76	**ID: 76**	**Points: 1.00**

Unit 2 is in Mode 4 with preparations being made to start Shutdown cooling.

902-3 E-15, SHUTDOWN COOLING LOW PRESS PERM, is in ALARM.

MO 2-1001-47, SDC SUCT HDR DOWNSTREAM SV, is OPEN.

MO 2-1001-50, SDC SUCT HDR UPSTREAM SV, is CLOSED.

A transient results in the loss of RB 250 VDC MCC 2A.

What is the operability status of the RHR Shutdown Cooling (SDC) System, and what actions, if any, are required in accordance with Technical Specification 3.4.8 Residual Heat Removal (RHR) Shutdown Cooling System—Cold Shutdown?

A. Only ONE RHR SDC subsystem is INOPERABLE.
Verify an alternate method of decay heat removal is available for the INOPERABLE RHR SDC subsystem within 1 hour.

B. TWO RHR SDC subsystems are INOPERABLE.
Verify the affected penetration flow path is isolated within 31 days.

C. TWO RHR SDC subsystems are INOPERABLE.
Verify an alternate method of decay heat removal is available for each INOPERABLE RHR SDC subsystem within 1 hour.

D. ALL RHR SDC subsystems are OPERABLE.
No action is required.

Answer: D

Answer Explanation

Two RHR SDC subsystems are required to be operable in Mode 4.

RB 250 VDC MCC 2A is the power supply to MO 2-1001-47.

The MO 2-1001-47 is an isolation valve on the suction line common to both loops of the RHR system, and therefore affects all RHR SDC subsystems.

The Tech Spec Bases states "Each shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (remote or local) in the shutdown cooling mode for removal of decay heat."

Since MO 2-1001-50 has not lost power and can be manually aligned, all required RHR SDC subsystems are operable.

Distractor 1 is incorrect: Plausible if assumed that the RHR SDC system is inoperable and that only one SDC subsystem is required.
Distractor 2 is incorrect: Plausible because the PCIV T.S. would apply if the reactor were in mode 3.
Distractor 3 is incorrect: Plausible because this would be the correct answer if the TS Bases note were not applicable.

Reference: Tech Spec Bases B.3.4.8
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 1 **Group:** 1

K/A: 295004 Partial or Complete Loss of D.C. Power
2.2.37 Ability to determine operability and/or availability of safety related equipment.
(CFR: 41.7 / 43.5 / 45.12)
IMPORTANCE RO 3.6 SRO 4.6

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

Facility operating limitations in the TS and their bases.

- Knowledge of TS bases that is required to analyze TS required actions and terminology

Can question be answered *solely* by knowing ≤ 1 hour TS/TRM Action? NO
Can question be answered *solely* by knowing the LCO/TRM information listed “above-the-line?” NO
Can question be answered *solely* by knowing the TS Safety Limits? NO

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

295004.2.2.37 Ability to determine operability and/or availability of safety related equipment. (RO=3.6 / SRO=4.6)

S-1000-K27 (Freq: LIC=B)
ANALYZE a given condition that may impact the operability of the RHR or RHRSW systems, (ie component/controller failure, Clearance) using P&ID/C&IDs, E-prints and Tech Specs, if necessary, and DETERMINE if the RHR/RHRSW meets Tech Spec operability requirements.

77	**ID: 77**	**Points: 1.00**

Both Units were at rated conditions when a fire in the control room required its evacuation. The crew has entered QOA 0010-05, Plant Operation With The Control Room Inaccessible. The initial actions in the control room for the Unit NSOs were completed prior to evacuation.

It has been 35 minutes since the evacuation and the operators have yet to fully establish plant control. The fire has just been reported extinguished.

(1) Which of the following describes how RPV pressure is controlled?

(2) What is the HIGHEST emergency action level that has been met?

HS2 Control Room evacuation has been initiated and plant control cannot be established. 1 2 3 4 5 D **EAL Threshold Values:** **Note:** The Emergency Director should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1. Control Room evacuation has been initiated. **AND** 2. Control of the plant **cannot** be established in **< 30 minutes** per: • QOA 0010-05 OR • QCARP 0050-01 OR • QCARP 0050-02	**HA2** Control Room evacuation has been initiated. 1 2 3 4 5 D **EAL Threshold Values:** Entry into **ANY** of the following for Control Room evacuation: • QOA 0010-05 OR • QCARP 0050-01 OR • QCARP 0050-02

A. (1) DEHC will automatically initiate a cooldown based on reactor pressure.
(2) An Alert must be declared.

B. (1) Operators will manually cycle the Relief Valves to establish a cooldown.
(2) An Alert must be declared.

C. (1) DEHC will automatically initiate a cooldown based on reactor pressure.
(2) A Site Area Emergency must be declared.

D. (1) Operators will manually cycle the Relief Valves to establish a cooldown.
(2) A Site Area Emergency must be declared.

Answer: D

Answer Explanation

QOA 0010-05 directs the operators insert a manual reactor scram before leaving the Main Control room and then establishing a cooldown by manually actuating relief valve solenoids locally.
The threshold values for HS2, Site Area Emergency have been satisfied and must be declared.

Distractor 1 is incorrect: Combination of distractors 2 and 3.
Distractor 2 is incorrect: A SAE must be declared because control of the plant has not been established within 30 minutes of control room evacuation.
Distractor 3 is incorrect: DEHC will automatically swap to different functions based on reactor pressure, but not a cooldown.

Reference: QOA 0010-05 Rev 25, EP-AA-1006 Rev 35
Reference provided during examination: None
Cognitive level: High

Level (RO/SRO): SRO
Tier: 1 **Group:** 1

K/A: 295016 Control Room Abandonment
2.4.34 Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.
(CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 4.2 SRO 4.1

SRO Justification: Unique to the SRO position.

The question is linked to a learning objective that is specifically labeled in the lesson plan as being SRO-only

Question Source: Modified from Nine Mile Point 2010 NRC ILT Exam
Question History: N/A

Comments:

Associated objective(s):

295016.2.4.34 Knowledge of RO tasks performed outside the main control room during emergency operations including system geography and system implications. (RO=3.8 / SRO=3.6)

S-EVAC-K11 (Freq: LIC=B)
Given a copy of EP-AA-111, Emergency Classification and Protective Action Recommendations, DETERMINE the proper GSEP Emergency Action Level condition and classification that should be entered during an evacuation of the Control Room.

78 **ID: 78** **Points: 1.00**

Unit 1 is at rated conditions.

The U1NSO reports that BOTH the OPEN AND CLOSED lights are LIT for the following Scram Discharge Instrument Volume valves:

- AO 1-302-21A, NORTH INST VOLUME INBD VENT VLV
- AO 1-302-22A, NORTH INST VOLUME INBD DRN VLV

There are NO other abnormal indications to report.

