 st 6.5.2	ep 2.2.16, DB-OP-01003 step
Ques	tion Source: Ne	ew		Level Of Difficu	lty: (1-5)	
Ques	tion Cognitive Level:	High		10 CFR Part 55	Content:	CFR:41.5/43.5/45.3/45.13
Obje	ctive: SYS-406, G 500	OP-				

91. Current conditions:

- Loss of all Feedwater
- Thot 610 °F and lowering
- The RC2A, Pressurizer Power Operated Relief Valve (PORV) is locked open

The following occurs:

• Annunciator 4-1-B, SUBCOOL MARGIN LO comes into alarm

Based on these Plant conditions what is the **NEXT** required action and procedure routing?

- A. Trip all Reactor Coolant Pumps Section 5, Loss of Subcooling Margin
- B. Trip all Reactor Coolant Pumps Section 12 MU/HPI Cooling
- C. Close RC2A, PORV Section 5, Loss of Subcooling Margin
- D. Close RC2A, PORV Section 12 MU/HPI Cooling

Answer: B

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.E. SRO knowledge based on detailed knowledge of procedure actions and procedure routing determination. K/A match based on understanding the annunciator alarm is consistent with plant conditions but procedure routing is different when MU/HPI Cooling is in progress

- A. Incorrect plausible because tripping all RCPs is part of specific rule 2 for a loss of SCM and transitioning to section 5 loss of SCM priority unless caused by MU/HPI cooling as stated in caution 13 of DB-OP-02000 RPS, SFAS, SFRCS Trip, or Steam Generator Tube Rupture Attachment 4, Initiate MU/HPI Cooling
- B. Correct Attachment 4, Initiate MU/HPI Cooling would be in progress or completed for these plant conditions and directs the steps required for specific rule 2 (stop RCPs and select incore input). Attachment 4, caution 13 states DO NOT got to section 5 if SCM is loss. Attachment 4 will direct transition to Section 12 MU/HPI Cooling

C. Incorrect – Plausible since closing the PORV would stop the loss of inventory and thus the pressure decrease. Attachment 4, Initiate MU/HPI Cooling caution 13 states DO NOT got to section 5 if SCM is loss. Attachment 4, caution 13 states DO NOT got to section 5 if SCM is loss. Attachment 4 will direct transition to Section 12 MU/HPI Cooling

D. Incorrect – Plausible since closing the PORV would stop the loss of inventory and thus the pressure decrease. Section 12 MU/HPI Cooling is correct

00	meci					
Sys #	System	Category			KA Statement	
017	In-core Temperature Monitor	Generic			Ability to verify that t the plant conditions.	he alarms are consistent with
K/A#	2.4.46	K/A Importance	4.2	Exam Level	SRO	
Referen	ces provided to C	andidate None		Technical References:	DB-OP-02000 Attac	h 4 Caution 13 and step 22
Questio	n Source:	New		Level Of Difficu	ulty: (1-5)	
Questio	n Cognitive Level	Low		10 CFR Part 55	Content:	CFR:41.10/43.5/45.3/45.12
Objectiv	/e:	GOP-311				

• Mode 5

The following occurs:

• Flooding in the Auxiliary Building

Current conditions:

- Spent Fuel Pool is at 9 feet and stable
- Unisolable leak has been identified in the Spent Fuel Pool Cooling System

Per DB-OP-02547, Spent Fuel Pool Cooling Malfunctions which of the following procedures will mitigate this event?

- A. Severe Accident Management Guidelines
- B. DB-OP-00030, Fuel Handling Operations
- C. DB-OP-02600, Operational Contingency Response Action Plan
- D. DB-OP-06012, Decay Heat and Low Pressure Injection System Operating Procedure

Answer: C

-

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.E. SRO knowledge based on detailed knowledge of procedure actions and procedure selection. KA match based on knowing the actions of SFP Cooling malfunctions

- A. Incorrect Plausible since a Spent Fuel Pool level of 1 foot requires entry into the Severe Accident Management Guidelines
- B. Incorrect Plausible since this procedure would be selected if the SFP Pool was in contact with the refueling canal
- C. Correct Step 4.2.17 RNO step 2 of DB-OP-02547, Spent Fuel Pool Cooling System Malfunctions
- D. Incorrect Plausible since placing a DHR pump in service would be the correct action required if level was above 19 feet and if the leak was isolable at the SFP pumps

