1	K/A Importance: 3.3/3.5			**Points: 1.00**
R01	Difficulty: 0.00	Level of Knowledge: Fund	Source: BANK	91127

The plant is operating at 75% power with the Reactor Mode Switch in RUN, when Both Reactor Recirculation Pumps trip.

Plant operating procedures require immediate action because adequate margin to _____ may not exist during this condition.

A. LHGR

B. MCPR

C. APLHGR

D. APRM Setpoints

Answer: B

Answer Explanation:
Per 23.138.01 BASES for Immediate action IA.1:

Due to the possibility of the core developing unacceptable core thermal-hydraulic instabilities with no recirculation pumps operating while in Mode 1, the Reactor Mode Switch must be placed in the shutdown position. The major mode of oscillations that are of concern are the regional oscillations in which one half of the core oscillates 180 degrees out of phase with the other half. An adequate margin to the Safety Limit MCPR may not exist during regional oscillations.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. LHGR is a term defined in Tech Spec and is plausible because it is related to the core. This distractor is incorrect because the bases of the immediate action is MCPR.
C. APLHGR is a term defined in Tech Spec and is plausible because it is related to the core. This distractor is incorrect because the bases of the immediate action is MCPR..
D. APRM Setpoints are defined in Tech Spec and is plausible because it is related to the core. This distractor is incorrect because the bases of the immediate action is MCPR..

Reference Information:

23.138.01 BASES

NUREG 1123 KA Catalog Rev. 2
295001 Partial or Complete Loss of Forced Core Flow Circulation
295001 AK1 Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION :
295001 AK1.02 Power/flow distribution

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

2	K/A Importance: 4.4			**Points: 1.00**
R02	Difficulty: 0.00	Level of Knowledge: High	Source: MODIFIED	91128

A complete loss of offsite and onsite AC power has occurred.

Which ONE of the following conditions would ALLOW starting of CTG11-1 from the Fermi 2 Main Control Room?

	CTG 11 Mark V Controller	43P Selector Switch
A.	Auto	Local
B.	Auto	Remote
C.	Remote	Remote
D.	Remote	Local

Answer: C

Answer Explanation:
Per 23.324 P&L 3.15 and Enclosure C:

For CTG 11-1 to be able to be operated remotely from the Main Control Room, both the CTG11 Unit 1 local Mark V Controller must be in Remote (AUTO places CTG11 Unit 1 in the LOCAL Control Mode only and prevents remote operation from COP H11-P811 and dedicated shutdown panel H21-P623) and the 43P selector switch must be in Remote. Any other switch combination prevents remote operation. Distractors are all plausible because they are possible combinations of the 2 switches, each with 2 positions. They are all incorrect because, as can be seen from Enclosure C, any combination other than Remote/Remote will remove the capability of operating CTG 11-1 from the Main Control Room.

Distractor Explanation:
Distractors are all plausible because they are possible combinations of the 2 switches, each with 2 positions. They are all incorrect because, as can be seen from Enclosure C, any combination other than Remote/Remote will remove the capability of operating CTG 11-1 from the Main Control Room

Reference Information:

23.324

NUREG 1123 KA Catalog Rev. 2
295003 Partial or Complete Loss of A.C. Power
295003 AA1. Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER :
295003 AA1.03 Systems necessary to assure safe plant shutdown

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (8) Components, capacity, and functions of emergency systems.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
Modified
RO

Associated objective(s):

3	K/A Importance: 3.5			Points: 1.00
R03	Difficulty: 0.00	Level of Knowledge: Fund	Source: BANK	91130

The plant is operating at 100% power when the following alarms are received:

- 10D68, Div II ESS 130 V Battery 2PB Trouble
- 2D24, Div II CS Logic Power Failure
- 2D30, RHR Logic B 125V DC Bus Power Failure
- 2D50 HPCI Logic Bus Power Failure

Under these conditions, the normal control power source for Safety Relief Valves ___(1)___ is lost.
Safety Relief Valve ___(2)___ has power available from an alternate DC power source.

A. (1) A, B
(2) B

B. (1) E, H, J, P, and R
(2) E

C. (1) C, D, F
(2) C

D. (1) G, K, L, M, and N
(2) G

Answer: D

Answer Explanation:
SRVs C, D, F, G, K, L, M, and N receive control power from Div II DC power. (I-2095-01) SRV G has an alternate control power feature. 125V DC is available from Dedicated Shutdown PNL H21P623 (BOP) (I-2095-04) via a control power transfer switch, therefore SRV G has power available from an alternate DC power source.

Distractor Explanation:
A & B are incorrect and plausible; SRVs A, B, E, H, J, P, and R are unaffected by a Div II DC power loss; they receive Div I DC control power. Note: All Division 1 SRVs (H, E, R, P, J, A and B) have dual power supplies (they all receive power from Div 1 DC 2PA2-5, Ckt 1 AND 2PA2-6, Ckt 1). Therefore, if the candidate determined that the list from Part (1) was correct, then it is plausible the candidate could determine that either of the Part (2)s are correct.

C is incorrect and plausible; SRV C has no redundant DC power source, and is LOST by a Div II DC power loss.

Reference Information:

I-2095-01 & I-2095-04

Plant Procedures
20.300.260VESF
23.201

NUREG 1123 KA Catalog Rev. 2

295004	Partial or Complete Loss of D.C. Power
295004 AA2.	Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER :
295004 AA2.02	Extent of partial or complete loss of D.C. power

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b) (7)	Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILO 2017 Exam
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

4	K/A Importance: 3.8			**Points: 1.00**
R04	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91147

The plant is operating at 35% power when a turbine trip occurs.

What is the response of the reactor and the reason for the response?

The reactor will ___(1)____, because___(2)____.

A. (1) Scram

(2) Turbine Stop Valve/Turbine Control Valve Closure Trip is UNBYPASSED in RPS

B. (1) Scram

(2) Turbine Bypass Valves DO NOT respond quickly enough to prevent a High-Pressure Scram

C. (1) Remain Operating

(2) Turbine Stop Valve/Turbine Control Valve Closure Trip is BYPASSED in RPS

D. (1) Remain Operating

(2) Turbine Bypass Valves respond quickly enough to prevent a High-Pressure Scram

Answer: A

Answer Explanation:
Reactor Scram is not bypassed above 161.9 psig first stage Turbine Pressure (>29.5% thermal Power). Reactor will scram.

Distractor Explanation:
Distractors are incorrect and plausible because:
B. Is incorrect because scram will be due to TSV/TCV scram, not high-pressure scram.
C. Is incorrect because Reactor Scram is not bypassed at Turbine first stage pressure above 161.9 (~30% reactor power).
D. Is incorrect because Reactor Scram is not bypassed at Turbine first stage pressure above 161.9 (~30% reactor power).

Reference Information:

3D89, Turbine Stop Valve Closure Channel Trip.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

5	K/A Importance: 3.9			**Points: 1.00**
R05-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	97827

The plant is operating at 75% power.

A reactor scram occurs. 90 seconds after the scram are the following conditions:

- Reactor Pressure is 930 psig and steady.
- Reactor Level is 140 and slowly lowering.
- RPV Startup LCV Mode Switch in RUN.
- 3D153, RFP Startup Valve Open, is in alarm.
- RFPT A and B speed is 2650 rpm.
- All control rods inserted.

Which of the following methods is used to restore level to the desired band per 20.000.21, Reactor Scram?

A. Open N2100-F045A or B, N (S) RFP Discharge Hyd Stop Valve.

B. Open N2100-F607 or F608, N (S) RFP Discharge Line Iso Valve.

C. Place N21-F403, RPV Startup LCV, in MANUAL and adjust the setpoint to control at the desired level.

D. Verify C32-R616A(B) North(South) Reactor Feedwater Pump (RFP) Controllers are in MANUAL and adjust RFPT speed on one or both RFPs.

Answer: D

Answer Explanation:
20.000.21 has a note that due to Post Scram Feedwater Logic, RFP Discharge Pressure may be inadequate to feed the vessel. Placing one or both Reactor Feed Pump Individual Feedwater Flow A (B) Controls in MANUAL and adjusting RFPT speed may be required.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. N2100-F045A (B), N (S) RFP Disch Hyd Stop Valve, receive a CLOSE signal (8 second stroke time), with the RPV Startup LCV Mode switch in RUN. They are in series with F607, 608 valves and would also need to be opened to establish a flow path. Plausible because this could establish a flow path if only one valve in the flow path auto closed on a scram.
B. N2100-F607 (F608), N (S) RFP Disch Line Iso Valves, receive a CLOSE signal (90 second stroke time), with the RPV Startup LCV Mode switch in RUN. They are in series with FO45 valves and would also need to be opened to establish a flow path. Plausible because this could establish a flow path if only one valve in the flow path auto closed on a scram
C. T-30 seconds (with RPV Startup LCV Mode Switch in RUN) N21-F403, RPV Startup LCV, transfers to AUTO. The presence of 3D153, RFP Startup Valve Open, indicates the valve is responding in automatic and is >80% open.. Therefore, there is no reason to take the valve to MANUAL and open it further. Plausible because the candidate may not recall that 3D153 alarms when the SULCV is 80% open and instead determine that the alarm comes in when the valve is open only 5 or 10%, which is consistent with many 'valve open' alarms.

Reference Information:

20.000.21 Reactor Scram

NUREG 1123 KA Catalog Rev. 2
295006 SCRAM
295006 AA1 Ability to operate and/or monitor the following as they apply to SCRAM:
295006 AA1.02 3.9/3.8 Reactor water level control system

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

6	K/A Importance: 3.5/3.7			**Points: 1.00**
R06	Difficulty: 0.00	Level of Knowledge: Low	Source: BANK	91407

During the implementation of 20.000.19, "Shutdown from Outside the Control Room" the following actions from Condition E are directed:

E.1 Position CMC switches on H21-P100 to match Control Room position.

E.2 Place the following in ON (H21-P100):

- C3500-M130, Div 2 DC Transfer switch.
- C3500-M131, BOP Transfer switch.
- C3500-M134, Swing Bus Transfer switch.
- C3500-M132, Div 1 DC Transfer switch.
- C3500-M133, Div 1 AC Transfer switch.

The reasons for performing these actions are:

A. (E.1) Any misalignment of these switches will prevent equipment operation.
(E.2) Transfers control power from the normal source to an alternate source, for remote service.

B. (E.1) Any misalignment of these switches will prevent equipment operation.
(E.2) Precludes simultaneous operation of the reactor plant from two locations.

C. (E.1) Any mispositioned CMC switches will either start or shutdown equipment unnecessarily.
(E.2) Transfers control power from the normal source to an alternate source, for remote service.

D. (E.1) Any mispositioned CMC switches will either start or shutdown equipment unnecessarily.
(E.2) Precludes simultaneous operation of the reactor plant from two locations.

Answer: D

Answer Explanation:
Per 20.000.19 Bases
(E.1) The operation of CMC switches on the Remote Shutdown Panel to match the position of the Main Control Room is in preparation of operation of the transfer switches on the Remote Shutdown Panel. Once these transfer switches are repositioned, control of the equipment is transferred to the Remote Shutdown Panel, any mispositioned CMC switches will either start or shutdown equipment unnecessarily.

(E.2) The requirement for a transfer switch exists to preclude simultaneous operation of the reactor plant from two locations. These switches must be in the ON position for operation of equipment from the Remote Shutdown Panel. Power supplies for the Remote Shutdown System equipment and components shall be consistent with that used by the interfacing system. Control power shall be the normal power serving this equipment or components. The Remote Shutdown System provides an alternate means for control of equipment and not an alternate means for supplying power to it. As a result, transfer of control power from the normal source to an alternate source is not provided.

Distractor Explanation:
The distractors are incorrect and plausible because:
"(E.1) Power is from the normal power serving this equipment or components, misalignment of this switch will prevent proper operation." - while Power does come from the normal source, misalignment will not prevent operation, just start or shutdown equipment unnecessarily.

"(E.2) Transfers of control power from the standard source to an alternate source, for remote service." Control power is not realigned just control itself to the new remote location.

Reference Information:
20.000.19 Bases

Plant Procedures
20.000.19
20.000.19 Bases

NUREG 1123 KA Catalog Rev. 2
295016 Control Room Abandonment
295016 AK3. Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT :
295016 AK3.03 Disabling control room controls

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Fermi 2 NRC Exam Usage
ILO 2019 Exam
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

7	K/A Importance: 3.3			Points: 1.00
R07-VER 2	Difficulty: 0.00	Level of Knowledge: Low	Source: NEW	97828

The plant is operating at 100% power when a TOTAL LOSS of RBCCW occurs.

EECW/EESW Auto initiated and Attachment 1 of 20.127.01, “LOSS OF REACTOR BUILDING CLOSED COOLING WATER SYSTEM” has been performed.

Which ONE of the following loads does NOT have cooling water flow?

A. Control Air Compressors

B. CRD Pumps Room Cooler

C. RB Steam Tunnel Space Coolers

D. Control Air Compressors Room Coolers

Answer: C

Answer Explanation:
Per 20.127.01 RB Steam tunnel space coolers are only cooled by RBCCW and not by EECW/EESW.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Per 20.127.01 Control Air Compressors will be cooled by EECW/EESW. Plausible because it is a load that is normally cooled by RBCCW but will be cooled by EECW/EESW on a loss of RBCCW.
B. Per 20.127.01 CRD Pumps Room Cooler will be cooled by EECW/EESW. Plausible because it is a load that is normally cooled by RBCCW but will be cooled by EECW/EESW on a loss of RBCCW once the P11-F604 is opened during performance of Attachment 1 as stated in the stem of the question.
D. Per 20.127.01 Control Air Compressors Room Coolers will be cooled by EECW/EESW. Plausible because it is a load that is normally cooled by RBCCW but will be cooled by EECW/EESW on a loss of RBCCW.

Reference Information:

20.127.01, “LOSS OF REACTOR BUILDING CLOSED COOLING WATER SYSTEM"

NUREG 1123 KA Catalog Rev. 2

295018	Partial or Complete Loss of Component Cooling Water
295018 AK2.	Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER and the following:
295018 AK2.01	System loads

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b)(10)	Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

8	K/A Importance: 3.2			**Points: 1.00**
R08-VER 2	Difficulty: 3.00	Level of Knowledge: High	Source: MODIFIED	97829

The plant is operating at 100% power.

- 7D53, Station Air Header Pressure Low, Alarms.
- AOP 20.129.01, Loss of Station and Control Air AOP is entered.

The following alarm is subsequently received:

- 7D57, Station Air Isolation Valve Closed.

The CRLNO then observes the following:

- P50-R802, Station Air Header Pressure Recorder is 82 psig, lowering.
- P5000-F401, Station Air to TB Hdr Iso Vlv, is OPEN.
- P5000-F402, Station Air to NIAS Iso Vlv, is OPEN.
- P5000- F440, Div 1 Control Air Iso Vlv, is OPEN.
- P5000-F441, Div 2 Control Air Iso Vlv, is OPEN.

Which of the following actions is required and why?

Close __(1)__ to prevent the __(2)__ MSIVs from closing.

A. (1) P5000-F401, Station Air to TB Hdr Iso Vlv
(2) Inboard

B. (1) P5000-F402, Station Air to NIAS Iso Vlv
(2) Inboard

C. (1) P5000-F401, Station Air to TB Hdr Iso Vlv
(2) Outboard

D. (1) P5000-F402, Station Air to NIAS Iso Vlv
(2) Outboard

Answer: C

Answer Explanation:
20.129.01, Loss of Station and Control Air AOP, Condition B contains the guidance for the actions that would be taken for the set of conditions in the stem of the question.

The candidate must evaluate 7D57 and recall that it alarms when the P5000-F401, Station Air to TB Header Iso Valve, closes at 85 psig. The candidate must then recognize that the F401 is still open, with indicated pressure below 85 psig, and determine that (1) the P5000-F401 must be closed to attempt to isolate the source of the leak.

The candidate must recall that IAS supplies the motive force for the (2) the Outboard MSIVs and closing the F401 should be performed to attempt to stop the leak and prevent them from drifting closed.

Distractor Explanation:
Distractors are incorrect and plausible because:
(1) P5000-F402 closes at 75 psig Station Air Header Pressure. It is plausible the candidate could incorrectly recall which valve(s) isolate and 85 psig.
(2) NIAS supplies air to the Division 1 containment Nitrogen isolation valves which would drift shut causing the inboard MSIVs to drift shut, so it is plausible the candidate could incorrectly recall this interrelationship and determine that stopping the IAS leak will prevent the Inboard MSIVs from closing. This is incorrect because, once Station Air Header Pressure reaches 75 psig, NIAS will isolate from IAS. NIAS has its own set of divisional air compressors that will maintain NIAS header pressure, thus preventing the Inboard MSIVs from closing.

Reference Information:
20.129.01, Loss of Station and/or Control Air
20.129.01 BASES, Loss of Station and/or Control Air Bases
7D53, Station Air Header Pressure Low, Alarms
7D57, Station Air Isolation Valve Closed

Question Use
Closed Reference
ILO
RO

NUREG 1123 KA Catalog Rev. 2

295019	Partial or Complete Loss of Instrument Air
295019 AK3.	Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR:
295019 AK3.03	3.2/3.2 Service air isolations: Plant-Specific

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b) (7)	Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
Modified
RO

Associated objective(s):

9	K/A Importance: 3.6			**Points: 1.00**
R09-VER 2	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	97830

The plant is operating in Mode 4 when a Loss of Shutdown Cooling occurs.

Shutdown Cooling CANNOT be restored to either loop of RHR.

23.800.05, "Alternate Reactor Coolant Circulation and Decay Heat Removal Core Spray or RHR" is entered.

Which of the following describes the plant configuration and systems which will be necessary to remove decay heat per 23.800.05?

A. Reactor level maintained at 220".
Core Spray injecting.
RHR is shutdown.

B. Reactor level maintained at 220"
Core Spray injecting.
RHR in Torus cooling.

C. Reactor level maintained at the main steam lines.
SRV's open.
Core Spray injecting.
RHR is shutdown.

D. Reactor level maintained at the main steam lines.
SRV's open.
Core Spray injecting.
RHR in Torus cooling.

Answer: D

Answer Explanation:
Per 23.800.05 RHR is placed in torus cooling and then level is raised with core spray or RHR to the main steam lines with 1 to 3 SRV's open. This completes a path for reactor water to flow out the SRV's to the torus which will be cooled by RHR in torus cooling, which removes decay heat.

Distractor Explanation:
Distractors are incorrect and plausible because:
A, B are incorrect because level needs to be raised to the main steam lines. These are plausible because a candidate may think that core spray injecting over the core is adequate to remove decay heat. But there is no flow path back to the torus.
C is incorrect because RHR needs to be running in Torus Cooling for DHR.

Reference Information:

20.205.01, 23.800.05

NUREG 1123 KA Catalog Rev. 2
295021 Loss of Shutdown Cooling
295021 AK1. Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING:
295021 AK1.01 3.6/3.8 Decay heat

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

10	K/A Importance: 3.4			**Points: 1.00**
R10	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	89788

An irradiated Fuel Assembly has been dropped in the Reactor Cavity; gas bubbles are rising to the surface of the pool.

Which one of the following alarms is associated with actuation of automatic protective functions related to this event?

A. 16D1, RB REFUELING AREA FIFTH FLOOR HIGH RADN.

B. 3D32, DIV I/II RB VENT EXH RADN MONITOR UPSCALE.

C. 3D35, DIV I/II FP VENT EXH RADN MONITOR UPSCALE TRIP.

D. 3D41, CONT CENTER MAKEUP AIR RADN MONITOR UPSCALE.

Answer: C

Answer Explanation:
Correct Answer Justification: C is correct, 3D35, DIV I/II FP VENT EXH RADN MONITOR UPSCALE TRIP is associated with isolations and actuations which result from fission product detection following a dropped fuel assembly. Candidate must identify protective and non protective radiation monitor conditions.

A is plausible; this alarm is expected during the REFUELING ACCIDENT scenario, but causes no actuations.
B is plausible; this alarm is expected during the REFUELING ACCIDENT scenario, but causes no actuations.
D is plausible; this alarm is expected during the REFUELING ACCIDENT scenario, but causes no actuations.

Objective Link: LP-OP-315-0151-A014

NUREG 1123 KA Catalog Rev. 2
295023 Refueling Accidents
295023 AK2. Knowledge of the interrelations between REFUELING ACCIDENTS and the following:
295023 AK2.03 Radiation monitoring equipment

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(11) Purpose and operation of radiation monitoring systems, including alarms and survey equipment.

Fermi 2 NRC Exam Usage
ILO 2009 Exam
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

11	K/A Importance: 3.4			Points: 1.00
R11	Difficulty: 3.00	Level of Knowledge: Fundamental	Source: BANK	91148

The plant has scrammed due to a LOCA. You have been directed to Spray the Drywell.

(1) What is the Torus Water Level above which initiation of Drywell Spray is prohibited?
(2) Why is Drywell Spray prohibited above this level?

A. (1) 569 feet as read on T50-R810, Div 2 Primary Containment Water Level Recorder.

(2) The Suppression Chamber to Drywell Vacuum Breakers are being submerged.

B. (1) 569 feet as read on T50-R810, Div 2 Primary Containment Water Level Recorder.

(2) Water has reached the elevation of the Torus Vent.

C. (1) 45 inches as read on T50-R804A(B) Div 1(2) Torus Level Recorder.

(2) The Suppression Chamber to Drywell Vacuum Breakers are being submerged.

D. (1) 45 inches as read on T50-R804A(B) Div 1(2) Torus Level Recorder.

(2) Water has reached the elevation of the Torus Vent.

Answer: C

Answer Explanation:
NOTE: This question is from one of the previous two Fermi 2 NRC exams (specifically from the 2019 Retake Exam).

Per the BWROG EPGs / SAGs, appendix B, Vol 1, SP/L-3.2:

Maintain suppression pool water level below [17 ft. 2 in. (elevation of bottom of suppression chamber to drywell vacuum breaker openings [less vacuum breaker opening pressure in feet of water])]. If suppression pool water level cannot be maintained below [17 ft. 2 in. (elevation of bottom of suppression chamber to drywell vacuum breaker openings [less vacuum breaker opening pressure in feet of water])]:
• Terminate drywell sprays.
• If adequate core cooling is assured, terminate injection into the RPV from sources external to the primary containment except from systems required to shut down the reactor.

Step SP/L-3.2 applies only to plants with suppression chamber-to-drywell vacuum breaker penetrations significantly below the top of the suppression chamber (i.e., those in which a significant volume of noncondensables could be trapped if the suppression chamber is flooded). If the penetrations are submerged, the vacuum breakers cannot function as designed to relieve noncondensables into the drywell and equalize drywell and suppression chamber pressures. Suppression pool water level must therefore be maintained below the bottom of the vacuum breaker openings to permit initiation and operation of drywell sprays.