An EO sent out to investigate reports that the air operators for both valves are physically stuck at approximately 80% OPEN and will NOT CLOSE.

Per Technical Specifications Section 3.1.8 Scram Discharge Volume (SDV) Vent and Drain Valves, the reported conditions require...

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more SDV vent or drain lines with one valve inoperable.	A.1 Isolate the associated line.	7 days
B. One or more SDV vent or drain lines with both valves inoperable.	B.1 Isolate the associated line.	8 hours

A. isolating EITHER the SDV Drain Line OR Vent Line within 8 hours per Condition B.

B. isolating BOTH the SDV Drain Line AND Vent Line within 8 hours per Condition B.

C. isolating EITHER the SDV Drain Line OR Vent Line within 7 days per Condition A.

D. isolating BOTH the SDV Drain Line AND Vent Line within 7 days per Condition A.

Answer: D

Answer Explanation

When one SDV vent or drain valve is inoperable in one or more lines, the line must be isolated to contain the reactor coolant during a scram.

The ACTIONS Table is modified by a Note indicating that a separate Condition entry is allowed for each SDV vent and drain line. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable SDV line. Complying with the Required Actions may allow for continued operation, and subsequent inoperable SDV lines are governed by subsequent Condition entry and application of associated Required Actions.

Since each of the inoperable valves are in separate lines, each line must be isolated within 7 days in accordance with LCO 3.1.8 Condition A.

Distractor 1 is incorrect: The two valves that are inoperable are in separate lines. Plausible if the note indicating separate condition entry for each line is not recalled. Or if assumed that both valves are in the same line, or if the entire pathway is one line.
Distractor 2 is incorrect: The required time to isolate both lines is 7 days. Plausible if assumed that both valves are in the same line, or if the entire pathway is one line.
Distractor 3 is incorrect: The two valves that are inoperable are in separate lines. Plausible if the note indicating separate condition entry for each line is not recalled.

Reference: T.S. 3.1.8 Amendment 199/195, P&ID M-41 Sh 3
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 1 **Group:** 1

K/A: 295019 Partial or Complete Loss of Instrument Air
2.2.22 Knowledge of limiting conditions for operations and safety limits.
(CFR: 41.5 / 43.2 / 45.2)
IMPORTANCE RO 4.0 SRO 4.7

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

Facility operating limitations in the TS.

Can question be answered *solely* by knowing ≤ 1 hour TS/TRM Action? NO
Can question be answered *solely* by knowing the LCO/TRM information listed “above-the-line?” NO
Can question be answered *solely* by knowing the TS Safety Limits? NO

Question Source: Modified from LaSalle 2008 ILT NRC Exam
Question History: N/A

Comments:

Associated objective(s):

S-0500-K27 (Freq: LIC=B)
ANALYZE a given condition that may impact the operability of the Reactor Protection System (ie component/controller failure, Clearance) using P&ID/C&IDs, E-prints and Tech Specs, if necessary, and DETERMINE if the Reactor Protection System meets Tech Spec operability requirements.

295019.2.2.22 Knowledge of limiting conditions for operations and safety limits. (RO=3.4 / SRO=4.1)

79	ID: 79	Points: 1.00

Unit 1 is in a Refueling outage with the following conditions:

- An irradiated fuel assembly is currently being lowered into the reactor core.
- RHR **LOOP** B is Out-Of-Service
- Indicated Reactor water level is in the normal level band at +338 inches
- 1A RHR and 1B RHRSW pumps are operating in the Shutdown Cooling Mode

If the 1A RHR pump TRIPS due to equipment failure, which of the following is the required action, if any, to be taken in regards to LCO 3.9.8 Residual Heat Removal (RHR) - High Water Level?

A. NO action required. LCO 3.9.8 is NOT applicable with the current plant conditions.

B. NO action required. LCO 3.9.8 is met with the remaining OPERABLE equipment.

C. Verify an alternate method of decay heat removal and monitor temperatures and pressures within 1 hour.

D. Suspend loading of irradiated fuel assemblies into the RPV immediately.

Answer: B

Answer Explanation

Only one RHR shutdown cooling subsystem is required to be OPERABLE in MODE 5 with irradiated fuel in the RPV and the water level greater than or equal to 23 ft above the RPV flange. Only one subsystem is required to be OPERABLE because the volume of water above the RPV flange provides backup decay heat removal capability.
An OPERABLE RHR shutdown cooling subsystem consists of an RHR pump, a heat exchanger, valves, piping, instruments, and controls to ensure an OPERABLE flow path.
The B RHR pump is still available (the B pump is in the A RHR loop), and therefore there are no required actions per LCO 3.9.8.

Distractor 1 is incorrect: Plausible if assumed that the applicability for LCO 3.9.8 is with RPV level less than 23 ft above the RPV flange (applicability for LCO 3.9.9).
Distractor 2 is incorrect: Plausible if assumed that two RHR pumps constitute one subsystem (similar to RHR-LPCI mode of operation).
Distractor 3 is incorrect: Plausible because this action will eventually be required if a total loss of SDC occurs.

Reference: LCO 3.9.8 Amendment No. 199/195, LCO 3.9.8 Bases Revision 0
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 1 **Group:** 1

K/A: 295021 Loss of Shutdown Cooling
2.2.40 Ability to apply Technical Specifications for a system.
(CFR: 41.10 / 43.2 / 43.5 / 45.3)
IMPORTANCE RO 3.4 SRO 4.7

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

Facility operating limitations in the TS and their bases.

- Knowledge of TS bases that is required to analyze TS required actions and terminology

Can question be answered *solely* by knowing ≤ 1 hour TS/TRM Action? NO
Can question be answered *solely* by knowing the LCO/TRM information listed “above-the-line?” NO
Can question be answered *solely* by knowing the TS Safety Limits? NO

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

S-1000-K33 (Freq: LIC=B)
Discuss the bases for RHR/RHRSW System LCO's.

295021.2.2.40 Ability to apply Technical Specifications for a system. (RO=3.4 / SRO=4.7)

80	ID: 80	Points: 1.00

REFER TO THE INFORMATION PROVIDED ON THE FOLLOWING PAGES

Unit 1 has a small break LOCA and ATWS.

- Reactor power is 25% and OSCILLATING
- Reactor pressure is 900 psig and RISING
- Actions have been completed to Terminate and Prevent Injection
- Reactor water level is -130 inches and LOWERING
- RCIC is injecting at 400 gpm
- Drywell pressure is 5 psig and RISING
- Both loops of Drywell Sprays are on service
- Torus water temperature is 166 degrees F and RISING
- Torus water level is 14 feet and LOWERING
- The 1-1001-36A, A TORUS H2O TEST VLV, is THROTTLED OPEN
- All ADS valves are CLOSED

Based on the given indications, what action is required NEXT?

