76	K/A Importance: 4.4			Points: 1.00
S76	Difficulty: 3.00	Level of Knowledge: High	Source: BANK	115049

You are the Control Room Supervisor. The plant is operating at 100% power with the following conditions:

- N RRMG Set Speed: 74.6%.
- S RRMG Set Speed: 74.6%.
- B21-R611A, Jet Pump 11-20 Loop A Flow: 44.7 x 10^6 LB/Hr.
- B21-R611B, Jet Pump 1-10 Loop B Flow: 44.7 x 10^6 LB/Hr.
- B21-R613, Reactor Jet Pump Total Flow: 89.43 x 10^6 LB/Hr.

Several alarms are subsequently received on the H11-P603 panel, and the following are observed:

- N RRMG Set Speed: 64% and lowering.
- S RRMG Set Speed: 74.6% and steady.
- B21-R611A, Jet Pump 11-20 Loop A Flow: 39.0 x 10^6 LB/Hr and lowering rapidly.
- B21-R611B, Jet Pump 1-10 Loop B Flow: 45.0 x 10^6 LB/Hr and rising slowly.
- B21-R613, Reactor Jet Pump Total Flow: 83.0 x 10^6 LB/Hr and lowering rapidly.

(1) Which of the following actions will you ensure is carried out by the P603 Operator?

(2) What action(s), if any, is(are) required by Technical Specifications?

A. (1) Lock the Scoop Tube for the N RRMG Set.
(2) No Tech Spec required actions are necessary.

B. (1) Trip the N RRMG Set.
(2) Apply limitations for single loop operation within 4 hours

C. (1) Lock the Scoop Tube for the N RRMG Set.
(2) Declare Recirculation Loop A “not in operation” within 2 hours.

D. (1) Trip the N RRMG Set.
(2) Declare Recirculation Loop A “not in operation” within 2 hours then apply limitations for single loop operation within 4 hours.

Answer: C

Answer Explanation:

Note: This question was on the Fermi 2 2020 NRC Exam. That makes it from one of the "last 2" NRC exams. 2 SRO questions from the last 2 exams are allowed per NUREG-1021 Form 2.3-4. This is the only SRO question on the 2023 exam from the last 2 NRC exams.
For part (1), per 20.138.03, Immediate Actions, the correct action to take per IA is to Lock the scoop tube for the affected RRMG Set, which is RRMG Set A.
For part (2), per Technical Specifications for LCO 3.4.1, SR 3.4.1.1, loop jet pump flows must be within 5% when operating at ≥70% core flow. The candidate must evaluate core flows and determine that (1) total core flow is 83% and (2) jet pump flow mismatch is 6%, thus making SR 3.4.1.1 NOT MET. Therefore, the candidate must recall that LCO 3.4.1 Condition A requires declaring the recirculation loop with lower flow (in this case, Loop A) "not in operation" within 2 hours.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. (1) This part is correct. (2) This part is plausible because of the confusion (common misconception made) regarding the requirements for matched loop flows in SR 3.4.1.1. This SR requires the two loop jet pump flows to be within 5% when operating with rated core flow ≥70%. It is common for licensed operators to apply the larger allowable mismatch (10%) to the higher rated core flow (≥70%). This distractor is incorrect because a lower mismatch (5%) is allowed with higher rated core flow (≥70%), therefore the SR is not met.
B. (1) This part is plausible because Immediate Action IB requires tripping the affected RRMG set when its speed has increased ≥10%. Since the conditions in the stem indicate a pump decrease ≥10%, the candidate could incorrectly determine that the correct action is to trip the RRMG set with the changing speed. This is incorrect because IB only requires tripping the RRMG set if speed has increased ≥10%. (2) This part is plausible because this is the correct action, required by Technical Specifications, for a tripped recirculation pump. However, since the AOP does not require tripping the RRMG set, this distractor is incorrect.
D. (1) This part is plausible because Immediate Action IB requires tripping the affected RRMG set when its speed has increased ≥10%. Since the conditions in the stem indicate a pump decrease ≥10%, the candidate could incorrectly determine that the correct action is to trip the RRMG set with the changing speed. This is incorrect because IB only requires tripping the RRMG set if speed has increased ≥10%. (2) This part is plausible because Condition A allows 2 hours before declaring a recirculation loop with lower flow "not in operation" so the candidate might add these 2 hours to the 4 hours allowed by the note in the LCO statement before taking action for transitioning to single loop operations. This is incorrect because Condition A only applies to jet pump loop flows not within mismatch limits and is not applicable for a tripped recirculation loop.

10 CFR 55.43(b)(2) SRO Justification:
This question meets ES-401 Attachment 2 requirements to be SRO-Only because answering this question requires application of required actions (>1 hour) and knowledge of surveillance requirements which are not listed "above the line".
The question cannot be answered solely by knowing ≤1-hour TS/TRM Actions, or solely by knowing information in TS/TRM listed "above the line" or solely by knowing TS Safety Limits.

Reference Information:
20.138.03, Uncontrolled Recirc Flow Change AOP.
Technical Specifications LCO 3.4.1, Recirculation Loops Operating

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (2) Facility operating limitations in the technical specifications and their bases.

Fermi 2 NRC Exam Usage
ILT 2020 Exam
ILT 2023 Exam

NRC Question Use (ILT 2023)
Bank
Closed Reference
High Cognitive Level
NRC Early Review
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
295001 Partial or Complete Loss of Forced Core Flow Circulation
G2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls (CFR: 41.10 / 43.2 / 45.6)

Associated objective(s):

77	K/A Importance: 4.1			Points: 1.00
S77	Difficulty: 3.00	Level of Knowledge: High	Source: BANK (PREVIOUS 2)	102568

The plant is operating in MODE 1 with breakers BM and DF open.

(1) What is the status of LCO 3.8.1, AC Sources – Operating?

(2) What AOP(s) would you enter if the Main Turbine Generator were to trip?

A. (1) MET with all qualified offsite circuits OPERABLE.
(2) 20.300.345kV, Loss of 345KV.

B. (1) NOT MET with one qualified offsite circuit INOPERABLE.
(2) 20.300.345kV, Loss of 345KV.

C. (1) MET with all qualified offsite circuits OPERABLE.
(2) 20.300.69J, Loss of Bus 69J and 20.300.69K, Loss of Bus 69K.

D. (1) NOT MET with one qualified offsite circuit INOPERABLE.
(2) 20.300.69J, Loss of Bus 69J and 20.300.69K, Loss of Bus 69K.

Answer: B

Answer Explanation:

The SRO candidate should recall the discussion of degraded offsite circuits from ODE-12, LCOs, which states: “Since all analyzed accidents assume a Turbine/Generator trip, the Fermi 2 Generator cannot be relied upon to maintain incoming grid voltages. In a degraded grid voltage event with the Fermi 2 Generator on-line, ESF bus voltages may be within Tech Spec values. However, after a scram, the “post trip” voltages could be below the Tech Spec (UFSAR) values.” Therefore, (1) the SRO examinee must determine that the given breaker configuration will result in a complete loss of Div 2 (345 kV) offsite power if a MTG trip were to occur. This should lead the examinee to determine that the impact of this is to declare the 345kV offsite circuit INOPERABLE because 345kV post-trip voltages would not be acceptable to sustain operability of safety-related loads as spelled out on Page 12, paragraph b, of ODE-12.

If the MTG were to trip, breakers CM and CF would trip, on reverse power, causing loss of power to Bus 301. Therefore, (2) the SRO candidate should determine that, when informed of the loss of power to Bus 301 by the CRLNO, that 20.300.345kV is the correct AOP to enter as specified on Enclosure A of 30.300.345kV.
NOTE: The decision to enter specific electrical AOPs at Fermi 2 using this, and similar Enclosures, is an SRO-Only function. The RO will perform an “electrical evaluation” and report the results of the evaluation to the CRS (by marking up the laminated enclosure), who will then take that information and decide which AOP(s) to enter.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. (1) The examinee may not recognize the impact of the given breaker configuration on the operability of the 345kV Offsite circuit. This is plausible because, normally, TS is concerned with availability of voltage on the given bus. However, GDC-17, as spelled out in ODE-12 and described above, is not only concerned with availability but also quality of the voltage source. Therefore, this part is incorrect because, if the MTG were to trip, post-trip voltages would be below the Tech Spec (UFSAR) values and the offsite circuit must be declared INOPERABLE. The examinee could still recognize that the given breaker configuration would result in a loss of Bus 301, thus requiring entry into 20.300.345kV AOP, which is correct.
C. (1) The examinee may not recognize the impact of the given breaker configuration on the operability of the 345kV Offsite circuit. This is plausible because, normally, TS is concerned with availability of voltage on the given bus. However, GDC-17, as spelled out in ODE-12 and described above, is not only concerned with availability but also quality of the voltage source. Therefore, this part is incorrect because, if the MTG were to trip, post-trip voltages would be below the Tech Spec (UFSAR) values and the offsite circuit must be declared INOPERABLE. (2) If the examinee failed to determine the impact of the open breakers on the configuration of power at the 345kV mat, this could lead the examinee to conclude that only Bus 302 would be lost when the MTG tripped, which could therefore lead the examinee to determine that entry into 20.300.69J and 20.300.69K would be required. This is incorrect because, if the MTG were to trip with the breaker configuration given, Bus 301 would be lost, which requires entry into 20.300.345kV AOP.
D. The examinee may (1) recognize the breaker configuration as needing to declare one offsite circuit INOPERABLE, which is correct but then (2) determine that, if the MTG is lost, only Bus 302 would be lost when the MTG tripped, which could then lead the examinee to determine that entry into 20.300.69J and 20.300.69K would be required. This is incorrect because, if the MTG were to trip with the breaker configuration given, Bus 301 would be lost, which requires entry into 20.300.345kV AOP

10 CFR 55.43(b)(2) SRO Justification:
Part (1) of this question meets ES 4.2-2 requirements to be SRO-Only because it cannot be answered solely by knowing ≤1-hour TS/TRM Actions, LCO/TRM information listed above the line, the TS safety limits, or the bases of TS information contained above the line. Part (1) requires knowledge of TS bases (as spelled out in ODE-12, LCOs) that is required to analyze TS-required terminology.

Part (2) of this question meets ES 4.2-2 requirements to be SRO-Only because it cannot be answered solely from systems knowledge, or by knowing immediate operator actions, or by knowing entry conditions for the AOPs, or by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure. The question requires assessment of conditions of the plant after the MTG trip, determining which bus has been lost, and then prescribing the procedure to use to mitigate the power loss.

Reference Information:
ODE-12, LCOs
23.300.345kV, Loss of 345kV AOP

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (2) Facility operating limitations in the technical specifications and their bases.

Fermi 2 NRC Exam Usage
ILT 2020 Exam
ILT 2023 Exam

NRC Question Use (ILT 2023)
Bank
Closed Reference
High Cognitive Level
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
295003 Partial or Complete Loss of AC Power
295003.AA2 Ability to determine and/or interpret the following as they apply to Partial or Complete Loss of AC Power: (CFR: 41.10 / 43.5 / 45.13)
295003.AA2.01 Partial or complete loss of AC power

Associated objective(s):
Emergency and Abnormal Operating Procedures Performing Training
Cognitive Terminal
Given abnormal plant operating conditions and parameters, perform the required actions for the appropriate operator response in accordance with approved Fermi 2 Alarm Response Procedures, Abnormal Operating Procedures, and Emergency Operating Procedures: Analyze conditions and apply the appropriate technical specifications. (SRO)

78	K/A Importance: 4.4			Points: 1.00
S78-V2	Difficulty: 3.00	Level of Knowledge: Fund	Source: NEW	105507

You are the Control Room Supervisor (CRS).

The plant is in MODE 5 with movement of recently irradiated fuel in progress.

A refueling accident results in RBHVAC isolating on high exhaust radiation levels.

Under which of the following conditions, if any, would you be allowed to direct a start of RBHVAC in accordance with 23.426, RBHVAC System SOP?

Restarting RBHVAC using 23.426 would ...

A. not be allowed, under any conditions, until the high radiation condition cleared.

B. be allowed under 10 CFR 50.54(x) if approved by a licensed senior reactor operator per 10 CFR 50.54(y).

C. be allowed ONLY IF Secondary Containment radiation levels are hindering operation of systems required to respond to the refueling accident.

D. be allowed IF Secondary Containment radiation levels are hindering operation of systems required to respond to the refueling accident AND the SGTS is not maintaining Secondary Containment vacuum.

Answer: D

Answer Explanation:

Per 29.100.06, Sheet 2 - Containment Control - 5:

The 4th statement in PC-OR1 allows for (1) defeating isolations IAW 29.ESP.24 to support (2) restarting RBHVAC and (3) permitting offsite rad release rates to be exceeded if necessary.
The examinee must recognize that the IF statement of that override is met because (1) RBHVAC has isolated on high radiation, (2) SGTS is not maintaining Secondary Containment pressure <0" WC AND Secondary Containment rad levels hinder operation of systems required to support combat the Refueling Accident.

Therefore, the SRO examinee must determine that use of the SOP to restart RBHVAC is only permitted when BOTH of the above conditions are met.

