

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 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

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91247

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.
- RFPT A and B speed is 2650 rpm.
- All control rods inserted.

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

- A. Open N2100-F607 or F608, N (S) RFP Discharge Line Iso Valve.
- B. Open N2100-F045A or B, N (S) RFP Discharge Hyd Stop Valve.
- C. Place N21-F403, RPV Startup LCV, to AUTO and adjust the setpoint to control at the desired level.
- D. Place one or both Reactor Feed Pump Individual Feedwater Flow A (B) Controls in MANUAL and adjust RFPT speed.

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. Therefore is already in auto. Plausible because may not know that LCV transfers to auto on a reactor scram.

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

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	Difficulty: 0.00	Level of Knowledge: Low	Source: NEW	91427

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	Difficulty: 3.00	Level of Knowledge: High	Source: BANK	89774

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.
- P50-R802, Station Air Header Pressure Recorder is 90 psig, lowering.
- All AOP actions have been taken for these conditions ONLY.

The following alarm is subsequently received:

- 7D57, Station Air Isolation Valve Closed.

The NEXT required action is ___(1)___ to avoid conditions which will result in ___(2)___ MSIVs drifting SHUT.

- A. (1) Start any available Station Air Compressors
(2) Inboard
- B. (1) Start any available Station Air Compressors
(2) Outboard
- C. (1) Start Div I and Div II Control Air Compressors
(2) Inboard
- D. (1) Start Div I and Div II Control Air Compressors
(2) Outboard

Answer: C

Answer Explanation:

20.129.01, Loss of Station and Control Air AOP, Condition A contains the guidance for the actions that would be taken for the first set of conditions in the stem of the question, namely starting all available Station Air Compressors when Station Air Pressure drops <95 psig. The Candidate must recognize that the Station Air Compressors would have been started.

The candidate must then 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 recall that 20.129.01 Condition B requires verifying/starting the Division 1 and Division 2 Control Air Compressors.

Finally, the candidate must recall that Division 1 NIAS supplies air to the Division 1 containment Nitrogen isolation valves which would drift shut causing the inboard MSIVs to drift shut so starting the Control Air Compressors will limit further degradation of the Division 1 (and 2) NIAS pressures and prevent closure of the Inboard MSIVs.

Distractor Explanation:

Distractors are incorrect and plausible because:

- A. The candidate could forget that Condition A of the AOP requires starting any available Station Air Compressor when Station Air Pressure lowers <95psig and determine that this action was only required when 85 psig was reached as evidenced by receipt of alarm 7D57. This is incorrect because this action would be complete by the time 7D57 was received. The candidate could incorrectly recall that IAS pressure impacts the Inboard MSIVs, which is incorrect because the Outboard MSIVs are impacted by IAS.
- B. Note: This distractor was the correct answer for the BANK version of this question. The candidate could forget that Condition A of the AOP requires starting any available Station Air Compressor when Station Air Pressure lowers <95psig and determine that this action was only required when 85 psig was reached as evidenced by receipt of alarm 7D57. This is incorrect because this action would be complete by the time 7D57 was received.
- D. The candidate could correctly determine that the Div 1 and 2 NIAS compressors need to be started for the conditions given in the stem of the question but incorrectly recall that NIAS impacts the Outboard MSIV, which is incorrect since NIAS impacts the Inboard MSIVs as described above.

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)

Bank

Closed Reference

Higher Cognitive Level

RO

Associated objective(s):

9	K/A Importance: 3.6			Points: 1.00
R09	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	91887

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 ONE 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" with NO recirc pumps running. Core Spray injecting with RHR in Torus cooling.
- B. Reactor level maintained at 220" with one recirc pump running. Core Spray injecting with RHR in Torus cooling.
- C. Reactor level maintained at the main steam lines with SRV's open with NO recirc pumps running. Core Spray injecting with RHR in Torus cooling.
- D. Reactor level maintained at the main steam lines with SRV's open with one recirc pump running. Core Spray injecting with RHR in Torus cooling.

Answer: D

Answer Explanation:

Per 23.800.05 one recirc pump must be running or started. 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.