A. Anticipate RPV Blowdown and OPEN all Main Turbine Bypass Valves.

B. Continue to let reactor water level DROP to -142 inches, and LOWER reactor pressure.

C. Immediately enter QGA 500-1, RPV BLOWDOWN, and OPEN all five ADS valves.

D. Re-inject with Condensate and Feedwater to MAINTAIN reactor water level -130 to -166 inches, and MAXIMIZE Torus Cooling.

Answer: B

Answer Explanation

The included graphics show the reactor water level control leg of QGA 101, RPV CONTROL ATWS, the Torus temperature control leg of QGA 200, PRIMARY CONTAINMENT CONTROL, and the Heat Capacity Temperature Limit graph, which will need to be referenced in order to make the correct decision. Reactor pressure and torus temperature are both rising, threatening the Heat Capacity Temperature Limit.

The required action is to continue to let reactor water level suppress reactor power (let drop to -142) and to lower reactor pressure to stay within the Heat Capacity Temperature Limit.

Distractor 1 is incorrect: In an ATWS, the override to anticipate blowdown is not applicable [located in QGA 100 and QGA 100 was exited to enter QGA 101]. Plausible since anticipating blowdown is a correct action when containment conditions are worsening while in QGA 100.
Distractor 2 is incorrect: Reactor pressure has not been reduced per QGA 200 as an attempt to stay within the Heat Capacity Temperature Limit graph, so a blowdown is not applicable until this attempt has been made. Plausible because this is the follow-on step if reducing reactor pressure proves unsuccessful.
Distractor 3 is incorrect: The conditions to re-inject have not yet been met (reactor power remains >5%, reactor water level has not reached top of active fuel {-142"}, nor drywell pressure remaining below 2.5 psig), so resuming injection is not applicable. Plausible because re-injection will occur once reactor water level reaches top of active fuel and maximizing torus cooling is an applicable QGA 200 step.

Reference: QGA 101 Rev 13, QGA 200 rev 9
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 1 **Group:** 1

K/A: 295025 EA 2.03
Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE:
Suppression pool temperature
(CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 3.9 SRO 4.1

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

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

- Assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed
- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps
- Knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific subprocedures or emergency contingency procedures
- Knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures

Can the question be answered solely by knowing “systems knowledge”, i.e., how the system works, flowpath, logic, component location? NO

Can the question be answered solely by knowing immediate operator actions? NO

Can the question be answered solely by knowing entry conditions for AOPs or plant parameters that require direct entry to major EOPs? NO

Can the question be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure? NO

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

S-0001-K24 (Freq: LIC=B)
Given QGA 200, 'Primary Containment Control' and QGA 200-5, 'Hydrogen Control', and various conditions, EVALUATE the conditions and DESCRIBE how to proceed through the flowcharts including transitions within QGA 200 or 200-5, to other QGA procedures or to normal operating procedures.

295025.EA2.03 Suppression pool temperature. (RO=3.9 / SRO=4.1)

1. Lower RPV water level by preventing all RPV injection except:
   - Boron injection
   - CRD
   - RCIC

   ☛ Ignore any power or level oscillations.
2. Let level drop at least to -35 in.
3. Let level continue to drop until:
   - Power drops below 5%

     OR
   - Level drops to -142 in. (TAF)

     OR
   - All ADS valves stay closed and drywell pressure stays below 2.5 psig
4. Record final level: ________________________

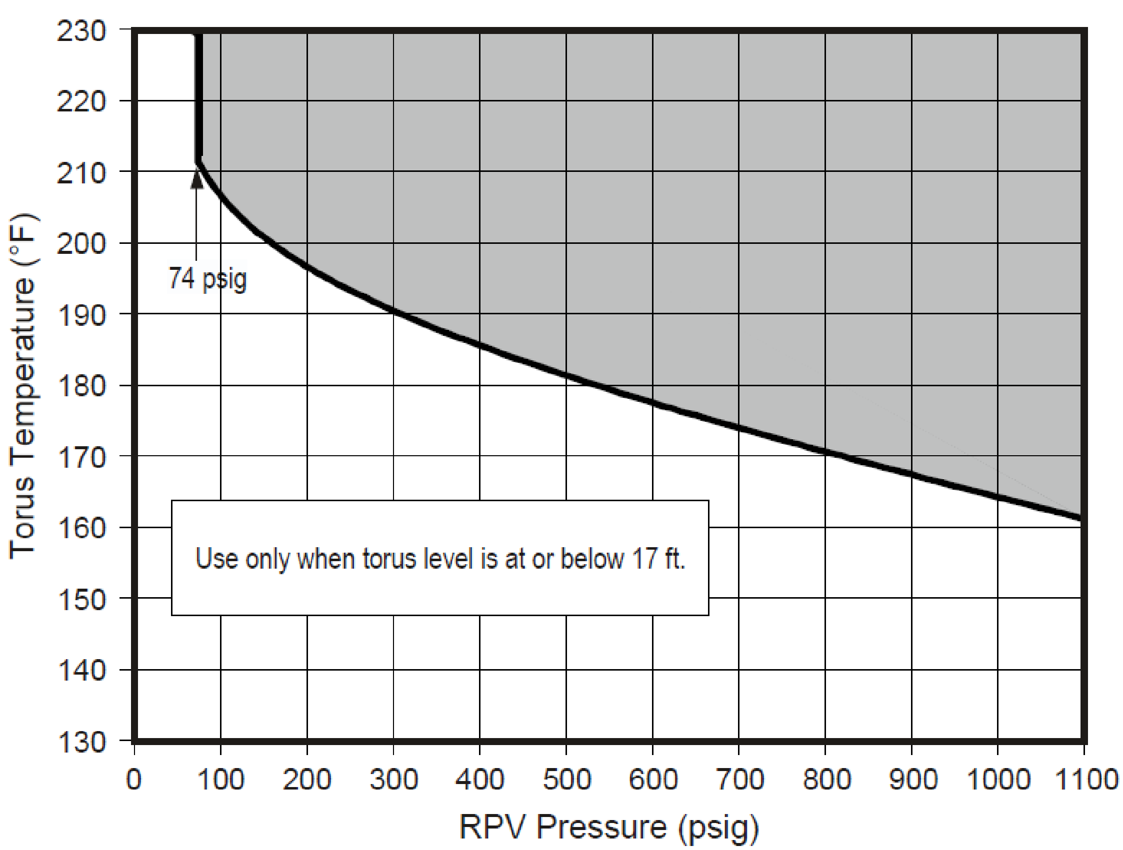
9

Using only Preferred ATWS Systems (Detail G), hold RPV water level between -166 in. and the level you lowered it to.

Hold torus temperature below Fig M, Heat Capacity Limit.