Sys #	System	Category			KA Statement	
033	Spent Fuel Pool Cooling	A2 Ability to (a) predic operations on the Spe on those predictions, u the consequences of t	t the impacts of the nt Fuel Pool Coolin use procedures to c hose malfunctions	following malfunctions or g System ; and (b) based orrect, control, or mitigate or operations:	Abnormal Spent Fue water level	el Pool water level or loss of
K/A#	A2.03	K/A Importance	3.5	Exam Level	SRO	
Referenc	es provided to Ca	ndidate None		Technical References:	DB-OP-02547 R05,	Step 4.2.17 RNO step 2
Question	Source: Ne	ew		Level Of Difficu	ılty: (1-5)	
Question	Cognitive Level:	High		10 CFR Part 55	Content:	CFR:41.5/43.5/45.3/45.13
Objective	GOP-147					

- 93. Initial Conditions:
 - Mode 6 Equipment Hatch is OFF Fuel handling operations are in progress
 - The Fuel Handling Bridge has a fuel assembly in the mast and is transitioning to the Fuel Transfer Mechanism

The following occurs:

- An assembly in the Spent Fuel Pool is dropped
- Gas bubbles are escaping from the dropped assembly

Per DB-OP-02530, Fuel Handling Accidents and DB-OP-00030, Fuel Handling Operations which of the following actions will the Command SRO direct to be taken?

- A. Evacuate the Radiological Controlled Area **ONLY** Place the fuel element being moved in Containment in the Refueling Canal Rack
- B. Evacuate the Radiological Controlled Area **ONLY** Place the fuel element being moved in Containment in the Upender Horizontal Position
- C. Evacuate Containment **AND** the Radiological Controlled Area Place the fuel element being moved in Containment in the Refueling Canal Rack
- D. Evacuate Containment **AND** the Radiological Controlled Area Place the fuel element being moved in Containment in the Upender Horizontal Position

Answer: D

Expla	anation/Justification:	NUREG-1021, Revision the procedure and sele Handling SRO who wo impact of a dropped fue	n 10, Section ES-401 Attachment 2, step II. E. ecting the required action. Fuel movements are uld direct DB-OP-00030 Fuel Handling Operat el element on Fuel Handling	SRO base on requiring k performed by a Vendor t ions actions. Meets the K	nowledge of the content of under direction of the Fuel /A by addressing the
A.	A. Incorrect – plausible since evacuating the Radiological controlled area only would seem appropriate since the spent fuel pool is outside of containment and the Refueling Canal Rack may be used as a fuel storage location when fuel handling operations are being performed				
В.	Incorrect – plausible si containment and the s	nce evacuating the Radio econd part is correct	ological controlled area only would seem appro	priate since the spent fue	el pool is outside of
C.	Incorrect – plausible si as a fuel storage locat	nce evacuating Containm on when fuel handling op	nent AND the Radiological Controlled Area is operations are being performed	orrect and the Refueling	Canal Rack may be used
D.	Correct – per DB-OP-0	2530 R8, Fuel Handling	Accidents steps 4.3.1 and DB-OP-00030 step	6.3.2 and 6.3.3	
Sys #	f System	Category		KA Statement	
034	Fuel Handling	A2 Ability to (a) predict t	the impacts of the following malfunctions or	Dropped fuel element	
	Equipment	operations on the Fuel H predictions, use procedu consequences of those	Handling System ; and (b) based on those ures to correct, control, or mitigate the malfunctions or operations:		
K/A#	Equipment	operations on the Fuel H predictions, use procedu consequences of those K/A Importance	Handling System ; and (b) based on those ures to correct, control, or mitigate the malfunctions or operations: 4.4 Exam Level	SRO	
K/A# Refer	Equipment A2.01 rences provided to Ca	coperations on the Fuel H predictions, use procedu consequences of those K/A Importance ndidate None	Handling System ; and (b) based on those ures to correct, control, or mitigate the malfunctions or operations: 4.4 Exam Level Technical References:	SRO DB-OP-02530 R8 Acci OP-00030 R13 step 6.3	dents step 4.3.1 and DB- 3.2, 6.3.3
K/A# Refer	Equipment A2.01 rences provided to Ca tion Source: No	operations on the Fuel H predictions, use procedu consequences of those K/A Importance ndidate None	Handling System ; and (b) based on those ures to correct, control, or mitigate the malfunctions or operations: 4.4 Exam Level Technical References: Level Of Difficu	SRO DB-OP-02530 R8 Acci OP-00030 R13 step 6.3 Jlty: (1-5)	dents step 4.3.1 and DB- 3.2, 6.3.3
K/A# Refer Ques Ques	A2.01 rences provided to Ca tion Source: No tion Cognitive Level:	operations on the Fuel H predictions, use procedu consequences of those K/A Importance ndidate None	Handling System ; and (b) based on those ures to correct, control, or mitigate the malfunctions or operations: 4.4 Exam Level Technical References: Level Of Difficu 10 CFR Part 55	SRO DB-OP-02530 R8 Accid OP-00030 R13 step 6.3 Ilty: (1-5) Content: 4	dents step 4.3.1 and DB- 3.2, 6.3.3 FR: 41.5 / 43.5 / 45.3 / 5.13