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 a recirc pump needs to be running to mix the water and prevent thermal stratification. This is plausible because all other requirements are met per the procedure.

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

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 MINIMUM 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:

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:

- (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".
- (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.
- (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

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, RPV Control-ATWS, is being executed.
- Low-Low Set (LLS) is controlling in Automatic.
- Reactor pressure is now 910 psig and slowly lowering.

Which ONE 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) 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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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 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 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 $\leq +2$ 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 suction (-48 in).

Both distracters 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 distracters 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 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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

NRC Question Use (ILT 2021)

Bank

Closed Reference

Fundamental

RO

Associated objective(s):

20	K/A Importance: 3.6			Points: 1.00
R20	Difficulty: 0.00	Level of Knowledge: Fund	Source: BANK	91168

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 58 Hz.

Which of the following actions is required per 20.300 Grid and why?

- A. Reduce generator load to raise frequency.
- B. Place the Mode Switch in SHUTDOWN to protect the plant from conditions that might damage the Main Generator.
- C. Trip the turbine to protect the plant from conditions that might damage the Main Generator.
- D. Start CTG 11-1 to minimize the impact of a potential loss of the 120Kv Mat.

Answer: C

Answer Explanation:

With generator frequency less than 58.6% 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 mover exceeds torque of the load. However, the frequency given in the stem of the question requires a turbine trip.
- B. The AOP override requires placing the Mode Switch in Shutdown. However, this is incorrect because reactor power is less than 30%.
- D. 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.

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	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	91828

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 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, 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

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	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91613

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 and why?

- A. Venting from the Torus is directed first because it takes advantage of the benefits of suppression pool scrubbing.
- B. Concurrent venting using both the Torus and Drywell 1" vent paths is preferred because it provides the maximum controlled vent rate.
- C. The 1", 6", and 24" vent paths can be used in any order/combo depending on the severity of the threat to containment integrity.
- D. Venting from the Drywell 1" vent path via SBTG OR RBHVAC is preferred because they are elevated/monitored release paths

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 BWROG EPG Bases provides 3 considerations when factoring radioactivity release as it pertains to venting primary containment: "If the containment atmosphere may be contaminated, vent lineups should be selected so as to minimize the amount of radioactivity released while still achieving the objective of the venting requirement ... Venting from the suppression chamber is generally preferred, to obtain the benefits of suppression pool scrubbing ... Filtered vent paths are generally preferred over unfiltered paths ... Elevated release points are generally preferred over ground-level releases."

Immediately prior to the steps that initiate venting the Drywell via the 1" Pressure Control Valves, a caution states that "venting the Primary Containment may release radioactive gas/steam into the Reactor Building

Distractor Explanation:

Distractors are incorrect and plausible because:

- A. Plausible because guidance for venting from either the Drywell or the Torus is contained in ESP 29.ESP.07 and for primary containment sprays, the PCP leg of EOP 29.100.01, Sheet 2, directs initiation of Torus Sprays before Drywell Sprays. However, this option is incorrect because EOP 29.100.01 step PCP-1 specifically directs performance of 29.ESP.07, Section 1.0 (Venting the Drywell to Control Pressure < 1.68#) ... NOT via the Torus.
- B. Plausible because the 1" vent path does provide the greatest control and concurrent venting via both the Torus and Drywell 1" vent paths would provide a "maximum controllable vent rate". However, this option is incorrect because numerous procedures (including 29.ESP.07) have multiple instances of the following caution: "Simultaneously venting the Drywell and Torus is prohibited".
- 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); EOP 29.100.01 SH. 2 (Primary Containment Control); SOP 23.406 (Primary Containment N2 Inerting and Purge System); BWR Owners' Group Emergency Procedure and Severe Accident Guidelines, Appendix B: Technical Basis, Volume I: Introduction and References, Sect. 5.4 (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	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	91187

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 MG Scoop Tubes are LOCKED.
Both Recirc Pumps are operating.
- B. The Mode Switch is in SHUTDOWN.
Both Recirc MG Scoop Tubes are LOCKED.
Both Recirc Pumps are tripped.
- C. The plant is operating at a lower power level.
Both Recirc MG Set Scoop Tubes are LOCKED.
One Recirc Pump is tripped.
- D. The plant is operating at a lower power level.
Both Recirc MG Set Scoop Tubes are LOCKED.
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	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	91620

The plant is at 100% power.