IF	THEN
Cannot hold torus temperature below Fig M, Heat Capacity Limit	1. IF......... you are not in RPV Flooding (QGA 500-4) or Steam Cooling (QGA 500-2), THEN .. lower RPV pressure to stay below Fig M. ☛ OK to exceed 100°F/hr cooldown rate. 2. IF......... you still cannot stay below Fig M, Heat Capacity Limit, THEN .. **BLOW DOWN:** Enter QGA 500-1 while continuing here. ↓

M Heat Capacity Limit



81	ID: 81	Points: 1.00

REFER TO THE INFORMATION ON THE FOLLOWING PAGE

A LOCA has occurred with all automatic isolations and actuations functioning as designed. The Unit Supervisor has entered QGA 100 and QGA 200. Actions taken in QGA 100 have stabilized RPV water level at -130 inches. NO actions have been taken in QGA 200.

Containment parameters are reported as follows:

- Drywell pressure 20 psig and rising
- Torus pressure 18 psig and rising
- Drywell temperature 270°F and rising
- Torus temperature 100°F and rising
- Torus level 14 ft. and steady
- Drywell/Torus H_2 None detected

Which of the following QGA 200 actions is required FIRST?

A. Blowdown the RPV

B. Initiate Drywell Sprays

C. Restart RBCCW and Drywell Coolers

D. Trip both Reactor Recirc Pumps

Answer: B

Answer Explanation

The given parameters are within the DSIL curve, therefore, initiating Drywell sprays is allowed. Since all automatic actions occurred as designed, the Reactor Recirculation pumps have tripped as well as RBCCW and the Drywell Coolers.

The included graphics show a portion of the Primary Containment Pressure leg of QGA 200, a portion of the Drywell Temperature leg of QGA 200, the Pressure Suppression Pressure limit curve, and the Drywell Spray Initiation Limit curve.

Distractor 1 is incorrect: The given parameters (Torus pressure and level) exceed the PSP curve. However, Drywell /Torus Sprays, if available, must be established prior to concluding parameters "cannot stay below the PSP curve" before entering QGA 500-1.
Distractor 2 is incorrect: QCOP 5750-19, Limitations and Actions step E.2 states" Do NOT attempt to restart RBCCW flow to the Drywell Coolers if a LOCA has occurred AND Drywell temperature has been > 260°F during the accident." The current conditions have Drywell temperature at 270°F.
Distractor 3 is incorrect: Plausible because this would be correct for the first action to be taken in QGA 200, however, with RPV water level at -130 inches, the Recirc pumps have already tripped.

Reference: QGA 200 Rev 9
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 1 **Group:** 1

K/A: 295028 EA2.04
Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE:
Drywell pressure
(CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 4.1 SRO 4.2

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

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

- Assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed
- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps
- Knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific subprocedures or emergency contingency procedures
- Knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures

Can the question be answered solely by knowing “systems knowledge”, i.e., how the system works, flowpath, logic, component location? NO

Can the question be answered solely by knowing immediate operator actions? NO

Can the question be answered solely by knowing entry conditions for AOPs or plant parameters that require direct entry to major EOPs? NO

Can the question be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure? NO

AND

Unique to the SRO position.

The question is linked to a learning objective that is specifically labeled in the lesson plan as being SRO-only

Question Source: Quad Cities ILT Exam Bank
Question History: N/A

Comments:

Associated objective(s):

S-0001-K24 (Freq: LIC=B)
Given QGA 200, 'Primary Containment Control' and QGA 200-5, 'Hydrogen Control', and various conditions, EVALUATE the conditions and DESCRIBE how to proceed through the flowcharts including transitions within QGA 200 or 200-5, to other QGA procedures or to normal operating procedures.

295028.EA2.04 Drywell pressure (RO=4.1 / SRO=4.2)

CAUTION: Exceeding RHR NPSH/Vortex Limits may cause system damage.

1. Trip all recirc pumps.
2. Trip all drywell cooling fans.
3. Start drywell sprays (QCOP 1000-30).
   - Do not use pumps needed for core cooling.
   - OK to use external spray sources.
   - Reducing primary containment pressure affects margin to NPSH limits.

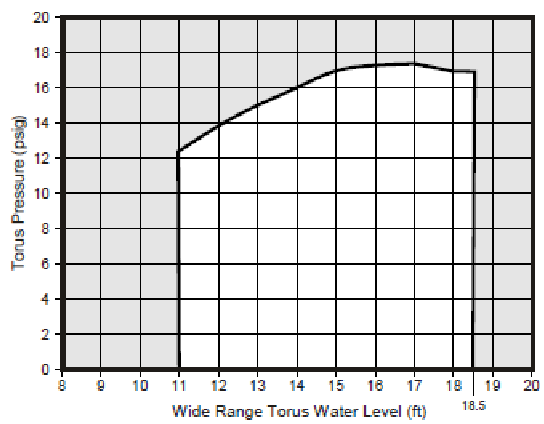
Continue to control drywell and torus pressures.

IF	THEN
Cannot stay inside Fig L, Pressure Suppression Pressure	Go to 16.

16

BLOW DOWN:
Enter QGA 500-1 while continuing here.

L Pressure Suppression Pressure



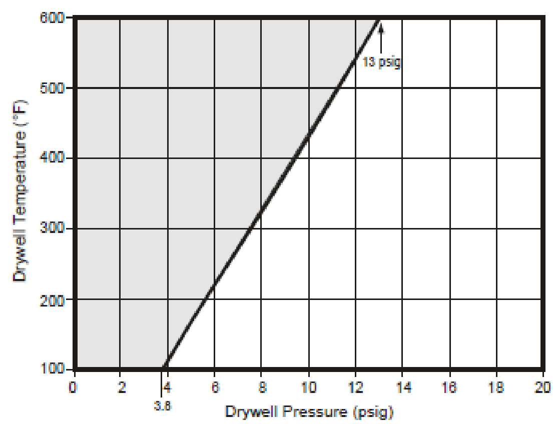
Hold drywell temperature below 180°F using drywell cooling.

IF	THEN
Cannot hold drywell temperature below 180°F	Go to 18.

18

Start all available drywell cooling (QCOP 5750-19).

K Drywell Spray Initiation Limit



82	ID: 82	Points: 1.00

Which of the following radiological events requires an IMMEDIATE Emergency Action Level (EAL) classification of a SITE AREA EMERGENCY or HIGHER?

(Consider each event separately)

Event 1: Dose assessment methodology using actual meteorology data indicates a dose of 350 mRem TEDE at the Technical Support Center (TSC).

Event 2: A radioactive release has been in progress for 19 minutes with a rate of 3.9 E+08 µCi/sec as measured by the Rx Bldg Vent and Chimney SPINGs.