94. In accordance with the guidance provided in DB-OP-00030, Fuel Handling Operations:

Which one of the following identifies the individuals required to approve the bypass of Main Fuel Handling Bridge interlock to continue fuel handling operations?

- A. Fuel Handling Director and Shift Manager
- B. Fuel Handling Director and Reactor Engineer
- C. Outage Director and Shift Manager
- D. Outage Director and Reactor Engineer

Answer: A

Explanation/Justification: . NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.G SRO knowledge based on this is an administrative responsibility pertaining to two individuals both required to be SROs. An RO would only be required to know to obtain permission from their immediate supervisor. K/A match based on knowledge of the fuel-handling responsibilities of SROs
 A. Correct - Required per DB-OP-00030 step 6.13.1
 B. Incorrect – plausible because FH Director is correct and the Reactor Engineer is integrally involved with fuel movements

Incorrect – plausible because Shift Manger is correct and the Outage Director is the senior outage management individual

D. Incorrect – plausible because the Outage Director is the senior outage management individual and the Reactor Engineer is integrally involved with fuel movements

Sys #	System	Category			KA Statement	
N/A	N/A	Generic			Knowledge of the fue SROs	el-handling responsibilities of
K/A# 2	2.1.35	K/A Importance	3.9	Exam Level	SRO	
Reference	s provided to Ca	ndidate None		Technical References:	DB-OP-00030 step 6	5.13.1
Question S	Source: Ba	ank 173538		Level Of Difficu	ılty: (1-5)	
Question 0	Cognitive Level:	Low		10 CFR Part 55	Content:	CFR: 41.10 / 43.7
Objective:	FHT-103					

- 95. An approach to criticality is being performed in accordance with DB-OP-06912, APPROACH TO CRITICALITY. Current plant status is as follows:
 - The reactor is subcritical
 - CRD Safety Group 1 is 100 percent withdrawn and at the OUT LIMIT
 - Control Rod Safety Groups 2 through 4 are withdrawn to the OUT LIMIT.
 - Control Rod Regulating Groups 5 through 7 are fully inserted.
 - While attempting to withdraw Control Rod Regulating Group 5 a problem is encountered with the Control rod drive system. Control Rod Regulating Group 5 will NOT withdraw.

Maintenance has been contacted, and reports that the problem is limited to Control Rod Regulating Group 5 AND it will be several hours before they can repair the problem.

As Shift Manager and IAW the guidance provided in DB-OP-06912, APPROACH TO CRITICALITY what direction are you required to give the crew regarding the continued approach to criticality?

- A. Stop all Rod Motion
- B. Manually trip the Reactor
- C. Manually Insert ONLY Control Rod Groups 4 through 2
- D. Manually Insert Control Rod Groups 4 through 1