Per Sheet 2, DWT-7, PCP-8, and TWL-12, at Fermi this level corresponds to +45 inches in the Torus.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. (1) 569' is plausible because it is the highest level at which Torus Spray, which is closely related to Drywell Spray, may be initiated as per Sheet 2. Drywell spray will already have been terminated by this point, so this is not the LOWEST level at which it would be required to terminate Drywell Spray. The candidate who fails to correctly recall the elevation of the Suppression Chamber to Drywell Vacuum Breakers may choose this distractor. (2) Is the correct response for +45" This distractor is incorrect because Drywell Spray may continue until +45".
B. (1) 569' is plausible because it is the highest level at which Torus Spray, which is closely related to Drywell Spray, may be initiated as per Sheet 2. Drywell spray will already have been terminated by this point, so this is not the LOWEST level at which it would be required to terminate Drywell Spray. The candidate who fails to correctly recall the elevation of the Suppression Chamber to Drywell Vacuum Breakers may choose this distractor. (2) Is the correct response for 569' because this is the elevation of the highest Torus Vent and therefore the reason why Torus Spray is prohibited. However, this distractor is incorrect because Drywell Spray would have been terminated at 45" and it is Torus Spray that is terminated at this elevation for this reason.
D. (1) +45" is the highest torus water level that allows the use of Drywell Spray. (2) Is the reason for terminating Torus Spray (not Drywell Spray) at 569' because this is the elevation of the highest Torus Vent and therefore the reason why Torus Spray is prohibited. However, this distractor is incorrect because Drywell Spray is terminated because the vacuum breakers are becoming submerged and not the Torus Vent.

10 CFR 55.41(b)(10) RO Justification:
This question DOES NOT meet ES-401 Attachment 2 requirements to be SRO-Only because it can be answered with systems knowledge (how the system works) by knowing the elevation of the Torus to Drywell vacuum breakers and that covering these with water could result in failure.

Reference Information:

BWROG EPGs / SAGs Sheet 2, Sheet 6

NUREG 1123 KA Catalog Rev. 2

295024	High Drywell Pressure.
295024 EA1.	Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE:
295024 EA1.16	3.4/3.4 Containment/drywell vacuum breakers

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b)(10)	Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILO 2019 Retake Exam
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

12	K/A Importance: 3.7			Points: 1.00
R12	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91467

The plant has experienced a turbine trip from 100% power with the following:

- Reactor power now indicates 20% on APRMs.
- Reactor water level reached a low of 60” during the initial transient.
- Reactor water level is now 100” and stable with Feedwater injecting.
- Main Condenser vacuum is 2 psia and stable.
- 29.100.01 Sheet 1A, RPV Control-ATWS, is being executed.
- Low-Low Set (LLS) is controlling in Automatic.
- Reactor pressure is now 910 psig and slowly lowering.

Which of the following describes the preferred mitigation strategy for controlling Reactor Pressure?

A. Use SRVs AND Turbine bypass valves.

B. Reset LLS to close the SRVs and use ONLY Turbine bypass valves.

C. Use SRVs ONLY. Turbine bypass valves are unavailable for pressure control because MSIVs are closed and CANNOT be re-opened.

D. Use SRVs until Turbine bypass availability is restored. Turbine bypass valves are unavailable for pressure control because MSIVs are closed but CAN be re-opened.

Answer: B

Answer Explanation:
29.100.01 directs to use turbine bypass valves if available. The TBVs are available and can accommodate up to 25% power. They are currently closed because LLS is controlling SRVs below the pressure regulator setpoint but could be re-opened by resetting LLS and allowing RPV pressure to rise as the BPV open.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. 29.100.01 directs to using turbine bypass valves if available. The TBVs are available and can accommodate 25% power. Therefore, there is not a need to use SRVs and heat up the torus.
C. MSIVs are currently open. Plausible; would be correct if Reactor water level lowered to Level 1 and conditions did not support bypassing Level 1 interlocks, or if vacuum was further degraded.
D. MSIVs are currently open. Plausible; would be correct if Reactor water level lowered to Level 1, because FSP-OR2 of 29.100.01 would allow MSIVs to be re-opened, using 29.ESP.11 to bypass Level 1 interlocks.

Reference Information:

29.100.01, Sheet 1A - RPV Control ATWS

NUREG 1123 KA Catalog Rev. 2

295025	High Reactor Pressure
G2.4.6	Knowledge of EOP mitigation strategies

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b)(10)	Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

13	K/A Importance: 3.8			**Points: 1.00**
R13	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	91149

After a plant transient and reactor scram, the following conditions exist:

- Div 1 RHR is being used for Torus Cooling/Torus Spray with ONE Pump at 11,500 gpm.
- Div 1 Core Spray is injecting with TWO Pumps at 7,750 gpm.
- Torus Pressure is 5.0 psig.
- Torus Level is -70 (minus 70) inches.
- Torus Temperature is 190°F.

The NO in the Reactor Building calls to report the RHR and Core Spray Pumps are rattling. Using current pump configuration, which of the following is the highest flow permissible?

A. Core Spray Flow - 5,500 gpm; RHR Flow - 8,000 gpm

B. Core Spray Flow - 6,500 gpm; RHR Flow - 10,000 gpm

C. Core Spray Flow - 6,500 gpm; RHR Flow - 8,000 gpm

D. Core Spray Flow - 5,500 gpm; RHR Flow - 10,000 gpm

Answer: C

Answer Explanation:
Note: Sheet 6 (without Notes and Cautions and without the RPV Sat Temperature Curve) will be provided with this question.

Candidate must apply NPSH and Vortex limits. Torus Overpressure calculates to be (5+3.5+((-70)/30))=6.2 psig. This means that the 5 PSIG overpressure curve applies.
The RHR vortex limit for -70" is <9,000 gpm, while NPSH is 12,000 gpm.
The CS vortex limit for -70" is <7,000 gpm, while NPSH is 8150 gpm (Max).
The CS flow is limited by Vortex limit curve (<7000), and RHR flow is limited by Vortex limit curve (<9000).

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Plausible because Core Spray (CS) flow of 5,5000 gpm is less than the CS 7,000 gpm Vortex Limit, but is incorrect because it is not the highest flow permissible. RHR flow of 8,000 gpm is correct.
B. RHR flow of 10,000 gpm is plausible if the applicant incorrectly applies the "2 PUMP" values for RHR (LPCI) flow on the RHR (LPCI) Vortex Limit Curve. The RHR Vortex Limit for -70" Torus Level is <9,000 gpm. Core Spray (CS) flow of 6,5000 gpm is correct.
D. Plausible because Core Spray (CS) flow of 5,5000 gpm is less than the CS 7,000 gpm Vortex Limit, but is incorrect because it is not the highest flow permissible. RHR flow of 10,000 gpm is plausible if the applicant incorrectly applies the "2 PUMP" values for RHR (LPCI) flow on the RHR (LPCI) Vortex Limit Curve. The RHR Vortex Limit for -70" Torus Level is <9,000 gpm.

Reference Information:

29.100.01 SH 6

NUREG 1123 KA Catalog Rev. 2
295026 Suppression Pool High Water Temperature
295026 EA2. Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE:
295026 EA2.02 3.8/3.9 Suppression pool level

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (8) Components, capacity, and functions of emergency systems.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Higher Cognitive Level
Reference Provided
RO

Associated objective(s):

14	K/A Importance: 4.0			Points: 1.00
R14	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91549

The Plant was operating at 100% when Drywell Temperature and Drywell Pressure began to slowly rise due to a small LOCA.

Drywell cooling is in a normal lineup per 23.415, Drywell Cooling System.

The plant scrams automatically due to High Drywell Pressure.

Primary Containment Control is entered on High Drywell Pressure.

Drywell Temperature is 130 degrees.

If the size of the LOCA stays the same, after the scram what would be (1) the trend in Drywell Temperature, and (2) the actions you would take to lower Drywell Temperature?

A. (1) Trend stays the same.

(2) Start Drywell Cooling Fans 9 and 14 ONLY, by taking individual CMC switches to RUN.

B. (1) Trend stays the same.

(2) Start Drywell Cooling Fans, as desired, by taking individual CMC switches to RUN.

C. (1) Trend Rises.

(2) Restore cooling water to the Drywell and start Drywell Cooling Fans, as desired, by taking individual CMC switches to RUN.

D. (1) Trend Rises.

(2) Restore cooling water to the Drywell, place the two Drywell Cooling Fan Mode switches to ALL STOP, and then back to ALL AUTO.

Answer: C

Answer Explanation:
Upon receipt of the Drywell High Pressure Scram signal (1.68 psig), the Two-Speed Drywell Cooling Fans (Fans 1-4) will shift to low speed, the other (single-speed) running fans will stop, and cooling water to the Drywell is isolated. Therefore, the temperature trend will rise. The Primary Containment Control EOP directs keeping drywell temperature <145 degrees per 23.415, "Drywell Cooling System," by verifying the 4 Two-Speed Fans in slow speed and starting the Single-Speed fans by placing their individual CMC Switches in RUN. However, with a High Drywell Pressure signal also present, cooling water (RBCCW/EECW) isolated to the Drywell. Therefore, the candidate must determine that (1) tripping of Drywell Fans and loss of Drywell Cooling will cause the Drywell Temperature trend to rise and (2) to address Drywell Temperature, cooling water flow to the Drywell will have to be restore and then Drywell Fans restarted

Distractor Explanation:
Distractors are incorrect and plausible because:

A. The candidate could fail to recall the response of Drywell Cooling to the High Drywell Pressure signal and determine that starting the two standby Drywell Cooling Fans (9 and 14) is the correct action because this will allow the two additional fans to help control Drywell Temperature. This is plausible if the candidate: (a) does not realize the LOCA signal shifts drywell cooling to low and secures the rest of the fans, and (b) believes that Drywell Cooling Fans 9 and 14 were not previously running prior to the 1.68 scram signal based on the NOTE preceding Step 4.2.7, which states that *Fans 9 and 14 are only required if additional cooling is desired near the Reactor Recirculation Pump Motors.* This is incorrect because the high drywell scram signal will secure the running Single-Speed Drywell Cooling Fans and shift the 4 Two-Speed Drywell Cooling Fans from High to Low speed, which will cause drywell cooling to lower and the temperature trend to rise
B. The candidate could incorrectly conclude that the drywell cooling configuration immediately following the 1.68 scram signal does not result in less Drywell Cooling, and associated rise in the rate of temperature change, perhaps because the candidate failed to recall that cooling water to the Drywell was lost and instead concludes that all that happened was the single-speed fans tripped off. This could lead the candidate to determine that all that is necessary is to restart the tripped fans in part (2). This is incorrect because the High Drywell Pressure causes all Single Speed fans to trip and cooling to isolate to the Drywell, which will require restoring drywell cooling prior to restarting Drywell Cooling Fans.
D. The candidate could correctly conclude that the drywell cooling configuration immediately following the 1.68 scram signal results in less Drywell Cooling which results in an associated rise in the rate of temperature change. The candidate could correctly recall that Drywell Cooling is interrupted and must be restored and that the Drywell Fan configuration changes. However, the candidate could incorrectly recall the operation of the Drywell Fan Mode switch, which could lead the candidate to determine that all that is necessary to restart the tripped Drywell Cooling Fans is to take the Fan Mode switches to ALL STOP and back to ALL AUTO. This is incorrect because, with the High Drywell Pressure signal still in, when the Fan Mode switch is taken back to ALL AUTO, all Single Speed fans will remain tripped, which is not the desired end state because cooling will not have been restored to the Drywell.

Reference Information:

23.415, Drywell Cooling System.
29.ESP.08, Drywell Cooling Water Restoration.

NUREG 1123 KA Catalog Rev. 2
295028 High Drywell Temperature
295028 EA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE :
295028 EA2.01 Drywell temperature

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

15	K/A Importance: 4.5			**Points: 1.00**
R15	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	91989

The plant is shutdown in MODE 3.

There is a small leak out of the torus.

Torus level is -2.5 inches and lowering slowly.

What are the required actions if any?

A. Enter 29.100.01 Sheet 2, Primary Containment Control ONLY.

B. Enter Technical Specification 3.6.2.2 Suppression Pool Water Level ONLY.

C. None. No EOP entry conditions or Technical Specifications have been exceeded.

D. Enter 29.100.01 Sheet 2, Primary Containment Control AND Technical Specification 3.6.2.2 Suppression Pool Water Level.

Answer: D

Answer Explanation:
+ or -2 inches for torus level is both the primary containment control entry condition, and the LCO limits. In addition, the EOP's are applicable for hot conditions, which Mode 3 is hot standby and the mode of applicability for TS is mode 1, 2 and 3.

LCO 3.6.2.2 Suppression pool water level shall be ≥ -2 inches and ≤ +2 inches.

APPLICABILITY: MODES 1, 2, and 3.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Only partially correct. Plausible because the candidate may not know the TS or Mode of applicability.
B. Only partially correct. Plausible because the candidate may not realize in Mode 3 the EOP entry conditions are still applicable.
C. Wrong for both TS and EOP. Plausible because the candidate may not think that in Mode 3 the TS is applicable or the EOP needs to be entered.

Reference Information:

TS 3.6.2.2.
29.100.01 sht 2

NUREG 1123 KA Catalog Rev. 2

295030	Low Suppression Pool Water Level
G2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b)(10)	Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

16	K/A Importance: 4.6/4.7			**Points: 1.00**
R16	Difficulty: 2.00	Level of Knowledge: Low	Source: BANK	91150

If there is NO source of water injecting into the RPV, which one of the following represents (1) the minimum RPV water level where Adequate Core Cooling (ACC) exists, and (2) the maximum expected clad temperature?

A. (1) -48"
(2) 1800°F

B. (1) -43"
(2) 2200°F

C. (1) -48"
(2) 2200°F

D. (1) -43"
(2) 1800°F

Answer: D

Answer Explanation:
The Minimum Zero Injection RPV Water Level (MZIRWL) is defined as the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1800°F with NO injection into the RPV. At Fermi 2, this value is calculated to be -43".

Distracter Explanation:

All distracters are incorrect and plausible if the examinee does not understand the MZIRWL requirements or if the examinee confuses the basis for the Minimum Zero-Injection RPV Water Level (MZIRWL) with the minimum allowable RPV level with one complete division of Core Spray Flow (>5725 gpm). Adequate Core Cooling is ensured as long as Core Spray requirements (5725 gpm from one full division) are satisfied and RPV water level can be restored and maintained at or above the elevation of the jet pump suctions (-48 in).

Both distractors with -48" are incorrect because that RPV water level is associated with injection from one full division of Core Spray and therefore not associated NO injection, as specified in the stem of the question.

Both distractors with 2200°F are incorrect because that value of maximum clad temperature is incorrect with regards to the MZIRWL. 2200°F is plausible because that value is the maximum allowable fuel element cladding temperature established by 10CFR50.46 for the acceptance criteria of the ECCS network for the entire spectrum of pipe break sizes for a postulated LOCA.

Reference Information:

BWROG EPG (pg B-18-60) MZIRWL

NUREG 1123 KA Catalog Rev. 2

295031	Reactor Low Water Level.
295031 EK1.	Knowledge of the operational implications of the following concepts as they apply to REACTOR LOW WATER LEVEL:
295031 EK1.01	Adequate core cooling

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b)(10)	Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

17	K/A Importance: 3.4			Points: 1.00
R17	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91967

A failure to scram has occurred and the crew is taking actions per EOP 29.100.01 Sh. 1A, RPV Control – ATWS.

Given:

- RPV pressure being maintained 900-1050 psig with SRVs.
- RPV level being maintained 0” to 50” with HPCI.
- SLC Pump A is running.
- SLC Tank level is 42” and slowly lowering.
- Rod 02-19 is at position 48 and will NOT move.
- Rod 54-43 is at position 02 and will NOT move.
- All other rods were manually inserted to position 00.
- All IRMs are on Range 7 and lowering.

Which of the following statements correctly describes the plant status?

A. The reactor IS NOT shutdown.

SLC injection can be terminated when tank level reaches 25".

B. The reactor IS shutdown.

Cooldown at < 90 °F/hr IS NOT ALLOWED UNTIL the Cold Shutdown Boron Weight has been injected.

C. The reactor IS shutdown.

Cooldown at < 90 °F/hr IS PERMITTED because the Hot Shutdown Boron Weight has been injected.

D. The reactor IS shutdown.

Cooldown at < 90 °F/hr WILL BE PERMITTED WHEN the Hot Shutdown Boron Weight has been injected.

Answer: B

Answer Explanation:
Shutdown is defined in the EPGs as “subcritical with reactor power below the heating range.”

SLC tank level < 44” is an acceptable value for HSBW and SLC tank level < 15” is an acceptable value for CSBW per EOP 29.100.01 Sh. 1A, RPV Control – ATWS, Tables 15 & 16 respectively.

In accordance with EOP 29.100.01 Sh. 1A, Step FSP-4 is a STOP SIGN stating: “WHEN Rx is S/D with no boron inj OR **Cold S/D boron weight has been inj into RPV (Table 16)**” which prevents depressurizing the RPV (Step FSP-5).

Injection of the Cold Shutdown Boron Weight (CSBW) of boron into the RPV provides adequate assurance that the reactor is and will remain shutdown. The CSBW is the least weight of soluble boron which, if injected into the RPV and mixed uniformly, will maintain the reactor shutdown under all conditions.

If any amount of boron less than the CSBW has been injected into the RPV, the core reactivity response from cooldown in a partially borated core is unpredictable and subsequent EPG steps may not prescribe the correct actions for such conditions if criticality were to occur

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Plausible because SLC injection would be allowed to be terminated if either of the 2 identified rods were driven full in or if 02-19 is brought to position 02. Also plausible if the candidate does not know the correct SLC tank levels for HSBW or CSBW. However, this option is incorrect because SLC injection cannot be terminated until the SLC tank is empty (CSBW injected).
C. Plausible because the reactor is shutdown and HSBW HAS BEEN injected. However, this option is incorrect because a cooldown is NOT permitted until CSBW is injected.
D. Plausible because the reactor is shutdown. However, this option is incorrect because HSBW has already been injected and a cooldown is NOT permitted until CSBW is injected.

Reference Information:

EOP 29.100.01 Sh. 1A (RPV Control - ATWS).
EPGs/SAGs Appendix B Vol. I (Introduction)(Definitions).

NUREG 1123 KA Catalog Rev. 2

295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or unknown.
295037 EK1.	Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN:
295037 EK1.05	3.4/3.6 Cold shutdown boron weight: Plant-Specific

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (8) Components, capacity, and functions of emergency systems.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

18	K/A Importance: 3.5			Points: 1.00
R18	Difficulty: 3.00	Level of Knowledge: Fund	Source: BANK	91990

Following a Main Steam Line Break from full power, the Offsite Release Rate has been exceeded. 3D45, CONT CENTER MAKEUP AIR RADN MONITOR UPSCALE TRIP alarms.

- Div 1 CCHVAC Makeup Air Radiation Monitor, D11-K809 reads 600 cpm.
- Div 2 CCHVAC Makeup Air Radiation Monitor, D11-K813 reads 700 cpm.

Which one of the following actions is correct per 20.000.02, Abnormal Release of Radioactive Material?

A. SHUTDOWN the running CCHVAC Supply Fan to reduce radioactive air intake.

B. SHUTDOWN the running CCHVAC Return Air Fan to reduce radioactive air intake.

C. OPERATE CCHVAC in the Recirculation Mode using ONE Emergency Makeup Fan to optimize filtration.

D. OPERATE CCHVAC in the Recirculation Mode using BOTH Emergency Makeup Fans to maximize filtration.

Answer: C

Answer Explanation:
High radiation conditions require CCHAVC in RECIRC Mode. Since the emergency fans are sized for 100% capacity, filtration is optimized by operating ONE make up Fan.

A is plausible because the normal intake for CCHVAC is isolated, when in the Recirc Mode, to minimize air intake through an unfiltered path. The candidate could relate the normally running Supply Fan with the normal intake and determine that it is necessary to shut this fan down to reduce radioactive intake. This is incorrect because the Supply Fan is needed in the Recirc mode and therefore is left running.
B is plausible because the normal intake for CCHVAC is isolated, when in the Recirc Mode, to minimize air intake through an unfiltered path. The candidate could relate the normally running Return Air Fan with the normal intake and determine that it is necessary to shut this fan down to reduce radioactive intake. This is incorrect because the Return Air Fan is needed in the Recirc mode and therefore is left running.
D is incorrect because AOP Bases state that dual fan operation reduces radionuclide residence time in the Charcoal Filter Trains, reducing filtration.

Reference: 20.000.02, page 5, Abnormal Release of Radioactive Material (Condition C) and BASES for Condition C.
ARP 3D45, Cont Center Makeup Air Radn Monitor Upscale Trip.

Plant Procedures
03D045
20.000.02

NUREG 1123 KA Catalog Rev. 2
295038 High Off-Site Release Rate
295038 EK2. Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following:
295038 EK2.07 Control room ventilation

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

19	K/A Importance: 4.4			**Points: 1.00**
R19	Difficulty: 0.00	Level of Knowledge: Fund	Source: BANK	91167

With a fire in the plant, components in the Relay Room (Fire Zone 8) have been affected.

20.000.18, Control of the Plant from the Dedicated Shutdown Panel, has been entered.

With these conditions, which one of the following sources will be established for maintaining RPV Water Level at the Dedicated Shutdown Panel?

A. Heater Feed Pump(s).

B. Standby Feedwater Pump(s)

C. Reactor Core Isolation Cooling Pump.

D. Control Rod Drive Hydraulic Pump(s).

Answer: B

Answer Explanation:
With 20.000.18 in effect, injection will be from the Standby Feedwater Pump.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Heater Feed Pumps are injection sources normally available after a scram. Heater Feed Pumps are not directed for use by 20.000.18.
C. RCIC is used as an injection source at the other panel used for shutdown outside the Main Control Room (Remote Shutdown Panel). Reactor Core Isolation Cooling Pump is not directed for use by 20.000.18 at the Dedicated Shutdown Panel.
D. Control Rod Drive Pumps can be used as an injection source at the other panel used for shutdown outside the Main Control Room (Remote Shutdown Panel). CRD Pumps are not directed for use by 20.000.18 at the Dedicated Shutdown Panel.

Reference Information:

20.000.18, Control of the Plant from the Dedicated Shutdown Panel.

NUREG 1123 KA Catalog Rev. 2

600000	Plant Fire On Site
G2.1.30	Ability to locate and operate components, including local controls

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b)(10)	Administrative, normal, abnormal, and emergency operating procedures for the facility.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

20	K/A Importance: 3.6			**Points: 1.00**
R20-VER 2	Difficulty: 0.00	Level of Knowledge: Fund	Source: BANK	97831

During startup, the plant is operating at 27% power. The Systems Operations Center notifies Fermi 2 that there is potential for degraded grid conditions due to erratic reactive loading in Monroe County. 4D132, Generator Frequency High/Low alarms, and the CRLNO reports that frequency is currently 57.6 Hz.