Event 3: Survey results 50 feet east of the intersection of Highway 84 and 206th Ave North (Site Access Road) indicate a closed window gamma dose rate of 130 mRem/hr. This dose rate is expected to remain constant for 90 minutes.

A. Event 3 ONLY

B. Events 1 and 3 ONLY

C. Events 2 and 3 ONLY

D. Events 1, 2 and 3

Answer: C

Answer Explanation

Event 2 will be classified as a Site Area Emergency (RS1) because the Emergency Director will declare the event since the release duration exceeds 15 minutes. Event 3 will be classified as a Site Area Emergency (RS1) because the location given is a public highway beyond the site boundary.

Distractor 1 is incorrect: Plausible if the candidate applies the EAL classifications incorrectly. For example, if the candidate moves from the right of the page to the left, they may classify Event 2 as an Alert or Unusual Event (OPEX from LOR training).
Distractor 2 is incorrect: Combination of distractors 1 and 3.
Distractor 3 is incorrect: Plausible if candidate assumes that the TSC falls within the definition of offsite since it is outside of the Reactor and Turbine Building. Also plausible if candidate is not familiar with the TSC location and assumes it is offsite. An EAL classification is not required for this event because the TSC is located on-site and is not an area listed in Table R2 and R3 of EP-AA-1006.

Reference: EP-AA-1006 Rev 35
Reference provided during examination: EP-AA-1006 Hot Matrix

Cognitive level: High

Level (RO/SRO): SRO
Tier: 1 **Group:** 1

K/A: 295038 EA2.03
Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: Radiation levels
(CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 3.5 SRO 4.3

SRO Justification: 10 CFR 55.43(b)(4)

Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

- Process for gaseous/liquid release approvals, i.e., release permits
- Analysis and interpretation of radiation and activity readings as they pertain to selection of administrative, normal, abnormal, and emergency procedures
- Analysis and interpretation of coolant activity, including comparison to emergency plan criteria and/or regulatory limits

Question Source: Quad Cities ILT Exam Bank
Question History: N/A

Comments: None

Associated objective(s):

295038.EA2.03 Radiation levels (RO=3.5 / SRO=4.3)

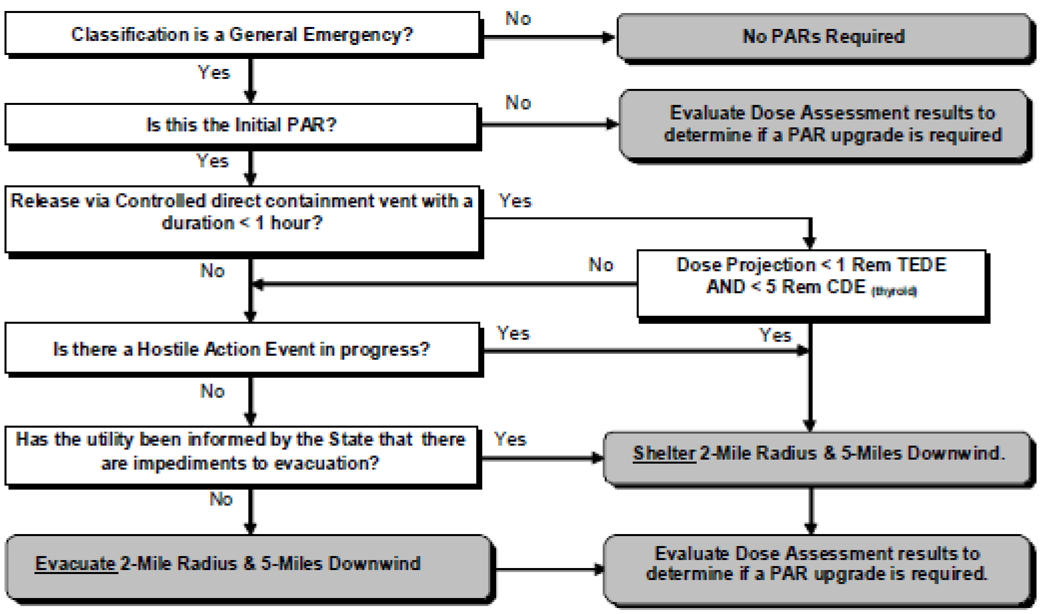
S-EP-P01 (Freq: LIC=A) (ILT-MP) Given an event, classify the event and activate the Emergency Response organization in accordance with EP-AA-111 and EP-AA-112.

83 **ID: 83** **Points: 1.00**

A Tornado has struck Quad Cities Generating Station, resulting in the following conditions:

- A General Emergency has been declared due to an uncontrolled Radioactive Release in progress
- The wind is coming from 290 degrees at 25 mph
- Dose projections at the junction of Highway 84 and 206th Avenue North have been determined to be 100 mRem TEDE and 120 mRem CDE Thyroid

Based on the above information, what are the initial Protective Action Recommendations per EP-AA-111?



2 Mile Radius, 5 Miles Downwind				
WD (from)			Illinois	Iowa
009°	to	024°	1, 3	1, 2, 6
025°	to	029°	1, 3	1, 2, 4, 6
030°	to	081°	1	1, 2, 4, 6
082°	to	090°	1	1, 2, 3, 4, 6
091°	to	116°	1	1, 2, 3, 4
117°	to	165°	1	1, 2, 3
166°	to	186°	1	1, 2, 3, 5
187°	to	215°	1	1, 2, 5
216°	to	240°	1, 2	1, 2, 5
241°	to	289°	1, 2	1, 2
290°	to	318°	1, 2, 3	1, 2
319°	to	008°	1, 3	1, 2

A. Shelter Illinois sectors 1, 2, 3 and Iowa sectors 1, 2

B. Shelter Illinois sector 1 and Iowa sectors 1, 2, 4, 6

C. Evacuate Illinois sectors 1, 2, 3 and Iowa sectors 1, 2

D. Evacuate Illinois sector 1 and Iowa sectors 1, 2, 4, 6

Answer: C

Answer Explanation

The release is not controlled and the State has not informed the utility that there are impediments to evacuation; therefore, with wind direction from 290 degrees, the initial Protective Action Recommendation would be the evacuation of Illinois sectors 1, 2, 3 and Iowa sectors 1, 2.

Distractor 1 is incorrect: Plausible if assumed that release is controlled.
Distractor 2 is incorrect: Combination of distractors 1 and 3.
Distractor 3 is incorrect: Plausible if wind direction is reversed.

Reference: EP-AA-111 Rev 18, EP-AA-111-F-06 Rev E
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 2 **Group:** 1

K/A: 295017 High Off-site Release Rate
2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc.
(CFR: 41.10 / 43.5 / 45.12)
IMPORTANCE RO 3.9 SRO 4.2

SRO Justification: 10 CFR 55.43(b)(4)

Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

- Analysis and interpretation of radiation and activity readings as they pertain to selection of administrative, normal, abnormal, and emergency procedures

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

295017.2.1.25 Ability to interpret reference materials, such as graphs,curves, tables, etc. (RO=3.9 / SRO=4.2)

S-EP-P02 (Freq: LIC=A) (ILT-MP) Given an event, determine the public Protective Action Recommendation in accordance with EP-AA-111.