Answer: C

 Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II. E .SRO only since the candidate will need to assess the conditions in the stem and select the appropriate procedural section that provides the required recovery actions. The NOTE preceding step authorizes the Shift manager ONLY as the individual responsible for determining what constitutes a "delay". K/A based on knowledge of reactivity management as directed by the Approach to Criticality procedure A. Incorrect. Plausible since this would be a normal response to rod control problems. However, given the conditions in the stem where an approach to criticality is being made, DB-OP-06912 provides direction to insert groups 2-4. Also, the rod control problem is limited to group 5 B. Incorrect. Plausible since this would be a conservative action. However, this is not what DB-OP-06912 directs. C. Correct. IAW DB-OP-06912, Approach To Criticality page 13 NOTE 4.21. Since the delay will be > 1 hour, the SM is then required to direct the crew to manually insert CR groups 2-4. D. Incorrect. Inserting CRD Safety group 1 is not required 							
Sys #	# System	Category			KA Statement		
N/A	N/A	Generic			Knowledge of pro limitations associa management	cedures, guidelines, or ated with reactivity	
K/A#	2.1.37	K/A Importance	4.6	Exam Level	SRO		
Refe	rences provided to Ca	ndidate None		Technical References:	DB-OP-06912 pa	ge 12 NOTE and step 4.21	
Ques	Question Source: Bank 173727 Level Of Difficulty: (1-5)						
Ques	tion Cognitive Level:	High		10 CFR Part 55	Content:	(CFR: 41.1 / 43.6)	
Obje	ctive: GOP-210						

96. An Equipment Operator reports one of the close control power fuses for Decay Heat Removal Pump 2 is discolored.

The Shift Manager determines this is a Priority 200 Urgent Maintenance condition as defined in NOP-WM-9001, FIN, Minor, Toolpouch, Immediate, Urgent Maintenance. Troubleshooting is required to determine safety system status.

Per NOP-WM-9001, which of the following is **REQUIRED** to be performed prior to performing this troubleshooting?

- A. Perform a 10CFR50.59 screen per NOBP-LP-4003A, FENOC 10 CFR 50.59 User Guidelines
- B. Perform a Risk Assessment per NOP-OP-1007, Risk Determination
- C. Conduct a briefing per NOBP-OP-0007, Conduct of Infrequently Performed Tests or Evolutions
- D. Establish a Problem Solving and Decision making team per NOP-ER-3001, Problem Solving and Decision Making

Answer: B

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.E. SRO based on procedure selection and administrative requirements determined/performed by SRO. K/A match based on knowledge of the process for managing troubleshooting activities

A. Incorrect – Plausible since required whenever the possibility exists that design functions of structures, systems, and components (SSCs) being relied on to support plant operation or achieve and maintain safe shutdown could be adversely impacted by the troubleshooting activity

B. Correct – Per NOP-WM-9001, FIN, Minor, Toolpouch, Immediate, Urgent Maintenance step 2.5.2 a Risk Assessment is required to be performed by the Control Room Unit Supervisor or Shift Engineer prior to the Urgent Maintenance troubleshooting. NOP-OP-1007 is the parent procedure for all risk assessments which includes task risk, shutdown risk and PRA risk

C. Incorrect - plausible since this evolution would be infrequent

D. Incorrect – plausible since this process is used to ensure that troubleshooting and problem solving activities for plant issues are conducted consistently and effectively without adverse or unintended consequences on nuclear safety, personnel safety or plant performance. This procedure is utilized by request and is not required

Sys #	System	Category			KA Statemen	t
N/A	N/A	Generic			Knowledge of troubleshootin	the process for managing g activities
K/A#	2.2.20	K/A Importance	3.8	Exam Level	SRO	
References provided to Candidate None			Technical References:	NOP-WM-9001 Attachment 2, step 2.5.2		
Questic	on Source:	New		Level Of Difficu	ulty: (1-5)	
Questic	on Cognitive Lev	vel: Low		10 CFR Part 55	Content:	CFR: 41.10 / 43.5 / 45.13
Objecti	ve: GOP-51	7				

- 97. The following plant conditions exist:
 - The plant is at 100% power.
 - At 0345 on June 8, HPI Pump 1 is declared inoperable.
 - At 0700 on June 8, HPI Pump 2 is declared inoperable.
 - At 0730 on June 8, HPI Pump 1 is restored to operable status.

Including any extensions that are permitted by Tech. Specs., which one of the following describes the latest time and date to restore HPI Subsystem 2 to operable status without requiring a unit shutdown to commence?