Which of the following actions is required per 20.300.GRID, Grid Disturbance AOP, and why?

A. Reduce generator load to raise frequency.

B. Start CTG 11-1 to minimize the impact of a potential loss of the 120Kv Mat.

C. Trip the turbine to protect the plant from conditions that might damage the Main Generator.

D. Place the Mode Switch in SHUTDOWN to protect the plant from conditions that might damage the Main Generator.

Answer: C

Answer Explanation:
With generator frequency less than 57.8 Hz and power less than 30%, 20.300.GRID directs tripping the turbine.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Reducing load could cause output frequency to raise when torque of the prime move exceeds torque of the load. However, the frequency given in the stem of the question requires a turbine trip.
B. This is not required but could be used for supplemental power and taking additional load by the CTG could take load off of the Main Turbine thus allowing frequency to raise and/or starting the CTG could stabilize the grid.
D. The AOP override requires placing the Mode Switch in Shutdown when <57.8 Hz. However, this is incorrect because reactor power is less than 30%.

Reference Information:

20.300 Grid

NUREG 1123 KA Catalog Rev. 2
700000 Generator Voltage and Electric Grid Disturbances
700000 AK3. Knowledge of the reasons for the following responses as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES:
700000 AK3.02 3.6/3.9 Actions contained in abnormal operating procedure for voltage and grid disturbances

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

21	K/A Importance: 3.2			Points: 1.00
R21-VER 2	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	97832

Given the following conditions:

- The plant is at 100% power.
- 20.125.01, Loss of Condenser Vacuum, has been entered.
- Condenser Vacuum is 2.3 psia and continuing to rise.

What is the basis for reducing reactor power in accordance with 20.125.01?

Reducing reactor power will...

A. reduce the temperature of the steam generated and passed to the condenser.

B. reduce Fission Product Gas generation and subsequent build up in the condenser.

C. allow placing a MVP in service to aid in the removal of air and other non-condensable gases.

D. reduce the heat input to the condenser to attempt to stay within the heat removal capability of the condenser.

Answer: D

Answer Explanation:
From AOP 20.125.01 Bases: “If condenser vacuum cannot be stabilized between 0.7 and 2.5 psia this condition directs a rapid power reduction in an attempt to lower the heat input to the condenser to within the heat removal capabilities to stabilize condenser vacuum."

Distractor Explanation:
Distractors are incorrect and plausible because:

A. a candidate could believe that the power reduction will cause a reduction in temperature. However, this option is incorrect for the same reason as shown above.
B. FP gas generation would reduce as power reduces. However, this option is incorrect for the same reason as shown above.
C. a rapid power reduction will reduce power below 100% and Condition C address placing MVP(s) in service. This is incorrect because rapid power reduction from 100% will lower power to approximately 55%, which is not low enough to support MVP operation

Reference Information:

AOP 20.125.01 (Loss of Condenser Vacuum)
AOP 20.125.01 BASES

NUREG 1123 KA Catalog Rev. 2
295002 Loss of Main Condenser Vacuum
295002 AK3. Knowledge of the reasons for the following responses as they apply to LOSS OF MAIN CONDENSER VACUUM :
295002 AK3.09 3.2/3.2 Reactor power reduction

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

22	K/A Importance: 4.0			Points: 1.00
R22	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	91468

The Plant is at 100% power when the controlling pressure regulator setpoint drifts high.

Reactor Pressure stabilizes at 1085 psig with no operator actions.

Which of the following is required?

A. Enter 29.100.01 Sheet 1A, RPV Control-ATWS.

B. Enter LCO 3.4.3 Condition A, Safety Relief Valves.

C. Enter LCO 3.4.11 Condition A, Reactor Steam Dome Pressure.

D. Enter LCO 3.3.4.1 Condition A, Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation.

Answer: C

Answer Explanation:
LCO 3.4.11 is not met. The LCO is the reactor steam dome pressure shall be < 1045 psig. Since reactor Pressure is 1085 the LCO is not met and 3.4.1 Condition A actions must be taken.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. RPV control entry on high pressure is >1093 psig. The entry condition is not met and therefore entry is not required. This is plausible because a candidate may think the reactor should have scrammed on high pressure and therefore ATWS control is required to be entered.
B. LCO 3.4.3 is met. The LCO is the safety function of 11 SRVs shall be OPERABLE. All SRV's are operable. This is plausible because a candidate may think an SRV should have lifted and did not therefore the LCO is not met. The lowest setpoint for an SRV is 1135 PSIG.
D. LCO 3.3.4.1 is met. The LCO is two channels per trip system for each ATWS-RPT instrumentation Function listed below shall be OPERABLE: b. Reactor Vessel Pressure-High. The high-pressure trip is still operable. This is plausible because a candidate may think an ATWS high pressure trip should have occurred. The setpoint is 1153 psig and therefore the trip will not have happened at 1085 psig.

Reference Information:

TS 3.4.11.a

NUREG 1123 KA Catalog Rev. 2

295007	High Reactor Pressure
G2.2.22	Knowledge of limiting conditions for operations and safety limits

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b) (5)	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

23	K/A Importance: 3.6			Points: 1.00
R23	Difficulty: 4.00	Level of Knowledge: High	Source: BANK	91469

The Mode Switch has been taken to shutdown at 30% power for the start of RF-19. The following plant conditions currently exist:

- Post Scram Feedwater Logic actuated on the Scram.
- Reactor Pressure has been lowered to 500 psig.
- 3D148, FW/MTG RPV H2O Level 8 Trip is in alarm.
- RPV water level is 216" and slowly rising.
- 20.000.23, High RPV Water Level has been entered.

Which of the following Reactor Water Level Control actions should be taken, in accordance with the High RPV Water Level AOP, to mitigate these conditions?

A. Lower SETPOINT on C32-R618, Master Feedwater Level Controller.

B. Lower DEMAND on C32-R620, N21-F403 RPV Startup LCV Controller.

C. Lower DEMAND on C32-R616A (B), N (S) Reactor Feed Pump Controllers.

D. Lower SETPOINT on N21-K858A (B), N (S) Reactor Feed Pump Min Flow Controllers.

Answer: B

Answer Explanation:
The conditions given in the stem of the question indicate that a high RPV water level condition has occurred. AOP 20.000.23, High RPV Water Level, provides actions that can be taken, for a high RPV water level condition, when leakage past the Startup Level Control Valve (SULCV) is suspected. For this condition, the operator should attempt to lower the demand on the SULCV Controller to minimum (-5) to attempt to fully seat the valve. The candidate should recognize that this action should be taken for the conditions given in the stem of the question.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. The C32-R618, Master Feedwater Level Controller, is the controller that is normally manipulated to control components associated with the Feedwater Control System, and the candidate could assume that lowering the setpoint of this controller would have the desired impact. However, when a scram occurs, Post Scram Feedwater Logic actuates as described in ARP 3D157, Post Scram FW Logic Actuated. One of the results of this is that the C32-R616A and B (N and S RFP Controllers) get set to MANUAL mode. When this occurs, the C32-R618 also gets set to MANUAL, so it no longer controls the RFP speeds. Also, as stated in Section 1.1 of 23.107, this controller can NOT be placed in AUTO until one of the RFP controllers is placed in AUTO, so lowering its setpoint will not have any impact.
C. After a scram, the C32-R616A and B (N and S RFP Controllers) get set to MANUAL mode. When this occurs, the operator can adjust the output of these controllers to change RFP speed. The candidate could determine that lowering the output of these controllers will have the desired impact. However, the stem of the question states that RPV level is 216", which is above the High RPV Water Level Trip Setpoint of 214" (Level 8), so the RFPs will be tripped and lowering their controller outputs will have no impact.
D. The candidate could determine that leakage is occurring through the RFP Min Flow lines, which could be impacting RPV Water Level. The candidate could assume that lowering the Setpoint of these controllers will have the desired impact. However, the stem of the question states that RPV level is 220", which is above the High RPV Water Level Trip Setpoint of 214" (Level 8), so the RFPs will be tripped. When an RFP trips, its Minimum Flow Line motor operated valve (MOV) goes shut to isolate the minimum flow line, so adjusting these controllers will have no impact.

Reference Information:
20.000.32, High RPV Water Level AOP.
23.107, Reactor Feedwater and Condensate Systems, Section 1.1, System Description for the Feedwater Control System.
ARP 3D157, Post Scram FW Logic Actuated.

NUREG 1123 KA Catalog Rev. 2
295008 High Reactor Water Level
295008 AK2. Knowledge of the interrelations between HIGH REACTOR WATER LEVEL and the following:
295008 AK2.03 3.6/3.7 Reactor water level control

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILO 2018 Exam
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

24	K/A Importance: 3.1			**Points: 1.00**
R24-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	97833

Given the following conditions:

- The unit was S/D due to a small unidentified leak in the Drywell.
- Average Drywell temperature is 146°F and slowly going up.
- Drywell pressure is 1.48# and slowly going up.
- Torus pressure is 1.44# and slowly going up.
- 29.ESP.07, Primary Containment Venting, has been directed from EOP 29.100.01, Primary Containment Control.

Which of the following is the preferred vent path for the Drywell?

A. Via the 1”, 6”, and/or 24” vent paths, in any order/combination, through RBHVAC ONLY.

B. Via the 1”, then 6”, and then the 24” vent paths, as necessary, through RBHVAC ONLY.

C. Via the 1”, 6”, and/or 24” vent paths, in any order/combination, through RBHVAC or SGTS.

D. Via the 1”, then 6”, and then the 24” vent paths, as necessary, through RBHVAC or SGTS.

Answer: D

Answer Explanation:
29.ESP.07 (Primary Containment Venting) section 1.0, directs venting first by opening the 1” Vent Path Valves. IF "Drywell Pressure is not being reduced as fast as necessary", the procedure continues on to open the 6" Vent Path Valves. IF the 6" Vent Path Valves are still not enough, the procedure continues on to open the 24" Purge Isolation Valve.

The procedure allows venting through either RBHVAC (preferred) or SGTS (if RBHVAC is unavailable).

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Plausible because 29.ESP.07 gives direction for venting using all 3 of the possible vent path sizes (1”, 6”, and 24”). However, this option is incorrect because 29.ESP.07 provides specific direction regarding the order of use as described above.
B. Plausible because the preferred vent path is via RBHVAC; However, the ESP does allow venting through SGTS if RBHVAC is unavailable. The candidate could choose this option because it is preferable to NOT vent containment through SGTS because, if the leak worsens, high DW Pressure (>1.68 psig) could render SGTS unavailable.
C. Plausible because 29.ESP.07 gives direction for venting using all 3 of the possible vent path sizes (1”, 6”, and 24”). However, this option is incorrect because 29.ESP.07 provides specific direction regarding the order of use as described above.

Reference Information:

ESP 29.ESP.07 (Primary Containment Venting)

NUREG 1123 KA Catalog Rev. 2
295010 High Drywell Pressure
295010 AA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE:
295010 AA1.05 3.1/3.4 Drywell/suppression vent and purge

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b) (7)	Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
10 CFR 55.41(b)(10)	Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

25	K/A Importance: 3.6			**Points: 1.00**
R25-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	97834

The plant was operating at 50% power when an anomaly resulted in an uncontrolled speed increase of BOTH Reactor Recirculation MG Sets. Speed has increased greater than 10% on both MG Sets.

What is the configuration of the plant after immediate actions of 20.138.03, Uncontrolled Recirc Flow Change, are taken?

A. The Mode Switch is in SHUTDOWN.
   Both Recirc Pumps are operating.

B. The Mode Switch is in SHUTDOWN.
   Both Recirc Pumps are tripped.

C. The plant is operating at a lower power level.
   One Recirc Pump is tripped.

D. The plant is operating at a lower power level.
   Both Recirc Pumps are operating.

Answer: C

Answer Explanation:
Per the Immediate Actions, trip one of the affected RRMG sets, which would result in the plant operating at a lower power level.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Incorrect because one RRMG must be tripped, Mode Switch is not in SHUTDOWN.
B. Incorrect because must trip one RRMG, Mode Switch is not in SHUTDOWN, but if both sets tripped, must place Mode Switch in SHUTDOWN.
D. Incorrect because although the plant will be operating at a lower power level, it is due to tripping one RRMG set. The correct action, given the stated conditions, is to immediately trip one of the affected RRMG sets.

Reference Information:

20.138.03, Uncontrolled Recirc Flow Change.

NUREG 1123 KA Catalog Rev. 2
295014 Inadvertent Reactivity Addition
295014 AA1. Ability to operate and/or monitor the following as they apply to INADVERTENT REACTIVITY ADDITION:
295014 AA1.02 3.6/3.8 Recirculation flow control system

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

26	K/A Importance: 3.4			**Points: 1.00**
R26-VER 2	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	97835

The plant is shutdown in MODE 4 with RHR in Shutdown Cooling (SDC).

A Group 4 Isolation of the E1150-F009, RHR SDC Inboard Suction Isolation Valve occurs.

The outboard valve is still open.

Which of the following could cause this inadvertent isolation?

Failure of Trip Channels __(1)__ for the Reactor Vessel Low Water Level - __(2)__ Instruments.

A. (1) A and B
(2) Level 3

B. (1) C and D
(2) Level 3

C. (1) A and B
(2) Level 2

D. (1) C and D
(2) Level 2

Answer: A

Answer Explanation:
Choice A is correct because per 23.601, “Instrument Trip Sheets” (Page 11), A and B trips Group 4: E1150-F009 from the Reactor Vessel Low Water Level – Level 3 Instruments.

Distractor Explanation:
Distractors are incorrect and plausible because:

B. Plausible if the examinee correctly recalls that the Level 3 instruments cause isolation of the SDC valves but incorrectly recalls which NSSSS logic trips the outboard valves. Incorrect because C and D trip the outboard valves.
C. Plausible if the examinee incorrectly recalls that the Level 2 instruments input into SDC isolation logic, but correctly recalls that A and B is the correct logic. Incorrect because the Level 3 instruments cause isolation of SDC.
D. Plausible if the examinee incorrectly recalls that the Level 2 instruments input into SDC isolation logic and incorrectly recalls which NSSSS logic trips the inboard valves. Incorrect because the Level 3 instruments cause isolation of SDC and the correct logic is C and D trip the outboard valves.

Reference Information:

23.601, “Instrument Trip Sheets" Page 11.

NUREG 1123 KA Catalog Rev. 2
295020 Inadvertent Containment Isolation
295020 AA2 Ability to determine and/or interpret the following as they apply to INADVERTENT CONTAINMENT ISOLATION:
295020 AA2.06 Cause of isolation.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

27	K/A Importance: 3.9			**Points: 1.00**
R27	Difficulty: 3.00	Level of Knowledge: High	Source: BANK	89995

The control room receives annunciators 8D46 and 17D46, Div I and II Reactor Building Pressure High/Low, during a severe thunderstorm and high winds in the area.

The CRLNO observes that both the T41-R800A and B, Div 1 and 2 CR and RB Differential Pressure Recorders indicate RB differential pressure is reading +0.5 inches WC.

Which of the following indicates the response of secondary containment ventilation to these conditions as well as the reason for this response?

A. The RBHVAC Supply and Exhaust Fans will automatically trip to prevent damage to RBHVAC ductwork.

B. The RB Supply Fan blades will modulate to restore a negative differential pressure to prevent the unmonitored release of potentially contaminated air from Secondary Containment.

C. The RB Exhaust Fan inlet dampers will modulate to restore a negative differential pressure to prevent the unmonitored release of potentially contaminated air from Secondary Containment.

D. The RBHVAC Supply and Exhaust Fans will automatically trip and SGTS will automatically start to prevent damage to RBHVAC ductwork AND to restore a negative differential pressure to prevent the unmonitored release of potentially contaminated air from Secondary Containment.

Answer: C

Answer Explanation:
The Secondary Containment Atmosphere Pressure Monitoring System (which is part of the RBHVAC System) modulates the inlet dampers to the exhaust fans to maintain a differential pressure in the Reactor Building with respect to the outside air of -1/4" H2O.
With high wind conditions, RB pressure can increase and cause high RB pressure alarms to come in. The system will modulate the position of the exhaust fan dampers to restore negative RB pressure to prevent an unmonitored release of potentially contaminated air from Secondary Containment.

Distractor Explanation:

A. Is plausible because the RBHVAC Supply and Exhaust fans do trip at high RB pressure, but not until 2.5 inches WC. For a pressure this high, it is plausible to assume the fans would trip to protect the integrity of the RBHVAC ductwork.
B. Is plausible because some fans for various ventilation systems at Fermi do have, or had in the past, variable blading to control air flow. Also, the CCHVAC Compressors have variable inlet vanes to control compressor capacity. Additionally, some ventilation systems modulate the inlet dampers to their Supply Fans to maintain building pressure, but not RBHVAC. The reason for restoring RB pressure in this response is correct. Note: 2 (of 4) validators selected this response during validation, which lends further plausibility to this distractor.
D. Is plausible because the RBHVAC Supply and Exhaust fans do trip at high RB pressure, but not until 2.5 inches WC. Additionally, most RBHVAC system trips occur due to Secondary Containment Isolations, which also result in an automatic start of SGTS. The reasons behind this response are plausible because it is desirable to restore negative building pressure to prevent an unmonitored release from Secondary Containment and the candidate could assume that the high RB pressure could damage the RBHVAC ductwork.

Reference Information:
23.426 RBHVAC System SOP, Section 1.1 System Description for explanation of why negative pressure is maintained in the RB as well as a list of RBHVAC fan trips.
T41-00 RBHVAC System Design Basis Document, Section 4.1.8.1.

NUREG 1123 KA Catalog Rev. 2
295035 Secondary Containment High Differential Pressure
295035 EK1 Knowledge of the operational implications of the following concepts as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE :
295035 EK1.01 3.9/4.2* Secondary containment integrity

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

28	K/A Importance: 3.5			**Points: 1.00**
R28	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91188

Assume the following are the ONLY available injection sources:

- RHR Pumps A, B, C and D.
- Core Spray Pumps A and B.

Which of the following adequate core cooling methods is(are) possible for the entire spectrum of postulated pipe breaks?

A. Core Submergence ONLY.

B. Core Submergence AND Spray Cooling ONLY.

C. Core Submergence AND Steam Cooling ONLY.

D. Core Submergence, Spray Cooling AND Steam Cooling.

Answer: C

Answer Explanation:
If all high pressure RPV injection is lost, RHR, by itself, could maintain core submergence, after RPV depressurization, with no other injection sources. Depending on the size of the a LOCA, RHR injection can be used to partially cover the core above the Minimum Steam Cooling RPV Water Level (MSCRWL), at which time adequate core cooling would be assured through steam cooling. With the given CS pumps available, Spray Cooling is NOT a viable option because one FULL division of Core Spray (Pumps A and C for Div 1, or Pumps B and D for Div 2) are NOT available.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Core Submergence is the primary method used to assure ACC and is supported by the RHR LPCI and Core Spray systems. However, submergence is not the ONLY method possible with the conditions given in the stem of the question.
B. Spray Cooling is a valid method used to assure ACC. However, spray cooling is not possible in the case where 2/3 core height coverage is being maintained, with the CS pumps given, because one FULL division of Core Spray (Pumps A and C for Div 1, or Pumps B and D for Div 2) are NOT available.
D. Spray Cooling is a valid method used to assure ACC. However, spray cooling is not possible in the case where 2/3 core height coverage is being maintained, with the CS pumps given, because one FULL division of Core Spray (Pumps A and C for Div 1, or Pumps B and D for Div 2) are NOT available.

Reference Information:

23.205; TECH SPECS
BWROG Appendix B, Vol I, Definition of Adequate Core Cooling methods.

NUREG 1123 KA Catalog Rev. 2
203000 RHR/LPCI: Injection Mode
203000 K5. Knowledge of the operational implications of the following concepts as they apply to RHR/LPCI:
203000 K5.02 Core cooling methods

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (8) Components, capacity, and functions of emergency systems.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

29	K/A Importance: 3.4			Points: 1.00
R29	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	90007

The plant has been shutdown for 24 hours following 300 days of power operation with the following conditions:

- RHR Pump C is operating in Shutdown Cooling Mode.
- RHRSW Pumps A AND C are supplying the Div 1 RHR Heat Exchanger.
- RPV Level is 230 inches.

Which of the following actions should be taken for an over-current trip of RHRSW Pump C?

A. Throttle closed E1150-F068A, Div 1 RHR HX Serv WTR Outlet FCV, to establish proper RHRSW flow AND enter 20.205.01, Loss of Shutdown Cooling.

B. Throttle open E1150-F068A, Div 1 RHR HX Serv WTR Outlet FCV, to maximize service water flow AND cross tie RHRSW per 23.208, RHR Complex Service Water System.

C. Fully close E1150-F048A, RHR Heat Exchanger Bypass Valve, to increase heat exchanger load AND establish decay heat removal per 23.800.05, Alternate Remote Coolant Circulation and Decay Heat Removal.

D. Fully open E1150-F048A, RHR Heat Exchanger Bypass Valve, to reduce heat exchanger load AND establish decay heat removal per 23.800.05, Alternate Remote Coolant Circulation and Decay Heat Removal.

Answer: A

Answer Explanation:
Correct Answer : A
Justification: RHRSW valve is throttled closed to meet pump DP requirements. Both RHRSW pumps are needed for SDC per 20.205.01Correct Answer : A
Justification: RHRSW valve is throttled closed to meet pump DP requirements. Both RHRSW pumps are needed for SDC per 20.205.01Correct Answer : A
Justification: RHRSW valve is throttled closed to meet pump DP requirements. Both RHRSW pumps are needed for SDC per 20.Correct Answer : A
Normal RHRSW System operation is with two pumps operating and E1150-F068A(B) fully open. SOP 23.208, RHR Complex Service Water Systems, Precaution and Limitation 3.2.3 states: *"When only one RHR Service Water Pump is in operation with E1150-F068A(B), DIV 1(2) RHR Hx Serv Wtr Outlet FVC open, RHR Service Water flow should be maintained 5400 gpm to 6300 gpm to prevent excessive vibration of E1150-F068, and to prevent pump runout."* The overcurrent trip of RHRSW Pump C brings in overhead annunciator (OHA) 1D45, DIV 1 RHR SERV H2O PUMP A/C MTR TRIPPED, which directs entry into 20.205.01, Loss of Shutdown Cooling, if the RHR System was operating in Shutdown Cooling.