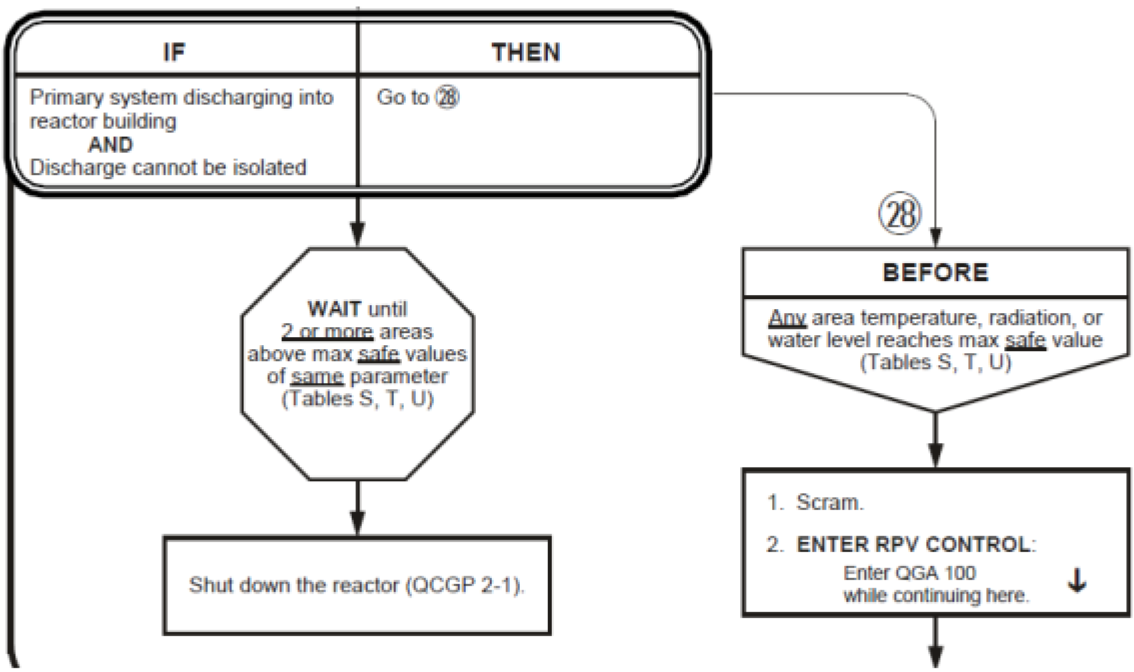
84	**ID: 84**	**Points: 1.00**

Unit 1 is at full power when a visually confirmed leak in the Torus is reported.

Torus level is currently 13 feet and being maintained per QCOP 1600-12, Torus Normal Level Control, Fill and Drain Procedure Directory.

Torus Area water level is 2 inches and slowly RISING.

Which of the following actions must be directed?



A. Shutdown the reactor per QCGP 2-1, Normal Unit Shutdown, as required by QCOA 1600-05, Leak in Torus.

B. Shutdown the reactor per QCGP 2-1, Normal Unit Shutdown, as required by QGA 300, Secondary Containment Control.

C. Initiate a manual reactor scram and enter QGA 100, RPV Control, as required by QCOA 1600-05, Leak in Torus.

D. Initiate a manual reactor scram and enter QGA 100, RPV Control, as required by QGA 300, Secondary Containment Control.

Answer: A

Answer Explanation

The given conditions will require the Unit Supervisor to utilize both the abnormal and emergency procedures and make a decision about the applicability of steps in both procedures.

QCOA 1600-05, Leak in Torus, directs the reactor to be shut down after a confirmation that a leak exists. The Torus by itself is not a primary system, nor are any conditions given in the stem that would indicate that a primary system is discharging into the Reactor Building.

It must be interpreted that the cause of the secondary containment water level is due to this non-primary system and that more extreme measures (such as a scram or blowdown) are NOT required, even though it is very plausible given the conditions and decision blocks of the QGA.

Distractor 1 is incorrect: Plausible because a reactor shutdown is required, but the criteria for doing so from QGA 300 have not been met.
Distractor 2 is incorrect: Plausible because a scram is required if Torus level decreases to 12 feet.
Distractor 3 is incorrect: Plausible because this would be correct if there was a primary system discharging into the Reactor Building that was unisolable.

Reference: QCOA 1600-05 Rev 9
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 1 **Group:** 2

K/A: 295036 EA2.03
Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: Cause of the high water level
(CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 3.4 SRO 3.8

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

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

- Assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed
- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps
- Knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific subprocedures or emergency contingency procedures
- Knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures

Can the question be answered solely by knowing “systems knowledge”, i.e., how the system works, flowpath, logic, component location? NO

Can the question be answered solely by knowing immediate operator actions? NO

Can the question be answered solely by knowing entry conditions for AOPs or plant parameters that require direct entry to major EOPs? NO

Can the question be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure? NO

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

SR-1601-K24 (Freq: LIC=B)
Given a Containment Systems operating mode and various plant conditions, PREDICT how each supported system will be impacted by the following failures:
a. Large leak resulting in a large amount of debris in the torus/ECCS suction strainer clogging
b. Leak from the torus
c. High torus water temperature

295036.EA2.03 Cause of the high water level (RO=3.4 / SRO=3.8)

85 **ID: 85** **Points: 1.00**

REFER TO THE INFORMATION ON THE FOLLOWING PAGE

A severe Loss Of Coolant Accident is in progress on Unit 2 with the following conditions:

- RPV water level -180 inches and steady
- Drywell pressure is 22 psig and slowly rising
- Drywell temperature is 195 degrees F and steady
- Drywell H_2 is 5% and rising slowly
- Drywell O_2 is 5% and rising slowly
- Torus H_2 and O_2 are unknown
- Torus water level is 18 feet and steady

Based on the above information:

(1) Are Offsite Release Rates allowed to be exceeded?

(2) Are Drywell Sprays allowed to be started?

A. (1) It is OK to exceed release rate limits
(2) Drywell Sprays are allowed to be started

B. (1) It is OK to exceed release rate limits
(2) Drywell Sprays are NOT allowed to be started

C. (1) It is NOT OK to exceed release rate limits
(2) Drywell Sprays are allowed to be started

D. (1) It is NOT OK to exceed release rate limits
(2) Drywell Sprays are NOT allowed to be started

Answer: B

Answer Explanation

Drywell Hydrogen concentration is 5%, Drywell Oxygen concentration is 5% and Torus Hydrogen is unknown. Using the Drywell H_2 vs O_2 table, the correct step is step 33, which directs the Drywell vented with release rates OK to be exceeded.
Drywell sprays are prohibited from being used with Torus water level greater than 17 feet.