A Group 13 Isolation of the outboard valves, G1100-F003 "DW FLR DRN SUMP OTBD CNTM ISO VLV" and G1100-F019 "DW EQUIP DRN SUMP OTBD CNTM ISO VLV," occurs.

The inboard valves are still open.

Which ONE of the following could cause this inadvertent isolation?

Reactor Vessel Low Water Level 3?

- A. Trip Channels A and B.
- B. Trip Channels C and D.
- C. Trip Channels A and C.
- D. Trip Channels B and D.

Answer: A

Answer Explanation:

Choice A is correct because per 23.601, "Instrument Trip Sheets" (Page 11), A and B trips Group 13: G1154-F003 and G1154-F019

Distractor Explanation:

Distractors are incorrect and plausible because:

- B. Plausible if the examinee incorrectly recalls which NSSSS logic trips the outboard valves. Incorrect because A and B trip the outboard valves.
- C. Plausible if the examinee incorrectly recalls which NSSSS logic trips the outboard valves. Incorrect because A and B trip the outboard valves.
- D. Plausible if the examinee incorrectly recalls which NSSSS logic trips the outboard valves. Incorrect because A and B trip the outboard valves.

Reference Information:

23.601, "Instrument Trip Sheets," 23.427 Enclosure 1A, Primary Containment Isolation System.

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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 when a large LOCA occurs.

- 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 20.205.01

Correct Answer : A
Justification: RHRSW valve is throttled closed to meet pump DP requirements. Both RHRSW pumps are needed for SDC per 20.205.01

Correct Answer : A
Justification: RHRSW valve is throttled closed to meet pump DP requirements. Both RHRSW pumps are needed for SDC per 20.

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

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

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 scrambled 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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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

Also:

- RPV pressure is 974 psig and steady
- RPV level is 100" and slowly lowering
- Drywell Pressure is 1.0 psig and steady
- E4150-F001 (Turbine Steam Inlet Valve) is OPEN
- E4150-F004 (Booster Pump CST Suction Iso Valve) is CLOSED
- E4150-F042 (Booster Pump Inbd Torus Suction Iso Valve) is CLOSED
- E4150-F079 (Turbine Exh Line Inbd Vac Breaker Iso Valve) is OPEN

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

- A. F001 should be CLOSED.
- B. F042 should be OPEN.
- C. 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
G2.4.46

HPCI System.

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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

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 $1/10$ th 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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

NRC Question Use (ILT 2021)

Bank

Closed Reference

Fundamental

RO

Associated objective(s):

39	K/A Importance: 3.7			Points: 1.00
R39	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91487

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 lowering.

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 2000 rpm.
- Flow controller setting 650 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. Raise turbine speed ≥ 2150 rpm by lowering the flow controller automatic setpoint to prevent exhaust check valve damage.
- D. Continue to run RCIC. Raise turbine speed ≥ 2150 rpm by placing the RCIC flow controller in MANUAL and adjusting the Pulser Knob to raise flow and prevent bearing damage.

Answer: D

Answer Explanation:

Raising the flow in MANUAL by adjusting the Pulser Knob 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:

- 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.
- 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.
- Plausible if applicant remembers that throttling closed on discharge flowpath will raise rpm in auto (in pressure control mode) and exhaust check valve damage is one of the given reasons for requiring rpm to be ≥ 2150 rpm. This option is incorrect because lowering the flow setpoint will cause rpm to lower even further.

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 (R3200S064B).