Distractor Explanation:
B. Plausible if the applicant incorrectly believes that RHRSW subsystems can be cross-tied to provide additional RHRSW flow. The cross-tie is provided to connect the discharge of the Div 2 RHRSW pumps to the Div 2 RHR Heat Exchanger shell side discharge piping to provide a method of flooding the Reactor Vessel or Primary Containment following a postulated LOCA with a minimum flowrate of 3250.
C&D. Plausible if the applicant incorrectly believes that the conditions have been met to establish decay heat removal per 23.800.5, Alternate Remote Coolant Circulation and Decay Heat Removal. SOP 23.800.5, Prerequisite 4.1.3 states: *"Alternate Methods of Decay Heat Removal are to be used only if RHR Shutdown Cooling is not available, and only until normal RHR Shutdown Cooling can be reestablished."* Shutdown Cooling capability has not been lost. Plausibility is enhanced by the fact that ALT Decay Heat removal procedures are directed from Loss of SDC AOP 20.205.01, Condition I. Operation of E1150-F048A, RHR Heat Exchanger Bypass Valve, is also plausible since RHR operates in the Suppression Pool Cooling mode to remove heat from the containment during the Alternate Coolant Circulation and Decay Heat Removal Method.

Reference Information:

ARP 1D45, ARP 2D47, 23.205, 23.208

NUREG 1123 KA Catalog Rev. 2
205000 RHR Shutdown Cooling Mode
205000 A4. Ability to manually operate and/or monitor in the control room:
205000 A4.04 Heat exchanger cooling water valves

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILO 2013 Exam
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

30	K/A Importance: 4.3			Points: 1.00
R30	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	91208

When starting an RHR pump in the Shutdown Cooling mode of operation:

(1) Why does 23.205, RHR System, direct immediately opening the E1150-F611A(B) Div 1(2) RHR LPCI Bypass Valve?

Once the pump is started and flow established:

(2) What should you immediately verify and why?

A. (1) Prevent tripping the RHR pump due to no discharge flowpath.
(2) Flow does not exceed 10,000 gpm to prevent pump runout.

B. (1) Prevent running the RHR pump against shutoff head for too long.
(2) Flow does not exceed 10,000 gpm to prevent pump runout.

C. (1) Prevent tripping the RHR pump due to no discharge flowpath.
(2) E1150-F007A(B) Div 1(2) RHR Pump Min Flow Valve remains closed to prevent loss of RPV level.

D. (1) Prevent running the RHR pump against shutoff head for too long.
(2) E1150-F007A(B) Div 1(2) RHR Pump Min Flow Valve remains closed to prevent loss of RPV level.

Answer: D

Answer Explanation:
Per 23.205, RHR System SOP, Section 6.1, Placing Division 1 RHR in Shutdown Cooling Mode with Flushes Step 18 directs the following:

18. Continuously monitor Reactor Water Level while performing the following steps:
a. Perform the following steps in rapid order:
1) Start E1102-C002A (C), Div1 RHR Pump A (C).
2) Immediately open E1150-F611A, Div 1 RHR LPCI Bypass Vlv (orificed to flow rate of 10,000 gpm).
b. If E1150-F007A, Div 1 RHR Pmps Min Flow Vlv, opens, close or verify closed E1150-F007A when loop flow exceeds 6900 gpm.

The examinee must recall a caution before these steps that provides the reason for immediately opening the E1150-F611A once the pump is started. The Caution states: Do not run RHR Pump(s) against shutoff head for more than two minutes. The examinee must also determine that Step b is then performed to verify that the E1150-F007A(B) closes because, when this valve is open, a continuous flowpath exists between the pump suction (aligned to the RPV when in SDC mode) to the Torus, therefore RPV level will drop.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. (1) This would be correct if the pump was interlocked with valves in its discharge flow path that would cause a pump trip if a discharge path was not established in a certain time. This is plausible because the RHR pumps have several interlocks with valves in the system that cause pump trips if not open. This distractor is also plausible because it is true for other systems at Fermi 2, such as the RWCU system, which has a low-flow trip that is disabled for 10 seconds on pump start and if RWCU system flow is not established in 10 seconds, the RWCU pump will trip. It is plausible that one of these types of design features is installed to protect the pump against minimum flow by preventing it from running without a discharge path established. This distractor is incorrect because such a trip does not exist in the RHR system at Fermi 2.
(2) When in SDC the RHR pumps are more susceptible to runout conditions due to pumping against low RPV pressure (<89.5 psig maximum and normally much lower). This distractor is incorrect because the flowpath through the LPCI Bypass Valve is limited to 10,000 gpm, by orifices in the line, to prevent runout.

B. (1) This part is correct.
(2) When in SDC the RHR pumps are more susceptible to runout conditions due to pumping against low RPV pressure (<89.5 psig maximum and normally much lower). This distractor is incorrect because the flowpath through the LPCI Bypass Valve is limited to 10,000 gpm, by orifices in the line, to prevent runout.

C. (1) This would be correct if the pump was interlocked with valves in its discharge flow path that would cause a pump trip if a discharge path was not established in a certain time. This is plausible because the RHR pumps have several interlocks with valves in the system that cause pump trips if not open. This distractor is also plausible because it is true for other systems at Fermi 2, such as the RWCU system, which has a low-flow trip that is disabled for 10 seconds on pump start and if RWCU system flow is not established in 10 seconds, the RWCU pump will trip. It is plausible that one of these types of design features is installed to protect the pump against minimum flow by preventing it from running without a discharge path established. This distractor is incorrect because such a trip does not exist in the RHR system at Fermi 2.
(2) This part is correct.

Reference Information:

23.205 RHR System SOP.

NUREG 1123 KA Catalog Rev. 2
205000 RHR Shutdown Cooling Mode
G2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (8) Components, capacity, and functions of emergency systems.

Fermi 2 NRC Exam Usage
ILO 2019 Exam
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

31	K/A Importance: 4.0			**Points: 1.00**
R31	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91248

Given the following:

- The unit automatically scrammed following a steam leak in the Drywell and Loss of Offsite Power.
- After the scram, RPV level rose to 220 inches.
- RPV level is presently 180 inches and slowly lowering.
- Drywell Pressure is 3.5 psig and continuing to rise.

WHICH ONE of the following actions is required to initiate and inject into the RPV with HPCI?

A. No action is required. HPCI will re-inject when water level drops below the Scram setpoint.

B. Reset the HPCI Isolation, HPCI will re-inject when water level drops below the Scram setpoint.

C. Depress the HPCI High Level Reset pushbutton, HPCI will re-inject immediately.

D. Arm and Depress the HPCI Manual Initiation button, HPCI will re-inject immediately.

Answer: C

Answer Explanation:
The HPCI high water level trip can be reset when level is less than Level 8 by depressing the High Level Reset Pushbutton. If an auto initiation signal (DWP >1.68# or Level<Level 2 (110.8”)) is present, HPCI will restart.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Plausible if the candidate believes the high-level trip auto-resets like the other HPCI trips. Incorrect because the “trip reset” button must be reset, or level must drop to Level-2 (110.8").
B. Plausible if the candidate believes the high-level condition causes an isolation to protect the steam lines from water intrusion. Incorrect because Level 8 does not cause a HPCI Isolation.
D. Plausible if the candidate believes Arm and Depress will override the trip (or isolation if they think one exists). Incorrect because the “trip reset” button must be reset for HPCI to inject immediately.

Reference Information:

23.202 (HPCI SOP)
ARP 2D93 (HPCI Turbine Tripped)
ST0021001 (RPV Instrumentation Student Text)
ST0039001 (HPCI Student Text)

NUREG 1123 KA Catalog Rev. 2
206000 HPCI System.
206000 A2. Ability to (a) predict the impacts of the following on the HIGH PRESSURE COOLANT INJECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
206000 A2.01 4/4 Turbine trips: BWR-2,3,4

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

32	K/A Importance: 4.2			Points: 1.00
R32	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91249

Given the following:

The following alarms are in:

- 1D35 NSSSS REAC VESSEL H2O LEVEL L2 CH A/C TRIP
- 2D32 NSSSS REAC VESSEL H2O LEVEL L2 CH B/D TRIP
- 2D48 HPCI/RCIC SUCTION TRANS CST LEVEL LOW
- 2D61 HPCI TURBINE EXH DIAPH PRESSURE HIGH

The following conditions currently exist:

- RPV pressure is 974 psig and steady
- RPV level is 100” and slowly lowering
- Drywell Pressure is 1.0 psig and steady
- E4150-F001, HPCI Steam Supply Inlet Valve, is OPEN
- E4150-F004, HPCI CST Suction Isolation Valve, is CLOSED
- E4150-F042, HPCI Torus Suction Inboard Isolation Valve, is CLOSED
- E4150-F079, HPCI Exhaust Vacuum Breaker Inboard Isolation Valve, is OPEN

Which of the following is true regarding the status of HPCI?

A. E4150-F001 should be CLOSED.

B. E4150-F042 should be OPEN.

C. E4150-F079 should be CLOSED.

D. All valves listed are in the expected positions for the conditions given.

Answer: D

Answer Explanation:
HPCI is automatically tripped, isolated, and inhibited from subsequent restart upon high area temperature, high steam line flow, **high turbine exhaust diaphragm pressure**, or low HPCI steam supply pressure.

When an isolation signal is received, the following events occur:

- Valves F002, F600 and F003 close, shutting off the steam supply to the HPCI Turbine and isolating the steam line. **Valve F001 remains open unless closed by operator action**.
- Valves **F041 and F042 close to isolate the water line to the Suppression Pool**.
- **Isolation valves F079 and F075 in the HPCI vacuum breaker line remain open** to connect the air space in the Suppression Pool with the HPCI Turbine exhaust line. **F075 and F079 close automatically upon receipt of high Drywell pressure (1.68#) and low HPCI steam supply pressure (100#) signals**

While the CST is the preferred water source for HPCI, makeup water can be supplied from the Suppression Pool if the water in the **CST falls below a minimum level (32")** or Suppression Pool water level is high (3.5"). In these situations, **HPCI Pump suction automatically transfers to the Suppression Pool.**

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Plausible if the candidate recognizes that a HPCI Isolation signal exists. However, this is incorrect because the F001 (Turbine Steam Inlet Valve) remains OPEN.
B. Plausible if the candidate recognizes that a HPCI CST/Torus suction transfer signal exists. However, this is incorrect because F042 (Booster Pump Inbd Torus Suction Iso Valve) is CLOSED due to the HPCI Isolation signal. The F004 strokes closed upon receipt of the HPCI CST/Torus suction transfer signal resulting from CST low level.
C. Plausible if the candidate recognizes that a HPCI Isolation signal exists. However, this is incorrect because F079 (Turbine Exh Line Inbd Vac Breaker Iso Valve) in the HPCI vacuum breaker line remains open to connect the air space in the Suppression Pool with the HPCI Turbine exhaust line and its isolation signals (low steam line pressure and high D/W pressure) do not exist.

Reference Information:

23.202 (HPCI SOP).
ARP 2D48 (HPCI-RCIC Suction Transfer CST Low Level).
ARP 2D49 (HPCI Isolation Trip – Logic A).
ARP 2D53 (HPCI Isolation Trip – Logic B).
ARP 2D61 (HPCI Turbine Exhaust Diaphragm Pressure High).
ARP 2D93 (HPCI Turbine Tripped).
ST0016001 (Containment Systems Student Handout).
ST0021001 (RPV Instrumentation Student Handout).
ST0039001 (HPCI Student Handout).

NUREG 1123 KA Catalog Rev. 2

206000	HPCI System.
G2.4.46	Ability to verify that the alarms are consistent with the plant conditions

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b) (7)	Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

NRC Question Use (ILT 2021)

Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

33	K/A Importance: 2.9			**Points: 1.00**
R33	Difficulty: 3.00	Level of Knowledge: High	Source: BANK	90029

With the plant operating at full power, a relay malfunction resulted in the following annunciators:

- 1D1, DIV I CSS ACTUATED.
- 1D48, ADS ECCS PUMP CH A PERMISSIVE.

What will be the affect, if any, of this failure on Emergency Diesel Generators?

Emergency Diesel Generators 11 and 12 will...

A. remain in STANDBY.

B. START and LOAD with ALL trips active.

C. START and LOAD with ONLY essential trips active.

D. START and OPERATE UNLOADED with ONLY essential trips active.

Answer: D

Answer Explanation:
Annunciator 1D1 indicates Div 1 Core Spray Logic is activated. CS logic Relay(s) 12a and/or 12c in panel H11P626 has/have repositioned.
If one of these is the only relay that has failed, there is no CSS pump start, and therefore 1D48 will not be in alarm.
However, alarm 1D48 is an indication that CSS have started. Either relay K9A or K10A in panel H11P628 has repositioned. Per I-2095-06, this indicates that the required ECCS pump starts have occurred to satisfy the ADS interlock for Division 1. (Either 1 RHR or both CS pumps.)
The start signals for the CSS pumps require H11P626 K10A to be energized. The path that energizes the K10A relay also energizes the K11A relay, unless the K24A relay is energized by the diesel LOCA signal bypass. (I-2215-02). The K11A relay provides the signal to place the Division 1 EDGs in Emergency mode.
With no LOP sensed, the EDGs will operate UNLOADED, Core Spray Pumps will operate on transformers. The Emergency Start signal will bypass non-essential trips, ONLY essential trips will be active.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. would be true if NO start signal were generated by Core Spray Logic.
B. would be true if both EDGs were MANUALLY started and loaded.
C. would be true with a concurrent LOP condition.

Reference Information:

I-2095-06, I-2215-02

Objective Link: LP-OP-315-0165-A021

NUREG 1123 KA Catalog Rev. 2

209001	Low Pressure Core Spray System.
209001 K3.	Knowledge of the effect that a loss or malfunction of the LOW PRESSURE CORE SPRAY SYSTEM will have on following:
209001 K3.03	Emergency generators

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b) (7)	Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

34	K/A Importance: 3.7			**Points: 1.00**
R34	Difficulty: 2.00	Level of Knowledge: Low	Source: BANK	90030

Which of the following instruments would be adversely affected by a break in the SLC injection piping within the Reactor Pressure Vessel?

A. CRD Drive Water Pressure.

B. Core Spray Discharge Pressure.

C. Core Plate Differential Pressure.

D. Calibrated Jet Pump Differential Pressure.

Answer: C

Answer Explanation:
Note: Refer to M-5701-2, Nuclear Boiler System FOS, Grid D5 for this explanation.

The SLC system penetration and piping provides above core plate pressure for the Core Spray line break detection instrumentation from the outside pipe. The same penetration is also used for Core Plate DP, Jet Pump DP: and CRD Drive Water DP, from the inside pipe (SLC discharge sparger pipe).

A break in the SLC injection piping would adversely affect the Core Plate Differential Pressure instrument, which is the correct answer for this question.

This break would also adversely affect the CRD Drive Water Differential Pressure, Core Spray Break Detection and non-calibrated Jet Pump Differential Pressure instruments.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. The candidate could incorrectly recall that the SLC penetration impacts the CRD Drive Water Pressure instrument, which is incorrect but plausible because this SLC penetration provides the RPV Pressure (above Core Plate pressure) input to the CRD Drive Water Differential Pressure instrument and not the Drive Water Pressure instrument.
B. The candidate could incorrectly recall that the SLC penetration impacts the Core Spray Discharge Pressure instrument, which is incorrect but plausible because this SLC penetration provides the RPV Pressure (above Core Plate pressure) input to the Core Spray Break Detection (differential pressure) instrument and not the Core Spray Discharge Pressure instrument.
D. The candidate could incorrectly recall that the SLC penetration impacts the Calibrated Jet Pump Differential Pressure instrument, which is incorrect but plausible because this SLC penetration provides the high-pressure input, i.e. diffuser pressure, from the below Core Plate pressure tap to the NON calibrated Jet Pumps. The Calibrated Jet Pumps (Jet Pumps 5, 10, 15 & 20) have a separate tap directly in their diffuser section that provides the high-pressure input to the Calibrated Jet Pump Differential Pressure instruments.

Reference Information:
ST-OP-315-0014 SLC System Student Text, System Interrelations section on the Core Spray System.
M-5701-2 Nuc Boiler Instrumentation FOS.

NUREG 1123 KA Catalog Rev. 2
211000 SLC System
211000 K1. Knowledge of the physical connections and/or cause-effect relationships between STANDBY LIQUID CONTROL SYSTEM and the following:
211000 K1.06 3.7/3.7 Reactor vessel

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (2) General design features of the core, including core structure, fuel elements, control rods, core instrumentation, and coolant flow.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

35	K/A Importance: 3.2			**Points: 1.00**
R35	Difficulty: 0.00	Level of Knowledge: Low	Source: BANK	90031

The plant is operating at 100% power, with RPS BUS B powered from its ALTERNATE source. Breaker 64B-B6 trips.

Which of the following describes the status of the Reactor Protection System (RPS)?

A. RPS BUS A is de-energized.

B. RPS BUS B is de-energized.

C. NEITHER RPS BUS is affected, because RPS BUS A is powered from its NORMAL source.

D. NEITHER RPS BUS is affected, because RPS BUS B is powered from its ALTERNATE source.

Answer: A

Answer Explanation:
A trip of 64 B will de-energize MCC 72B, which powers RPS MG Set A. RPS BUS A is de-energized by this failure.

Distractor Explanation:
Distractors are incorrect and plausible because:
B. is incorrect because 65F has not tripped.
C. is incorrect because 64B has tripped.
D. is incorrect because 64B has tripped.

Reference Information:

AOP 20.300.64B (Loss of the 64B Bus); Student Text ST0027001 (RPS)

NUREG 1123 KA Catalog Rev. 2
212000 RPS
212000 K2.01 3.2/3.3 RPS motor-generator sets

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (6) Design, components, and function of reactivity control mechanisms and instrumentation.

Fermi 2 NRC Exam Usage
ILO 2019 Exam
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

36	K/A Importance: 3.0			Points: 1.00
R36	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	92590

A reactor startup is in progress. The reactor has been declared critical and the operator has established a 150 second period. ALL IRMs read ~70 on Range 4. All IRM's range switches are moved to range 5.

The following are the observed indications:

- IRM 'B' reads 22.
- IRM 'C' reads 70.

What is the cause of these indications and what is required to continue with the startup?

A. IRM 'B' range switch failed to range up to range 5.
Bypass IRM 'B'.

B. IRM 'C' range switch failed to range up to range 5.
Bypass IRM 'C'.

C. IRM 'B' high frequency preamp failed.
Calibrate the 'B' high frequency preamp.

D. IRM 'C' high frequency preamp failed.
Calibrate the 'C' high frequency preamp.

Answer: B

Answer Explanation:
Note: Fermi 2 operates with the IRM recorders always on the 0-125 scale. The recorder automatically 'scales' the reading so that, even if the IRM is on an odd (0-40) range, it reads proportionally the same on the 0-125 scale. For example, if an IRM is at 20 on Range 3 (a 0-40 range), the recorder scales it to read 63 on the 0-125 scale (~50% of scale).

The examinee should recall that Ranges 3 and 4 are the second decade of the IRM and Ranges 5 and 6 are the third decade. When ranging from range 4 to 5, the output of the IRM should drop by a factor of 10 (from 70 to 7) which is what the indication would read on range 5 IF the operator was monitoring the 0-40 scale. However, since the operator normally monitors the 0-125 scale, the reading would be the equivalent of 7/40 on the 125 scale, or ~22 (7/40 * 125).

If the range switch fails to close contacts in range 5, and attenuate the signal, then the reading will be the same because the operator is still monitoring the 0-125 scale. IF the operator were monitoring the 0-40 scale, the IRM with the failed range switch would see a reading of approximately 22.

Therefore, the examinee must determine that IRM B has ranged correctly and the C IRM range switch has failed. If no actions are taken, a rod block will come in shortly (34.6/108) preventing rod movement. For the startup to progress, the examinee must determine that the IRM C must be bypassed to be able to withdraw rods.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. The examinee could incorrectly conclude that, since the reading is not 1/10th of the original reading, the IRM range switch must have failed requiring IRM B be bypassed. This is incorrect because IRM B is reading correctly (22/125 is equivalent to 7/40).
C. If the examinee misunderstood how to calculate a predicted reading for IRM B, this could lead the examinee to conclude that something has happened with an amplifier associated with IRM B. This is incorrect because IRM B is reading correctly (22/125 is equivalent to 7/40) and because switching from Range 4 to 5 doesn't involve switching preamps as described below for Distractor D.
D. The examinee could recognize that IRM B is reading correctly and IRM C is not. This could lead the examinee to conclude that something must be wrong with one of the amplifiers associated with IRM C. This is incorrect because there is a high-gain low frequency preamp for ranges 1-6 and a low-gain high frequency preamp for ranges 7-10. Switching from range 4 to 5 does not involve switching preamps which may cause an erroneous indication due to the correlation between preamps not being adjusted correctly. This distractor is plausible if the candidate does not remember that it is when ranging from 6 to 7 that the preamp used will be switched.

Reference Information:

ST-OP-315-0023 IRM System.

NUREG 1123 KA Catalog Rev. 2
215003 IRM System
215003 A2. Ability to (a) predict the impacts of the following on the INTERMEDIATE RANGER MONITOR (IRM) SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
215003 A2.06 3/3.2 Faulty range switch

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (2) General design features of the core, including core structure, fuel elements, control rods, core instrumentation, and coolant flow.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

37	K/A Importance: 2.8			Points: 1.00
R37	Difficulty: 2.00	Level of Knowledge: Fund	Source: BANK	90036

Which of the following statements is an accurate description of the operation of the Source Range Monitoring System regarding simultaneous movement of all four SRM detectors?

A. It is ONLY possible to do so in the inward direction after a Reactor Scram due to limitations imposed by the control circuitry.

B. It is NOT permissible to do so at any time as this will result in unreliable indications as the detector travels through flux in the core.

C. It is ONLY possible to do so in the inward direction during a Reactor Shutdown due to limitations imposed by the control circuitry.

D. It is NOT permissible to do so during a Reactor Startup as this will result in unreliable indications as the detector travels through flux in the core.

Answer: D

Answer Explanation:
The examinee should correctly determine that simultaneous detector movement is always allowed by the detector control circuitry; however, 23.602 Precaution & Limitation (P&L) 3.11 prohibits simultaneous detector movement during a Reactor Startup as this will result in an indicated change in log count rate and period as the detector travels through flux in the core.

Distracter Explanation:

A. Is plausible because the candidate could remember that inserting SRMs and IRMs is part of the operator immediate operator actions following a Reactor Scram and incorrectly determine that this limitation must be imposed by the control circuitry. This is also made plausible by the fact that most of the P&Ls in 23.602 cover system limitations, response, etc., imposed by the SRM control circuits.

B. Is incorrect but plausible because the examinee could incorrectly determine that simultaneous movement of SRM detectors is never permissible due to unreliable indications, when in fact the P&L only prohibits simultaneous movement during Reactor Startup.

C. Is plausible because the candidate could remember that inserting SRMs and IRMs is part of the operator immediate operator actions following a Reactor Scram and incorrectly determine that this limitation is imposed by the control circuitry. This is also made plausible by the fact that most of the P&Ls in 23.602 cover system limitations, response, etc., imposed by the SRM control circuits.