The graphics show the Drywell Hydrogen and Oxygen decision block, step 32, and step 33 from QGA 200-5.

Distractor 1 is incorrect: Plausible because step 33 directs the use of Drywell sprays, however, only if Torus level is 17 feet or less.
Distractor 2 is incorrect: Plausible if Drywell O^2 is mistaken for Torus H^2 when reading the table.
Distractor 3 is incorrect: Plausible if Drywell O^2 is mistaken for Torus O^2 when reading the table, and because step 33 directs the use of Drywell sprays, however, only if Torus level is 17 feet or less.

Reference: QGA 200-5, Rev 5
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 1 **Group:** 2

K/A: 500000 High Containment Hydrogen Concentration
2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.
(CFR: 41.7 / 43.5 / 45.12)
IMPORTANCE RO 4.0 SRO 4.6

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

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

- Assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed
- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps
- Knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific subprocedures or emergency contingency procedures
- Knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures

Can the question be answered solely by knowing “systems knowledge”, i.e., how the system works, flowpath, logic, component location? NO

Can the question be answered solely by knowing immediate operator actions? NO

Can the question be answered solely by knowing entry conditions for AOPs or plant parameters that require direct entry to major EOPs? NO

Can the question be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure? NO

Question Source: New
Question History: N/A

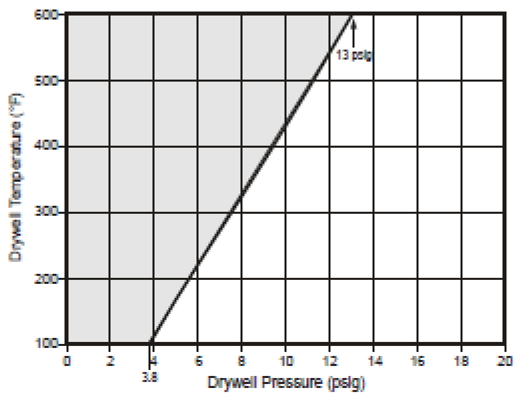
Comments:

Associated objective(s):

S-0001-K24 (Freq: LIC=B)
Given QGA 200, 'Primary Containment Control' and QGA 200-5, 'Hydrogen Control', and various conditions, EVALUATE the conditions and DESCRIBE how to proceed through the flowcharts including transitions within QGA 200 or 200-5, to other QGA procedures or to normal operating procedures.

500000.2.4.21 Knowledge of the parameters and logic used to assess the status of removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc. (RO=4.0 / SRO=4.6)

K Drywell Spray Initiation Limit



Drywell H_2	Drywell O_2 < 5%	Drywell O_2 ≥ 5% or unknown, Torus H_2 None	Drywell O_2 ≥ 5% or unknown, Torus H_2 < 6%	Drywell O_2 ≥ 5% or unknown, Torus H_2 ≥ 6% or unknown
None	No action	No action	32	33
< 6%	31	32	32	33
≥ 6% or unknown	31	33	33	33

32

Evaluate radioactivity release rate through sampling or dose assessment.

IF ....offsite release rate is expected to stay below the General Emergency level during venting,
OR ....you cannot hold RPV water level above -142 in. (TAF),
THEN ...vent and purge the drywell:

- OK to defeat all isolations (QCOP 1600-17).

1. Vent the drywell (QCOP 1600-13).
2. IF .... the primary containment can be vented,
   THEN .. purge the drywell with nitrogen at max flow (QCOP 1600-25).
3. Stop drywell vent and purge (if not required by other QGA steps) when:
   - Hydrogen is no longer detected in either the drywell or the torus,
     OR
   - Hydrogen is no longer detected in the drywell and drywell oxygen is less than 5%,
     OR
   - Offsite release rate reaches the General Emergency level and you can hold RPV water level above -142 in. (TAF).

33

■ **BLOW DOWN:**

1. Scram.
2. Enter QGA 100 while continuing here. ↓
3. Enter QGA 500-1 while continuing here. ↓

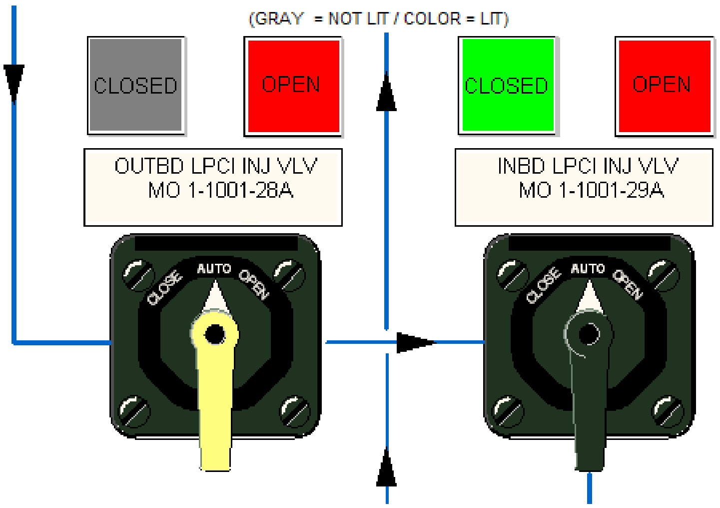
■ Vent and purge the drywell:

- OK to defeat all isolations (QCOP 1600-17).
- OK to exceed release rate limits.

1. Vent the drywell (QCOP 1600-13).
2. IF .... the primary containment can be vented,
   THEN .. purge the drywell with nitrogen or air at max flow (QCOP 1600-25, 1600-26).
   - Use whichever method will reduce hydrogen below 6% or oxygen below 5% faster.
3. IF .... torus level is below 17 ft,
   AND .... drywell temperature is below Fig K, Drywell Spray Limit,
   THEN .. spray the drywell:
   1. Trip all recirc pumps.
   2. Trip all drywell cooling fans.
   3. Start drywell sprays (QCOP 1000-30).
      - **CAUTION: Exceeding RHR NPSH/Vortex Limits may cause system damage.**
      - Start sprays even if core cooling will be lost.
      - OK to defeat spray interlocks (QCOP 1000-40).
      - OK to use external spray sources.
      - Reducing primary containment pressure affects margin to NPSH limits.

86 **ID: 86** **Points: 1.00**

Unit 1 was at full power when the following indications were reported at the 901-3 panel:



All attempts to reposition the MO 1-1001-29A, INBD LPCI INJ VLV, have failed.

An EO dispatched to investigate reports that there is a small amount of flow through MO-1-1001-29A.