References provided

- A. 0345 on June 11
- B. 0700 on June 11
- C. 0345 on June 12
- D. 0700 on June 12

Answer: B

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.B. Knowledge of Tech Spec section 1 requirements. K/A match based on tracking requirements for ECCS LCO

A. Incorrect – plausible since this is the completion time required to be tracked with one pump inoperable

B. Correct – Tech Spec section 1.3 allows a 24 hour extension from the first pump inoperable completion time but not to exceed the stated completion as measured from the discovery of the subsequent operability

D. Incorrect – plausible since this would be the time if a 24 hour extension was allowed from the second pump

Sys #	System	Category			KA Statement	
N/A	N/A	Generic			Ability to track Teo conditions for ope	chnical Specification limiting rations
K/A#	2.2.23	K/A Importance	4.6	Exam Level	SRO	
References provided to Candidate TS section 1.3			Technical References:	TS pages 1.3-2 and 3.5.2-1		
Question Source: Bank 172420			Level Of Difficu	ılty: (1-5)		
Question Cognitive Level: High			10 CFR Part 55	Content:	CFR: 41.10 / 43.2 / 45.13	
Objectiv	/e: GOP-435	-				

C. Incorrect – plausible since this would be the time if a 24 hour extension was allowed from the first pump

- 98. The following plant conditions exist:
 - A General Emergency has been declared.
 - An operator must be dispatched to the Aux Building to protect valuable property.

In accordance with RA-EP-02620, Emergency Dose Control and Potassium lodide Distribution, (1) what is the **maximum** dose the operator allowed to receive for this entry and

- (2) who is responsible for authorizing this dose?
- A. (1) 10 rem TEDE
 - (2) Emergency Director
- B. (1) 10 rem TEDE(2) Emergency Radiation Protection (RP) Manager
- C. (1) 25 rem TEDE
 - (2) Emergency Director
- D. (1) 25 rem TEDE
 - (2) Emergency Radiation Protection (RP) Manager

Answer: A

Explanation/Justification: NUREG-1021, Revision 10, Section ES-401 Attachment 2, step II.D SRO based on knowledge of emergency dose requirements. K/A match based on knowledge of radiation exposure limits under normal or emergency conditions Correct - 10 rem is the limit for preventing serious injury and protecting valuable property. Per RA-EP-02620 the Emergency Director is Α. responsible for emergency dose authorizations Incorrect - plausible since 10 is correct and per RA-EP-02620 The Emergency Radiation Protection (RP) Manager shall be responsible for В. evaluating, recognizing, and formally recommending in writing to the Emergency Director the need for emergency dose authorization. In addition the RP manager typically makes all decisions related to radiation protection C. Incorrect - plausible since Emergency Director is correct and during declared emergencies emergency workers are allowed to receive up to 25 rem TEDE for the duration of the emergency regardless of normal exposure to date for the year to perform lifesaving actions or to perform actions to protect large D. Incorrect - plausible refer to explanation for B (RP Manager) and D (25 rem) Sys # System Category **KA Statement** N/A N/A Generic Knowledge of radiation exposure limits under normal or emergency conditions

K/A# 2.3. References p	4 K/A Importance 3.7 provided to Candidate None	Exam Level Technical References:	SRO RA-EP-02620 step 4.1 and 6.1	1.3
Question Sou	Irce: Bank Oconee 2010 SRO exam	Level Of Difficu	ılty: (1-5)	
Question Co	gnitive Level: Low	10 CFR Part 55	Content: CFR: 41	.12 / 43.4 / 45.10
Objective:	GOP-601			

99. The Miscellaneous Waste Monitor Tank (MWMT) has been prepared for batch discharge.

The following radiation monitors and flow elements are out of service and INOPERABLE.

- Miscellaneous RE 1878A
- Miscellaneous RE 1878B
- Clean RE 1770B
- FE 4687 Storm Sewer Flow

All other instrumentation is OPERABLE.

Based on these conditions, what Offsite Dose Calculation Manual (ODCM) actions will be **required** in order to discharge this tank?

(References provided)

- A. The system/process flow rate is estimated at least once per 4 hours during the actual release.
- B. At least two independent samples of the tank's content are analyzed and at least two independent verifications of the release rate calculations and discharge valve lineups are performed AND the system/process flow rate is estimated at least once per 4 hours during the actual release.
- C. Grab samples are collected, at least once per 12 hours, and analyzed, at least once per 12 hours, for gross radioactivity (beta or gamma) at a lower limit of detection no greater than $1.0^{-07} \mu$ Ci/ml or a gamma isotopic analysis meeting the LLD Requirement of Table 2-3.
- D. At least two independent samples of the tank's content are analyzed and at least two independent verifications of the release rate calculations and discharge valve lineups are performed.