When power is lost to 2PB2-6 (R3200S064B), 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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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:

MS LINE LOW PRESS CH-A	MS LINE LOW PRESS CH-C	MS LINE LOW PRESS CH-B	MS LINE LOW PRESS CH-D
RPV WTR LVL 1 LOW CH-A	RPV WTR LVL 1 LOW CH-C	RPV WTR LVL 1 LOW CH-B	RPV WTR LVL 1 LOW CH-D
STEAM TNL HI TEMP CH-A	STEAM TNL HI TEMP CH-C	STEAM TNL HI TEMP CH-B	STEAM TNL HI TEMP CH-D
MS LINE HI FLOW CH-A	MS LINE HI FLOW CH-C	MS LINE HI FLOW CH-B	MS LINE HI FLOW CH-D
MS LINE HI RAD CH-A	MS LINE HI RAD CH-C	MS LINE HI RAD CH-B	MS LINE HI RAD CH-D
CNDR VAC LOW CH-A	CNDR VAC LOW CH-C	CNDR VAC LOW CH-B	CNDR VAC LOW CH-D
TURB BLDG TEMP HI CH-A	TURB BLDG TEMP HI CH-C	TURB BLDG TEMP HI CH-B	TURB BLDG TEMP HI CH-D
NSSSS ISO LOGIC CH-A TRIP	NSSSS ISO LOGIC CH-C TRIP	NSSSS ISO LOGIC CH-B TRIP	NSSSS ISO LOGIC CH-D TRIP

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

- All MSIV RED OPEN indicating lights will be lit.
- All MSIV GREEN CLOSED indicating lights will be lit.
- 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: 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
Closed Reference
Fundamental
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. Torus Drain Outboard Isolation Valve (F601).
- B. Drywell Nitrogen Make-up Bypass Isolation Valve (F453).
- C. Traversing In-Core Probe System Ball Isolation Valve (F002A).
- D. Div. II Suppression Chamber Nitrogen Supply Isolation Valve (F404).

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	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	92167

The unit has experienced a LOCA. An Emergency Depressurization was successfully initiated using the ADS SRVs and the following conditions exist:

- All control rods are fully inserted.
- Drywell pressure is 35 psig and slowly lowering.
- Torus pressure is 34 psig and slowly lowering.
- Torus water temperature is 198 °F and rising.
- Torus water level is 4 in. and steady.
- Reactor pressure is 115 psig and slowly lowering.
- Reactor level is +50 in. and rising.
- Condensate is injecting.

The Drywell Pneumatics Supply Valve (T4901-F466) has failed closed and cannot be reopened.

What is the status of the ADS SRVs?

The ADS SRV OPEN indicating lights are __ (1) __ and the ADS SRVs are physically __ (2) __.

- A. (1) ON
(2) OPEN
- B. (1) OFF
(2) OPEN
- C. (1) ON
(2) CLOSED
- D. (1) OFF
(2) CLOSED

Answer: B

Answer Explanation:

The SRV will indicate open if Main Steam D/P is about 150 psig or greater (**D/P across the valve**). As the pressure lowers the OPEN indicating light on the H11-P601 will go out at about 100 psig **D/P**. When the **D/P across the valve (RPV-Torus) reaches approximately 50 psig, the SRV will physically close.**

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 solenoid-operated valve (T4901-F466). ADS SRVs have accumulators inside containment. Therefore, manual operation of the ADS valves is NOT IMPACTED by the F466 failure.

The question stem indicates 81 psig D/P across the valve (115-34). Therefore, the SRV OPEN indicating lights will be **OUT** but the valves will be **physically OPEN**.

Distractor Explanation:

Distractors are incorrect and plausible because:

- A. If the candidate does not recall that the critical value is D/P across the valve, sees 115 psig as more than 100 psig (OPEN indicating lights ON) but more than 50 psig (physically OPEN).
- C. If the candidate does not recall that the critical value is D/P across the valve and sees 115 psig as more than 100 psig (OPEN indicating lights ON) and misinterprets the closure of the pneumatic supply valve as impacting all pneumatic force allowing the valves to go shut on spring force (physically CLOSED).
- D. If the candidate understands that the critical value is D/P across the valve, sees 115 psig as more than 100 psig (OPEN indicating lights ON) but misinterprets the closure of the pneumatic supply valve as impacting all pneumatic force allowing the valves to go shut on spring force (physically CLOSED).

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)

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)3.2 fails OPEN.

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91087

The plant at 100% power.