Distractor Explanation:
A. Plausible because the examinee may fail to recognize that conditions in the stem meet the PC-OR1 requirements to permit use of 23.426. This is incorrect because use of 23.426 is permitted as described above.
B. Plausible because the examinee could fail to recall that the override statement allows restarting RBHVAC using the SOP and determine that, since restarting RBHVAC would require bypassing interlocks that would result in departing from technical specifications, it would only be allowed by 10 CFR 50.54(x) if approved by an SRO per 10 CFR 50.54(y) which is plausible because 10.CFR 50.54(x) allows a licensee to take reasonable action that departs from a license condition or a technical specification (contained in a license issued by the NRC) in an emergency when this action is immediately needed to protect the public health and safety and no action consistent with license conditions and technical specifications that can provide adequate or equivalent protection is immediately apparent This is incorrect because the EOP override statement allows RBHVAC to be restarted as described above and, since our EOPs are approved plant procedures, 10 CFR 50.54(x) is not required. It is also a common misconception that SROs can "invoke" 10 CFR 50.54(x) at any time to protect the health and safety of the public. This is incorrect in this instance because an action consistent with license conditions (an approved EOP action) exist for the conditions given in the stem of the question.
C. Plausible because the examinee could recall a portion of the override statement and determine that using the SOP to restart RBHVAC is allowed any time SC rad levels are hindering the ability to respond to the event. This is incorrect because BOTH conditions of the override must be met.

10 CFR 55.43(b)(5) SRO Justification:
This question meets ES 4.2-2 requirements to be SRO-Only because it cannot be answered solely from systems knowledge, or by knowing immediate operator actions, or by knowing entry conditions for the AOPs or EOPs, or by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure. The question requires assessment of conditions of the plant in MODE 5 during a Refueling Accident and then recognizing the conditions under which a normal procedure (the RBHVAC SOP) could be used to mitigate the effects of the Refueling accident to allow personnel to respond to the event.

Reference Information:
29.100.06, Sheet 2 - Containment Control - 5

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
Fundamental (Low) Cognitive Level
New
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
295023 Refueling Accidents
G2.1.23 Ability to perform general or normal operating procedures during any plant condition (CFR: 41.10 / 43.5 / 45.2 / 45.6)

Associated objective(s):
Secondary Containment Control and Radioactive Release
Cognitive Terminal
Given plant procedures and plant conditions as appropriate, Using a current copy of 29.100.01 Sh 1 through Sh 6 determine which step(s) is (are) to be directed by the CRS, in accordance with management expectations.

Emergency and Abnormal Operating Procedures Performing Training
Cognitive Terminal
Given abnormal plant operating conditions and parameters, perform the required actions for the appropriate operator response in accordance with approved Fermi 2 Alarm Response Procedures, Abnormal Operating Procedures, and Emergency Operating Procedures: When multiple EOPs / AOPs are used, prioritize actions based on plant conditions and crew resources. (SRO)

79	K/A Importance: 3.5			Points: 1.00
S79	Difficulty: 2.00	Level of Knowledge: High	Source: NEW	104967

You are the Control Room Supervisor (CRS).

The reactor was scrammed due to loss of condenser vacuum.

The following plant conditions exist:

- Reactor Power is 11.3%.
- Reactor Water Level is -12" and steady.
- RPV injection is from HPCI, SBFW and RCIC.
- RPV Pressure is 1100 psig and being controlled manually with SRVs.
- Torus Water Level is 10" and rising slowly.
- Torus Water Temperature is 172°F and rising slowly.

What will you direct per the EOPs?

A. Open 5 SRVs, ADS preferred, ignore cooldown rate.

B. Bypass MSIV Level 1 & Off Gas Hi Rad interlocks per 29.ESP.11.

C. Lower RPV pressure, ignore cooldown rate, but keep pressure above 350 psig.

D. Deliberately lower RPV water level, by controlling RPV injection, until Rx Power is <3%.

Answer: C

Answer Explanation:

29.100.01 Sheet 6, with Notes section removed, will be provided with the exam when using this question.

The examinee must first interpret the indications in the stem of the question, most notably the High RPV Pressure, High Torus Water Level (TWL), and High Torus Water Temperature (TWT), as being above the HCL Curve.

The examinee must then recall that, per the TWT Leg of 29.100.01 Sheet 2, exceeding the HCL curve requires the RPV be Emergency Depressurized per step TWT-5 when Torus water temp and RPV pressure cannot be kept <HCL. The examinee must then recall that normal ED (Contingency #3) methods cannot be used due to the ATWS conditions present and that FSP-OR2 is applicable. The examinee must recall that, per FSP-OR2, when TWT cannot be kept <HCL, but only if RPV depressurization will not result in loss of injection required for ACC, the correct action is to lower RPV pressure to stay <HCL, but not less than 350 psig. Per the HCL curve, RPV pressure could be lowered to <1000 psig (or even <800 psig) to establish conditions <HCL, and steam driven sources (HPCI and RCIC) would still be available.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. This distractor is plausible because it is directed from FSED-6 when an ED is required in an ATWS when the reactor is shut down (per step FSED-4). This is incorrect because step FSED-4 should be answered NO, since Reactor Power is 11% in the stem of the question, therefore this method of ED is currently incorrect.
B. This distractor is plausible because it is directed in FSP-OR2 and is a plausible strategy to open the MSIVs, which would allow restoration of the condenser as a heat sink, therefore allowing the SRVs to be closed, which would stop heat addition to the Torus. This is incorrect because (1) the HCL has already been exceeded, so action is required to lower pressure. Also, the override IF statement for this distractor requires that the Main Condenser be "available". Since the stem indicates the reactor was scrammed on loss of condenser vacuum, the main condenser is not available.
D. This distractor is plausible because it is directed from FSL-OR1 and, if RPV injection were terminated, power would lower <3% which would reduce the number of SRVs that need to remain open to control RPV pressure and therefore reduce the heat input into the Torus. This is incorrect because the override in FSL-OR1 requires RPV level above 0" to direct deliberately lowering RPV level, which is incorrect since the stem indicates that RPV level is -12".

10 CFR 55.43(b)(5) SRO Justification:
This question meets ES-401 Attachment 2 requirements to be SRO-Only because answering this question requires the SRO to assess plant conditions, in an emergency, and then select the procedure with which to proceed.
The question cannot be answered solely by knowing "systems knowledge", or solely by knowing immediate operator actions, or solely by knowing entry conditions for AOPs or plant parameters that require direct entry into major EOPs, or solely by knowing the purpose, overall sequence of events, or mitigative strategy of a procedure.

Reference Information:
29.100.01 Sheet 6, Curves, Cautions and Tables (provided with notes redacted).
29.100.01 Sheet 2, Primary Containment Control.
29.100.01, Sheet 1A, RPV Control-ATWS.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
High Cognitive Level
New
Reference Provided
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
295025 High Reactor Pressure
295025.EA2 Ability to determine and/or interpret the following as they apply to High Reactor Pressure: (CFR: 41.10 / 43.5 / 45.13)
295025.EA2.03 Suppression pool temperature

Associated objective(s):
Primary Containment Control
Cognitive Terminal
Given appropriate procedures and conditions, Using the graphs from the Emergency Operating Procedure Flowcharts, and parameter values for specific plant conditions, determine appropriate operator actions per the EOP Flowcharts, in accordance with plant/management expectations

80	K/A Importance: 4.0			Points: 1.00
S80	Difficulty: 3.00	Level of Knowledge: High	Source: NEW	102669

The plant is in MODE 1 and an SRV has stuck open.

Consider each of the following actions that are required by 20.000.25, Stuck Open SRV, as Torus Water Temperature is rising:

1. Place the Mode Switch in Shutdown.
2. Place all available RHR in Torus Cooling.
3. Reduce Pressure Regulator Setpoint to 900 psig.
4. Depressurize the RPV to <200 psig within 12 hours.
5. Commence plant shutdown IAW 22.000.03 / 22.000.04.

If Torus Temperature is at 125°F with the SRV STILL STUCK OPEN, which of the above sets of actions should have been directed by the CRS per 20.000.25?

A. 1 and 2 ONLY.

B. 2 and 5 ONLY.

C. 1, 2 and 3 ONLY.

D. 1, 2, 3 AND 4.

Answer: D

Answer Explanation:

NOTE: The actions listed in the stem of the question were not placed in any particular order so as to cue the examinee. Instead, they were put in order from longest to shortest as determined by the number of words in each sentence.

In accordance with AOP 20.000.25, Failed SR, each of the actions listed are plausible because they all would be directed based on different plant conditions:

1. Mode Switch is placed in SHUTDOWN when TWT is above 110°F.
2. RHR is placed in Torus Cooling when an SRV cannot be closed using the Immediate Actions.
3. The pressure regulator setpoint is reduced to 900 psig when the Mode Switch is in SHUTDOWN and the SRV is still open.
4. The RPV is depressurized <200 psig within 12 hours when TWT is above 110°F.
5. A plant shutdown is commenced using GOPs 22.000.03 / 22.000.04 when the SRV has closed AND the cause of the SRV failure cannot be determined.

Therefore, the examinee should interpret Torus Water Temperature and determine that placing the Mode Switch in SHUTDOWN (1), placing RHR in TC (2), reducing the Pressure Regulator setpoint to 900 psig (3) and depressurizing the RPV to <200 psig within 12 hours (4) are all applicable.

Distractor Explanation:

A. Actions 1 and 2 are plausible because they are taken for a stuck open SRV with TWT above 110°F. However, this choice of actions is incomplete as 3 and 4 would also be required.
B. Actions 2 and 5 are plausible because they are taken for a stuck open SRV when the SRV has been closed but the cause of it opening cannot be determined. This choice is incorrect because the SRV is still open.
C. Actions 1, 2 and 3 are plausible because they are taken for a stuck open SRV with TWT above 110°F with the SRV still stuck open after the MS was taken to S/D. However, this choice of actions is incomplete as action 4 would also be required.

10 CFR 55.43(b)(5) SRO JUSTIFICATION

This question meets ES 4.2-2 requirements to be SRO-Only because it cannot be answered solely from systems knowledge, or by knowing immediate operator actions, or by knowing entry conditions for the AOPs or EOPs, or by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure. The question requires interpreting TWT as it applies to a stuck open SRV and then assessing those conditions and selecting the required actions of the AOP that are applicable to mitigate the consequences of the rising Torus Water Temperature.

Reference Information:

AOP 20.000.25, Failed SRV

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (2) Facility operating limitations in the technical specifications and their bases.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
High Cognitive Level
New
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
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: (CFR: 41.10 / 43.5 / 45.13)
295026.EA2.01 Suppression pool water temperature

Associated objective(s):
Emergency and Abnormal Operating Procedures Performing Training
Cognitive Terminal
Given abnormal plant operating conditions and parameters, perform the required actions for the appropriate operator response in accordance with approved Fermi 2 Alarm Response Procedures, Abnormal Operating Procedures, and Emergency Operating Procedures: When multiple EOPs / AOPs are used, prioritize actions based on plant conditions and crew resources. (SRO)

81	K/A Importance: 4.0			Points: 1.00
S81	Difficulty: 3.00	Level of Knowledge: High	Source: NEW	102709

(1) What is the LOWEST Drywell Temperature above which Drywell Spray operation is directed from the Drywell Temperature (DWT) leg of 29.100.01, Sheet 2 Primary Containment Control?

(2) If Drywell Temperature is above the allowable value of the Drywell Spray Initiation Limit (DWSIL) curve, why is Drywell Spray prohibited?

A. (1) 145°F

(2) To prevent exceeding the capability of the vacuum relief system and challenging the primary containment negative pressure limit.

B. (1) 145°F

(2) To prevent rapidly lowering containment pressure causing a loss of net positive suction head to pumps taking a suction from the Torus.

C. (1) 242°F

(2) To prevent exceeding the capability of the vacuum relief system and challenging the primary containment negative pressure limit.

D. (1) 242°F

(2) To prevent rapidly lowering containment pressure causing a loss of net positive suction head to pumps taking a suction from the Torus.

Answer: C

Answer Explanation:

(1) Per 29.100.01 Sheet 2 Step DWT 4, 242°F is the lowest temperature above which Drywell Spray is directed.
(2) Per the EPG Appendix B Definition of the Drywell Spray Initiation Limit (DWSIL), unrestricted operation of drywell sprays could result in a negative drywell pressure large enough to deinert the primary containment atmosphere or challenge the primary containment negative pressure capability. This question focuses on the second part of this definition.

Distractor Explanation:

Distractors are incorrect and plausible because:

A. (1) 145°F is plausible because this is the value above which actions are taken in 29.100.01 including the operation of all available drywell cooling, which includes defeating interlocks per 29.ESP.08. The candidate could incorrectly recall that Drywell Spray is directed above this Drywell Temperature. 145°F is also plausible because the DWSIL curve (which will be provided to the candidates during the exam) goes all the way down to 50°F. 145°F is incorrect because Drywell Spray is not directed until Drywell Temperature exceeds 242°F.
(2) This part is correct.

B. (1) 145°F is plausible because this is the value above which actions are taken in 29.100.01 including the operation of all available drywell cooling, which includes defeating interlocks per 29.ESP.08. The candidate could incorrectly recall that Drywell Spray is directed above this Drywell Temperature. 145°F is also plausible because the DWSIL curve (which will be provided to the candidates during the exam) goes all the way down to 50°F. 145°F is incorrect because Drywell Spray is not directed until Drywell Temperature exceeds 242°F.
(2) This part is plausible because Caution 8 warns against reducing primary containment pressure and the fact that it may cause exceeding NPSH limits for pumps taking a suction on the Torus. References to Caution 8 are found throughout 29.100.01 Sheet 2, Primary Containment Control, whenever Drywell (and Torus) Sprays are on. The candidate could partially remember this caution and determine that it is applicable to the DWSIL curve. This is incorrect because the basis of the DWSIL curve is given above.

D. (1) 242°F is correct.
(2) This part is plausible because Caution 8 warns against reducing primary containment pressure and the fact that it may cause exceeding NPSH limits for pumps taking a suction on the Torus. References to Caution 8 are found throughout 29.100.01 Sheet 2, Primary Containment Control, whenever Drywell (and Torus) Sprays are on. The candidate could partially remember this caution and determine that it is applicable to the DWSIL curve. This is incorrect because the basis of the DWSIL curve is given above.