Answer: D

Explanation/Justification: SRO only white paper item A Page 3 – ODCM is listed in TS Section 5.5 and Page 3 item B 4th bullet. SRO ONLY since it requires the SRO to have knowledge of the SRO responsibilities for approving liquid waste releases. K/A match based on determining when a radiation release can be authorized

A. Incorrect. Plausible if the candidate believes the tank being discharged will pass thru the storm sewer FE and that having Clean RE 1770A operable meets the one RM channel operable requirement.

B. Incorrect. Storm sewer FE is not required for this discharge flowpath. Independent actions are correct.

C. Incorrect. These are the correct compensatory actions for the liquid waste flow indicator being out of service

D. Correct. IAW ODCM Rev. 26 Table 2-1 pages 19 and 20.

Sys #	System	Category				KA Statement	t
N/A	N/A	Generic				Ability to control	ol radiation releases
K/A#	2.3.11	K/A Import	tance	4.3	Exam Level	SRO	
Referer	nces provided to	o Candidate	ODCM R and 2-2 p	ev. 30 Table 2-1 bages 19 thru 22	Technical References:	ODCM Rev. 30	0 Table 2-1 pages 19 and 20
Questic	on Source:	Bank DB 2013	3 NRC Exa	m Q97	Level Of Difficu	ulty: (1-5)	
Questic	on Cognitive Le	vel: H	ligh		10 CFR Part 55	Content:	CFR: 41.11 / 43.4 / 45.10
Objecti	ve: GOP-52	21					

- Mode 5, BOTH RCS Loops and BOTH Decay Heat Removal Loops are Operable
- Decay Heat Pump 1 is running, Decay Heat Pump 2 is in standby

The following occurs:

- Decay Heat Pump 1 shears its shaft
- Decay Heat Pump 2 will not start

Current conditions:

- Maintenance reports Decay Heat Pump 2 requires a breaker replacement and will be available in 2 hours
- Decay Heat Cooler inlet temperature is 100°F and rising at 10°F per hour
- DB-OP-02527, Loss of Decay Heat Removal is in progress

Which of the following DB-OP-02527, Loss of Decay Heat Removal attachments will the Command SRO direct to be performed to mitigate this event?

- A. Attachment 3, Establish SG Heat Transfer
- B. Attachment 4, Using the SFP Cooling System to Cool the Core
- C. Attachment 5, Establish Feed and Bleed Cooling.
- D. Attachment 10: Using Gravity Drain of BWST to the RCS

Answer: A

Expla	anation/Justification:	NUREG-1021, Revi selecting appropriat	sion 10, Sect	ion ES-401 Attachment 2, step II.E. s	SRO based on a	ssessing plant conditions and
Α.	Correct - per DB-OP	-02527, Loss of DHR, t	his is the pref	erred method if DHR Pumps cannot	be restarted	s of Drive magadon strategy
В.	Incorrect – plausible since this is one method of cooling directed if SF1 and SF2 are open and SG Heat Transfer is not available. This method is only viable when the RCS inventory is in contact with the Refueling Canal inventory. SF1 and SF2 are not open in mode 5.					
C.	Incorrect – plausible based on the fact that	since this is a method c t the RCS will heat up t	of heat remove o mode 4 usi	al but will only be used if SG Heat Tr ng the SG Heat Transfer method	ansfer were not	available. This may be selected
D.	Incorrect – plausible	since this would be a m	itigation strat	egy at reduced inventory		
Sys #	f System	Category			KA Statement	:
N/A	N/A	Generic			Knowledge of accident (e.g., residual heat r	low power/shutdown implications in loss of coolant accident or loss of emoval) mitigation strategies.
K/A#	2.4.9	K/A Importance	4.2	Exam Level	SRO	
Refe	rences provided to C	andidate None		Technical References:	DB-OP-02527	R19 RNO step 4.1.7.c.1.
Ques	tion Source:	New		Level Of Difficu	ulty: (1-5)	
Ques	tion Cognitive Level	: High		10 CFR Part 55	Content:	CFR: 41.10 / 43.5 / 45.13
Obje	ctive:	GOP-127				