Reference Information:
23.602 (pg 8) P&L 3.11
AOP 20.000.21, Reactor Scram

NUREG 1123 KA Catalog Rev. 2
215004 SRM System
215004 K5. Knowledge of the operational implications of the following concepts as they apply to SOURCE RANGE MONITOR (SRM) SYSTEM:
215004 K5.03 2.8/2.8 Changing detector position

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (6) Design, components, and function of reactivity control mechanisms and instrumentation.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

38	K/A Importance: 2.6			Points: 1.00
R38	Difficulty: 0.00	Level of Knowledge: Fund	Source: BANK	90038

The plant is operating at 100% power when 9D70, DIV 1 120V RPS BUS 1A POWER FAILURE, alarms.

What affect will this condition have on the Average Power Range Monitors (APRMs)?

A. APRMs will remain energized.

B. APRM channel 1/3 will be INOP.

C. Control Rod Block AND APRM Upscale will alarm.

D. APRM 1/3 Simulated Thermal Power output fails low.

Answer: A

Answer Explanation:
Power is auctioneered such that a loss of RPS power results in the APRM, LPRM and RBM remaining energized and functional.

Distractor Explanation:
Distractors are incorrect and plausible because:
B. APRMs 1/3 receive primary power through RPS A.
C. It is ONLY partially correct, Control Rod Block will occur but APRMs remain powered through QLVPS and upscale will not occur.
D. APRMs will remain powered through auctioneered power via RPS B.

Reference Information:

SOP 23.605 (APRMs)
Student Text ST0024001 (Power Range Neutron Monitoring System).

NUREG 1123 KA Catalog Rev. 2
215005 APRM/LPRM
215005 K2 02 2.6/2.8 APRM channels
215005 K2. Knowledge of electrical power supplies to the following:

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

39	K/A Importance: 3.7			**Points: 1.00**
R39-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	97836

The plant has experienced a trip of all Condenser Pumps from rated power.

- HPCI is inoperable.
- SBFW is unavailable.
- RCIC, CRD and SLC are in operation.
- Reactor water level is 50" and rising.

RCIC is operating in AUTOMATIC with the following control board indications:

- Pump Suction Pressure 13" Hg Vac.
- Pump Discharge Pressure 825 psig.
- Turbine Inlet Pressure 940 psig.
- Turbine Exhaust Pressure 13 psig.
- Turbine Speed 2100 rpm.
- RCIC discharge flow 600 gpm.

Given these plant conditions, which of the actions is required for RCIC, including the reason?

A. IMMEDIATELY secure RCIC. The Pump Suction Pressure Low Trip has failed.

B. IMMEDIATELY secure RCIC. The Turbine Exhaust Pressure High Trip has failed.

C. Continue to run RCIC. Lower turbine speed by lowering the flow controller automatic setpoint to prevent exhaust check valve damage.

D. Continue to run RCIC. Raise turbine speed by raising the flow controller automatic setpoint to prevent bearing damage and control valve instability.

Answer: D

Answer Explanation:
Raising RCIC flow by adjusting the automatic setpoint higher will raise rpm, oil pressure (when above 2150 will reduce the likelihood of bearing damage), and discharge pressure (when above reactor pressure, flow will also rise).

Surveillance Procedure 24.206.04 (SP 24.206.04 RCIC System Automatic Actuation and Flow Test) precaution/limitation 2.6 – *Do not operate RCIC below 2100 rpm and minimize RCIC operation below 2150 RPM to reduce the possibility of low lube oil pressure condition and exhaust valve slamming*.

SOP 23.206 (RCIC) precaution/limitation 3.5 – *Limit extended RCIC Turbine operation at speeds less than 2100 rpm for the following considerations:*

- *Low oil pressure may result in bearing damage.*
- *Low oil pressure may result in control valve instability.*
- *Low speed or steam flow causes control valve to operate very close to its seat, which may cause water hammer to occur in exhaust line. Repeated occurrence can physically damage Turbine exhaust check valve.*

RCIC System Turbine Isolation & Trip Setpoints:

• Auto Isolation	
• Emergency Area Cooler High Temperature	154°F
• Steam Line High Differential Press (3 second delay)	87" WC
• Steam Supply Pressure Low	62 psig
• Turbine Exhaust Diaphragm Pressure High	10 psig
• Turbine Trip	
• Auto Isolation A(B)	See Above
• Pump Suction Pressure Low (2 second delay)	20" Hg Vac
• Turbine Exhaust Pressure High	50 psig
• Reactor Pressure Vessel Level 8	214 inches
• Mechanical Overspeed (local reset required)	122.3%

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Plausible if the applicant confuses the Pump Suction Pressure Low turbine trip with the Turbine Exhaust Diaphragm Pressure High (10 psig) isolation … (13 > 10). This option is incorrect because the trip setpoint (20" Hg Vac) has not been exceeded.
B. Plausible if the applicant confuses the Turbine Exhaust Pressure High turbine trip with the Turbine Exhaust Diaphragm Pressure High (10 psig) isolation. This option is incorrect because the trip setpoint (50 psig) has not been exceeded.
C. Plausible if the applicant recalls that RCIC exhaust check valve damage is associated with turbine speed, which is correct, but incorrectly recalls the speed of concern. With RPV level rising in the stem, if the candidate believes that the speed of concern is a range, for example 2100-2150 rpm, then it is plausible that the applicant could conclude lowering rpm would get the turbine outside of the undesirable speed range and have minimal impact on RPV level.

Reference Information:

SOP 23.206 (RCIC)
SP 24.206.04 (RCIC System Automatic Actuation and Flow Test)
Student Text ST0043001 (RCIC)

NUREG 1123 KA Catalog Rev. 2
217000 RCIC System
217000 A1. Ability to predict and/or monitor changes in parameters associated with operating the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) controls including:
217000 A1.05 3.7/3.7 RCIC turbine speed

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

40	K/A Importance: 4.5			**Points: 1.00**
R40	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91567

AOP 20.300.260VESF has been entered due to loss of DC Distribution Cabinet 2PB2-6.

What, if any, impact does this have on ADS's ability to function as designed?

A. ONLY Logic A ADS Initiation capability is impacted.

B. ONLY Logic B ADS Initiation capability is impacted.

C. BOTH Logic A and Logic B ADS Initiation capabilities are impacted.

D. NEITHER Logic A nor Logic B ADS Initiation capability is impacted.

Answer: B

Answer Explanation:
Logic A is powered from DC Distribution Cabinet 2PA2-5 (R3200S061A). Logic B is powered from DC Distribution Cabinet 2PA2-6 (R3200S061B). Logic B is backed up by 2PA2-5 (loss of 2PA2-6 results in automatic transfer (via b-contacts) to 2PA2-5 supplying Logic B).

The ADS Initiation Relays, K6A(B) (D/W-P & Rx-L) and K7A(B) (D/W-P, Rx-L Low-P & ECCS Pump Running), energize to close contacts in the logic circuitry for ALL ADS SRVs to cause them to OPEN to depressurize the Reactor. Either (K6A **&** K7A) **OR** (K6B **&** K7B) are required to actuate the ADS Function of each ADS SRV.

The Logic A D/W Pressure, Reactor Water Level 1 (Lo, Lo, Lo), and Reactor Water Level 3 relays are also powered from DC Distribution Cabinet 2PA2-5.

However, the Logic B (String II) D/W Pressure, Reactor Water Level 1 (Lo, Lo, Lo), and Reactor Water Level 3 relays are powered from DC Distribution Cabinet 2PB2-6 (R3200S0**64B**).

When power is lost to 2PB2-6 (R3200S0**64B**), the K6B & K7B relays, in the Logic B Auto Initiation logic, WILL NOT energize to operate if required.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Plausible because there is power "crossover" as described above. However, this option is incorrect because Logic A ADS Initiation function is powered by 2PA2-5.
C. Plausible because Logic B logic is impacted. However, this option is incorrect because Logic A ADS Initiation function is powered by 2PA2-5.
D. Plausible because the ADS Logic is power by EITHER 2PA2-5 or 2PA2-6. Therefore, candidates could assume 2PB2-6 has no impact. However, this option is incorrect because the Logic B Initiation Logic is impacted as described above.

Reference Information:

AOP 20.300.260VESF (Loss of ESS 130/260V Battery Busses)
Student Text ST0042001 (ADS)
I-2095-01, 01A, 02, 06, 07, 08, 29, 30 (ADS Logic Prints)

NUREG 1123 KA Catalog Rev. 2
218000 ADS
218000 K3. Knowledge of the effect that a loss or malfunction of the AUTOMATIC DEPRESSURIZATION SYSTEM will have on the following:
218000 K3.02 4.5*/4.6* Ability to rapidly depressurize the reactor

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

41	K/A Importance: 3.4/3.4			Points: 1.00
R41	Difficulty: 0.00	Level of Knowledge: Fund	Source: BANK	90043

The plant is at 100% power when a change in plant conditions results in the following indications:

What will the Main Steam Isolation Valve (MSIV) indicating lights show 10 seconds later?

A. All MSIV RED OPEN indicating lights will be lit.

B. All MSIV GREEN CLOSED indicating lights will be lit.

C. The B2103-F022A-D, Inboard MSIV, GREEN CLOSED indicating lights will be lit.

The B2103-F028A-D, Outboard MSIV, RED OPEN indicating lights will be lit.

D. The B2103-F022A-D, Inboard MSIV, RED OPEN indicating lights will be lit.
The B2103-F028A-D, Outboard MSIV, GREEN CLOSED indicating lights will be lit.

Answer: A

Answer Explanation:
Note: (Embedded Reference) A graphic is included in this question showing a picture of applicable control board status lights – all GREEN EXCEPT:

- **MS LINE HI FLOW CH-B**
- **MS LINE HI FLOW CH-D**
- **NSSSS ISO LOGIC CH-B TRIP**
- **NSSSS ISO LOGIC CH-D TRIP**

This question requires the candidate to interpret the information provided by some indicating lights associated with the Primary Containment Isolation System (PCIS) and then determine the impact of that prediction on MSIV indicating light status.

Per ARP 2D36, with channels B or D tripped, no isolation actions will occur. IF a B/D channel were to trip AND an A/C channel were to trip, then a full MSIV isolation would occur. This is known as 1 out of 2 twice logic or [Full Isolation = (A OR C) AND (B OR D)]. Therefore, A is the correct answer since only half of the trip logic was satisfied with the B and D instruments being in trip as shown in the stem of the question. Therefore, the candidate must determine that the MSIV red open indicating lights will be lit.

Distractor Explanation:
Distractors are incorrect and plausible because:

B. The candidate could incorrectly recall MSIV isolation logic as 2 out of 2 taken once or [Full isolation = (A AND C) OR (B AND D)]. With this assumption, and with the B and D channels tripped, the candidate could determine that a full isolation has occurred.
C. The candidate could incorrectly recall MSIV isolation logic as 2 out of 2 taken once or [Otbd isolation = (A AND C)] OR [Inbd isolation = (B AND D)]. With this assumption and the B and D channels tripped, the candidate could determine that only the Inbd MSIVs would indicate closed (green).
D. The candidate could incorrectly recall MSIV isolation logic as 2 out of 2 taken once or [Inbd isolation = (A AND C)] OR [Otbd isolation = (B AND D)]. With this assumption and the B and D channels tripped, the candidate could determine that only the Otbd MSIVs would indicate closed (or green).

Reference Information:
ARP 2D36 NSSS Isolation Ch B/D Trip
ST-OP-315-0048, PCIS System Student Text
ST-OP-315-0005, Nuclear Boiler System Student Text

NUREG 1123 KA Catalog Rev. 2
223002 PCIS/NSSS
223002 A3. Ability to monitor automatic operations of the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF including:
223002 A3.01 3.4/3.4 System indicating lights and alarms

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Fundamental
Reference Provided
RO

Associated objective(s):

42	K/A Importance: 3.3			Points: 1.00
R42	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	91648

I&C reports that faulty circuit cards have caused all Reactor Vessel Low Water Level L3 PCIS instruments to be failed “as-is” and will not actuate as designed.

Which one of the following valves will NOT receive an automatic signal to CLOSE if actual RPV water level drops to 95"?

A. T4800-F453, Drywell Pressure Control Vent Isolation Valve.

B. G5100-F601, South TWMS Pump Outboard Suction Isolation Valve.

C. C5100-F002A, Channel A Traversing In-Core Probe System Ball Valve.

D. T4800-F404, Nitrogen Inerting Suppression Pool Nitrogen Supply Isolation Valve.

Answer: C

Answer Explanation:
The Nitrogen Inerting, Torus Water Management, and Drywell and Suppression Pool Ventilation Systems are all designed to isolate when RPV Level goes below “Level 2” (110.8”).

The F601, F453, and F404 valves will all receive automatic signals to CLOSE when RPV level is 110.8” and lowering.

The Traversing In-Core Probe (TIP) System is designed to isolate when RPV Level goes below “Level 3” (173.4").

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Plausible because the system does have a reactor level isolation. However, this option is incorrect as described above.
B. Plausible because the system does have a reactor level isolation. However, this option is incorrect as described above.
D. Plausible because the system does have a reactor level isolation. However, this option is incorrect as described above.

Reference Information:

Student Text ST0048001 (PCIS)

NUREG 1123 KA Catalog Rev. 2

223002	PCIS/NSSS
223002 K6.	Knowledge of the effect that a loss or malfunction of the following will have on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF:
223002 K6.04	Nuclear boiler instrumentation

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b) (7)	Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

43	K/A Importance: 3.1			**Points: 1.00**
R43 - VER 4	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	98649

All RPV level indication has been lost. The RPV is being Emergency Depressurized to establish flooded conditions.

During RPV depressurization, a High Drywell Pressure condition occurs.

30 seconds after the High Drywell Pressure is received, the following conditions are observed:

- Drywell Pressure is 2.5 psig and rising.
- The CRLNO observes the open lights go out for the ADS SRVs.
- RPV Pressure is 115 and slowly lowering.
- Torus Pressure is 2.0 psig and rising.

What is the status of the SRVs?

A. CLOSED because drywell pneumatics has isolated.

B. OPEN because drywell pneumatics has not isolated.

C. OPEN regardless of whether drywell pneumatics has isolated or not.

D. CLOSED regardless of whether drywell pneumatics has isolated or not.

Answer: C

Answer Explanation:
As the RPV pressure lowers and the **D/P** across the valve (RPV-Torus) reaches approximately 50 psig, the SRV will physically close. Also, ODE-10 section on RPV Flooding (page 24) mentions that SRVs will close when reactor pressure lowers to less than 100 psig and will typically re-open at approximately 150 psig (when RPV pressure rises during RPV flooding). 115 psig was chosen in the stem of the question, to be above 100 psig consistent with the ODE-10 guidelines.

The pneumatic operator is a "pressurize-to-open" or "fail closed" device. To open the SRV, the pneumatic operator is pressurized with nitrogen from the Primary Containment Pneumatic Subsystem (PCPS) of the Nitrogen Inerting System through a series of containment isolation valves. These valves close on RPV Level 2 or High Drywell Pressure (DWP), which is present in the stem of the question. ADS SRVs have accumulators inside containment. Therefore, manual operation of the ADS valves is NOT IMPACTED by the containment isolation.

Since the question stem indicates 113 psig D/P across the valve (115-2.0), and RPV pressure >100 psig, the SRVs will be OPEN, and since these SRVs have accumulators, they will be OPEN regardless of the status of drywell pneumatics.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. The candidate could correctly recognize that DW pneumatics isolated on High DWP, and incorrectly determine that this will cause the pilot solenoid to close, thus causing the main SRV disc to close. This is incorrect because the ADS SRVs are provided with accumulators, inside containment, that will provide N2 pressure to allow for at least 5 valve cycles, therefore the open SRV will remain open.
B. The candidate could incorrectly determine that loss of DW pneumatics would cause an open SRV to close by not recognizing that the presence of N2 accumulators will keep the SRVs open. The candidate could also incorrectly determine that DW pneumatics has not isolated on high DWP so the SRVs would still remain open. This is incorrect because, although the SRVs are open, DW pneumatics isolated on High DWP.
D. If the candidate fails to recall the D/P that is necessary to open the SRV and believes that it would be CLOSED for the D/P given in the stem of the question, regardless of the status of drywell pneumatics. This is incorrect, because D/P in the stem is sufficient to open the SRVs.

Reference Information:

Lesson Plan LP0005 (Nuclear Boiler)
P&ID M-5740 (Primary Containment Pneumatic Supply)
Student Text ST0005001 (Nuclear Boiler)
Student Text ST0019001 (Primary Containment Pneumatic Systems)
Student Text ST0042001 (ADS)
ODE-10

NUREG 1123 KA Catalog Rev. 2
239002 SRVs
239002 K4. Knowledge of RELIEF/SAFETY VALVES design feature(s) and/or interlocks which provide for the following:
239002 K4.07 3.1/3.2 Minimum steam pressure required to keep SRV open or to open SRV

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

44	K/A Importance: 3.2			**Points: 1.00**
R44	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91227

The Unit is operating at full power with the following conditions present:

- Master Feedwater Level Control Station is in AUTOMATIC with a +196” Setpoint.
- Level Control Mode Switch is selected to 3-ELEMENT.
- RPV level stable at +196".

Then, the following failures occur at the same time:

- One Feedwater Flow input FAILS DOWNSCALE.
- North Long Cycle Cleanup Recirc Valve (N2100-F604) is inadvertently OPENED.

Assuming NO operator action is taken, which one of the following describes:

(1) The condition of the Feedwater Control System, AND;
(2) The RPV water level response

A. (1) The Feedwater Control System automatically switches to 1-ELEMENT control.
(2) RPV level RISES initially then recovers to +196”.

B. (1) The Feedwater Control System remains in 3-ELEMENT control.
(2) RPV level DOES NOT change (remains steady at +196”.

C. (1) The Feedwater Control System automatically switches to 1-ELEMENT control.
(2) RPV level LOWERS initially then recovers to +196”.

D. (1) The Feedwater Control System remains in 3-ELEMENT control.
(2) RPV level LOWERS initially then recovers to +196”.

Answer: C

Answer Explanation:
If a failure of one or both Feedwater Flow signals occurs, DCS logic will automatically force Single Element Control.

Three Element Control uses Steam Flow, Feedwater Flow and Reactor Water level to control feedwater flow to maintain Reactor Water Level to a predetermined setpoint. This mode of operation provides an anticipatory feature for rapid changes in reactor level, allowing quicker response by the FWCS.

Single Element Control only uses the measurement of Reactor Water Level to control feedwater flow to maintain the Reactor Water Level to a predetermined setpoint. Diverting flow to the hotwell via the North Long Cycle Cleanup Recirc Valve will initially cause level to lower due to an ACTUAL Steam Flow / Feed Flow Mismatch. Eventually, the system will respond to restore level to the +196" setpoint.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. This option is plausible because the FWCS does switch to 1-ELEMENT control. However, this option is incorrect because level will initially lower as described above.
B. This option is plausible because it takes failure of 2 or more steam flow signals to cause a switch to 1-ELEMENT control (it is plausible that a candidate would assume feed flow & steam flow signals operate in the same way). However, as described above, failure of ONLY 1 feed flow signal is enough to cause the switch to 1-ELEMENT. In addition, N2100-F603 failing OPEN will divert flow and cause level to lower initially.
D. This option is plausible because it takes failure of 2 or more steam flow signals to cause a switch to 1-ELEMENT control (it is plausible that a candidate would assume feed flow & steam flow signals operate in the same way).

Reference Information:

ST0046001 FW Control Student Text.
3D164 FWC DCS Trouble ARP
23.107 FW & Cond't SOP (Att. H DCS Failures)

NUREG 1123 KA Catalog Rev. 2
259002 Reactor Water Level Control System
259002 A3. Ability to monitor automatic operations of the REACTOR WATER LEVEL CONTROL SYSTEM including:
259002 A3.04 3.2/3.2 Changes in reactor feedwater flow

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

45	K/A Importance: 2.9			Points: 1.00
R45	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	92487

The plant is at 100% power.

Drywell pressure is 7 inches of water as read on T48-R808, Primary Containment Pressure Rec.

Torus pressure is 14 inches of water as read on T48-R808, Primary Containment Pressure Rec.

Which of the following will meet the primary containment pressure control requirements per 23.406, Primary Containment Nitrogen Inerting and Purge System?

A. Lower Torus pressure until Torus pressure is 3 inches of water.

B. Lower Torus pressure until Torus pressure is 10 inches of water.

C. Raise Drywell pressure until Drywell pressure is 20 inches of water.

D. Lower Drywell and Torus pressure, at the same time, until both pressures are at 5 inches of water.

Answer: B

Answer Explanation:
Per 23.406 precaution and limitation 3.10, Torus to Drywell Differential Pressure shall not exceed 5 inches of water as read on T48-R808, Primary Containment Pressure Rec, at any time during normal plant operation.

Currently Torus to Drywell differential pressure is out of band at 7 inches of water.

Lowering Torus pressure to 10 with the drywell at 7 will leave the differential at 3, which is acceptable.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Per 23.406 precaution and limitation 3.10, pressure is to be maintained 5 to 19 inches. Although lowering torus pressure to 3 inches would fix the DP issue, the Torus would be out of the 5 to 19 inch band.
C. Per 23.406 precaution and limitation 3.10, pressure is to be maintained 5 to 19 inches. Although raising drywell pressure to 20 inches would fix the DP issue, the Drywell would be out of the 5 to 19 inch band.
D. Although both the torus and drywell and DP would be in band at 5 inches, 23.406 prohibits venting both the torus and drywell at the same time. See caution on page 26.

Reference Information:

23.406, Primary Containment Nitrogen Inerting and Purge System

NUREG 1123 KA Catalog Rev. 2
261000 Standby Gas Treatment System
261000 A4. Ability to manually operate and/or monitor in the control room:
261000 A4.05 2.9/3.2 Drywell to suppression chamber/torus differential pressure: Mark-I,II

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

46	K/A Importance: 3.3			Points: 1.00
R46-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	97847

The plant is at 100% power.

There is a fault on the 120 Kv Bus #101.

Breakers open to clear the fault.

Which of the following describes:

1. The status of SST 64 Normal source of power?
2. The status of SST 64 Alternate source of power?

A. 1. Unavailable
   2. Unavailable

B. 1. Unavailable
   2. Available via 13.8Kv Bus 1-2

C. 1. Available via 13.2kV Bus 11
   2. Unavailable

D. 1. Unavailable
   2. Available via 13.8Kv Bus 3-4

Answer: B

Answer Explanation:
The normal power to SST 64 is from the 101 120Kv bus through the #1 transformer to the 13.2 Kv Bus 11. The alternate power to SST 64 bus is from the 102 bus through the CTG #11 transformer to the 13.8Kv Bus 1-2. With a fault on the 101 bus the normal supply to SST 64 will be deenergized, and since the 102 bus is not affected, the alternate supply is still energized.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Plausible if the candidate does not remember which bus feeds the #1 transformer. Also, the candidate may think because the A6 breaker (which is normally open) is not actually supplying SST 64, it means that the source is deenergized. The loss of 120Kv AOP Step F has direction to close breaker A6 if 13.8 KV bus 1-2 is energized to power SST 64.
C. Plausible if the candidate does not remember which busses the 101 and 102 120Kv busses supply.
D. Plausible if the candidate does not remember which bus powers the alternate power to SST 64.