10 CFR 55.43(b)(5) SRO Justification:

This question meets ES-4.2 requirements to be SRO-Only because it cannot be answered solely from systems knowledge, or by knowing immediate operator actions, or by knowing entry conditions for the AOPs or EOPs, or by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure.
The question requires knowledge of diagnostic steps and decision points in the Primary Containment Control EOP that lead to directing Drywell Sprays, as well as the basis for why unrestricted use of Drywell Sprays to combat high Drywell Temperature is prohibited.

Reference Information:

29.100.01 Sheet 2, Primary Containment Control
EPGs/SAGs Appendix B Vol. I (Introduction) Section 9.0, Variables and Curves, Page B.I-9-14.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
High Cognitive Level
New
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
295028 High Drywell Temperature (Mark I and II Only)
G2.4.18 Knowledge of the specific bases for emergency and abnormal operating procedures (CFR: 41.10 / 43.1 / 45.13)

Associated objective(s):
Primary Containment Control
Cognitive Terminal
Given appropriate procedures and conditions, Describe the plant conditions that would require use of the alternative actions contained in 29.100.01 Sh 2, Primary Containment Control, including: in accordance with plant/management expectations: a. Emergency Depressurization; b. Torus Spray; c. Drywell Spray; d. Venting the Drywell;

82	K/A Importance: 3.6			Points: 1.00
S82	Difficulty: 3.00	Level of Knowledge: High	Source: BANK	106426

You are the Control Room Supervisor (CRS).

The plant scrammed and is experiencing an ATWS with the following:

- Reactor power is 30% and lowering.
- SLC is injecting with SLC Storage Tank level 38” and lowering.
- Manual control rod insertion is in progress.
- RPV level is 90” and steady.
- RPV pressure is 970 psig and steady.

Under which of the following conditions will you direct performance of 20.000.21, Reactor Scram AOP?

A. 178 Control Rods are Full-In, 7 Control Rods are at Position 02.

B. 184 Control Rods are at Position 02, 1 Control Rod is at Position 48.

C. The P603 Operator reports SLC Storage tank level indicator is at 0".

D. Reactor power has dropped below the Point of Adding Heat (POAH).

Answer: A

Answer Explanation:

Per 29.100.01, Sheet 1A FSQ leg, when it is determined that the Rx will remain S/D under ALL conditions w/o boron, the CRS will direct boron injection be terminated and AOP 20.000.21, Reactor Scram entered. 178 control rods full-in and 7 at position 02 satisfies the first part of the first statement in FSQ-OR1, thus requiring the CRS to direct that SLC be shutdown (terminate boron injection for reactivity) and 20.000.21 performed.

Per LP-OP-802-3003B, RPV Control Sheet 1A Rev 2 Lesson Plan, Slide 19:
At Fermi 2 the Maximum Subcritical Banked Withdrawal Position (MBSWP) is defined to be the lowest control rod position to which all control rods may be withdrawn in bank and the reactor will nevertheless remain shutdown under all conditions, this can be either notch position 00 (all rods fully inserted) or is notch position 02 (all rods banked at 02). Other criteria may be employed to determine that the reactor is shutdown, such as:

Existence of the core design basis shutdown margin with the single strongest control rod full-out and all other control rods full-in then the Reactor will remain shutdown under all conditions without boron injection.

NOTE: If a control rod is > 02 and any other rod is not fully inserted, at position (00), the Reactor MAY NOT remain shutdown under all conditions and entry into Sheet 1A is required.(ATWS)

Compliance with the Technical Specification requirements governing control rod position and the allowable number of inoperable control rods, etc.

If any possibility exists that the reactor may not always remain shutdown on control rod insertion alone, the actions required for control of RPV water level differ from those prescribed in RPV Control. The RPV water level control actions that are appropriate under this condition are specified in RPV Control - ATWS.

HOW IS 29.100.01 Sheet 1A Step RC-5 is ANSWERED:

Per Fermi PSTGs (Emergency Operating Procedure Support Documentation) Differences Document. (PSTG)

“The operators are taught they can make the shutdown determination only if all rods are inserted beyond the MSBWP or all rods are full in except one, any other determination is performed by Rx Engineering.”

Distractor Explanation:
Distractors are incorrect and plausible because:

B. 184 control rods at Position 02 with only one Full-Out is plausible because it seems to satisfy Shutdown Margin requirements. However, the MSBWP at Fermi 2 is only satisfied if (1) all control rods except 1 are fully inserted or (2) all control rods are inserted to or beyond the Maximum Subcritical Banked Withdrawal Position (MSBWP) of 02. Even though 184 control rods are at position 02, the 1 rod beyond position 02 means that the MSBWP is not satisfied.
C. Step FSQ-22 directs shutdown of SLC pumps when SLC tank level indicates empty at FSQ-21. Since shutting down the SLC pumps (terminating boron injection) in FSQ-OR1 is closely tied to directing performance of 20.000.21, it is plausible that the SRO candidate could determine that, when SLC pumps are shut down due to an empty SLC tank, 20.000.21 is also directed. However, step FSQ-22 does not require the CRS to direct 20.000.21 when SLC is shut down for an empty tank
D. The second statement of FSQ-OR1 requires the CRS to direct 20.000.21 when it is determined that the Rx is S/D with no boron injection. Since this statement is satisfied if power is <POAH, at the start of an ATWS, the SRO candidate could determine that this override is taken ANY time power drops <POAH. However, this is incorrect because taking this override requires power <POAH on control rod insertion alone, hence the statement “with no boron injection." Once boron has been injected, as specified in the stem, this override cannot be taken when power is <POAH.

10 CFR 55.43(b)(5) SRO Justification:
This question meets ES-4.2 requirements to be SRO-Only because the question cannot be answered solely by knowing systems knowledge, immediate operator actions, entry conditions into the EOPs or the overall mitigative strategy of the EOPs.
Answering this question requires assessment of emergency plant conditions and then selection of the conditions under which a separate procedure (AOP) must be entered to proceed.

Reference Information:
29.100.01, Sheet 1A, RPV Control - ATWS
LP-OP-802-3003B, RPV Control Sheet 1A Rev 2 Lesson Plan

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILO 2019 Retake Exam
ILT 2023 Exam

NRC Question Use (ILT 2023)
Bank
Closed Reference
High Cognitive Level
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown
G2.4.16 Knowledge of emergency and abnormal operating procedures implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, or severe accident management guidelines (CFR: 41.10 / 43.5 / 45.13)

Associated objective(s):
RPV Control
Cognitive Terminal
Given appropriate procedures and conditions, State the basis for the Override Statements contained in 29.100.01 Sh 2, Primary Containment Control, in accordance with plant/management expectations

83	K/A Importance: 4.5			Points: 1.00
S83	Difficulty: 3.00	Level of Knowledge: High	Source: BANK	102767

You are the Control Room Supervisor (CRS).

The Mode Switch has been taken to shutdown. The following plant conditions currently exist:

- A GROSS fuel failure has occurred.
- All Immediate operator actions have been taken.
- Post Scram Feedwater Logic actuated on the Scram.
- Reactor Pressure has been lowered to 900 psig.
- 3D148, FW/MTG RPV H2O Level 8 Trip is in alarm.
- 20.000.23, High RPV Water Level has been entered.
- RPV water level is 225" and rising at 0.8"/min.

One minute later, B21-R605, RPV Flood Up Level Indicator, becomes unavailable.

In accordance with AOP 20.000.23, High RPV Water Level, which of the following level control actions will you direct and why?

A. Close the Inboard MSIVs to prevent flooding the Main Steam Lines.

B. Establish RWCU Blowdown to restore RPV Water Level to a band directed by the SM.

C. Reset Reactor Scram IAW 23.610, RPS System SOP, to minimize input from the CRD system.

D. Close C1100-F034, CRD Charging Water Header Iso Vlv, to minimize input from the CRD system.

Answer: D

Answer Explanation:

The examinee must determine that, with RPV Level rising but <265", the correct actions to take are per 20.000.23, High RPV Water Level AOP Condition E. Per Condition E, the examinee must recall that slowing input from the CRD system will be attempted to try to arrest the RPV level increase and prevent level from rising to the elevation of the Main Steam Lines (279" per Caution 1 on Page 6 of the AOP). The preferred method of slowing input from the CRD system is to reset the scram if possible, IAW Action E.2, and per 23.610. However, 23.610 Section 6.2, Reset Following Reactor Scram, has a pre-requisite that the SRO should recall that prevents resetting the scram if fuel damage is suspected (part of the reason why Action E.2 states Reset scram "if possible".

Therefore, the SRO examinee must determine that they must direct closing the C11-F034, CRD Charging Water Header Iso Vlv to minimize input from the CRD system.

Distractor Explanation:

Distractors are incorrect and plausible because:

A. This distractor is correct if RPV level was >265" IAW Action F.1 of 20.000.23. Also, Caution 1 states that the bottom of the MSLs is 279" and, if RPV Flood Up Indication is not available, the determination to close the MSIVs is based on evaluation regarding RPV level trend and injection status. This distractor is incorrect because, with RPV level <265", it is preferable to maintain the MSIVs open to allow for more means of removing excess inventory from the RPV. The trend given in the stem would not support MSIV isolation per Caution 1.
B. This distractor is correct if fuel damage had not occurred because Condition I is performed if (1) RWCU is available, (2) No indication of fuel element failure exists and (3) SM directs RPV level lowered. However, since the stem of the question indicates that fuel damage has occurred, this distractor is incorrect.
C. This distractor is correct if fuel damage was not occurring IAW Action E.2 of 20.000.23. Additionally, 23.610, RPS SOP, Section 6.2, Reset Following Reactor Scram, pre-requisite 6.2.1.4 prohibits resetting a scram if fuel damage is suspected. This distractor is incorrect because the stem of the question states that fuel failure has occurred.

10 CFR 55.43(b)(5) SRO Justification:

This question meets ES-4.2 requirements to be SRO-Only because answering this question requires the examinee to interpret control room indications, verify the status of systems, assess plant conditions due to that assessment, and then select the correct procedure (AOP) section to direct that will mitigate the impact and with which to proceed. The examinee also has to understand how the actions will affect the plant.

The question cannot be answered solely by knowing "systems knowledge", or solely by knowing immediate operator actions, or solely by knowing entry conditions for AOPs or plant parameters that require direct entry into major EOPs, or solely by knowing the purpose, overall sequence of events, or mitigative strategy of a procedure.

Reference Information:

20.000.23, High RPV Water Level AOP.
23.610, Reactor Protection System (RPS) SOP.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILO 2019 Exam
ILT 2023 Exam

NRC Question Use (ILT 2023)
Bank
Closed Reference
High Cognitive Level
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
295008 High Reactor Water Level
G2.1.9 Ability to direct licensed personnel activities inside the control room (SRO Only) (CFR: 43.1 / 45.5 / 45.12 / 45.13)

Associated objective(s):
Emergency and Abnormal Operating Procedures Performing Training
Cognitive Terminal
Given abnormal plant operating conditions and parameters, perform the required actions for the appropriate operator response in accordance with approved Fermi 2 Alarm Response Procedures, Abnormal Operating Procedures, and Emergency Operating Procedures: Establish and maintain critical parameter monitoring. (SRO)

84	K/A Importance: 4.3			Points: 1.00
S84	Difficulty: 3.00	Level of Knowledge: High	Source: BANK	102787

While operating the reactor in MODE 1, a fission product release into the reactor coolant occurs. Current plant conditions are:

- Reactor is shutdown following the SCRAM.
- Reactor Pressure is 940 psig.
- RPV level in +100 inches.
- Main Steam Line C Inboard & Outboard MSIVs failed to close.
- The Main Turbine is tripped.
- Dose assessment indicates site boundary doses are 980 mrem (TEDE) and 500 mrem (Adult Thyroid) and rising.

(1) What action is required by 29.100.01 Sheet 5, Radiation Release?

(2) What is the CURRENT event classification?

A. (1) Emergency Depressurize the RPV.
(2) Alert.

B. (1) Emergency Depressurize the RPV.
(2) Site Area Emergency.

C. (1) Use the SRV's to commence a reactor cool down at less than 90°F/hr rate.
(2) Site Area Emergency.

D. (1) Use the SRV's to commence a reactor cool down at less than 90°F/hr rate.
(2) General Emergency.

Answer: B

Answer Explanation:

Answer Explanation:
Note: The examinees will be provided EP-101, Enclosure A, as a reference for this question.
Per 29.100.01, Sheet 5, the EOPs require Emergency Depressurization BEFORE offsite radiation release rates reach the General Emergency (GE) release rate.
EP-101, Enclosure A, Table R defines the Site Area Emergency (SAE) offsite radiation release rate, as determined by dose assessment as stated in the stem of the question, as doses >100 mrem TEDE or 500 mrem thyroid CDE at or beyond the site boundary.
EP-101, Enclosure A, Table R defines the GE offsite radiation release rate, as determined by dose assessment as stated in the stem of the question, as doses >1,000 mrem TEDE or 5,000 mrem thyroid CDE at or beyond the site boundary.