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

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. Deenergized
 2. Deenergized
- B.
 1. Deenergized
 2. Energized by 13.8Kv Bus 1-2
- C.
 1. Energized by 13.2kV Bus 11
 2. Deenergized
- D.
 1. Deenergized
 2. Energized by 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 13.8Kv 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 the UNINTERRUPTABLE 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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	97628

The following conditions exist for ESF battery charger 2A-1 and its respective battery:

- Battery charger 2A-1 output voltage is 135 VDC.
- Respective battery voltage is 129 VDC.

The battery charger timer switch on the front panel of battery charger 2A-1 is then rotated from Hold to 0 (zero).

How will output voltage of battery charger 2A-1 change, if at all, and what effect will this have on the battery charging rate, if any?

- A. It will go up to raise the battery charging rate.
- B. It will go down to lower the battery charging rate.
- C. It will go to 0 (zero) and battery charging will stop.
- D. It will stay the same and battery charging rate will not change.

Answer: B

Answer Explanation:

The candidate must recognize that, with the battery charger timer switch in HOLD, battery charger 2A-1 was in the EQUALIZE mode for the conditions presented at the start of this question.

NOTE: Hold position on the timer is the furthest clockwise position on the switch and, when in Hold, will put the charger in the Equalize Mode for an indefinite period.

The candidate must then determine that, when the battery charger timer switch is rotated to 0 (zero), it will put the battery charger in the FLOAT mode.

Finally, the candidate must conclude that battery charger output voltage will lower (nominal output voltage in the FLOAT mode is 130 Volts DC), which will lower the battery charging rate.

Distractor Explanation:

Distractors are incorrect and plausible because:

- A. The candidate could fail to recall that HOLD puts the charger in the Equalize mode and instead think that it holds the charger in its normal (FLOAT) mode indefinitely. This could lead the candidate to determine that taking the charger out of Hold will place the charger in Equalize, thus causing output voltage to increase further and charging rate to increase. This is incorrect because conditions in the stem indicate the charger is already in Equalize and rotating the switch to 0 will put it in Float, thus lowering output voltage and charging rate.
- C. The candidate could fail to recall the impact of placing a battery charger in the Float mode and determine that rotating the switch to 0 will cause the battery charger to shut down and completely stop battery charging. This is incorrect because rotating the switch to 0 will put the charger in Float, which does not shut down the battery charger, but lowers output voltage to approximately 130 VDC (nominal battery voltage), which would lower the charging rate but not cause it to stop.
- D. Plausible because, if the switch is rotated from Hold to any position other than zero (0), the charger will remain in Equalize mode and output will not change. This is not correct because placing the switch in zero (0) places the charger in the Float mode, which would cause output voltage and charging rate to lower.

Reference Information:

23.309, DC Electrical Distribution System SOP.

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:

- Control Rods All fully inserted
- MSIVs All closed
- RCIC System injecting at 650 gpm
- 1D6, DIV I CSS LOGIC POWER FAILURE Alarming
- 1D8, RHR LOGIC A 125V DC BUS POWER FAILURE Alarming
- 9D17, DIV I ESS 130V BATTERY TROUBLE Alarming
- ALL Div. 1 ECCS Pumps CMC indication lost (no lights)

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	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91991

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 that 4A13-RHR, "STARTING AIR PRESSURE LOW" is alarming.

Air pressure is 210 psig.

What is the effect on the 13/14 EDG's?

- A. 13 EDG is inoperable, but will start on a LOCA signal.
- B. 14 EDG is inoperable, but will start on a LOCA signal.
- C. 13 EDG will not start due to low air receiver pressure.
- D. 14 EDG will not start due to low air receiver pressure.

Answer: B

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. The control room alarm is a common alarm for the 13/14 EDGS. Each EDG has a local alarm. 14 EDG alarm is 4A13. 13 EDG alarm is 3A13.