Reference Information:

20.300.120Kv, Loss of 120Kv

NUREG 1123 KA Catalog Rev. 2
262001 AC Electrical Distribution
262001 K2. Knowledge of electrical power supplies to the following:
262001 K2.01 3.3/3.6 Off-site sources of power

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (8) Components, capacity, and functions of emergency systems.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

47	K/A Importance: 2.8			**Points: 1.00**
R47	Difficulty: 4.00	Level of Knowledge: High	Source: MODIFIED	90050

The plant is in MODE 3. UPS B is being manually transferred from the NORMAL power supply to the ALTERNATE power supply in accordance with SOP 23.308.01, Uninterruptible Power Supply System.

Which of the following identifies the Main Control Room evolutions impacted if improper operation results in the LOSS of UPS B?

A. Post-Scram Feedwater level control.

B. Rod Worth Minimizer Functional Test.

C. Section Breaker 101-102 Breaker Position GH Shutdown.

D. Reactor Manual Control/Reactor Mode Switch/Refueling Platform Refueling Interlocks surveillance.

Answer: B

Answer Explanation:
C11-J601, Rod Worth Minimizer is affected by LOSS of UPS B.

Since the Rod Worth Minimizer is affected by LOSS of UPS B, the Rod Worth Minimizer Functional Test cannot be completed successfully.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. This option is incorrect because on loss of UPS A, Post Scram Feedwater Logic is de-energized.
C. This option is incorrect because the 120KV remote breaker operation is powered by UPS C.
D. This option is incorrect because the RPIS is powered by UPS A.

Reference Information:

23.308.01, Uninterruptible Power Supply.

Plant Procedures
23.308.01

NUREG 1123 KA Catalog Rev. 2
262002 UPS (AC/DC)
262002 A3. Ability to monitor automatic operations of theUNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) including:
262002 A3.01 2.8/3.1 Transfer from preferred to alternate source

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
Modified
RO

Associated objective(s):

48	K/A Importance: 2.5			Points: 1.00
R48 - VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	98687

The plant is operating at 100% power.

Division 1 normal battery charger 2A-1 is out of service due to a faulty circuit card. Preparations are being made to place spare charger 2A1-2 in service in place of 2A-1.

All other normal battery chargers are in operation.

Loss of all Offsite Power concurrent with a Loss of Coolant Accident (LOCA) occurs.

How will battery charging/discharge rates be affected?

A. Div 1 not affected.

Div 2 will discharge until EDG Output breakers close, with no operator action.

B. Div 1 and 2 discharge rates will increase.

Div 2 will discharge until EDG Output breakers close, with no operator action.

C. Div 1 not affected.

Div 2 will discharge until EDG Output breakers close AND battery charger CMCs taken to OFF/RESET then to ON.

D. Div 1 and 2 discharge rates will increase.

Div 2 will discharge until EDG Output breakers close AND battery charger CMCs taken to OFF/RESET then to ON.

Answer: D

Answer Explanation:
At the start of the event, the Div 1 battery is already supplying some DC loads, thus discharging, due to normal charger 2A-1 being OOS. When the LOP/LOCA is received, although the Div 1 battery was already in service, an increase in Div 1 loads will occur due to increased current to things like EDG Auto Start circuit, RCIC start logic, DC powered valves, etc. This will further increase the discharge rate on the Div 1 battery.
Division 2 DC loads will increase because of the LOP/LOCA, which will cause Div 2 batteries to start discharging.

Upon restoration of power by the EDGs, the Div 1 battery will not be impacted (it will remain discharging) since a battery charger is not in service.

Div 2 DC loads will still draw current and maintain discharge on the Div 2 batteries. Although the 480V MCCs that supply the Div 2 battery chargers ARE powered when the EDG Output Breakers close, the CR1 relay will drop out preventing automatic restart of the battery chargers. Therefore, as can be seen in 20.300.Offsite Actions AP.1-AZ.1 (and associated bases) once the EDG supplies power to the bus (output breakers close) the battery charger must be restarted by taking the CMC Switch to OFF/RESET, which will reset the CR1 relay, and then to ON.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. The candidate could incorrectly determine that, since the Div 1 DC loads are already on the battery due to the faulty battery charger, then its discharge rate will be unaffected. This is not true since the LOCA will cause Div 1 loads to start (like EDG Auto Start circuit, RCIC, etc.) which will increase the discharge rate on the Div 1 battery. Also, the candidate could determine that the ESF battery chargers will auto sequence back on, when the EDG Output Breakers close, which is plausible because ESF batteries are safety related and most safety related equipment does auto sequence on the EDGs. And the 480V MCCs that supply the battery chargers are powered when the EDG Output Breakers close, but the CR1 relay will drop out preventing automatic restart of the battery chargers. Therefore, as can be seen in 20.300.Offsite Actions AP.1-AZ.1 (and associated bases) once the EDG supplies power to the bus (output breakers close) the battery charger must be restarted by taking the CMC Switch to OFF/RESET, which will reset the CR1 relay, and then to ON.
B. The first part is correct since Div 1 and Div 2 battery discharge rates will increase when EDGs start, RCIC and HPCI start, etc., upon receipt of the LOP/LOCA. The candidate could determine that the ESF battery chargers will auto sequence back on, when the EDG Output Breakers close, which is plausible because ESF batteries are safety related and most safety related equipment does auto sequence on the EDGs. And the 480V MCCs that supply the battery chargers are powered when the EDG Output Breakers close, but the CR1 relay will drop out preventing automatic restart of the battery chargers. Therefore, as can be seen in 20.300.Offsite Actions AP.1-AZ.1 (and associated bases) once the EDG supplies power to the bus (output breakers close) the battery charger must be restarted by taking the CMC Switch to OFF/RESET, which will reset the CR1 relay, and then to ON.
C. The candidate could incorrectly determine that, since the Div 1 DC loads are already on the battery due to the faulty battery charger, then its discharge rate will be unaffected. This is not true since the LOCA will cause Div 1 loads to start (like EDG Auto Start circuit, RCIC, etc.) which will increase the discharge rate on the Div 1 battery.

Reference Information:

23.309, DC Electrical Distribution System SOP.
20.300.Offsite, Loss of Offsite Power AOP.
30.300.Offsite Bases

NUREG 1123 KA Catalog Rev. 2
263000 DC Electrical Distribution
263000 A1. Ability to predict and/or monitor changes in parameters associated with operating the DC Electrical Distribution controls including:
263000 A1.01 2.5/2.8 Battery charging/discharging rate

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

49	K/A Importance: 3.5			Points: 1.00
R49	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	91650

The plant is operating at 100% power with RHR Pump "A" operating in Torus Cooling. A transient occurs, resulting in the following conditions:

- 1D6, Div 1 CSS Logic Power Failure is alarming.
- 1D8, RHR LOGIC A 125V DC BUS POWER FAILURE is alarming.
- 9D17, DIV I ESS 130V BATTERY TROUBLE is alarming.
- All Div 1 ECCS Pump CMS indications are lost (no lights lit).

Based on these conditions, the RHR Pump "A" breaker is ___(1)___ and _______(2)______.

A. (1) CLOSED
(2) CAN be OPENED remotely

B. (1) CLOSED
(2) CANNOT be OPENED remotely

C. (1) OPEN
(2) WILL auto CLOSE on receipt of a valid signal

D. (1) OPEN
(2) WILL NOT auto CLOSE on receipt of a valid signal

Answer: B

Answer Explanation:
RHR Pump “A” has lost control power (indicated by the DC Annunciators) and therefore RHR Pump “A” will continue to run and cannot be electrically tripped. Control power is required for both CMC indication and trip function.

The caution statement at the beginning of ARP 1D8 reads: “Div 1 RHR equipment may be manually operated, but all automatic start, stop, valve position, isolation, pressure, pump safety interlocks, and inputs to other systems will not be active.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Is plausible and incorrect; RHR pump will remain running, but cannot be electrically tripped.
C. Is plausible and incorrect; RHR pump loses control power, which is required for BOTH trip and start functions.
D. Is plausible and incorrect; RHR pump loses control power, which is required for BOTH trip and start functions.

Reference Information:

ARP 1D8 (RHR Logic A 125VDC Bus Power Failure)

NUREG 1123 KA Catalog Rev. 2
263000 DC Electrical Distribution
263000 K3. Knowledge of the effect that a loss or malfunction of D.C. ELECTRICAL DISTRIBUTION will have on the following:
263000 K3.02 3.5/3.8 Components using D.C. control power (i.e. breakers)

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

50	K/A Importance: 3.8			Points: 1.00
R50- VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	97848

The plant is at 100% power when the following alarm annunciates in the control room.

- 10D1 EDG 13/14 STARTING AIR TANK PRESSURE LOW.

An NO is dispatched and reports the following:

- EDG 13 starting air pressure is 225 psig.
- EDG 14 starting air pressure is 210 psig.

What is the status of the EDGs and how will they respond if a LOCA signal is received?

A. ONLY EDG 13 is OPERABLE. Both will start on a LOCA.

B. EDGs 13 and 14 are OPERABLE. Both will start on a LOCA.

C. EDGs 13 and 14 are INOPERABLE. Neither will start on a LOCA.

D. ONLY EDG 14 is INOPERABLE. ONLY EDG 13 will start on a LOCA.

Answer: A

Answer Explanation:
TS pressure required for EDG air receivers is 215 psig. This pressure ensures that each EDG has enough air for 5 starts, therefore since the air receiver pressure is 210 psig the EDG is inoperable however it would still start if it received a signal to start.

Distractor Explanation:
Distractors are incorrect and plausible because:

B. EDG 14 has low starting air pressure (<215 psig) so it is INOPERABLE. Plausible because the applicant may not recall the correct starting air pressure limit in TS.
C. EDG 13 does not have low starting air pressure so it is OPERABLE. Plausible because the applicant may not recall the correct starting air pressure limit in TS. Both EDGs will start on a LOCA.
D. 14 EDG does have a low air alarm in at 210 psig. The air start system still has enough air to start the EDG in this condition. Plausible because the applicant may think that with low pressure the EDG will not start, not realizing that the low-pressure alarm is based on having 5 start capabilities for the EDG.

Reference Information:

LP-0065
ARP 10D1
TS 3.8.3

NUREG 1123 KA Catalog Rev. 2
264000 Emergency Generators (Diesel/Jet)
264000 K6. Knowledge of the effect that a loss or malfunction of the following will have on the EMERGENCY GENERATORS (DIESEL/JET) :
264000 K6.01 3.8/3.9 Starting air

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (8) Components, capacity, and functions of emergency systems.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

51	K/A Importance: 3.4/3.5			**Points: 1.00**
R51	Difficulty: 3.00	Level of Knowledge: Low	Source: BANK	90058

The plant experienced a loss of Bus 64B.

The bus was subsequently restored to the normal lineup EXCEPT the operators neglected to reset the digital load sequencer.

Following the restoration, all power is again lost to Bus 64B.

How will the EDG and electrical distribution system respond to this event?

The EDG will __(1)__ and loads on bus 64B __(2)__ sequence after the output breaker is closed.

A. (1) automatically start
(2) will

B. (1) require a manual start
(2) will

C. (1) require a manual start
(2) will NOT

D. (1) automatically start
(2) will NOT

Answer: A

Answer Explanation:
This questions tests misconceptions on the operation of the EDG Digital Load Sequencer, specifically the operational implication of not resetting the load sequencer and how it will function if it is NOT manually reset.

From Section 3.0 of 23.321: "The associated Digital Load Sequencer must be manually reset upon restoring power to the associated 4160V EDG Bus. Failure to do so will result in the operation of the Digital Load Sequencer following a manual start of the associated EDG and the subsequent closing of its output breaker."

A common misconception is that, if the load sequencer is not reset, the EDG will require manual action to restart. That is not what this precaution says, and not how the load sequencer functions. Contributing to this another misconception regarding where the undervoltage start signal is developed.
The undervoltage start signal comes from the LOAD SHED logic for the respective 4160V ESF bus and NOT from the Load Sequencer. Therefore, if the load sequencer is not reset, the EDG will still automatically start.
Another misconception is that, if the load sequencer is not reset, then it has already actuated and it will not actuate again when the EDG output breaker closes, therefore the loads will not be sequenced back on. This is also not correct because the load sequencer resets on any subsequent undervoltage (load shed) condition. Therefore, when the EDG output breaker re-closes, the load sequencer will actuate again and re-sequence loads back on without any operator action.

The impact of the precaution is how the load sequencer responds to a MANUAL EDG start (during EDG testing, for example) if it is not reset. If the load sequencer is not reset, and the EDG is manually started, when the EDG output breaker is closed the load sequencer will actuate and go through its normal sequencing, which may be undesirable with the bus energized by the EDG in parallel with offsite power.

Therefore, the correct response of the EDG to this condition is that it will still start, and load properly, if power to a 4160V bus is lost even if the EDG load sequencer was not reset.

Distractor Explanation:
Distractors are incorrect and plausible because:
B. The candidate could misunderstand the precaution discussed above and believe that the EDG will not automatically start if the load sequencer was not properly reset, which is not the case as explained above.
C. The candidate could misunderstand the precaution discussed above and believe that the EDG will not automatically start if the load sequencer was not properly reset, which is not the case, as explained above. The candidate could also believe that, if not reset, the EDG load sequencer will not actuate when its output breaker closes, so loads will not sequence on as they should, which is also incorrect as explained above.
D. The candidate could correctly recognize that the EDG will automatically start, however, incorrectly determine that, if not reset, the EDG load sequencer will not actuate when its output breaker closes, so loads will not sequence on as they should, which is incorrect as explained above.

Reference Information:
23.321, Engineered Safety Features Auxiliary Electrical Distribution System

NUREG 1123 KA Catalog Rev. 2
264000 Emergency Generators (Diesel/Jet)
264000 K5. Knowledge of the operational implications of the following concepts as they apply to EMERGENCY GENERATORS (DIESEL/JET) :
264000 K5.06 3.4/3.5 Load sequencing

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

52	K/A Importance: 2.9			**Points: 1.00**
R52-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	97849

The unit was at rated power when a common mode failure results in restricted flow in both IAS Air Dryers and one of the NIAS Air Dryers.

The following annunciators are in alarm:

- 7D50, DIV I/II Control Air Compressor Auto Start.
- 7D52, DIV II Control Air System Trouble.
- 7D54, Interruptible Control Air Header Press Low.
- 7D56, Interruptible Control Air Air Dryer Trouble.

Which of the following describes the impact of the above conditions on ATWS EOP actions?

A. SLC tank level indication would fail off scale high, which would require checking SLC tank level locally.

B. Inboard MSIVs would lose their normal air supply, which would prevent their re-opening to re-establish the condenser as a heat sink.

C. Scram Discharge Volume (SDV) Vent and Drain Valves would go closed, which would prevent draining the SDV for scram reset and re-scram.

D. Reactor Feedwater Pumps would lose their minimum flow protection, which would cause loss of Feedwater and complicate ATWS level control.

Answer: C

Answer Explanation:
The loss of Station Air is one of the most serious malfunctions that can affect a power plant. The following are some of the failure modes listed in the Systems Interrelations section of ST0071001 (Compressed Air System Student Text):

SDV Vent & Drain Valves FAIL CLOSED and the Scram Inlet & Outlet Valves FAIL OPEN.
Loss of bubbler flow to the SLC Tank Level Indicator causes it to indicate a LOW LEVEL.
The Inboard MSIVs (B21-FO22A,B,C,D) are supplied by Div 1 Primary Containment Pneumatic System (PCPS) and NIAS DIV I is the backup supply for DIV I PCPS.
Condensate Minimum Flow Recirc Valve FAILS CLOSED.
Reactor Feed Pump Minimum Flow Valves FAIL OPEN.

Since the SDV Vent & Drain valves fail CLOSED, EOP actions to drain the SDV will be complicated and ESP actions to perform scram reset and re-scram may not be effective.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Plausible because SLC bubbler flow is impacted. However, this option is incorrect because SLC tank level fails LOW, which would require checking SLC tank level locally.
B. Plausible because the Inboard MSIVs are impacted by a loss of Division I NIAS, which could potentially complicate an ATWS by not allowing the MSIVs to be re-opened. However, this option is incorrect because DIV I NIAS is NOT lost.
D. Plausible because Condensate DOES lose minimum flow protection. However, this option is incorrect because RFP minimum flow protection is NOT lost.

Reference Information:

AOP 20.129.01 (Loss of Station and/or Control Air)
Student Text ST0071001 (Compressed Air Systems)
P&ID M-5740 (Primary Containment Pneumatic Supply)

NUREG 1123 KA Catalog Rev. 2
300000 Instrument Air System
300000 A2. Ability to (a) predict the impacts of the following on the INSTRUMENT AIR SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:
300000 A2.01 Air dryer and filter malfunctions

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

53	K/A Importance: 3.4			**Points: 1.00**
R53-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	97850

RBCCW Supplemental Cooling System (SCS) is in service (RBCCW SCS-1 PUMP A and SCS-2 PUMP B) due to high GSW temperatures.

- The discharge piping of RBCCW SCS-1 PUMP A fails.
- 1D95, DIV I/II RBCCW DIFF PRESS LOW.

What is the system response?

A. No automatic action occurs. 2D112, RBCCW Makeup Tank Level HIGH-LOW, will alarm.

B. The standby RBCCW SCS-1 PUMP C will start and provide cooling to the Drywell Sump Heat Exchanger.

C. RBCCW Supplemental Cooling will isolate and RBCCW will provide cooling to the Recirc Pump Motor Coolers.

D. Emergency Equipment Cooling Water will start and provide cooling to the Control Air Compressor Space Cooler.

Answer: D

Answer Explanation:
Alarm 1D95 indicates RBCCW D/P was 20 psid for greater than 11 seconds which results in auto initiation of Div 1(2) EECW/EESW. When EECW/EESW initiates, RBCCW and RBCCW SCS are isolated from EECW loads and the EECW pumps and heat exchanges provide cooling to the EECW loads.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. A leak in the system could cause a low-level condition in the RBCCW M/U tank. However, this option is incorrect because EECW auto initiates.
B. There is an automatic start feature on the RBCCW SCS pumps. However, this option is incorrect because the Drywell Sump Heat Exchanger is a Div II EECW load and it will have cooling provided by the EECW pump.
C. RBCCW SCS will be isolated from the EECW loads. However, this option is incorrect because the Recirc Pump Motor Coolers will have cooling provided by the EECW pump.

Reference Information:

ARP 2D112 (RBCCW Makeup Tank Level HIGH-LOW)
Lesson Plan LP0067 (RBCCW & EECW)
P&ID M-5727 (RBCCW); P&ID M-5727-1 (RBCCW Supplemental Cooling)
P&ID M-5729-1 (EECW)
Div I SOP 23.127.01 (RBCCW Supplemental Cooling)
Student Text ST0067001 (RBCCW & EECW)
Student Text ST1002001 (RBCCW Supplemental Cooling).

NUREG 1123 KA Catalog Rev. 2
400000 Component Cooling Water System
400000 K4. Knowledge of CCWS design feature(s) and or interlocks which provide for the following:
400000 K4.01 3.4/3.9 Automatic start of standby pump

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

54	K/A Importance: 3.5			**Points: 1.00**
R54	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	91968

Backup Scram solenoid valves C11-F110A and C11-F110B are powered from __(1)__.

If one valve fails to reposition on a valid signal, the backup scram function ____(2)____ vent the scram air header.

A. (1) RPS Buses A and B
(2) Will

B. (1) DIV I and II ESF DC
(2) Will

C. (1) RPS Buses A and B
(2) Will Not

D. (1) DIV I and II ESF DC
(2) Will Not

Answer: B

Answer Explanation:
Both RPS channels must trip to cause valves to energize. Only 1 valve must energize to re-position to cause header to vent (due to check valve). P/S to the solenoids is DIV I and II ESF DC. Logic to actuate backup scram valves is from RPS bus A and B.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Wrong power supply. Plausible because the RPS busses supply the logic that actuate the solenoid valves.
C. Wrong power supply. Plausible because the RPS busses supply the logic that actuate the solenoid valves.
D. Correct power supply however a single backup scram solenoid valve will vent the scram air header.

Reference Information:

23.610, Reactor Protection System (Rev 24)
ST-OP-315-0027-001, Reactor Protection System, (Rev 15)

NUREG 1123 KA Catalog Rev. 2
201001 CRDH System
201001 K2. Knowledge of electrical power supplies to the following:
201001 K2.03 3.5*/3.6* Backup SCRAM valve solenoids

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

55	K/A Importance: 3.3			**Points: 1.00**
R55	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	90091

The plant is operating at 96% power with the following seal indications for the A Reactor Recirculation Pump:

- Seal #1 Pressure 980 psig
- Seal #2 Pressure 972 psig
- Annunciator 3D123, RECIRC PMP A STAGING SEAL FLOW HIGH/LOW is alarming.

Which one of the following seal conditions exist?

A. Seal # 2 has failed due to blockage.

B. Seal # 1 has failed due to blockage.

C. Seal # 2 has failed by breaking down.

D. Both seals have failed due to breaking down.

Answer: A

Answer Explanation:
#1 seal is near normal pressure of 1000# and is not failing. If #1 seal was plugging pressure would not get by #1 seal and then #2 seal would be near zero psig. Normal pressure for #2 seal is approximately 500 psig. Since #2 seal pressure is high it is plugged.

Distractor Explanation:
Distractors are incorrect and plausible because:

B. Plausible if the candidate does not know what #1 seal blockage indications would look like. Blockage of the #1 seal would cause reduced flow to the inner cavity, causing #2 seal pressure to lower less than its normal value of 500 psig. Incorrect because indications given show a plugged #2 seal as described above.
C. If #2 seal was breaking down it would be reading less than a normal pressure of 500 psig. Plausible if the candidate does not know indications for #2 seal failure. Incorrect because indications given show a plugged #2 seal as described above.
D. Both seal pressures would be lower than normal if they were both failed. Plausible if the candidate does not know indications for multiple seal failures. Incorrect because indications given show a plugged #2 seal as described above

Reference Information:

DWG M-5702-1; 3D123

NUREG 1123 KA Catalog Rev. 2
202001 Recirculation System
202001 A1 Ability to predict and/or monitor changes in parameters associated with operating the RECIRCULATION SYSTEM controls including:
202001 A1.09 3.3/3.3 Recirculation pump seal pressures

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (3) Mechanical components and design features of reactor primary system.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

56	K/A Importance: 3.5			Points: 1.00
R56	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	90095

The Plant is operating at 100% power with both RWCU Pumps and Filter/Demineralizers in service.

Alarm 2D110, RWCU NON REGEN HX OUTLET TEMP HIGH, annunciates due to a sensed temperature of 142°F.