Therefore, the SRO examinee must interpret the offsite radiation release rate information given in the stem of the question as being above the Site Area Emergency action threshold and approaching the GE threshold. The SRO examinee must also recall that, with offsite radiation release rates approaching the GE release rate, Emergency RPV Depressurization is required by the Radioactive Release leg of the EOPs.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. EOP Sheet 5 requires an ED prior to GE release rate. Also, the examinee could incorrectly convert between Rem (in the stem of the question) and mrem (in EP-101) and conclude that dose rates at the site boundary are not yet at the Site Area Emergency level. Also, since adult thyroid dose is at 0.5 R (500 mrem) the examinee could misread and assume that BOTH the TEDE AND thyroid dose levels must be exceeded for an SAE. This distractor is incorrect, however, because the SAE radioactivity release level for TEDE dose has been exceeded.
C. Sending steam from the RPV to the Torus is an available method of cooling down the RPV with the MSIV closed and 90°F/hr is the normal cooldown rate. The examinee could incorrectly recall the conditions that require an ED and assume a normal cooldown is required. However, offsite radiation release rates dictate that an ED be performed irrespective of cooldown rate limits. The second part of the distractor is correct since the radiation level is still at the SAE level.
D. Sending steam from the RPV to the Torus is an available method of cooling down the RPV with the MSIV closed and 90°F/hr is the normal cooldown rate. The examinee could incorrectly recall the conditions that require an ED and assume a normal cooldown is required. However, offsite radiation release rates dictate that an ED be performed irrespective of cooldown rate limits. The second half of this distractor is incorrect because the GE radioactivity release rate has not yet been exceeded.

10 CFR 55.43(b)(5) SRO Justification:
This question meets ES-401 Attachment 2 requirements to be SRO-Only because answering this question requires the examinee to assess plant conditions and then determine the current site Emergency Classification per the Emergency Plan, which is not RO level of knowledge. The question also requires the examinee to use knowledge of the Emergency Classification to determine that an ED is required.

The question cannot be answered solely by knowing "systems knowledge", or solely by knowing immediate operator actions, or solely by knowing entry conditions for AOPs or plant parameters that require direct entry into major EOPs, or solely by knowing the purpose, overall sequence of events, or mitigative strategy of a procedure

Reference Information:
29.100.01, Sheet 5 - Secondary Containment Control and Radiation Release.
EP-101, Classification of Emergencies (provided with exam).

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILO 2010 Exam
ILO 2019 Exam
ILT 2023 Exam

NRC Question Use (ILT 2023)
Bank
High Cognitive Level
Reference Provided
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
295017 High Offsite Radioactive Release Rate
295017.AA2 Ability to determine and/or interpret the following as they apply to High Offsite Radioactive Release Rate: (CFR: 41.10 / 43.5 / 45.13)
295017.AA2.06 Emergency plan implementation

Associated objective(s):
Secondary Containment Control and Radioactive Release
Cognitive Terminal
Given plant procedures and plant conditions as appropriate, Using a current copy of 29.100.01 Sh 1 through Sh 6 determine which step(s) is (are) to be directed by the CRS, in accordance with management expectations.

85	K/A Importance: 4.3			Points: 1.00
S85-V3	Difficulty: 3.00	Level of Knowledge: Fund	Source: NEW	115649

The plant is in MODE 1.

Secondary Containment Sump Level is rising at a rapid rate.

Under which of the following sets of conditions will the CRS direct transitioning to the General Operating Procedures (GOPs) to conduct a plant shutdown, vice transitioning to 29.100.01, RPV Control EOP?

A. Before sump level reaches the Max Safe operating level in one sump due to a primary system discharging into secondary containment that cannot be isolated.

B. When sump level reaches the Max Safe operating levels in more than one sump due to a primary system discharging into secondary containment that cannot be isolated.

C. Before sump level reaches the Max Safe operating level in one sump due to a NON-primary system discharging into secondary containment that cannot be isolated.

D. When sump level reaches the Max Safe operating levels in more than one sump due to a NON-primary system discharging into secondary containment that cannot be isolated.

Answer: D

Answer Explanation:

Per the BWROG EPGs/SAGs Appendix B Vol II, Secondary Containment Control Section:

SC/L-3 When an area water level exceeds its maximum safe operating water level (Table SC-1) in more than one area, shut down the reactor .

Discussion

When the accumulation of water can no longer be confined to one secondary containment area, a direct threat exists relative to secondary containment integrity, to equipment located in the secondary containment, and to continued safe operation of the plant. Irrespective of the source of water, it is prudent to commence an orderly reactor shutdown.

Action to scram the reactor is not precluded by the wording of this step. However, if a primary system is not discharging into the secondary containment, a reactor scram would not achieve the desired reduction in area water level. Shutting down the reactor in accordance with normal operating procedures (for Fermi 2 this is the GOP) is the most appropriate action based upon the current status of secondary containment parameters. Should an operator determine at anytime while performing Step SC/L-3 that the secondary containment water level increase is, in whole or in part, due to a primary system discharge, Step SC/L-2 (being executed concurrently) provides the necessary direction to scram the reactor and depressurize the RPV.

Therefore, the SRO examinee must evaluate the responses and determine that the conditions necessary to transition to the GOP are met when sump level reaches the Max Safe operating levels in more than one sump due to a non-primary system discharging into secondary containment that cannot be isolated.

Distractor Explanation:

A. Plausible because BWROG EPGs/SAGs step *SC/L-2 states "If a primary system discharging into secondary containment cannot be isolated:*
SC/L-2.1 Before any area water level reaches its maximum safe operating water level (Table SC-1), enter the RPV Control Emergency Procedure Guideline at Step RC-1 and execute it concurrently with this guideline. The examinee could recall this guidance and determine that it is these conditions that require transitioning to the GOPs when the conditions in this distractor would require transitioning to the RPV Control EOP to conduct the plant shutdown.
B. Plausible because BWROG EPGs/SAGs step *SC/L-2.2 states "When an area water level exceeds its maximum safe operating water level (Table SC-1) in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.* Note that the ED would require transitioning to the procedure section for Contingency 2 - Emergency Depressurization. The examinee could recall this guidance and inappropriately determine that it is under these conditions that transition to the GOPs would be made, which is plausible because the only difference between the 2 sets of conditions is where the leakage is coming from. This distractor is incorrect because, with leakage coming from a primary system under these conditions, transition to the ED contingency would be required.
C. Plausible because BWROG EPGs/SAGs step *SC/L-2 states "If a primary system discharging into secondary containment cannot be isolated:*
SC/L-2.1 Before any area water level reaches its maximum safe operating water level (Table SC-1), enter the RPV Control Emergency Procedure Guideline at Step RC-1 and execute it concurrently with this guideline. The examinee could recall this guidance and determine that it is these conditions that require transitioning to the GOPs, which is incorrect because transitioning to the GOPs is not required when just one area has exceeded its MSO value due to leakage from a non-primary source.

10 CFR 55.43(b)(5) SRO Justification:

This question meets ES-4.2 requirements to be SRO-Only because it cannot be answered solely from systems knowledge, or by knowing immediate operator actions, or by knowing entry conditions for the AOPs or EOPs, or by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure.
This question requires specific knowledge of conditions that require transitioning from the EOPs into another procedure to mitigate the consequences of high Secondary Containment sump level, which is SRO-Only knowledge.

Reference Information:
BWROG EPGs/SAGs Appendix B Vol II, Secondary Containment Control Section

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
Fundamental (Low) Cognitive Level
New
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
295036 Secondary Containment High Sump/Area Water Level
G2.4.5 Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions (CFR: 41.10 / 43.5 / 45.13)

Associated objective(s):

86	K/A Importance: 3.4			**Points: 1.00**
S86-V2	Difficulty: 3.00	Level of Knowledge: High	Source: NEW	103450

You are the CRS. The plant is in a transient, with the following conditions:

- Reactor Water Level 10 inches and steady
- Reactor Pressure 250 psig and lowering slowly
- Torus Pressure 1.0 psig and steady
- Core Spray 1 pump injecting at 1,000 gpm, rising slowly
- RHR 1 pump injecting at 12,000 gpm, rising slowly
- Torus water level 0 inches and steady
- Torus water temperature 180°F and steady

(1) What is the impact of continued operation with the above conditions?

(2) What action will you direct to mitigate the consequences of the above conditions?

A. (1) Containment Pressure limits may be exceeded before all pressure from the RPV is passed to the Torus.

(2) Terminate injection into the RPV from external sources and vent containment to lower containment pressure.

B. (1) Design limits for SRV tailpipes, quenchers and supports may be exceeded.

(2) Open 5 SRVs, ADS Preferred.

C. (1) Containment Pressure Limits may be exceeded due to loss of the pressure suppression function.

(2) Open 5 SRVs, ADS Preferred.

D. (1) Damage to and loss of the use of the only remaining RHR Pump may occur.

(2) Lower RHR Flow and raise Core Spray Flow to maintain RPV level constant.

Answer: D

Answer Explanation:

29.100.01 Sheet 6, with Notes section removed, will be provided with the exam when using this question.

Per 29.100.01, Sheet 6, Cautions, Curves and Tables:

First, the examinee must use the Torus Overpressure calculation to determine where on the curves the pumps are operating (1.0 psig + 3.5 psig + 0 inches/30) = 4.5 psig. Since the calculation has a note stating the operators should not interpolate between the curves, the next lower curve should be used, which is the 0 psig curve. The Torus water temperature and 0 psig overpressure results in a limit of about 3,500 gpm for one core spray pump and about 10,000 gpm for one RHR pump. With RHR flow about 2,000 gpm over the NPSH limit, the examinee must determine that damage to the RHR pump may occur, which may cause loss of that pump's injection capability. The examinee must determine that Core Spray has enough NPSH capacity to accept the additional 2,000 gpm, thus preserving BOTH pumps' injection capability.

Distractor Explanation:

Distractors are incorrect and plausible because:

A. Plausible because Part (1) is the impact of approaching/operating above the PCPL curve. Having this statement in Part (1) will require the SRO to evaluate the PCPL curve and, if improperly evaluated, the examinee may choose that Part (2) is correct, which are the actions, per 29.100.01 Sheet 1, RPV Control, 3rd Override Statement in L-OR1, that should be taken if the PCPL curve is being challenged. This answer is incorrect because the PCPL is not being exceeded, so (1) the impact of continued operation under these conditions is incorrect and (2) the mitigating actions are incorrect.
B. Plausible because Part (1) is the impact of operating outside the limits of the SRVTPLL curve. Having this statement in Part (1) will require the SRO to evaluate the SRVTPLL curve and, if improperly evaluated, the examinee may choose that Part (2) is correct, which are the actions that should be taken if the SRVTPLL curve is exceeded. This answer is incorrect because the SRVTPLL is not being exceeded, so (1) the impact of continued operation under these conditions is incorrect and (2) the mitigating actions are incorrect.
C. Plausible because Part (1) is the impact of operating above the PSP curve. Having this statement in Part (1) will require the SRO to evaluate the PSP curve and, if improperly evaluated, the examinee may choose that Part (2) is correct, which are the actions that should be taken if the PSP curve is exceeded. This answer is incorrect because the PSP is not being exceeded, so (1) the impact of continued operation under these conditions is incorrect and (2) the mitigating actions are incorrect.

10 CFR 55.43(b)(5) SRO Justification:

The question (SRO Knowledge) is not systems knowledge, is not an immediate operator action, is not an entry condition for AOP/EOP, and is not purpose or mitigative strategy of the procedure.
It requires evaluation of plant conditions, beyond what is required of an RO, recognizing the impact of those plant conditions, and then selecting the appropriate actions with which to proceed, which is SRO required knowledge.

Reference Information:

29.100.01, Sheet 6, Cautions, Curves and Tables (Provided, with Notes section removed).

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
High Cognitive Level
New
NRC Early Review
Reference Provided
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
203000 RHR/LPCI: Injection Mode
203000.A2 Ability to (a) predict the impacts of the following on the RHR/LPCI: Injection Mode and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6)
203000.A2.18 High suppression pool temperature

Associated objective(s):
Residual Heat Removal
Cognitive Terminal
In accordance with approved plant procedures, given various controls and indications for system operations: Identify normal and alarm values for significant monitored Residual Heat Removal System parameters.

87	K/A Importance: 3.7			Points: 1.00
S87-V4 (TOO)	Difficulty: 4.00	Level of Knowledge: High	Source: NEW	115687

The plant is in MODE 4 making final preparations to enter MODE 2 to conduct a startup.

All IRMs are inserted and reading 0 on Range 1.

A fault with the IRM F drawer causes detector voltage to lower to 70 VDC.

(1) What is the impact of this condition on IRM F?

(2) What, if anything, will the CRS direct to mitigate the consequences of this condition, and what type of LCO would need to be written per MOP05, Control of Equipment?

A. (1) IRM Downscale with no protective features.
(2) Write a Tracking LCO per MOP05 ONLY.

B. (1) IRM Downscale with no protective features.
(2) Bypass IRM F IAW 23.603, IRM System, and write an Active LCO per MOP05.

C. (1) IRM INOP with Half Scram.
(2) Bypass IRM F IAW 23.603, IRM system, Reset the 1/2 Scram IAW 23.610, RPS System and write a Tracking LCO per MOP05.

D. (1) IRM INOP with Half Scram.
(2) Bypass IRM F IAW 23.603, IRM system, Reset the 1/2 Scram IAW 23.610, RPS System and write an Active LCO per MOP05.

Answer: C

Answer Explanation:

For Part (1) the examinee must first recall that IRM voltage going below 80 VDC will result in IRM F INOP condition, which will cause the receipt of ARP 3D60, IRM CH B/F/D/H Upscale Trip/INOP the result of which is a Half Scram.
For Part (2) the examinee must determine that IRM F must be bypassed IAW 23.603, which will allow the 1/2 scram to be reset per 23.610. Finally, the examinee must recall that IRM is not required to be OPERABLE in the current Mode (Mode 4). Therefore, per MOP05, a Tracking LCO needs to be written for IRM F because, although LCO 3.3.1.1 does not require IRM F to be OPERABLE, MOP05 requires a Tracking LCO be "written when a system or component does not meet the LCO and the system or component is not required to be operable in the present operating mode or other specified conditions."