Distractor Explanation:

Distractors are incorrect and plausible because:

- A. 13 EDG does not have a low air alarm in and is therefore both operable and will start on a LOCA signal. Plausible because the applicant may think the 4A13 alarm is for the 13 EDG.
- C. 13 EDG does not have a low air alarm in and is therefore both operable and will start on a LOCA signal. Plausible because the applicant may think the 4A13 alarm is for the 13 EDG.
- 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 question 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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

NRC Question Use (ILT 2021)

Bank

Closed Reference

Fundamental

RO

Associated objective(s):

52	K/A Importance: 2.9			Points: 1.00
R52	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91707

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.

With no operator actions taken, which of the following statements accurately describes the system response?

- A. A hydraulic ATWS is more likely.
- B. SLC tank level indication fails off scale high.
- C. B & D Inboard MSIVs lose their backup supply.
- D. Reactor Feed and Condensate pumps lose their minimum flow protection.

Answer: A

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 and Scram Inlet & Outlet Valves fail as described above, the SDV will fill while control rods drift in (as described in the 1st caution statement in AOP 20.129.01). This condition makes a hydraulic ATWS more likely since the SDV may fill completely before ALL rods drift in.

Question meets the A2 K/A for testing at the RO License level because: 1) it meets **Part (b)** of the K/A statement by virtue of the fact that it requires diagnosis that leads to selection of the ATWS EOP procedure, and 2) it satisfies NUREG-1021, ES-401 guidance for limiting the scope of the question primarily to that aspect of the K/A statement requiring the highest cognitive level (i.e., in this case, **Part (a)**), without the expenditure of inordinate amounts of time and resources

Distractor Explanation:

Distractors are incorrect and plausible because:

- B. Plausible because SLC bubbler flow is impacted. However, this option is incorrect because SLC tank level fails low.
- C. Plausible because the Inboard MSIVs are impacted. However, this option is incorrect because the backup supply (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	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91787

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, alarms.

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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 temperate 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 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 where 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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	91987

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.

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 the temperature to continue to trend down but at a slower rate. F010 is a normally open valve but if the candidate thinks it may be shut, the stem states RHR was placed in the containment cooling modes using Enclosure A, which does not include explicit guidance to close the E1150-F010, then the DIV I pumps are lined up to continue to supply flow to the torus through the Div I valves and to the drywell, through the DIV II valves, via the system cross connect F010.

Distractor Explanation:

Distractors are incorrect and plausible because:

- A. Incorrect because drywell sprays are still being supplied, but at a lower rate. Plausible if the candidate does not realize F010 is open and thinks the trip of B RHR means there is no drywell spray flow.
- B. Incorrect because drywell sprays are still being supplied, but at a lower rate. Plausible if the candidate thinks B RHR is a DIV 1 pump and therefore torus cooling is secured. DIV I is A and C pumps.
- C. Incorrect because torus cooling is still being supplied, but at a lower rate. Plausible if the candidate does not realize F010 is open and thinks (a) the trip of B RHR means there is half the drywell spray since the procedure states if a second pump is available then start the second pump, and (b) the same flow is maintained to the torus.

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	Difficulty: 0.00	Level of Knowledge: High	Source: BANK	90100

The plant is in MODE 5 with fuel handling operations in progress and Division 1 RHR 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 Core Spray Pump and open SRVs to drain water to the Torus.

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 & D are plausible and incorrect; If the Head and Fuel Pool Gates were in place and MS line plugs removed these would be correct actions.

Reference Information:

20.205.01 Condition J (pg 9).

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	Difficulty: 0.00	Level of Knowledge: High	Source: MODIFIED	91327

The main generator has been operating in MANUAL voltage control due to a failure of the automatic voltage regulator (AVR). The following conditions are initially present:

- Generator voltage 121.3
- Generator VARs 100 MVAR out
- Generator Output 400 MWe

The crew then raises power until generator load is 500 MWe.

With no operator adjustments to the generator during the power ascension, the generator output voltage _____.

- A. initially lowers, then rises
- B. remains the same
- C. lowers
- D. rises

Answer: C

Answer Explanation:

The generator is operating on a lagging power factor as indicated by the positive VARs and power is much less than rated and field current is static in manual. As load is raised the increase in armature current tends to lower field current and therefore voltage. This would lower the VARs and the voltages on this end of the grid. 4160VAC busses voltage would tend to lower.