In what way, if any, will the RWCU system automatically respond?

A. No automatic system response will occur.

B. G3352-F119, RWCU Supply Suct Iso Vlv, will shut and the RWCU Pumps will trip on low flow.

C. G3352-F119, RWCU Supply Suct Iso Vlv, will shut and the RWCU Pumps will remain running.

D. G3352-F001, RWCU Inboard Containment Iso Vlv, G3352-F004, RWCU Outboard Containment Iso Vlv, and G3352-F220, RWCU Return Iso Valve will shut and the RWCU Pumps will trip on interlock.

Answer: B

Answer Explanation:
The G3352-F119 will close on the sensed high temperature, which will result in an indirect trip of the RWCU Pumps on Low Flow.
The NRHX Outlet Temperature High Isolation has no accident mitigation function. The basis for this isolation is to protect the ion exchange resin from deterioration due to high temperature. The low flow trip protects the pumps from damage due to running on low flow.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. The candidate could determine that the temperature given is not valid for the alarm condition and determine that automatic closure of the G3352-F119 would not occur. Or, the candidate could recognize the alarm and temperature as being valid, but not correctly recall the automatic system response that would take place as described above. Either of these reasons could lead the candidate to determine that no automatic system response will occur, which is not correct as described above.
C. The candidate could recognize the initiating condition as a signal that causes the G3352-F119 to close. However, the candidate could fail to recognize that closure of the G3352-F119 will result in a low flow condition in the system that will in turn cause the RWCU pumps to trip.
D. The candidate could incorrectly recall the high temperature trip as an isolation signal and conclude that the RWCU system isolation valves (G3352-F001, F004 and F220) would close and cause the RWCU pumps to immediately trip, since the RWCU pumps do immediately trip (direct trip) on closure of any of these valves.

Reference Information:
ARP 2D110, RWCU Non-Regen HX Outlet Temp High
23.707, RWCU System SOP

NUREG 1123 KA Catalog Rev. 2
204000 RWCU System
204000 K4.04 System isolation upon-receipt of isolation signals

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

57	K/A Importance: 3.1			Points: 1.00
R57	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91447

The plant is starting up at 5% power with the following:

- Withdrawing control rods to heat up.
- The group of rods is being moved from 00 to 12.
- Control rod 30-31 is single notched out from 10 with a target of 12.
- The reed switch for position 12 is failed open.

Which of the following describes (1) the effect on the plant and (2) what action should be taken?

A. 1) The rod worth minimizer will NOT enforce a rod drive withdraw block.
2) Bypass the control rod in the Rod Worth Minimizer per 23.608,

B. 1) The rod worth minimizer will NOT enforce a rod drive withdraw block.
2) Insert a substitute control rod position per 23.608.

C. 1) The rod worth minimizer will enforce a rod drive withdraw block.
2) Bypass the control rod in the Rod Worth Minimizer per 23.608.

D. 1) The rod worth minimizer will enforce a rod drive withdraw block.
2) Insert a substitute control rod position per 23.608.

Answer: D

Answer Explanation:
WITHDRAW MOTION ROD DRIVE BLOCK: Withdraw Drive Block and Settle are applied a short time after the rod reaches the odd position short of the withdraw limit (N-1). A timer is set when the rod leaves the previous even position (N-2) in the event of failure of the withdraw limit.

12 is the withdraw limit and therefore even though the “12” reed switch is failed the withdraw motion drive block will be applied at N-1 (11).

Substituting the control rod position is the correct action. Bypassing the control rod in the Rod Worth Minimizer per 23.608 is not correct because the rod should only be bypassed if a condition exists which (without an RWM bypass) would result in development of an RWM out of sequence condition.

Distractor Explanation:

A, B and C are plausible because they are all related to possible RWM enforcement of withdraw errors.

Reference Information:

23.608 Rod Worth Minimizer

NUREG 1123 KA Catalog Rev. 2
214000 RPIS
214000 A2. Ability to (a) predict the impacts of the following on the ROD POSITION INFORMATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
214000 A2.01 3.1/3.3 Failed reed switches

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

58	K/A Importance: 3.8			**Points: 1.00**
R58	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	91889

The plant is operating at 100% power. A steam leak in the Reactor Building has resulted in entry into 29.100.01 Sheet 5, Secondary Containment Control and Radiation Release. Elevated Reactor Building temperatures are affecting both Reactor Pressure Vessel (RPV) Level Instrument racks.

If ONLY the Wide Range RPV level instruments' reference leg temperatures become elevated due to the steam leak, which of the following correctly completes the following statement indicating the effect on the RPV level actuations as compared to the RPV level trip setpoint under normal temperature conditions?

Due to the elevated temperature in the level instrument reference legs, ACTUAL RPV water level for a __(1)__ would be __(2)__ than INDICATED RPV water level when the actuation occurred.

A. (1) reactor scram
(2) higher

B. (1) reactor scram
(2) lower

C. (1) core spray logic actuation
(2) higher

D. (1) core spray logic actuation
(2) lower

Answer: D

Answer Explanation:
Heating of the reference legs of any RPV level instrument would cause the indicated level to increase due to the density change of the water in the reference leg. Based on the lowering density in the reference leg, the reference leg would have less mass as compared to the variable leg (actual level) thus making actual RPV level lower for any setpoint initiated actuation or trip.
The wide range instruments also provide core spray (ECCS) actuations.

Distracter Explanation:

A. Is incorrect but plausible because the examinee could incorrectly determine that wide range instruments provide reactor scram functions. The reactor scram functions are provided by narrow instruments. The instrument malfunction due to the elevated temperatures is indicated only if the variable leg temperatures were affected and not the reference leg which would be an incorrect assessment.
B. Is incorrect but plausible because the examinee could incorrectly determine that wide range instruments provide reactor scram functions. The instrument malfunction due to the elevated temperatures is commensurate with the elevated reference leg temperature and would be an accurate assessment of the effect.
C. Is incorrect but plausible because the examinee could incorrectly determine the instrument malfunction due to the elevated temperatures is indicated only if the variable leg temperatures were affected and not the reference leg which would be an incorrect assessment.

Reference Information:

BC07Sr4_Sensors May 2011 Explains temperature variations on instruments.
23.601 (pg 16) Core Spray actuation from these instruments / logic
I2rprod-CECO - Identifies the instruments listed in 23.601 as the wide range instruments.

Plant Procedures
23.601
29.ESP.01

Question Use
Closed Reference
ILO
RO

NUREG 1123 KA Catalog Rev. 2
216000 Nuclear Boiler System
G2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Fermi 2 NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

59	K/A Importance: 3.3			Points: 1.00
R59	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	90098

The plant is operating at 100% power with RCIC operating in test mode. Division 1 of RHR is operating in Torus Cooling with torus water temperature at 100°F. A small steam line break on the RCIC steam supply in the drywell has caused the reactor to scram on high drywell pressure.

What is the RHR system response specifically and what actions are required to restore Torus temperature to below the EOP entry condition?

A. Division 1 RHR system will remain in Torus Cooling Mode and RHRSW will remain in service provided RPV water level remains above level 2, the level at which the LPCI loop is selected for injection

B. Division 1 RHR system will remain in Torus Cooling Mode provided RPV water level remains above level 2, the level at which the LPCI loop is selected for injection. RHRSW will need to be returned to service.

C. The RHR system will realign to LPCI mode. RHR must be returned to Torus Cooling by turning the Containment Mode Selector Switch to ON and reopening the E1150-F024A and E1150-F028A and restoring Division 1 RHRSW to service.

D. The RHR system will realign to LPCI mode. A fill and vent on Division 1 RHR must be performed prior to realigning RHR to Torus Cooling by turning the Containment Mode Selector Switch to ON and reopening the E1150-F024A and E1150-F028A and restoring Division 1 RHRSW to service.

Answer: C

Answer Explanation:
The RHR system will realign to LPCI mode on a high drywell pressure signal. These are the steps to return to torus cooling mode with a LOCA signal.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. LPCI will realign. Plausible if the candidate does not know the ECCS LOCA logic.
B. LPCI will realign. Plausible if the candidate does not know the ECCS LOCA logic.
D. The system does not need to be filled and vented. Plausible because there are situations were LPCI can be drained to the torus and filling and venting needs to be done to restore the system.

Reference Information:

23.205, 23.601

Plant Procedures
23.205
23.601

NUREG 1123 KA Catalog Rev. 2
219000 RHR/LPCI: Torus/Suppression Pool Cooling Mode
219000 A3.01 3.3/3.3 Valve operation

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (3) Mechanical components and design features of reactor primary system.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

60	K/A Importance: 3.5			**Points: 1.00**
R60-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	97851

A LOCA is in progress with DIV I RHR lined up in Torus Cooling / Torus Spray mode and DIV II RHR lined up in Drywell Spray mode per 23.205, Residual Heat Removal System, Enclosure A, RHR Containment Cooling Modes Operation.

RHR is not being used in the LPCI mode.

E1150-F010, RHR Cross Tie Valve, is OPEN.

RHR Pump B subsequently trips.

With no operator actions, what is the effect on Drywell and Torus temperatures?

A. Drywell temperature stabilizes.
Torus Temperature maintains same trend down.

B. Drywell temperature maintains same trend down.
Torus Temperature stabilizes.

C. Drywell temperature trends down at a slower rate than before the pump trip.
Torus Temperature maintains same trend down.

D. Drywell temperature trends down at a slower rate than before the pump trip.
Torus Temperature trends down at a slower rate than before the pump trip.

Answer: D

Answer Explanation:
With the E1150-F010 (system cross connect valve) open, system flow (for any use) will be supported by both divisions of RHR. When an additional flow path is established by aligning Drywell Sprays with Division 2 RHR, because the E1150-F010 is open, both Division 1 and 2 pumps are supplying torus cooling and drywell sprays. When RHR B trips (DIV II), flow will lower to both the torus and drywell causing both temperatures to continue to trend down but at a slower rate.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Incorrect because drywell sprays are still being supplied, but at a lower rate, from Division 1 via the E1150-F010. Plausible if the candidate concluded that, even with the F010 open, trip of B RHR will secure all flow to the drywell spray header.
B. Incorrect because flow to the drywell spray header would be lowered and flow to the Torus Cooling/Spray lines would also be lowered but would not stop altogether. Plausible if the candidate thinks B RHR is a DIV 1 pump and therefore all flow to torus cooling would be lost with drywell spray flow being unaffected. This is incorrect because DIV I is A and C pumps and trip of the Div 2 (B) pump would result in a reduction, but not a complete loss, of flow to both flow paths.
C. Incorrect because flow to the drywell spray header would be lowered and flow to the Torus Cooling/Spray lines would also be lowered, which would cause a reduction in cooling and therefore a slower temperature trend than before. Plausible if the candidate failed to recognize that both division's pumps 'share the load' when the E1150-F010 open and instead concluded that the trip of the Division 2 pump would only impact division 2 loads. This is incorrect because trip of either division's pump(s) would impact both division's loads with the E1150-F010 open.

Reference Information:

23.205, Residual Heat Removal System.

NUREG 1123 KA Catalog Rev. 2
226001 RHR/LPCI: Containment Spray System Mode
226001 K3.02 3.5/3.5 Containment/drywell/suppression chamber temperature

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (4) Secondary coolant and auxiliary systems that affect the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

61	K/A Importance: 2.9			**Points: 1.00**
R61-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	97852

The plant is in MODE 5 with fuel handling operations between the RPV and the Spent Fuel Pool in progress.

Division 1 RHR is operating in Shutdown Cooling.

The operating RHR Pump trips when an electrical fault causes the closure of E1150-F008, RHR SDC Otbd Suction Isol Valve. The valve cannot be reopened electrically or manually.

Which ONE of the following actions is required under these conditions?

A. Place Division 2 RHR in Shutdown Cooling.

B. Start ONE RHR Pump and open SRVs to drain water to the Torus.

C. Shift Fuel Pool Cooling and Cleanup discharge to the Reactor Well.

D. Start ONE SBFW Pump and balance RWCU effluent flow with SBFW and CRD influent flow.

Answer: C

Answer Explanation:
BOTH Loops of RHR are rendered unavailable by the COMMON suction line isolation. With NO RHR available and the Reactor Vessel Head and Fuel Pool Gates removed, 20.205.01, Loss of Shutdown Cooling, directs shifting FPCCU discharge to the Reactor Well, maximizing flow to the Reactor Cavity.

Distractor Explanation:
Distractors are incorrect and plausible because:
A is plausible and incorrect; Since F008 is on the COMMON suction line, with no bypass valve, with no bypass valve DIV 2 RHR will not be available
B is plausible and incorrect; If the Head and Fuel Pool Gates were in place and MS line plugs removed this would be a correct action per 23.800.05, Alternate Reactor Coolant Circulation & Decay Heat Removal Core Spray or RHR.
D is plausible and incorrect; If the plant were in Mode 4, this is a viable DHR option per 23.800.04, Alternate Coolant and Decay Heat Removal.

Reference Information:

20.205.01 Condition J (pg 9).
23.800.05, Alternate Reactor Coolant Circulation & Decay Heat Removal Core Spray or RHR.
23.800.04, Alternate Coolant and Decay Heat Removal.

Plant Procedures
20.205.01

NUREG 1123 KA Catalog Rev. 2
233000 Fuel Pool Cooling and Cleanup
233000 K1. Knowledge of the physical connections and/or cause-effect relationships between FUEL POOL COOLING AND CLEAN-UP and the following:
233000 K1.02 2.9/3 Residual heat removal system: Plant-Specific

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

62	K/A Importance: 3.1			**Points: 1.00**
R62-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	98767

The plant is at 50% power conducting a startup.

Power is being raised with Control Rods.

AVR Channels 1 and 2 both trip.

How will the plant respond and what are the required operator actions?

A. The Generator will trip; Place the Mode Switch in Shutdown.

B. The AVR will shift to Manual; Stop changing load and station a designated Control Room operator to monitor and control Main Generator Voltage.

C. The AVR will shift to Manual; Station a designated Control Room operator to monitor and control Main Generator Voltage then continue with the startup.

D. The AVR will shift to Manual; Station a designated Control Room operator to monitor and control Main Generator Voltage then lower MTG load to <2400 Field Amps.

Answer: B

Answer Explanation:
Per 23.118 Section 1.1 System Description (Page 4, 3rd paragraph):

Under normal conditions the excitation control will start up in automatic voltage regulator (AVR). If a failure occurs in the operating channel AVR, a transfer to the remaining channel AVR will occur automatically. **If the second channel AVR fails, a transfer to manual regulator will occur automatically**. In addition to the automatic transfers during failure modes, manual selection by the operator of manual/auto regulator and channel 1/channel 2 can be made.

Per 23.118 Section 8.1 AVR Instability Step 8.1.2.3 CAUTION: **When AVR is operating in Manual, changes in System voltage will require operator action to maintain generator voltage. Designated Control Room operator supervision of Main Generator Voltage conditions is required.**

Per 4D61, AVR on Manual Control:

Step 1: Stop Main Generator load or excitation changes.

CAUTION: **Operation in the Manual Channel requires manual supervision of reactive power, generator voltage, and excitation current since there are no limiters in the Manual Channel. Automatic voltage regulation to be restored as soon as is possible.**

NOTE: Continued operation in MANUAL is not recommended, unless designated specific Control Room operator supervision of Main Generator Voltage conditions is implemented.

Therefore, the examinee should determine that trip of both AVR Channels will force the AVR to Manual and that , during manual control, there should be no load or excitation changes and a dedicated operator should be assigned to monitor and control Main Generator Voltage.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Several trips related to the Main Generator will cause a Main Turbine Trip. It is plausible for the examinee to assume that trip of both AVR channels will cause a MTG trip which, because power is >30%, would cause a reactor scram and require the Mode Switch be placed in Shutdown. This is not correct because trip of both AVR channels will force the AVR to manual and not cause a MTG trip.
C. The examinee could recognize that trip of both AVR channels will force the voltage regulator to manual and incorrectly recall that power ascension can continue once an operator is assigned to continuously monitor and control generator voltage in manual. This is incorrect because, as can be seen above, several notes and cautions warn about the instability when in manual voltage control, the procedure(s) require automatic control be restored as soon as possible, and ARP 4D61 requires that load and excitation changes be stopped.
D. The examinee could recognize that trip of both AVR channels will force the voltage regulator to manual but incorrectly recall that operation with the voltage regulator in manual requires lowering MTG load to <2400 Field Amps. This is plausible because 4D53, AVR General Alarm will be received when AVR Channels 1 and 2 trip. 4D53 has numerous failures that require lowering load <2400 Field Amps. However, both AVRs tripping is NOT one of those failures and, as can be seen above, several notes and cautions warn about the instability when in manual voltage control, the procedure(s) require automatic control be restored as soon as possible, and ARP 4D61 requires that load and excitation changes be stopped.

Reference Information:

23.118, Main Generator and Generator Excitation
4D61, AVR on Manual Control
4D53, AVR General

NREG 1123 KA Catalog Rev. 2

63	K/A Importance: 2.7			**Points: 1.00**
R63-VER 2	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	97853

The plant is at full power when a crew drops a piece of scaffolding which severs the air line to the in-service Ring Water Pressure Control Valve (N62-F406A(B)).

What is the effect on the Off Gas system?

A. Off Gas system Delay Pipe Pressure RISES.

B. Off Gas system Delay Pipe Pressure LOWERS.

C. Off Gas system discharge radiation levels will GO UP.

D. Off Gas system discharge radiation levels will REMAIN STEADY.

Answer: A

Answer Explanation:
The Ring Water Pressure Control Valves (N62-F406A(B)) is essentially a “recirculation valve” that modulates to control pressure in the Delay Pipe.

When Delay Pipe pressure is TOO HIGH, F406A(B) will CLOSE to force more of the pump suction to come from the Delay Pipe (instead of the recirc line).

When Delay Pipe pressure is TOO LOW, F406A(B) will OPEN to force more of the pump suction to come from the recirc line (instead of the Delay Pipe).

On a loss of air, the Ring Water Pressure Control Valves (N62-F406A(B)) FAIL OPEN. Therefore, there is MORE “recirc” flow and LESS suction flow on the Delay Pipe … MORE time spent in the Delay Pipe … gases BUILD UP … Off Gas System Pressure GOES UP.

Distractor Explanation:
Distractors are incorrect and plausible because:

B. candidates may not recall how the Ring Water Pressure Control Valves fail … if the valve failed CLOSED, Delay Pipe pressure would GO DOWN. This is incorrect because the valve fails OPEN.
C. candidates may not recall how the Ring Water Pressure Control Valves fail … if the valve failed CLOSED, the Ring Water Vacuum Pumps would be drawing a stronger vacuum on the system … gasses would travel through the system … radioactive isotopes would spend LESS TIME in the Delay Pipe … Off Gas system rad levels (on RRE-R602) would GO UP . This is incorrect because the valve fails OPEN.
D. candidates may not recall how the Ring Water Pressure Control Valves fail … if the valve failed AS-IS, no short-term impact would be seen on the system.

Reference Information:

AOP 20.125.01 (Loss of Condenser Vacuum)
AOP 20.129.01 (Loss of Station AND/OR Control Air)
Lesson Plan LP0035 (Off Gas)
P&ID M-5719 (Condenser Vacuum Systems & Off Gas)

NUREG 1123 KA Catalog Rev. 2
271000 Offgas System
271000 K6 Knowledge of the effect that a loss or malfunction of the following will have on the OFFGAS SYSTEM:
271000 K6.01 2.7/2.8 Plant air systems

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Higher Cognitive Level
New
RO

Associated objective(s):

64	K/A Importance: 3.1			Points: 1.00
R64	Difficulty: 2.00	Level of Knowledge: High	Source: BANK	90104

Division I CCHVAC is operating in Purge mode due to a fire in the Relay Room when the Main Control Room receives the following alarm:

3D36 DIV I/II RB VENT EXH RADN MONITOR UPSCALE TRIP

What will happen to the CCHVAC configuration?

A. Div I CCHVAC will transfer from Purge mode to Recirculation mode.

B. Div I CCHVAC will trip and will have to be manually started in the Recirculation mode.

C. Div I CCHVAC will trip and Div II CCHVAC will automatically start in the Recirculation mode.

D. Div I CCHVAC will continue to operate in Purge mode. Logic must be reset to allow shift to Recirculation mode.

Answer: A

Answer Explanation:
Per Design Base Document, Hierarchy of Modes, Automatic Recirc mode will initiate from any other mode. T-41-02 Section 2.2.4.3 Recirculation Mode states recirc mode will initiate due to Reactor building ventilation exhaust radiation high.

Distractor Explanation:
Distractors are incorrect and plausible because:

Distractors are incorrect and plausible because all distractors list actual modes of CCHVAC and describe events/modes for CCHVAC; the Hierarchy of Modes directs that an automatic shift to recirc will occur given the conditions stated

Reference Information:

DBD T-41-02 pg. 4-5, 20

NUREG 1123 KA Catalog Rev. 2
290003 Control Room HVAC
290003 K4. Knowledge of CONTROL ROOM HVAC design feature(s) and/or interlocks which provide for the following:
290003 K4.01 System initiations/reconfiguration: Plant-Specific

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (7) Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Higher Cognitive Level
RO

Associated objective(s):

65	K/A Importance: 3.1			**Points: 1.00**
R65-VER 4	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	98747

LCO 3.4.10, RCS Pressure and Temperature (P/T) Limits are Applicable __(1)__.

If the PTLR limits are exceeded, parameters must be restored to within limits, within __(2)__, to re-establish acceptable margin to brittle failure.

A. (1) at all times
(2) 15 minutes

B. (1) at all times
(2) 30 minutes

C. (1) ONLY in Modes 1, 2 and 3
(2) 15 minutes

D. (1) ONLY in Modes 1, 2 and 3
(2) 30 minutes

Answer: B

Answer Explanation:
Per LCO 3.4.10 and BASES:

3.4 REACTOR COOLANT SYSTEM (RCS)
3.4.10 RCS Pressure and Temperature (P/T) Limits
APPLICABILITY is (1) at all times.

BASES
BACKGROUND All components of the RCS are designed to withstand effects of cyclic loads due to system pressure and temperature changes. These loads are introduced by startup (heatup) and shutdown (cooldown) operations, power transients, and reactor trips. This LCO limits the pressure and temperature changes during RCS heatup and cooldown, within the design assumptions and the stress limits for cyclic operation.
The LCO establishes operating limits that provide a margin to brittle failure of the reactor vessel and piping of the reactor coolant pressure boundary (RCPB). The vessel is the component most subject to brittle failure. Therefore, the LCO limits apply mainly to the vessel. These limits define allowable operating regions and permit a large number of operating cycles while also providing a wide margin to brittle failure.

LCO 3.4.10 Condition A, Requirements of the LCO not met in MODES 1, 2 and 3
REQUIRED ACTION: Restore parameter(s) to within limits.
COMPLETION TIME: (2) 30 minutes.