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Part (1) is plausible because the IRM would read lower than normal with a low detector voltage and the examinee could determine that the malfunction would cause IRM downscale. And, since the IRMs are on Range 1, the examinee could determine that the IRM downscale would not result in a rod block (which would be correct if an actual IRM Downscale occurred and the IRM was on Range 1). However, since IRM F voltage went <80 VDC, an IRM INOP and 1/2 Scram results. Part (2) is plausible because, for the determination made in Part (1) the examinee would logically conclude that no procedural actions are complete for the failure and all that is required is to write a Tracking LCO per MOP05, which is the correct type of LCO for the current MODE.
B. Part (1) is plausible because the IRM would read lower than normal with a low detector voltage and the examinee could determine that the malfunction would cause IRM downscale. And, since the IRMs are on Range 1, the examinee could determine that the IRM downscale would not result in a rod block (which would be correct if an actual IRM Downscale occurred and the IRM was on Range 1). However, since IRM F voltage went <80 VDC, an IRM INOP and 1/2 Scram results. Part (2) is plausible because, for the determination made in Part (1), the examinee could determine that the IRM must still be bypassed since, once the startup commenced, IRM F indication may rise enough causing it to clear its downscale trip, therefore IRM F would need to be bypassed to prevent any unwanted protective features from the faulty IRM. This could lead the examinee to determine that an Active LCO must be written, since the IRM could be bypassed throughout the duration of the startup (i.e. while in MODE 2, which could plausibly lead to this conclusion). This is incorrect because, although the IRM would need to be bypassed, even if MODE 2 is entered, only a Tracking LCO is required because LCO 3.3.1.1 requires only 3 IRMs, per Trip System, to be OPERABLE in MODE 2. Per MOP05 paragraph 4.2.2 a Tracking LCO is also written for "components that become inoperable where a certain percentage of components are required (for example, three out of four APRMs are required to be operable), therefore a Tracking LCO is still required if MODE 2 is entered.
C. Part (1) is plausible this part is the correct response for the given conditions. Part (2) is plausible because the examinee could correctly determine that the IRM needed to be bypassed, to allow the 1/2 scram to be reset, which is correct, but could also determine that an Active LCO is required since the IRM could be bypassed throughout the duration of the startup (i.e. while in MODE 2, which could plausibly lead to this conclusion). This is incorrect because, although the IRM would need to be bypassed, even if MODE 2 is entered, only a Tracking LCO is required because LCO 3.3.1.1 requires only 3 IRMs, per Trip System, to be OPERABLE in MODE 2. Per MOP05 paragraph 4.2.2 a Tracking LCO is also written for "components that become inoperable where a certain percentage of components are required (for example, three out of four APRMs are required to be operable), therefore a Tracking LCO is still required if MODE 2 is entered.

10 CFR 55.43(b)(2) SRO Justification:

This question meets ES-4.2 requirements to be SRO-Only because it cannot be answered solely by knowing <1-hour TS Actions, information above the line, or by knowing TS safety limits nor can it be answered by knowing TS bases information associated with "above the line" LCO information. The question requires knowledge of the SRO Only function described in MOP05 step 4.1.1 (Responsibility), which states: The SM/CRS/FSS is responsible for the preparation and review of Limiting Condition for Operation (LCO) sheets and Safety Function Determinations (SFDs).

Reference Information:
Technical Specification LCO 3.3.1.1, Table 3.3.1.1-1, RPS Instrumentation.
3D60, IRM CH B/F/D/H Upscale Trip/INOP.
23.603, IRM System SOP.
MOP05, Control of Equipment

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (2) Facility operating limitations in the technical specifications and their bases.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
High Cognitive Level
New
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
215003 IRM Intermediate Range Monitor System
215003.A2 Ability to (a) predict the impacts of the following on the Intermediate Range Monitor System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6)
215003.A2.02 IRM inoperable condition

Associated objective(s):

88	K/A Importance: 3.7			Points: 1.00
S88-V2	Difficulty: 3.00	Level of Knowledge: High	Source: MODIFIED	103028

While testing Source Range Monitors (SRMs) prior to startup, the following SRM status is noted:

Channel	SRM Detectors Inserted	Signal to Noise Ratio
A	4.5 counts per second	18
B	2.5 counts per second	17
C	3.1 counts per second	17
D	3.0 counts per second	21

Which one of the following describes the status of SRMs and any actions necessary to make them able to support the startup?

A. ALL SRMs are OPERABLE and capable of supporting the startup.

B. An insufficient number of SRMs are OPERABLE to support a startup.

C. ONLY SRM B is INOPERABLE and must be bypassed IAW 23.602, SRM System to conduct the startup.

D. ALL SRMs are OPERABLE; However, SRM B must be bypassed IAW 23.602, SRM System to conduct the startup.

Answer: C

Answer Explanation:

Per TS SR 3.3.1.2.4, the SR is MET if SRM count rate ≥3.0 CPS or ≥0.7 CPS when the Signal-to-noise ratio is ≥20.1.
The examinee must determine that the SR is NOT met for SRM B, but is met for all other SRMs and, therefore, all only SRM B is INOPERABLE.

Also, the examinee must recognize that SRM B is downscale, which will result in a Control Rod Withdrawal Block. Therefore, the examinee must determine that only SRM B is INOPERABLE due to not meeting the surveillance requirement and SRM B must be bypassed IAW 23.602 to allow the startup to commence.

Distractor Explanation:
A. Plausible if the examinee did not correctly recall the Surveillance Requirement and determined that, since all SRMs are above 0.7 CPS that they are OPERABLE. However, since SRM B is below 3 cps, it is ONLY allowed to read below 3 CPS (but above 0.7 CPS) IF its S/N ratio is ≥20.1. Since its S/N ratio is <20:1, then it is INOPERABLE. Also, since SRM B is reading below 3.0 CPS, per 3D52, SRM Downscale, SRM B must be bypassed IAW 23.602, SRM System SOP, to clear the Control Rod Withdrawal Block to allow the startup to commence. Please note that SRM trips, and when they are automatically bypassed, are frequently missed concepts by ILT examinees. Several SRM trips are automatically bypassed by IRM Range Switch position, such as SRM downscale. However, they are bypassed when IRMs are above Range 2. Since the startup must be commenced with the IRMs on Range 1 (based on the low power level indicated by the SRMs) the SRM downscale trip would not be bypassed. Also, since the IRM downscale trip is bypassed with IRMs on Range 1, the examinee could, and ILT candidates frequently do, assume that the SRM downscale trip is also bypassed. This might make sense because TS SR 3.3.1.2.4 allows SRM counts to read as low as 0.7 CPS and still be operable. Therefore it would be plausible for an examinee to assume that IRMs on Range 1 would bypass SRM Downscale, which occurs at 3.0 cps decreasing. All of these assumptions are not true and therefore SRM B, although operable, must be bypassed.
B. Plausible because of the low SRM count rates on all of the SRMs, the examinee could fail to recall that SR 3.3.1.2.4 allows count rates as low as 0.7 cps, with signal to noise ratios ≥20.1, at count rates as low as 3 CPS otherwise. This is incorrect because SR 3.3.1.2.4 is met for all SRMs other than SRM B.
D. Plausible if the examinee did not correctly recall the Surveillance Requirement and determined that, since all SRMs are above 0.7 CPS, then they are OPERABLE. However, since SRM B is below 3 cps, it is ONLY allowed to read below 3 CPS (but above 0.7 CPS) IF its S/N ratio is ≥20.1. Since its S/N ratio is <20:1, it is INOPERABLE. The second part is correct since SRM B must be bypassed to clear the downscale trip and allow the startup to commence.

10 CFR 55.43(b)(2) SRO Justification:
This question meets ES-4.2 requirements to be SRO-Only because it cannot be answered solely by knowing ≤1-hour TS/TRM Actions, LCO/TRM information listed above the line, the TS safety limits, or the bases of TS information contained above the line. The question requires knowledge of TS Surveillance Requirements, which is SRO level of knowledge, to determine SRM OPERABILITY and actions necessary to mitigate the condition to allow the startup to commence.

Reference Information:
23.602
3D52, SRM Downscale
TS SR 3.3.1.2.4

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (2) Facility operating limitations in the technical specifications and their bases.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
High Cognitive Level
Modified
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
215004 SRMS Source Range Monitor System
215004.A2 Ability to (a) predict the impacts of the following on the Source Range Monitor System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6)
215004.A2.04 Upscale and downscale trips

Associated objective(s):
Source Range Monitoring
Cognitive Terminal
In accordance with approved plant procedures, given the condition of the system: Identify the impact of Source Range Monitoring System operability on technical specifications

89	K/A Importance: 3.8			Points: 1.00
S89-V2	Difficulty: 2.00	Level of Knowledge: Fund	Source: NEW	104487

An EDG is going to be removed from service for a planned Safety System Outage (SSO) that is expected to last for 10 days.

No other safety related equipment is out of service.

Which of the following is true regarding the performance of a Configuration Risk Management Program (CRMP) Assessment per MMR12, Equipment out of Service Risk Management?

A. It must be initiated AFTER entering LCO 3.8.1 Action A or B.

B. It must be performed BEFORE entering LCO 3.8.1 Action A or B.

C. It is not applicable as the program is only utilized for unplanned, emergent situations.

D. It is only required if other equipment becomes inoperable while in LCO 3.8.1 Action A or B.

Answer: B

Answer Explanation:

Per MMR12, Equipment out of Service Risk Management Section 3.0 Note (1): The Configuration Risk Management Program (CRMP) described is utilized to perform risk assessments during operating Modes 1, 2, and 3. This program assesses risks and evaluates the need for compensatory measures for planned maintenance and testing activities as well as emergent situations.

Per 24.000.01, Situational Surveillances / LCO Action Tracking, Attachment 28a: Action 1a) states that, for a pre-planned evolution, a CRMP assessment (MMR12) must be performed prior to entering LCO 3.8.1 Action A or B.

Distractor Explanation:
A. Plausible because 24.000.01 Att 28a Action 1b) states that the CRMP is performed after entering LCO 3.8.1 Action A or B. Since the examinees will have run several scenarios in the simulator where an EDG went inoperable and they then had to direct performance of a CRMP assessment, this could cause the examinee to choose this distractor. It is incorrect because Action 1a) states that, for a pre-planned evolution, a CRMP assessment (MMR12) must be performed prior to entering LCO 3.8.1 Action A or B.
C. Plausible because CRMP assessment are routinely initiated for equipment that goes out of service, in an unplanned manner, on shift. The examinee could easily recall this from time spent in the plant for U/I time and assume that the CRMP assessment is only performed for emergent work. This is incorrect because MMR12 states that the program assesses risks and evaluates the need for compensatory measures for planned maintenance and testing activities as well as emergent situations.
D. Plausible because this is another instance where a CRMP assessment is required as specified by 24.000.01 Att 28a Action 7), which states that, if other equipment becomes inoperable while in this action, a CRMP must be performed. The examinee could see in the stem of the question that no other equipment is out of service and determine that a CRMP assessment is only required to manage risk for multiple systems out of service. This is incorrect because Att 28a Action 1b) states that the CRMP is performed after entering LCO 3.8.1 Action A or B, regardless of the status of other systems or equipment.

10 CFR 55.43(b)(5) SRO Justification:
This question meets ES-4.2 requirements to be SRO-Only because this question cannot be answered solely from systems knowledge, or by knowing immediate operator actions, or by knowing entry conditions for the AOPs or EOPs, or by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure. The question requires knowledge of when to implement attachments (specifically 24.000.01, Attachment 28a), including how to coordinate this attachment with the performance of MMR12 for risk assessment.

Reference Information:
24.000.01, Situational Surveillances / LCO Action Tracking, Attachment 28a
MMR12, Equipment out of Service Risk Management

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
Fundamental (Low) Cognitive Level
New
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
262001 AC Electrical Distribution
G2.2.17 Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator (CFR: 41.10 / 43.5 / 45.13)

Associated objective(s):
SRO Qualification Card
Performance Enabler
Maintain LCO sheets

SRO Qualification Card
Performance Enabler
Determine Risk using the Phoenix program

90	K/A Importance: 4.7			Points: 1.00
S90-V2	Difficulty: 2.00	Level of Knowledge: High	Source: MODIFIED	103047

You are the CRS on shift with the plant at 100% power.

A malfunction has resulted in closure of P5000-F441, Division 2 Control Air Isolation Valve.

The Division 2 Control Air Compressor has failed to start both Automatically and Manually.

AOP 20.129.01, Loss of Station and Control Air has been entered.

Air Pressures are as follows:

- Station Air Header Pressure - 100 psig and steady.
- Interruptible Air Header Pressure - 100 psig and steady.
- Division 1 NIAS Header Pressure - 100 psig and steady.
- Division 2 NIAS Header Pressure - 80 psig and lowering.

(1) Which of the following CONDITIONS of AOP 20.129.01 will you enter?

(2) What ACTION(S) will you direct?

A. (1) CONDITION E, Div 2 NIAS lost AND IAS available.
(2) Defeat closure signal and open P5000-F403, IAS to Div 2 NIAS Isolation Valve.

B. (1) CONDITION E, Div 2 NIAS lost AND IAS available.
(2) Cross-tie NIAS with Div 1 supplying.

C. (1) CONDITION E, Div 2 NIAS lost AND IAS available.
(2) Cross-tie NIAS with Div 1 supplying AND open P5000-F403, IAS to Div 2 NIAS Isolation Valve.

D. (1) CONDITION K, Div 2 NIAS isolated due to MPU 2 transfer.
(2) Place Div 2 NIAS in Standby.

Answer: B

Answer Explanation:

NOTE: Fermi AOPs are broken down by CONDITIONS and ACTIONS that must be taken when the CONDITION(S) is(are) met. For Fermi, the 'major action categories' are the CONDITIONS of the applicable AOP.