Distractor Explanation:

Distractors are incorrect and plausible because:

- A. is incorrect because voltage would not return to 121.3.
- B. is incorrect because voltage lowers when load is raised.
- D. is incorrect because voltage lowers when load is raised.

Reference Information:

NUREG 1123 KA Catalog Rev. 2

245000 Main Turbine Generator and Auxiliary System
245000 A4.02 3.1/2.9 Generator 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

ILT 2021 Exam

NRC Question Use (ILT 2021)

Closed Reference
Higher Cognitive Level
Modified
RO

Associated objective(s):

63	K/A Importance: 2.7			Points: 1.00
R63	Difficulty: 0.00	Level of Knowledge: High	Source: NEW	92007

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 PRESSURE RISES due to LOWER Ring Water Vacuum Pump suction pressure at the Off Gas Delay Pipe.
- B. Off Gas system PRESSURE LOWERS due to HIGHER Ring Water Vacuum Pump suction pressure at the Off Gas Delay Pipe.
- C. Off Gas system rad levels (on RRE-R602) will GO UP due to radioactive isotopes spending LESS TIME in the Delay Pipe.
- D. Off Gas system rad levels (on RRE-R602) will REMAIN STEADY because the Ring Water Pressure Control Valves (N62-F406A(B)) FAIL AS-IS.

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 pressure 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.
- 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 .
- 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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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	Difficulty: 0.00	Level of Knowledge: Fund	Source: BANK	90102

The basis for limiting the Reactor Pressure Vessel (RPV) heatup and cooldown rates to 100° F/hr is to satisfy the stress limits for:

- A. Feedwater nozzles.
- B. RPV cyclic operation.
- C. RPV steady state operation.
- D. Jet Pump expansion/contraction

Answer: B

Answer Explanation:

Per reference, basis for the correct answer

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.10 RCS Pressure and Temperature (P/T) Limits

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.

Distractor Explanation:

Distractors are incorrect and plausible because:

All of the distractors are plausible because they deal with mechanical vessel components that do have stress limits. However to limit mechanical cyclical stresses during heatup and cooldown the technical specifications limit the heatup and cooldown rate.

Reference Information:

TS 3.4.10 Bases

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

NRC Question Use (ILT 2021)

Bank

Closed Reference

Fundamental

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

NRC Question Use (ILT 2021)

Fundamental

Modified

Reference Provided

RO

Associated objective(s):

67	K/A Importance: 3.7			Points: 1.00
R67	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	92747

You are an extra Licensed Nuclear Operator (LNO) on shift. You attended the shift turnover meeting at the start of shift.

The CRS directs you to provide a short-term relief of the CRLNO so he can go to the cafeteria to get lunch and to sign something in the Tagging Center.

Which of the following actions **MUST** you take **BEFORE** the off-going CRLNO leaves the Control Room?

- A. Review Control Room Status Checklist.
- B. Complete the CRLNO Shift Relief Checklist in its entirety.
- C. Review activities expected to continue during the relief period.
- D. Review surveillance activity and any testing conducted since the start of shift.

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. Among them are:

- 3.8.3.3.a Complete the items noted by an asterisk on the Shift Relief checklist.
- 3.8.3.3.b Review activities expected to continue during the relief period.

MOP01004 (CRLNO Shift Relief Checklist) requires the following items be completed BEFORE the off-going CRLNO leaves the Control Room:

1. Reviewed Unit Log and abnormal events that have occurred in the last 24 hours.
2. Reviewed surveillance activity and discussed any testing.
3. Reviewed Control Room Status Checklist.
4. Read Urgent Required Reading.
5. Reviewed General Plant Status by discussing operating condition, special limitations, bands, and ranges.
6. Reviewed LCOs.
7. Walked COPs, and discussed any off-normal condition, status of ESF equipment, reasons for lit annunciators, and IPCS alarms.
8. Discussed "non-triggered" situational surveillance requirements.
9. Verify qualification for position.
10. Review Unit Log Procedure Log for open procedures and discuss current status.

ONLY items 1 and 4-9 are REQUIRED for a "short-term relief".

Therefore, ONLY option C is correct.