Distractor Explanation:
Distractors are incorrect and plausible because:

All of the distractors are plausible because (1) LCO 3.4.10 is unusual in that it is applicable At all times. Many LCOs are only Applicable in Modes 1, 2 and 3 OR under shutdown (Modes 4 and 5) conditions. Also, the candidate could determine that P/T limits are only applicable with the plant at an elevated temperature (above Mode 4). This is incorrect since the RPV P/T limits are always applicable.

(2) The candidate could confuse the required Completion Time of LCO 3.4.11, Reactor Steam Dome Pressure Action A.1, Restore reactor steam dome pressure to within limit, required Completion Time of 15 minutes, with the required Completion Time of LCO 3.4.10 Condition A. This is plausible because LCOs 3.4.10 and 3.4.11 are closely related in that both are associated with limiting stresses imposed upon the Reactor Coolant System (RCS) and because both Actions are unusual in that they both have Completion Times of <1 hour.

Reference Information:

TS 3.4.10 Bases
LCO 3.4.11

NUREG 1123 KA Catalog Rev. 2
290002 Reactor Vessel Internals
290002 K5 Knowledge of the operational implications of the following concepts as they apply to REACTOR VESSEL INTERNALS: :
290002 K5.05 3.1/3.3 Brittle fracture

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

66	K/A Importance: 3.4			Points: 1.00
R66	Difficulty: 0.00	Level of Knowledge: Fund	Source: MODIFIED	92527

There is a small leak in the Steam Tunnel. Using a camera, an isolation valve has been identified.

During the pre-job brief, this activity is identified as MODERATE. RP has determined that OREX ULTRA PCs are required for entry. Wet Bulb temperature is 104°F, and no other heat stress prevention equipment will be used.

After isolating the leak, the Nuclear Operator reports the job took 10 minutes.

The EARLIEST this Nuclear Operator can be sent back to normal duties is after _____ minutes of rest time?

A. 15

B. 20

C. 30

D. 40

Answer: D

Answer Explanation:
NOTE: Safety Handbook, ALL of Section 21, will be provided with this question.

Using TABLE 21-2, stay time is 15 minutes for OREX ULTRA PCs for a temperature of 104°F and MODERATE (MED) activity.
Using the rest time calculation, rest time is actual time/time limit (10/15) times 60 minutes, or 40 minutes.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. 15 minutes could be selected if the candidate misread the chart and only took into consideration the stay time for work in Double PCs. This is incorrect based on chart and calculation for rest time.
C. 20 minutes could be selected if the candidate didn't understand what was being asked and only took into consideration the stay time for work in OREX ULTRA PCs. This is incorrect based on the calculation for rest time.
D. 30 minutes could be selected if the candidate calculated rest time for work in Double PCs. This is incorrect based on information in the chart, and the calculation of rest time, for work in OREX ULTRA PCs.

Reference Information:

Safety Handbook, Section 21, Table 21-2, Wet Globe Temperature - Stay Times.

Plant Procedures
Safety Handbook, Section 21, Hot and Cold Environments / Temperature Extremes

NUREG 1123 KA Catalog Rev. 2
G2.1.26 Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b) (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Fundamental
Modified
Reference Provided
RO

Associated objective(s):

67	K/A Importance: 3.7			Points: 1.00
R67 - VER 3	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	98749

During the shift the Shift Technical Advisor had to leave because he was experiencing a fever.

All licensed operators are required to go to Medical, at some time during the current shift, to be tested for COVID-19.

Per MOP01 Section 3.8.3, Short Term Relief:

(1) Who can provide a short-term relief of the CRS and CRLNO so that this can be accomplished?

(2) How could the short-term relief be provided?

A. (1) ANY fully qualified Licensed Operator who is qualified and licensed for the applicable position.

(2) The CRS or CRLNO have to be relieved one at a time.

B. (1) ANY fully qualified Licensed Operator who is qualified and licensed for the applicable position.

(2) The CRS and CRLNO can be relieved at the same time.

C. (1) ONLY a fully qualified Licensed Operator, qualified and licensed for the applicable position, that participated in shift turnover.

(2) The CRS or CRLNO have to be relieved one at a time.

D. (1) ONLY a fully qualified Licensed Operator, qualified and licensed for the applicable position, that participated in shift turnover.

(2) The CRS and CRLNO can be relieved at the same time.

Answer: C

Answer Explanation:
MOP01, Conduct of Operations, section 3.8.3, Short Term Relief, describes the requirements for short-term reliefs of the CRS or CRLNO. This section only applies to the CRLNO and CRS and contains the following requirements (among others):

1. Short term relief may only occur if the plant is in a stable condition.
2. Operators performing short term reliefs shall have participated in the shift turnover. Any duties of the previous position that are not completed must be reported to the CRS.
3. When short term relief occurs during a shift, the CRS or CRLNO shall ensure the oncoming persons are as knowledgeable of plant conditions as they would have been following a complete shift turnover. The following items, as a minimum, must be performed with their relief:
a. Complete the items noted by an asterisk on the Shift Relief checklist.
b. Review activities expected to continue during the relief period.
c. Review significant changes in plant conditions since shift turnover (power level, chemistry changes, etc.).
d. Review unusual plant conditions requiring special attention such as systems recently placed in service that have not yet reached steady state operating values, and may require adjustments, such as cooling water flows.
4. Except in cases of illness or accident, subsequent relief must be conducted with the original CRS or CRLNO, as applicable.
5. Only one position (CRS or CRLNO) may receive short term relief at a time.
6. Personnel on short term relief must always remain within five minutes of the Main Control Room (the cafeteria is acceptable).
7. The review of COPs for a short-term relief is not expected to be at the same detailed level occurring during regular shift turnover. It is meant to review panels containing key parameters for the actual plant condition.

Therefore, in order for someone to perform a short-term relief the operator performing the relief (1) shall have participated in shift turnover.

Distractor Explanation:
Distractors are incorrect and plausible because:

(1) This is true for an operator relieving the P603 (At Controls) Operator. Since the P603 position is NOT bound to the requirements of MOP01 Section 3.8.3, the person relieving the P603 operator does NOT need to attend shift turnover to provide a relief. NOTE: The requirements to relieve the P603 Operator are located in the 3rd bullet under Step 3.12.1.2 of Section 3.12, Monitoring of Plant Status, in MOP01. These requirements are:

When temporary relief of the P603 Operator is necessary, the licensed operator being relieved will brief their relief on general plant status, abnormal or unusual conditions, any evolutions in progress, and actions anticipated during the relief period.

Therefore, it is plausible that the examinee could recall participating in this type of temporary relief at the P603 panel and forget that the requirements of Short Term relief are more restrictive.

(2) Since each position (CRS and CRLNO) are both allowed a short-term relief, and each requires its own shift relief checklist be completed, and since neither checklist contains a check to verify that the other position has been relieved (short-term) it is plausible that the examinee could only recall the items on the checklist (failing to recall the procedural requirement) and determine that both positions could meet the requirements of their applicable checklist and therefore be relieved (short-term) at the same time. This is incorrect because MOP01 Step 3.8.3.5 allows only one short-term relief (CRS or CRLNO) at a time.

Reference Information:

MOP01, Conduct of Operations

NUREG 1123 KA Catalog Rev. 2
G2.1.3 3.7/3.9 Knowledge of shift or short-term relief turnover practices

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

68	K/A Importance: 3.0/3.6			**Points: 1.00**
R68	Difficulty: 0.00	Level of Knowledge: Low	Source: BANK	90118

Which one of the following situations is NOT appropriate for the use of Temporary Change Notice?

A. When an administrative procedure needs revision to accommodate a temporary change in approval requirements.

B. When a component identification in a system operating procedure is incorrect and the intended component is clear.

C. When the plant is in a temporary condition other than that assumed when the procedure was written because of Temporary modifications.

D. Where a step or steps cannot be performed exactly as stated, but the intent is clear, and a delay in performing the procedure affects operation of the plant.

Answer: A

Answer Explanation:
The approval requirements cannot be changed with the temporary change process IAW MGA04.

Distractor Explanation:

The distractors are plausible because they are all reasons that procedures are changed and are allowed by MGA04, “Temporary Change Notices".

Reference Information:

MGA04 Sections 3.3 & 3.4

NUREG 1123 KA Catalog Rev. 2
G2.2.6 Knowledge of the process for making changes to procedures.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

69	K/A Importance: 4.1/4.3			**Points: 1.00**
R69	Difficulty: 2.00	Level of Knowledge: Low	Source: BANK	90120

Which of the following is required when a visible break CANNOT be used to disconnect a piece of equipment from its power supply?

A. Independent verification of the danger tag.

B. An approved grounding device installed on the load side.

C. A safety observer is stationed for all work performed on the equipment.

D. An approved blocking device and a method for determining that power is removed.

Answer: D

Answer Explanation:
An approved blocking device and a method for determining that power is removed are required by MOP-12 section 3.2.10.

Distractor Explanation:
Distractors are incorrect and plausible because:
A. Independent Verification is used in the STR process without regard to the presence of a visible break.
B. Grounding devices are used for 120 kV and 345 kV work without regard to the presence of a visible break.
C. Safety observer use is not approved.

Reference Information:
MOP12

Plant Procedures
MOP12 - Tagging and Protective Barrier System

NUREG 1123 KA Catalog Rev. 2
G2.2.13 Knowledge of tagging and clearance procedures.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

NRC Exam Usage
ILT 2021 Exam - NRC Developed

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

70	K/A Importance: 3.6/4.5			Points: 1.00
R70	Difficulty: 3.00	Level of Knowledge: Fundamental	Source: BANK	90122

The following conditions exist:

- ALL RPV Head Closure Bolts are FULLY TENSIONED.
- Reactor Coolant System Temperature is 185°F.
- The Reactor Mode Switch is in REFUEL.

Based on these conditions, which ONE of the following is the correct MODE of operation per Technical Specifications?

A. MODE 2, Startup.

B. MODE 3, Hot Shutdown.

C. MODE 4, Cold Shutdown.

D. MODE 5, Refuel.

Answer: A

Answer Explanation:
Per Technical Specifications Table 1.1-1 MODES (see below):

Table 1.1-1 (page 1 of 1)
MODES

MODE	TITLE	REACTOR MODE SWITCH POSITION	AVERAGE REACTOR COOLANT TEMPERATURE (°F)
1	Power Operation	Run	NA
2	Startup	Refuel(a) or Startup/Hot Standby	NA
3	Hot Shutdown(a)	Shutdown	> 200
4	Cold Shutdown(a)	Shutdown	≤ 200
5	Refueling(b)	Shutdown or Refuel	NA

(a) All reactor vessel head closure bolts fully tensioned.

(b) One or more reactor vessel head closure bolts less than fully tensioned.

Therefore, the examinee must recall that, with the Mode Switch in REFUEL and all RPV Head Bolts fully tensioned, note (a) applies and the reactor is considered to be in MODE 2, Startup.

Distractor Explanation:
Distractors are incorrect and plausible because:
B. Plausible because this distractor would be true if the Reactor Mode Switch was in the Shutdown and Temperature was > 200 F. Incorrect because the correct mode for the listed conditions is Startup.
C. Plausible because this distractor would be true if the Mode switch was in shutdown. Incorrect because the correct mode for the listed conditions is Startup.
D. Plausible because this distractor would be true if the head closure bolts were not fully tensioned. Incorrect because the correct mode for the listed conditions is Startup.

Reference Information:

Technical Specifications Table 1.1-1 MODES.

NUREG 1123 KA Catalog Rev. 2

G2.2.35 Ability to determine Technical Specification Mode of Operation

10CFR55 RO/SRO Written Exam Content

10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage

ILO 2019 Exam

ILT 2021 Exam

NRC Question Use (ILT 2021)

Bank

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Fundamental

RO

Associated objective(s):

71	K/A Importance: 3.2/3.7			**Points: 1.00**
R71	Difficulty: 0.00	Level of Knowledge: Low	Source: BANK	90129

Which ONE of the following describes the annual limits for Total Effective Dose Equivalent (TEDE) as set forth in (1) 10CFR20 and (2) Fermi 2 Administrative Guidelines for persons with Radiation Training and complete current year records?

A. (1) 4 rem/year
(2) 1 rem/year

B. (1) 4 rem/year
(2) 2 rem/year

C. (1) 5 rem/year
(2) 1 rem/year

D. (1) 5 rem/year
(2) 2 rem/year

Answer: D

Answer Explanation:
10CFR20 limits TEDE to 5 rem/yr, and Administrative limits MRP03 are 2 rem/yr for trained personnel.

Distracter Explanation:
Distractors are incorrect and plausible because:
A. 1 rem/yr is the old administrative limit.
B. Is incorrect and plausible because 4 rem/year is not the Federal limit, but it is the limit that can be approved with section head, RP Manager, and Plant manager approval per MRP12.
C. Is incorrect and plausible because 1 rem/year is the old administrative limit.

Reference Information:
MRP03 Encl A (pg 1)

Objective Link:
Radwork Qualifications

NUREG 1123 KA Catalog Rev. 2
G2.3.4 Knowledge of radiation exposure limits under normal and emergency conditions

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(12) Radiological safety principles and procedures.

Fermi 2 NRC Exam Usage
ILO 2015 Exam
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NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

72	K/A Importance: 3.2			Points: 1.00
R72	Difficulty: 0.00	Level of Knowledge: Low	Source: NEW	91451

The plant is shutdown with the Drywell open for access.

Initial Drywell Entry has been performed.

Which of the following is required to be in service for personnel protection in the drywell during core alterations, in accordance with 23.425.01, Primary Containment Procedures?

A. First Floor Drywell ARM Channel 45.

B. Primary Containment Monitoring System (PCMS).

C. Primary Containment Radiation Monitoring System (PCRMS).

D. Div I or Div II Containment Area High Range Rad Monitor (CHRRMS).

Answer: A

Answer Explanation:
Per 23.425.01, Primary Containment Procedures, note on page 6 states “To maximize personnel protection, Radiation Monitor Channel 45 must be installed before core alterations or as directed by the Shift Manager."

Distractor Explanation:
Distractors are incorrect and plausible because:

B. PCMS monitors containment H2 and O2 concentrations and, since several steps in 23.425.01, as well as P&L 3.7, relate to containment oxygen being above a minimum safe value, the candidate could assume that PCMS must be functional and required for personnel protection. This is incorrect because Oxygen can be sampled without PCMS and because PCMS can be isolated for welding, grinding, etc.
C. PCRMS is a system that takes a suction from the Drywell, recirculates it through a radiation monitor, and returns it back to the Drywell. Plausible because the candidate could determine that it must be in service to monitor radiation levels in the drywell during core alterations. However, PCRMS is not required and is often shut down per 23.425.01, P&L 3.10 that requires PCRMS be shutdown whenever work is in the Drywell that may generate dust (such as grinding or welding), which is often the case.
D. There is no requirement for Div I or Div II Containment Area High Range Rad Monitor to be operable while making core alterations. Plausible because they are rad monitors in the drywell that would detect high radiation conditions.

Reference Information:

23.425.01, Primary Containment Procedures

NUREG 1123 KA Catalog Rev. 2
G2.3.12 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.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(12) Radiological safety principles and procedures.

Fermi 2 NRC Exam Usage
ILT 2021 Exam

NRC Question Use (ILT 2021)
Closed Reference
Fundamental
New
RO

Associated objective(s):

73	K/A Importance: 3.9			**Points: 1.00**
R73-VER 3	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	98667

Which of the following is an assumption used to calculate the Hot Shutdown Boron Weight?

A. No xenon is present in the reactor core.

B. RPV water is at its most reactive temperature.

C. Shutdown cooling is in service and RWCU is operating.

D. RPV pressure is 1100 psia and RPV temperature is at saturation.

Answer: D

Answer Explanation:
BWR Owners' Group Emergency Procedure and Severe Accident Guidelines Appendix B: Technical Basis Volume I: Introduction and References Section 9.0 Variables and Curves, 9.8 Hot Shutdown Boron Weight states the following:

The Hot Shutdown Boron Weight (HSBW) is the least weight of soluble boron which, if injected into the RPV and mixed uniformly, will maintain the reactor shutdown under hot standby conditions. The HSBW is determined assuming:

1. A critical control rod density is established with the reactor at its full licensed rated power and minimum licensed core flow at rated power. The minimum licensed core flow shall correspond to the maximum rod line that marks the boundary of the licensed operating domain (i.e. ELLLA, MELLLA, MELLLA+).
2. The reactor core is at its most reactive exposure. (A sufficient number of exposure points throughout the cycle shall be analyzed to adequately describe the point of least margin).
3. Full power equilibrium xenon is present in the reactor core.
4. No voids are present in the reactor core.
5. **<u>RPV pressure is 1100 psia and RPV temperature is at saturation</u>**.
6. RPV water level is at the high level trip setpoint.
7. No shutdown cooling is in service.

Section 9.2, Cold Shutdown Boron Weight states that the CSBW is determined assuming:

1. All control rods are fully withdrawn.
2. The reactor core is at its most reactive exposure.
3. No xenon is present in the reactor core.
4. No voids are present in the reactor core.
5. RPV water is at its most reactive temperature.
6. RPV water level is at the high level trip setpoint.
7. All shutdown cooling is in service and RWCU is operating in the recirculation mode.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Xenon concentration is part of both the HSBW and CSBW calculations. The CSBW calculation assumes no xenon is present in the reactor core (item 9.2.3 above). However, the HSBW calculation assumes full power equilibrium xenon is present in the reactor core.
B. RPV water temperature is part of both the HSBW and CSBW calculations. The CSBW calculation assumes RPV water is at its most reactive temperature (item 9.2.5 above). However, the HSBW calculation assumes RPV water temperature is at saturation temperature for 1100 psia.
C. Shutdown cooling status is part of both the HSBW and CSBW calculations. The CSBW calculation assumes Shutdown cooling and RWCU are in service. However, the HSBW calculation assumes that shutdown cooling is not in service.

Reference Information:

BWR Owners' Group Emergency Procedure and Severe Accident Guidelines Appendix B: Technical Basis Volume I: Introduction and References

NUREG 1123 KA Catalog Rev. 2
G2.4.17 3.9/4.3 Knowledge of EOP terms and definitions

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Closed Reference
Fundamental
New
RO

Associated objective(s):

74	K/A Importance: 2.6/3.8			Points: 1.00
R74	Difficulty: 0.00	Level of Knowledge: Low	Source: BANK	90137

An Alert has been declared and all required Emergency Response Facilities have been activated.
The CRLNO believes there is a leak from an injection system in the Reactor Building.
A Damage Control & Rescue Team (DCRT) comprised of two NOs, two Mechanical Maintenance technicians and an RP tech are being briefed to investigate the leak.
Which Emergency Response Facility is responsible for dispatching the DCRT?

A. Main Control Room (MCR).

B. Technical Support Center (TSC).

C. Operational Support Center (OSC).

D. Emergency Operations Facility (EOF).

Answer: C

Answer Explanation:
Per EP-110, Organization and Responsibilities, Section 4.3, Operational Support Center (OSC) Assignment and Responsibilities:

The OSC is a designated assembly point within the TSC envelope. The OSC provides an area for coordination of shift personnel to support emergency response operations without causing congestion in the Control Room. Personnel reporting to the OSC may include Fire Brigade, Damage Control and Rescue Teams, Onsite RETs, instrument control technicians and general maintenance personnel. The OSC is activated for an Alert, Site Area Emergency, or General Emergency. The OSC Coordinator integrates OSC activities and dispatches emergency personnel on assignments as directed by the Emergency Director.

Therefore, the examinee must use his/her knowledge of the Emergency Response Facilities and their roles and responsibilities to recall that the OSC is activated at an Alert and that it is the responsibility of the OSC to dispatch the emergency personnel once activated.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. The MCR is the normal assembly point for dispatching people to investigate plant issue during non-emergency events and also for emergency events at the Unusual Event level when the OSC is not activated. This distractor is incorrect because the OSC takes over this responsibility once active at an Alert or higher.
B. The TSC is activated when emergency conditions escalate to an Alert, Site Area Emergency or General Emergency. The TSC provides plant management and technical support to Control Room personnel and relieves the reactor operators of peripheral duties not directly related to reactor system manipulations during an emergency so it is plausible to assume that the TSC would take over dispatching emergency response teams to relieve the reactor operators of this duty. However, the TSC is only responsible for coordinating the deployment of emergency response teams and not for dispatching the teams.
D. The EOF is activated for an Alert, Site Area Emergency, or General Emergency. The EOF is a command post for the overall management of the offsite emergency response including the coordination of radiological and environmental assessments, the determination of protective actions for the public, and the management of recovery operations. One of the responsibilities of the EOF is to direct and coordinate offsite environmental assessment activities, which includes directing Radiological Emergency Team Coordinator, Dose Assessors, and EOF Laboratory Technicians and offsite Radiological Emergency-response teams (RETs), so it is plausible to assume that the EOF would take over dispatching emergency response teams to relieve the reactor operators of this duty. However, distractor is incorrect because the EOF is not directly responsible for this action.

Reference Information:

EP-110, Organization and Responsibilities.

NUREG 1123 KA Catalog Rev. 2
G2.4.42 Knowledge of emergency response facilities

10CFR55 RO/SRO Written Exam Content
10 CFR 55.41(b)(10) Administrative, normal, abnormal, and emergency operating procedures for the facility.

Fermi 2 NRC Exam Usage
ILO 2019 Exam
ILT 2021 Exam

NRC Question Use (ILT 2021)
Bank
Closed Reference
Fundamental
RO

Associated objective(s):

75	K/A Importance: 3.2			Points: 1.00
R75	Difficulty: 0.00	Level of Knowledge: Low	Source: BANK	90138

Per EP-290, Emergency Notifications, when the State Emergency Operations Center (SEOC) is functional, how are Emergency Communications affected?

After the State Emergency Operations Center is FUNCTIONAL, the Fermi 2 Communicator is:

A. NO LONGER required to make notifications to Canada.

B. NO LONGER required to make notifications to Monroe and Wayne counties.

C. NO LONGER required to make notifications to the Nuclear Regulatory Commission.

D. STILL REQUIRED to notify Monroe and Wayne counties, the State of Michigan, and Canada.

Answer: B

Answer Explanation:
Correct Answer: B After the State Emergency Operations Center is functional; it is NO LONGER required to make notifications to Monroe and Wayne counties. The SEOC will assume these communication duties.
Plausible Distractors:
A is plausible; Province of Ontario (Canada) SHALL receive all INITIAL notification messages. When the SEOC is functional, the SEOC will handle ONLY follow-up notifications to Canada.
C is plausible; the NRC is unaffected by the status of the State Emergency Operations Center.
D is plausible; Canada is unaffected by the status of the State Emergency Operations Center.
Objective Link: LP-OP-802-4101-0017

NUREG 1123 KA Catalog Rev. 2
G2.4.43 Knowledge of emergency communications systems and techniques.

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Fundamental
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Associated objective(s):