Per AOP 20.129.01, Loss of Station and Control Air, the conditions in the stem of the question indicate that CONDITION E is the correct condition to enter and, per the two Notes, directing action to Cross-tie NIAS with Div 1 supplying is correct.

Distractor Explanation:

A. Plausible because CONDITION E is the correct condition to enter, and it contains guidance to open P5000-F403. However, the condition also contains NOTE 1, which describes the isolation signals defeated by the defeat switch and the fact that the switch does NOT defeat closure of the P5000-F403 on low Div 2 Control Air Pressure (<85psig). Therefore, the examinee must determine that, with Div 2 NIAS pressure <85 psig, the F403 cannot be opened, even with the defeat switch, and therefore the correct action is to cross-tie NIAS.

C. Plausible because CONDITION E is the correct condition to enter, and it does contain guidance to open P5000-F403 and to cross-tie NIAS. Therefore, the examinee could determine that the correct action is to cross-tie NIAS and, when Div 2 NOAS pressure rises above 85 psig, then open P5000-F403. However, Note 2 of CONDITION E prohibits cross-connecting Interruptible Air (IAS) with NIAS (via the P5000-F403) with NIAS Div 1 and Div 2 cross-tied. Therefore, performance of these two actions concurrently is prohibited.

D. Plausible because transfer of MPU 2 can and has resulted in closure of P5000-F441 in the plant. If this occurs, the correct action is to enter Condition K and place Div 2 NIAS back to standby, which involves loading the Div 2 CAC and allowing Div 2 NIAS header pressure to rise to the point that the P5000-F441 can be re-opened. This is incorrect because failure of the Div 2 CAC to start would prevent the ability to restore Div 2 NIAS header pressure sufficiently to re-open P5000-F441. If the examinee failed to recall the specific steps taken in Condition K to restore Div 2 NIAS, then this response could be chosen.

10 CFR 55.43(b)(5) SRO Justification:

This question meets ES-4.2 requirements to be SRO-Only because this question cannot be answered solely from systems knowledge, or by knowing immediate operator actions, or by knowing entry conditions for the AOPs, or by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure. The question requires assessment of conditions of the plant air system, selecting the correct AOP Condition (major action category) and then directing the steps of that section of the AOP to mitigate the abnormal system conditions.

Reference Information:

AOP 20.129.01, Loss of Station and Control Air.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
High Cognitive Level
Modified
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
300000 Instrument Air System
G2.4.6 Knowledge of emergency and abnormal operating procedures major action categories (CFR: 41.10 / 43.5 / 45.13)

Associated objective(s):
Compressed Air Systems
Cognitive Terminal
In accordance with approved plant procedures/references, given the operating conditions and parameters for the Compressed Air System: Identify abnormal and emergency operating procedures associated with the system, as applicable.

91	K/A Importance: 4.2			Points: 1.00
S91-V2	Difficulty: 2.00	Level of Knowledge: Fund	Source: NEW	105698

You are the Control Room Supervisor (CRS).

Loss of all Rod Position Information System (RPIS) has occurred due to a blown fuse in UPS A Circuit 8.

You directed two operators to replace the fuse in accordance with MOP01, Conduct of Operations, Section 3.30.2, Fuse Replacement.

When the fuse was replaced, RPIS was restored for about 5 minutes, but was lost again when the fuse blew for a second time.

Under which conditions, if any, would you be able to direct replacement of the fuse a second time per MOP01?

A. Never.

B. At any time.

C. ONLY if you or the SM determine that an emergency exists.

D. ONLY if an unplanned power change of >25% were to occur.

Answer: C

Answer Explanation:

MOP01, Conduct of Operations Section 3.30.2, Fuse Replacement.

Step 3.30.2.3.f states "If the fault recurs following fuse replacement, do not replace the fuse a second time unless the SM/CRS determines an emergency exists and directs the action."

Distractor Explanation:
A. Plausible because the examinee could determine that the CRS does not have the authority to direct replacing the fuses a second time under any plant condition. This is incorrect because MOP01 Step 3.30.2.3.f only allows fuses to be replaced a second time if an emergency exists.
B. Plausible because the examinee could determine that the CRS has the authority to direct replacing the fuses a second time under any plant condition. This is incorrect because MOP01 Step 3.30.2.3.f only allows fuses to be replaced a second time if an emergency exists.
D. Plausible because the examinee could determine that a power change >25% was significant enough to warrant replacing the fuses. 25% is consistent with the EP-101 threshold for a significant transient, concurrent with a loss of Control Room indications, would require the declaration of an Alert. However, control rod position is not one of the Safety System Parameters that need to be lost to meet this condition (the parameters are limited to Reactor Power, water level, pressure and primary containment pressure, water level and temperature). Therefore, an emergency condition does not exist and MOP01 Step 3.30.2.3.f only allows fuses to be replaced a second time if an emergency exists.

10 CFR 55.43(b)(5) SRO Justification:
This question meets ES-4.2 requirements to be SRO-Only because this question cannot be answered solely from systems knowledge, or by knowing immediate operator actions, or by knowing entry conditions for the EOPs, or by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure. The question requires knowledge of administrative procedural requirements that allow replacement of fuses, more than one time, under emergency conditions. The requirement is for an SRO / Shift Manager and therefore not an RO job function.

Reference Information:
MOP01, Conduct of Operations

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
Fundamental (Low) Cognitive Level
New
NRC Early Review
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
214000 RPIS Rod Position Information System (BWR 2, 3, 4, 5)
G2.1.1 Knowledge of conduct of operations requirements (CFR: 41.10 / 43.10 / 45.13)

Associated objective(s):
SRO Qualification Card
Performance Enabler
Take actions that depart from License Conditions, procedures and Technical Specifications in an emergency

92	K/A Importance: 4.1			Points: 1.00
S92-V2	Difficulty: 3.00	Level of Knowledge: Fund	Source: NEW	104187

24.204.06, Div 2 LPCI and Suppression Pool Cooling/Spray Pump and Valve Operability Test was recently completed.

You have been handed the surveillance to review and you note the following flows:

- RHR Loop B Suppression Pool Cooling Flow with RHR Pump D running: 5,900 gpm.
- RHR Loop B Suppression Pool Cooling AND Spray Flow with RHR Pump D running: 6,500 gpm.

What is Status of Division 2 RHR Torus Cooling / Torus Spray?

A. BOTH subsystems are OPERABLE.

B. One Suppression Pool Spray subsystem ONLY is INOPERABLE.

C. One Suppression Pool Cooling subsystem ONLY is INOPERABLE.

D. One Suppression Pool Cooling AND one Suppression Pool Spray subsystem BOTH are INOPERABLE.

Answer: C

Answer Explanation:

Per 24.204.06, Div 2 LPCI and Suppression Pool Cooling/Spray Pump and Valve Operability Test, Acceptance Criteria Section 7.0:
Note: Acceptance Criteria is reviewed by an STA or SRO.
Verification of Step 7.1 ensures that established RHR Pump B and D flows satisfy, among others, Surveillance Requirement SR 3.6.2.3.2 by verifying each RHR pump develops a flow rate >9,250 gpm while in the suppression pool cooling mode.
Verification of Step 7.5 ensures that the increase in RHR Pump B and D flows satisfies, among others, Surveillance Requirement SR 3.6.2.4.2 by verifying flow increases by 500 gpm when RHR is placed in the suppression pool spray mode.

The examinee must first determine that Div 1 Suppression Pool Cooling flow, with Pump D running, is below Acceptance Criteria, therefore one Suppression Pool Cooling Subsystem is INOPERABLE. The examinee must then determine that, when Suppression Pool Spray was placed in service, flow increased by 600 gpm, which meets acceptance criteria, therefore Suppression Pool Spray is OPERABLE.

Distractor Explanation:
A. Plausible because the examinee may not recall from memory the acceptance criteria for developed RHR pump flows from 24.204.06. For example, the examinee could recall the Acceptance Criteria for Surveillance 24.203.03, Division 2 Core Spray System Pump and Valve Operability, and apply that surveillance's Acceptance Criteria of 5,725 gpm (see Section 7.0 of 24.203.03) to the RHR surveillance due to the similar design function of the RHR and CSS. This could lead the examinee to determine that the RHR flow requirement is satisfied. This is incorrect because SR 3.6.2.3.2 requires that each RHR Pump develops a flow rate of >9,250 gpm while in the Suppression Pool Cooling Mode, therefore the Acceptance Criteria is not met, and LCO 3.6.2.3 is not met for one Suppression Pool Cooling Subsystem.
B. Plausible because the examinee may not recall from memory the acceptance criteria for developed RHR pump flows from Technical Specifications and may determine that Suppression Pool Cooling flow is satisfactory while Suppression Pool Spray flow is not. This is incorrect because 24.204.06 requires that each RHR Pump develop a flow rate of >9,250 gpm while in the Suppression Pool Cooling Mode, therefore the Acceptance Criteria is not met and LCO 3.6.2.3 is not met for one Suppression Pool Cooling Subsystem and SR 3.6.2.4.2 requires that each RHR Pump develop a flow rate of >500 gpm while in the Suppression Pool Spray Mode, therefore the Acceptance Criteria is met and LCO 3.6.2.4 is met for Suppression Pool Cooling Spray.
C. Plausible because the examinee could recognize that Suppression Pool Cooling flow is low and outside of the Acceptance Criteria, but also incorrectly determine that Suppression Pool Spray flow is not acceptable. This is incorrect because 24.204.06 requires that each RHR Pump develop a flow rate of >500 gpm while in the Suppression Pool Spray Mode, therefore the Acceptance Criteria is met and LCO 3.6.2.4 is met for Suppression Pool Cooling Spray

10 CFR 55.43(b)(2) SRO Justification:
This question meets ES-4.2 requirements to be SRO-Only because this question cannot be answered solely by knowing <1-hour TS/TRM Actions, or solely by knowing the LCO/TRM information listed "above the line," or solely by knowing the TS safety limits. This question requires knowledge of TS Surveillance Requirements and Acceptance Criteria for those SRs, which is SRO-Only knowledge.

Reference Information:
24.204.06, Div 2 LPCI and Suppression Pool Cooling/Spray Pump and Valve Operability Test.
24.203.03, Division 2 Core Spray System Pump and Valve Operability.
Technical Specifications 3.6.2.3 and 3.6.2.4.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (2) Facility operating limitations in the technical specifications and their bases.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
Fundamental (Low) Cognitive Level
New
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
219000 RHR SPC RHR/LPCI: Torus/Suppression Pool Cooling Mode
G2.2.12 Knowledge of surveillance procedures (CFR: 41.10 / 43.2 / 45.13)

Associated objective(s):
Residual Heat Removal
Cognitive Terminal
Given the system operating conditions/parameters, in accordance with approved plant procedures: Describe the Residual Heat Removal System technical specification limiting conditions for operation, their bases, the associated surveillance requirement(s), and their relationship to operability.

93	K/A Importance: 3,9			Points: 1.00
S93	Difficulty: 3.00	Level of Knowledge: High	Source: BANK	104147

A plant shutdown is in progress in accordance with 22.000.04, Plant Shutdown from 25% Power.

At about 10% power, MTG load is reduced to approximately 55 MWe and the Main Turbine is tripped.

Following trip of the Main Turbine, the CRS notes the following:

- Turbine Stop Valve (TSV) #1 indicates OPEN.
- Turbine Control Valve (TCV) #1 indicates OPEN.
- All other stop and control valves indicate closed.

(1) What action must the CRS direct to mitigate the consequences of the above conditions?

(2) What is the reason for directing these actions?

A. (1) On-Load Closure of a Turbine Stop Valve to close #1 TSV.
(1) Turbine damage due to overspeed

B. (1) Place the Mode Switch in Shutdown and close the Outboard MSIVs
(2) Turbine damage due to overspeed

C. (1) On-Load Closure of a Turbine Stop Valve to close #1 TSV.
(2) Over-pressurizing the high pressure turbine casing.

D. (1) Place the Mode Switch in Shutdown and close the Outboard MSIVs.
(2) Over-pressurizing the high pressure turbine casing.

Answer: B

Answer Explanation:

The steps for taking the MTG off line are found in 22.000.04 Section 4.0, Step 4.2.13. The CRS must recall that this procedure requires that, at substep 6, all TSVs, TCVs, LPIVs, LPSVs and Extraction Steam Valves be verified closed and that substep 7 requires that, if at least one HP Stop Valve or HP Control valve is not closed in each HP steam line (as presented in the stem of the question for Steam Line #1) then the reactor must be manually scrammed and the Scram AOP entered, since the Scram AOP has the follow-on actions to take for this condition (and the bases). Note that this is not a "normal" entry into the Scram AOP and this condition is NOT listed in the Scram AOP as an AOP entry condition, therefore this is an abnormal system condition for a Main Turbine Trip that could be encountered that the CRS must be aware of and able to mitigate, therefore this is not RO knowledge. Therefore the CRS must recall that these conditions require (1) scramming the reactor by placing the Mode Switch in Shutdown and (2) closing the Outboard MSIVs. The examinee should also recall from Scram BASES that (2) MTG overspeed and damage may occur, which is why 22.000.04 directs entry into this procedure to perform these actions.

Distractor Explanation:

A. Plausible because the examinee may select this if they incorrectly believe that the SOP contains the appropriate direction for closing the TSV under trip conditions. Incorrect because the scram AOP requires that the outboard MSIVs be closed. Closing the TSV using the normal operating procedure is not procedurally directed under turbine trip conditions, nor would it be effective in preventing turbine overspeed due to the time required to perform the actions.