Distractor Explanation:

Distractors are incorrect and plausible because:

- A. The option listed is required to be completed before a long-term relief. However, this option is incorrect as described above.
- B. The ENTIRE checklist is required to be completed before a long-term relief. However, this option is incorrect as described above.
- D. The option listed is required to be completed before a long-term relief. However, this option is incorrect as described above.

Reference Information:

MOP01 (Conduct of Operations); MOP01004 (CRLNO Shift Relief Checklist).

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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.

Fermi 2 NRC Exam Usage

ILT 2021 Exam

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

ILT 2021 Exam

NRC Question Use (ILT 2021)

Bank

Closed Reference

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

ILT 2021 Exam

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. Area Radiation Monitor (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

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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.

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Fundamental

New

RO

Associated objective(s):

73	K/A Importance: 3.9			Points: 1.00
R73	Difficulty: 0.00	Level of Knowledge: Fund	Source: NEW	91430

Which of the following plant conditions would NOT assure adequate core cooling?

- A. Core Spray is injecting at design flow, with reactor level at the Minimum Zero Injection RPV Water Level.
- B. Steam flow is above the Minimum Core Steam Flow (MCSF), with reactor level below the Minimum Steam Cooling RPV Water Level.
- C. Steam flow is below the Minimum Core Steam Flow (MCSF), with reactor level above the Minimum Steam Cooling RPV Water Level.
- D. Standby Feedwater is injecting with reactor level between the Minimum Steam Cooling RPV Water Level and Minimum Zero Injection RPV Water Level.

Answer: D

Answer Explanation:

Adequate core cooling is NOT assured if a system is injecting and water level is below the Minimum Steam Cooling RPV Water Level (MSCRWL). This is because the lower value of the Minimum Zero Injection RPV Water Level (MZIRWL) is not allowed with injection since any injection invalidates assumptions of the MZIRWL calculation.

The minimum RPV water level at which adequate steam flow exists is higher when makeup capability exists because:

- The limiting fuel temperature is lower (1500°F). The higher limit of 1800°F is used only when cladding perforation cannot be avoided (i.e., when no injection is possible).
- With injection, water at the core inlet is subcooled. Some of the energy produced by the core must then be expended in raising the temperature of the liquid to saturation and less steam will be produced to cool the uncovered portions of the core, therefore limiting fuel temperature is lower with injection.

Therefore, ACC would NOT be assured with SBFW injecting and RPV level between the MSCRWL and the MZIRWL.

Distractor Explanation:

Distractors are incorrect and plausible because:

- A. Adequate core cooling can be assured by spray cooling if water level is above the jet pump suctions. The covered portion of the core is then cooled by submergence while the uncovered portion is cooled by the spray flow. Plausible because the candidate could fail to recall that RPV level at the MZIRWL means it is above the elevation of the jet pump suctions thus adequate core cooling is assured.
- B. The Minimum Core Steam Flow (MCSF) is the lowest steam flow which is sufficient to preclude any clad temperature from exceeding 1500°F even if the reactor core is not completely covered. ACC under ATWS conditions can be assured (see Stop Sign at step FSL-4) if MCSF -OR- MSCRWL level are met; Therefore, in this distractor, since MCSF is met then ACC is assured, even with level below MSCRWL. Plausible because the candidate could incorrectly recall that ACC cannot be assured with RPV water level below the MSCRWL, regardless of steam flow.
- C. Adequate core cooling is assured if RPV water level is above the MSCRWL. Therefore, in this distractor, even with MCSF not met, ACC is assured because RPV level is above the MSCRWL. Plausible because steam flow above the MCSF is another method that can be used to assure ACC, thus with steam flow <MCSF the candidate could assume that ACC is not assured.

Reference Information:

BWR Owners' Group Emergency Procedure and Severe Accident Guidelines Appendix B: Technical Basis Volume I: Introduction and References

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G2.4.17 3.9/4.3 Knowledge of EOP terms and definitions

10CFR55 RO/SRO Written Exam Content

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

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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.

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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.

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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.

10CFR55 RO/SRO Written Exam Content

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

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Associated objective(s):