C. Plausible because, while the turbine casing may become pressurized over time, the overriding effect is to prevent overspeed since the generator is disconnected as stated in the AOP bases for the actions taken. The examinee may select this if they incorrectly believe that the SOP contains the appropriate direction for closing the TSV under trip conditions, and incorrectly recall the basis. Incorrect because closing the TSV using the normal operating procedure is not procedurally directed under turbine trip conditions, nor would it be effective in preventing turbine overspeed due to the time required to perform the actions. Additionally, the basis for the action is to prevent overspeed.

D. Plausible because, while the turbine casing may become pressurized over time, the overriding effect is to prevent overspeed since the generator is disconnected as stated in the AOP bases for the actions taken. The examinee may select this if they incorrectly recall the basis for the action taken. Incorrect because the basis for the action is to prevent overspeed.

10 CFR 55.43(b)(5) SRO Justification:

This question meets ES-4.2 requirements to be SRO-Only because this question cannot be answered solely by knowing “system knowledge”, immediate operator actions, AOP or EOP entry conditions, or the purpose and overall mitigating strategy of the AOPs. Answering this question requires assessment of plant conditions and then selection of a procedure or section of a procedure to mitigate or recover, or with which to proceed, and recalling the basis for that action.

Reference Information:

20.000.21, Reactor Scram
20.000.21 BASES
23.109, Turbine Operating Procedure
22.000.04, Plant Shutdown from 25% Power

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILO 2019 Retake Exam
ILT 2023 Exam

NRC Question Use (ILT 2023)
Bank
Closed Reference
High Cognitive Level
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
245000 MTGEN Main Turbine Generator and Auxiliary Systems
245000.A2 Ability to (a) predict the impacts of the following on the Main Turbine Generator and Auxiliary Systems and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6)
245000.A2.01 Turbine trip

Associated objective(s):
Turbine Steam
Cognitive Terminal
In accordance with approved plant procedures, given the condition of the system: Discuss design considerations, capabilities, and limitations related to Turbine Steam System component operation.

94	K/A Importance: 4.2			Points: 1.00
S94-V2 (POST SUBMITTAL)	Difficulty: 3.00	Level of Knowledge: High	Source: NEW	104449

You are the Control Room Supervisor (CRS) on shift.

You have just been informed that the latch on door RM2-2 is malfunctioning and the door will NOT remain closed.

Establishing which of the following fire watches would ensure that ALL Technical Requirement Manual (TRM) requirements are satisfied?

A. A continuous fire watch ONLY.

B. An hourly fire watch patrol ONLY.

C. An hourly fire watch patrol WITH backup fire suppression equipment.

D. A continuous fire watch WITH backup fire suppression equipment available.

Answer: D

Answer Explanation:

The examinee must first recall that, per ODE-12 Section 13.0, any items that interfere with closing of a fire door would constitute changes to the tested configuration of the door and therefore render the door functionally impaired. Next, the examinee must refer to 35.000.242 to identify the proper classification of this door. The examinee should then obtain and interpret 35.000.242, Enclosure C, Page 4 of 12, and determine that door RM2-2 is a door that is required by TRM 3.12.8. Also, the examinee should determine that the door is part of a Halon boundary and therefore required by TRM 3.12.5.

The examinee should then reference TR LCO 3.12.8 and determine that the LCO is not met because door RM2-2 is required by the LCO and not capable of performing its function. The examinee should determine that Condition A is required, which allows for A.1 Establishing a continuous fire watch in the area OR A.2.2 establishing an hourly fire watch patrol (along with verifying that detectors on at least one side of the door operable per A.2.1).

The examinee should also reference TR LCO 3.12.5 and 35.000.242 Enclosure C to determine that Door RM2-2 impacts halon to the Cable Spreading Room (elevation 630' 6") and therefore LCO 3.12.5 is not met. The examinee should then determine that Condition A is required, because the Cable Spreading Room is system b, Action A.1 applies. Therefore, the examinee should determine that, although LCO 3.12.8 only requires an hourly fire watch, LCO 3.12.5 is more restrictive in that it requires establishing a continuous fire watch WITH backup fire suppression equipment.

Distractor Explanation:
A. Plausible because TR LCO 3.12.8 Action A.1 requires only establishing a continuous fire watch, on at least one side of the affected door, if the LCO is not met. Although the LCO allows for less restrictive actions, if fire detectors on at least one side of the inoperable door are operable, the examinee could choose to take the more restrictive action and establish a continuous fire watch per Action A.1. If the examinee did not look any further, for example did not properly interpret the table located in 35.000.242 Enclosure C, the examinee could stop here and choose this response. This is incorrect because 35.000.242 Enclosure C indicates that TR LCO 3.12.5 is also not met and Action A.1 of that LCO requires a continuous fire watch WITH backup fire suppression equipment.
B. Plausible because TR LCO 3.12.8 Action A.2.2 allows for establishing an hourly fire watch patrol, if fire detectors on at least one side of the inoperable door are operable, as is stated in the stem of the question. Also, TR LCO 3.12.5 Action A.2 allows for this, but only for system c (Computer room). Therefore, if the examinee missed the NOTE, this option could be chosen. This is incorrect because the NOTEs for TR LCO 3.12.5 require performance of Action A.1 for system b (Cable spreading room), which means a continuous fire watch, with backup fire suppression equipment, is required.
C. Plausible because establishing a continuous fire watch with backup fire suppression equipment available is required per TR LCO 3.12.5 Action A.1 and because establishing an hourly fire watch patrol is an option offered by TR LCO 3.12.8 Action A.2.2. The examinee could incorrectly apply the two requirements and determine that it would be acceptable to place backup fire suppression equipment in the area and then establish an hourly fire watch patrol to monitor the area. This is incorrect because proper application of the NOTEs means that A.1 is only applicable to systems a and b, while A.2 is only applicable to system c and, therefore, not required and because placing backup fire suppression equipment in the area and establishing an hourly fire watch would not meet the intent of the Required Actions in TR LCO 3.12.5.

10 CFR 55.43(b)(2) SRO Justification:

This question meets ES-4.2 requirements to be SRO-Only because this question cannot be answered solely by knowing <1-hour TS/TRM Actions, or solely by knowing the LCO/TRM information listed "above the line," or solely by knowing the TS safety limits. The question requires knowledge and application of the process for determining fire impairments by use of a procedure that is only used by SROs to evaluate the impact of inoperability of fire barriers on the TRM. The procedure, 35.000.242, is only associated with the SRO Task List, specifically Task Number 01A0001210, "For a given barrier, identify and classify the barrier according to 35.000.242 and determine its impact if found inoperable."

Reference Information:
ODE-12, LCOs, Section 13, Fire Doors (Barrier) Function
35.000.242, Barrier Identification / Classification (Enclosure C will be provided)
TRM LCOs for Section 12.0, Fire Protection (all of TRM Section 12.0 will be provided)

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (2) Facility operating limitations in the technical specifications and their bases.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
High Cognitive Level
New
Reference Provided
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
G2.1.25 Ability to interpret reference materials, such as graphs, curves, and tables (reference potential)
(CFR: 41.10 / 43.5 / 45.12)

Associated objective(s):
SRO Qualification Card
Performance Enabler
For a given barrier, identify and classify the barrier according to 35.000.242 and determine its impact if found inoperable

95	K/A Importance: 4.0			Points: 1.00
S95-V2	Difficulty: 2.00	Level of Knowledge: Fund	Source: NEW	114550

Preparations are being made to conduct a startup.

22.000.01, Plant Startup Master Checklist is almost complete.

The startup is going to be performed while relying on the provisions of a system's LCO action requirements.

Who must specifically approve the use of Technical Specification LCO 3.0.4?

A. The Shift Manager.

B. The Plant Manager.

C. The Operations Engineer.

D. The Control Room Supervisor.

Answer: B

Answer Explanation:

Per 22.000.01, Plant Startup Master Checklist: P&L 3.2 on Page 3 states that, If the startup is to be performed while relying on the provisions of action requirements, the Plant Manager or designee shall specifically approve each use of Technical Specifications LCO 3.0.4. The review/approval shall be documented in Step 7.27. Therefore, the examinee must recall that the Plant Manager shall specifically approve each use of TS LCO 3.0.4.

Distractor Explanation:
A. Plausible because the Shift Manager is an SRO and the SM signs for review of completion of 22.000.01 on Page 39. This is incorrect because P&L 3.2 requires Plant Manager approval.
C. Plausible because the Operations Engineer is an SRO and the OE signs for various steps in 22.000.01. Also, the OE determines which system lineups must be performed as can be seen in Step 4.1 on Page 4. This is incorrect because P&L 3.2 requires Plant Manager approval.
D. Plausible because the Control Room Supervisor is an SRO and the CRS can be delegated, per Note (1) on Page 4, to initial for the OE throughout 22.000.01. This is incorrect because P&L 3.2 requires Plant Manager approval.

10 CFR 55.43(b)(5) SRO Justification:
This question meets ES-4.2 requirements to be SRO-Only because this question cannot be answered solely from systems knowledge, or by knowing immediate operator actions, or by knowing entry conditions for the AOPs or EOPS, or by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure. The question requires knowledge of administrative procedures that specify implementation of plant normal (General Operating in this case) procedures. At Fermi 2 implementation of the GOPs is an SRO function. Although ROs may be handed sections of the GOP for completion, implementation (and sign-off) of the GOP is an SRO-Only function. This is especially the case for P&L 3.2, which deals with the requirements to implement TS LCO 3.0.4 prior to startup.

Reference Information:
22.000.01, Plant Startup Master Checklist

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
Fundamental (Low) Cognitive Level
New
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
G2.1.32 Ability to explain and apply system precautions, limitations, notes, or cautions (CFR: 41.10 / 43.2 / 45.12)

Associated objective(s):

96	K/A Importance: 4.2			Points: 1.00
S96	Difficulty: 2.00	Level of Knowledge: Fund	Source: BANK	103147

One REQUIRED Technical Specification (TS) related instrument has failed.

The instrument was removed from service and the channel to which it is associated was placed in trip to meet TS Limiting Conditions for Operation (LCO) Required Actions.

Technicians are currently performing corrective maintenance on the instrument.

Under which of the following conditions may the instrument be temporarily returned to service under administrative controls?

(1) To perform troubleshooting of the instrument.
(2) To perform testing required to demonstrate operability of the instrument following repairs.
(3) To complete a surveillance required to demonstrate operability of other instruments.

A. (1) ONLY

B. (2) ONLY

C. (1) and (3) ONLY

D. (2) and (3) ONLY

Answer: D

Answer Explanation:

Bank Source: Columbia Generating Station 2019 NRC Exam, Question 97.

This question requires the SRO to analyze the effect of maintenance activities (troubleshooting) on the status of LCOs to determine if instruments removed from service, to comply with required TS Actions, can be placed back in service to support the maintenance activity.

Per TS LCO 3.0.5:

Equipment removed from service or declared inoperable to comply with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate its OPERABILITY or the OPERABILITY of other equipment. This is an exception to LCO 3:0.2 for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.

Therefore Answer D is correct because it contains the 2 allowances from LCO 3.0.5.

Distractor Explanation:
A. Plausible if it is believed that troubleshooting is a legitimate reason to restore equipment under administrative controls. However, LCO 3.0.5 does not allow this.
B. Plausible since (2) is an example of an instance where it is allowed to restore equipment. However, (3) is also an acceptable reason in accordance with LCO 3.0.5.
C. Plausible since (3) is an example of an instance where it is allowed to restore equipment. However, (1) is NOT an acceptable reason in accordance with LCO 3.0.5.

10 CFR 55.43(b)(2) SRO Justification:
This question meets ES-4.2 requirements to be SRO-Only because this question cannot be answered solely by knowing <1-hour TS/TRM Actions, or solely by knowing the LCO/TRM information listed "above the line," or solely by knowing the TS safety limits. The question involves application of generic LCO requirements found in LCO 3.0.5.

Reference Information:
LCO 3.0.5

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (2) Facility operating limitations in the technical specifications and their bases.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Bank
Closed Reference
Fundamental (Low) Cognitive Level
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
G2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operation (CFR: 41.10 / 43.2 / 45.13)

Associated objective(s):
Technical Specifications for Licensed Operators
Performance Enabler
Given a copy of Technical Specifications and Bases, apply the Use and Application rules of Section 3.0 to specific plant conditions to ensure compliance with Technical Specifications.

97	K/A Importance: 4.5			Points: 1.00
S97-V3	Difficulty: 3.00	Level of Knowledge: Fund	Source: NEW	114547

A Technical Specification required system has the following Surveillance Requirement:

SURVEILLANCE:

Verify flow is within limits.

FREQUENCY:

Once within 12 hours after >25% RTP.

AND

24 hours thereafter.

At 1600 on June 1st, Thermal Power goes above 25%.

(1) What is the latest time the initial flow verification is required to be completed?

(2) What is the latest time the next flow verification would be required to be completed?

A. (1) 0400 on June 2nd
(2) 0400 on June 3rd

B. (1) 0400 on June 2nd
(2) 1000 on June 3rd

C. (1) 0700 on June 2nd
(2) 0700 on June 3rd

D. (1) 0700 on June 2nd
(2) 1300 on June 3rd

Answer: B

Answer Explanation:

Per Technical Specifications SR 3.0.2.

The conditions and limitations for time requirements to complete Surveillances per our license are as follows:

"The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met.
For Frequencies specified as "once." the above interval extension does not apply.
If a Completion Time requires Periodic performance, the above Frequency extension applies to each performance after the initial performance.
Exceptions to this Specification are stated in the individual Specifications."

Since the first performance in the SR is specified a "once" performance, the 1.25 time extension does NOT apply. The "thereafter" performance indicates that future performances should be established per SR 3.0.2 requirements and the 1.25 time extension can be used.

At 1600 on June 1st, Power was raised above 25%.

For Part (1), the latest the initial Surveillance must be completed within 12 hours after going above 25% RTP, 0400 the following morning (June 2nd), with no time extension allowed. Therefore the initial verification must be done by 0400 on June 2nd.
For Part (2), since this is a periodic performance SR, the 1.25 extension applies to when the initial Surveillance was completed. 1.25 X 24hrs = 30hrs. Therefore, the next surveillance shall be performed no later than 1000 the following day (June 3rd).

Distractor Explanation:

A. (1) This part is correct.
(2) Incorrect because the 1.25 extension DOES apply to follow on performances of the SR. The candidate may choose this option if they do not recall that the 1.25 extension is allowed for follow on performances by SR 3.0.2.
C. (1) Incorrect because the 1.25 extension does not apply to "once" completion time requirements. The candidate may select this option if they incorrectly believe that the 1.25 extension DOES apply to all times in the SR.
(2) Incorrect because the 1.25 time extension DOES apply to this requirement. The candidate may select this option if they incorrectly believe that the 1.25 extension does NOT apply to follow on performances of the SR.
D. (1) Incorrect because the 1.25 extension does not apply to "once" completion time requirements. The candidate may select this option if they incorrectly believe that the 1.25 extension DOES apply to all times in the SR.
(2) This part is the correct calculation based on the incorrect initial performance time above. The candidate may choose this option if they believe that the 1.25 time extension applies to BOTH time intervals specified in the SR.

10 CFR 55.43(b)(2) SRO Justification:
This question meets ES-4.2 requirements to be SRO-Only because this question cannot be answered solely by knowing <1-hour TS/TRM Actions, or solely by knowing the LCO/TRM information listed "above the line," or solely by knowing the TS safety limits or bases. This question requires the examinee to recall and apply specific time requirements and interval extension criteria for frequencies of performing Surveillances per SR 3.0.2 that are conditions in the Fermi 2 license.

Reference Information:
Technical Specifications SR 3.0.2

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (2) Facility operating limitations in the technical specifications and their bases.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
Fundamental (Low) Cognitive Level
New
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
G2.2.38 Knowledge of conditions and limitations in the facility license (CFR: 41.7 / 41.10 / 43.1 / 45.13)

Associated objective(s):
Technical Specifications for Licensed Operators
Cycle 12-1 Objectives
Performance Enabler
Given a copy of Technical Specifications and Bases, apply the Frequency rules of Section 1.4 to periodic actions (both Required Actions and Surveillance Requirements) to ensure compliance with Technical Specifications.

98	K/A Importance: 2.9			Points: 1.00
S98	Difficulty: 3.00	Level of Knowledge: Fund	Source: NEW	104327

As the Control Room Supervisor, how would you be able to determine if an area's radiation level has exceeded a MAXIMUM SAFE Operating (MSO) value for most areas inside the Reactor Building?

A. Direct an NO to determine radiation levels locally at the associated Auxiliary Unit.

B. Direct an RP Tech to determine radiation levels locally using portable radiation monitoring equipment.

C. Direct the STA to use IPCS to determine radiation levels in the Main Control Room on IPCS using the ARM turn-on-code.

D. Direct an LNO to use recorders D21-R600 (R602), Radiation Monitoring Channels 1-24 (25-44 & 46-48) to determine radiation levels from the Main Control Room.

Answer: B

Answer Explanation:

To answer this question, the examinee must recall specific limitations with monitoring the Area Radiation Monitors (ARMs) remotely. The SRO examinee must recall that, although ARMs can be monitored remotely, from the Main Control Room, using the plant computer (IPCS) and/or recorders installed in the MCR, these both have limitations that prevent monitoring radiation for the entire spectrum of operationally significant radiation levels. This concept is generic in nature in that it applies to all events that would result in elevated radiation levels, whether they would be from improper radioactive material movement or storage, steam leaks in secondary containment, or fuel handling accidents within secondary containment, etc.

Note that the range for ARMs can be found in 23.611, ARM System SOP, Enclosure A, ARM Listing. The examinee must recall that typical ARM Channels have an upper range of either 100 mr/hr (for Channels 1, 2, 13, 29, 30 and 33) or 1000 mr/hr (for Channels 7, 8, 9, 10, 11 and 31). The examinee must then recall that all of the Max Safe Operating Values are 5R/hr. Therefore, the examinee must determine that the ability to monitor ARMs up to the MSO values will be limited. The typical way a CRS would assign critical parameter monitoring, for Secondary Containment values other than Radiation, would be to read the MSO value off of the EOP (e.g., from Table 12 for high secondary containment temperature or Table 13 for high secondary containment water level), and then assign the critical parameter to a Licensed Nuclear Operator (LNO). The examinee must recall that, because of limitations associated with the ARM system, this normal method will not be appropriate. The SRO examinee must then recall that, for any radiation event, AOP 20.000.02, Abnormal Release of Radioactive Material, would be entered. The examinee must recall that Action A.3 of that AOP gives the CRS guidance to direct RP to perform surveys in the area of high radiation.

Therefore, the examinee must put all of the information above together and determine that, in order to monitor area radiation levels approaching MSO values, for a typical ARM the range of the monitor will be exceeded. Therefore RP must be directed to perform local surveys using portable radiation monitoring equipment.

Distractor Explanation:
A. Plausible because, as described in 23.611 Paragraph 1.1.3, the ARM system is made up of, among other things, Auxiliary Units. An Auxiliary Unit provides a local alarm and indication. It is electrically installed between the detector and the indicator unit. When a high level trip occurs, an amber light on the unit is on. This answer is incorrect, however, because the local Auxiliary Units have the same range as indicated in the MCR and the typical ARM has a top of range of either 100 or 1000 mr/hr so they would not be capable of indicating when the MSO is reached.
C. Plausible because this is another method by which critical parameters could be monitored for high secondary containment temperature and sump levels, by directing the STA to monitor those parameters on the IPCS screen installed in the MCR. And because one channel (ARM Channel 14 for the RBSB torus room) can read up to its MSO rad level of 5 R/hr, the STA would be able to monitor this channel on IPCS. However, for high radiation this is incorrect because the range of IPCS is also limited by the range of the ARM itself and, since most ARMs have a range less than the MSO value, this method of monitoring radiation levels would not be available to the CRS.
D. Plausible because this is how critical parameters would be monitored for high secondary containment temperature and sump levels, by directing the CRLNO to monitor those parameters on recorders installed in the MCR. And because one channel (ARM Channel 14 for the RBSB torus room) can read up to its MSO rad level of 5 R/hr. However, for high radiation this is incorrect for MOST of the areas because the recorders range is limited by the range of the ARM itself and, since most ARMs have a range less than the MSO value, this method of monitoring radiation levels would not be available to the CRS.

10 CFR 55.43(b)(4) SRO Justification:
This question meets ES-4.2 requirements to be SRO-Only because this question requires generic knowledge of the Area Radiation Monitoring system needed by the SRO for the analysis and interpretation of radiation readings as they pertain to the SRO's selection of administrative, normal, and emergency procedures.

Reference Information:
23.611, ARM System SOP
20.000.02, Abnormal Release of Radioactive Material

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
Fundamental (Low) Cognitive Level
New
NRC Early Review
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
G2.3.5 Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms or personnel monitoring equipment (CFR: 41.11 / 41.12 / 43.4 / 45.9)

Associated objective(s):
Area Radiation Monitoring System
Cognitive Terminal
In accordance with approved plant procedures/references, under all conditions of the Area Radiation Monitoring System: Describe system operation, including component operating sequence, normal operating parameters, and expected system response.

99	K/A Importance: 4.5			Points: 1.00
S99-V1	Difficulty: 2.00	Level of Knowledge: Fund	Source: NEW	104107

While marking the EOP flowcharts for a rising parameter associated with a parameter control leg, you encounter a stop sign symbol containing the words "CANNOT be kept."

Which of the following meets the expectation set forth in ODE-10, Emergency Operating Procedure Expectations, for execution of EOP steps containing this term?

A. Once the parameter exceeds the limit, action beyond the stop sign must be performed, and cannot be delayed any longer while attempting to restore the parameter.

B. Action beyond the stop sign can be delayed, if the specified value is exceeded, and actions are already in progress that will restore the parameter to the specified range.

C. Anticipatory action cannot be taken, if it is determined that the limit will be ultimately exceeded, and action beyond the stop sign must not be performed until the limit is actually reached.

D. The action beyond the stop sign does not require immediate action simply because the current value of the parameter is outside of the specified range, but the action must be taken as soon as it is apparent that the specified range cannot be attained.

Answer: A

Answer Explanation:

Per ODE-10, Emergency Operating Procedure Expectations:

"CANNOT be kept/maintained" means the identified parameter is not able to be *held* within the specified limit. Making this determination requires an evaluation of system performance and availability in relation to parameter values and trends. "CANNOT be kept/maintained" does not require anticipatory action, nor does it prohibit it. Depending on plant conditions, the action may be taken as soon as it is determined that the limit will ultimately be exceeded or delayed until the limit is actually reached. However, once the parameter exceeds the limit, the action must be performed. It cannot be delayed any longer, while attempting to restore the parameter.

Distractor Explanation:
B. Plausible because this distractor states that actions are in progress to restore the parameter and the examinee could determine that further action could be delayed in order to evaluate the effectiveness of the ongoing actions. This is incorrect because "CANNOT be kept" requires action once the parameter value is exceeded, without delay, even if compensatory actions are in progress.
C. Plausible because the examinee may not recall that "CANNOT be kept" allows for anticipatory action before the parameter exceeds the specified limit. This is incorrect because although the determination of "CANNOT be kept" does not require anticipatory action, it does not prohibit it either.
D. Plausible because the term "CANNOT be restored and maintained," which is very closely related to the term "CANNOT be kept/maintained," allows for actions to be taken to restore parameters, even if the specified value is exceeded. This is incorrect because CANNOT be kept requires action once the parameter value is exceeded, without delay

10 CFR 55.43(b)(5) SRO Justification:
This question meets ES-4.2 requirements to be SRO-Only because this question cannot be answered solely from systems knowledge, or by knowing immediate operator actions, or by knowing entry conditions for the EOPs, or by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure. The question requires knowledge of EOP guidelines (administrative procedures) that specify implementation of the EOPs.

Reference Information:
ODE-10, Emergency Operating Procedure Expectations.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
Closed Reference
Fundamental (Low) Cognitive Level
New
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
G2.4.14 Knowledge of general guidelines for emergency and abnormal operating procedures usage (CFR: 41.10 / 43.1 / 45.13)

Associated objective(s):

Introduction to Emergency Operating Procedures

Cognitive Terminal

Given a set of plant parameters that meet the entry conditions, Define the use of terms as they pertain to the Emergency Operating Procedures, in accordance with Fermi 2 Emergency Operating Procedures

100	K/A Importance: 4.1			Points: 1.00
S100	Difficulty: 2.00	Level of Knowledge: High	Source: MODIFIED	103069

The plant is in MODE 1 at 100% power.

The Outside Rounds NO reports that there is an on-going gun fight, with multiple intruders and Security officers, near the Auxiliary Boiler House (ABH).

Security confirms this report and adds that there has been an explosion in a manhole adjacent to the ABH.

Outside Rounds also reports he is exiting the area and there is extensive damage to the ABH.

What is the appropriate emergency classification for this event?

A. Unusual Event.

B. Alert.

C. Site Area Emergency.

D. General Emergency.

Answer: C

Answer Explanation:

NOTE: EP-101 Event Classification charts to be provided for this question.

NOTE: This question is modified from Question S100 on the 2020 Fermi 2 NRC exam. The question was modified by changing the location of the hostile action, such that the correct answer changed from Alert to SAE, because the Aux Boiler House at Fermi 2 is located inside the Protected Area.

Per EP-101, the appropriate emergency classification is Site Area Emergency, based on a HOSTILE ACTION is occurring within the PROTECTED AREA as reported by the Security Shift Supervisor under EAL HS1.1.

Distractor Explanation:
Distractors are incorrect and plausible because:

A. Unusual Event is the correct classification for a SECURITY CONDITION, but one that does NOT involve a HOSTILE ACTION per EAL HU1.1. This classification is incorrect because the stem indicates the threat is a HOSTILE ACTION inside the Protected Area.
B. ALERT is the correct classification for a HOSTILE ACTION within the OWNER CONTROLLED AREA per EAL HA1.1. This classification is incorrect because the stem indicates that the HOSTILE ACTION is inside the Protected Area. Note: This was the previously correct response.
D. GE is the correct classification for a HOSTILE ACTION within the PROTECTED AREA that causes loss of a critical safety function or damage to spent fuel per EAL HG1.1. This classification is incorrect because, although the stem indicates that an explosion has occurred inside the Protected Area, it did not threaten any of the listed safety functions nor did it cause damage to spent fuel.

10 CFR 55.43(b)(5) SRO Justification:
This question meets ES-401 Attachment 2 requirements to be SRO-Only because it requires assessment of plant conditions (normal, abnormal, or emergency) and then selection of a procedure or section of a procedure to mitigate or recover, or with which to proceed. It cannot be answered solely by knowing system knowledge, immediate actions, EOP/AOP entry conditions or the overall mitigating strategy of procedures.

Reference Information:
EP-101, Classification of Emergencies.

10CFR55 RO/SRO Written Exam Content
10 CFR 55.43(b) (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Fermi 2 NRC Exam Usage
ILT 2023 Exam

NRC Question Use (ILT 2023)
High Cognitive Level
Modified
Reference Provided
SRO

NUREG-1123-Rev 3 Boiling Water Reactors Knowledge and Abilities Catalog
G2.4.28 Knowledge of procedures relating to a security event (ensure that the test item includes no safeguards information) (CFR: 41.10 / 43.5 / 45.13)

Associated objective(s):
RERP: Emergency Classifications and Protective Action Recommendations
Performance Enabler
Classify Emergency Events