What actions is the Unit Supervisor required to direct, and what is the Operability status of LPCI in accordance with Technical Specifications?

A. CLOSE and electrically isolate the MO-1-1001-28A, OUTBD LPCI INJECTION VLV. Declare ONLY the A subsystem of LPCI INOPERABLE.

B. CLOSE and electrically isolate the MO-1-1001-28A, OUTBD LPCI INJECTION VLV. Declare BOTH subsystems of LPCI INOPERABLE.

C. CLOSE and electrically isolate the MO-1-1001-28A, OUTBD LPCI INJECTION VLV, AND dedicate an Operator to shut the breaker on a LPCI initiation. BOTH subsystems of LPCI are OPERABLE.

D. CYCLE the MO-1-1001-28A, OUTBD LPCI INJECTION VLV CLOSED and then OPEN to reseat check valve 1-1001-68A, LPCI TESTABLE CHECK VALVE A When 1-1001-68A reseats, both subsystems are OPERABLE.

Answer: B

Answer Explanation

The MO-1-1001-29A is a primary containment isolation valve (reference: TRM Appendix A). With a primary containment isolation valve stuck open, LCO 3.6.1.3 Condition A requires the line to be isolated by the following direction: "Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured."
The isolation is accomplished by closing and electrically isolating the 1-1001-28A.

With the "A" division's LPCI flowpath isolated, LPCI can select but NOT open the "A" division flowpath for injection. Because all LPCI flow is directed to the selected division, no LPCI flow will occur. Both loops (subsystems) of LPCI are thus declared Inoperable.

The small amount of flow reported by the EO indicates the check valve inboard of the 1-1001-29A is not completely isolating flow and is therefore an inadequate isolation for the purpose of LCO 3.6.1.3.

Distractor 1 is incorrect: With the 1-1001-28A isolated, the A loop flowpath of LPCI is disabled. Tech Specs require both LPCI flowpaths to be available or both subsystems are inoperable. Plausible because it appears only the A loop is affected.
Distractor 2 is incorrect: With the 1-1001-28A isolated, the A loop flowpath of LPCI is disabled. The LPCI response requires automatic response for Operability. Plausible because the "A" subsystem has a method to restore the affected flowpath.
Distractor 3 is incorrect: Regardless of whether the check valve reseats, the MO 1-1001-29A remains partially open. LPCI will NOT achieve full flow in this condition if the A loop is selected for injection and both subsystems would be inoperable. Plausible because cycling the 1-1001-28A is part of the procedural actions of QCOA 1001-01, ABNORMAL RHR DISCHARGE HEADER PRESSURE for leakage through the MO 1-1001-29A to reseat the 1-1001-29A.

Reference: TS Bases LCO 3.6.1.3 Rev 0, TS Bases LCO 3.5.1 Rev 0
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 2 **Group:** 1

K/A: 203000 A2.13
Ability to (a) predict the impacts of the following on the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Valve openings
(CFR: 41.5 / 45.6)
IMPORTANCE RO 3.2 SRO 3.3

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

Facility operating limitations in the TS and their bases.

- Application of Required Actions (Section 3) and Surveillance Requirements (Section 4) in accordance with rules of application requirements (Section 1)
- Application of generic LCO requirements (LCO 3.0.1 thru 3.0.7 and SR 4.0.1 thru 4.0.4)
- Knowledge of TS bases that is required to analyze TS required actions and terminology

Can question be answered *solely* by knowing ≤ 1 hour TS/TRM Action? NO
Can question be answered *solely* by knowing the LCO/TRM information listed “above-the-line?” NO
Can question be answered *solely* by knowing the TS Safety Limits? NO

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

203000.A2.13 Valve openings (RO=3.2 / SRO=3.3)

S-1000-K33   (Freq: LIC=B)
Discuss the bases for RHR/RHRSW System LCO's.

87	**ID: 87**	**Points: 1.00**

Unit 1 is in a startup after a refueling outage.

QCOS 1300-05, RCIC PUMP OPERABILITY TEST, was just completed satisfactorily.

QCOS 2300-05, HPCI PUMP OPERABILITY TEST, was in progress when the NSO reports that Annunciator 901-3 C-12, HPCI STEAM LINE HIGH DP, is in ALARM.

QCOS 2300-01, PERIODIC HPCI PUMP OPERABILITY TEST, was performed satisfactorily earlier in the startup.

Given the current conditions, is it permissible for the RX MODE SELECT switch to be transferred to RUN? Why or why not?

(Assume all other requirements to transition to MODE 1 are met)

A. YES. QCOS 2300-01 has already demonstrated that HPCI is OPERABLE.

B. YES. RCIC has been verified OPERABLE.

C. NO. Not until a risk assessment and determination of acceptability is performed in accordance with LCO 3.0.4.b.

D. NO. HPCI is INOPERABLE and must be restored to OPERABLE prior to entering MODE 1.

Answer: D

Answer Explanation

The conditions given state that the reactor is in a startup and the Mode switch has not yet been taken to RUN, so the Unit is in Mode 2. When the Mode switch is taken to RUN, the Unit will be in Mode 1.

HPCI is required to be operable in Modes 1, 2 and 3 with reactor pressure greater than 150 psig.

The given alarm indicates that a HPCI isolation has occurred, with all HPCI isolation valves not open, therefore making HPCI inoperable.

LCO 3.0.4.b states that when an LCO is not met, entry into a MODE shall only be made: "After performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE..., and establishment of risk management actions, if appropriate..."

However, a note in the applicability statement of LCO 3.5.1 states that LCO 3.0.4.b is NOT applicable to HPCI.

Because HPCI is required to be operable in the current Mode, it must be verified operable in the current Mode before the Unit can transition to Mode 1.

Distractor 1 is incorrect: Plausible if not recognized that the given alarm makes HPCI inoperable, or if not recognized that LCO 3.0.4.b is not applicable to HPCI.
Distractor 2 is incorrect: A note in LCO 3.5.1. states that LCO 3.0.4.b is not applicable to HPCI, preventing a transition to mode 1 until HPCI is restored to operable. Plausible because RCIC is verified operable immediately if HPCI is inoperable.

Distractor 3 is incorrect: Plausible because this would be the correct answer if not recognized that LCO 3.0.4.b is not applicable to HPCI.

Reference: LCO 3.5.1 Amendment No. 245/240, LCO 3.0.4
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 2 **Group:** 1

K/A: 206000 High Pressure Coolant Injection System
2.4.46 Ability to verify that the alarms are consistent with the plant conditions.
(CFR: 41.10 / 43.5 / 45.3 / 45.12)
IMPORTANCE RO 4.2 SRO 4.2

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

Facility operating limitations in the TS and their bases.

- Application of Required Actions (Section 3) and Surveillance Requirements (Section 4) in accordance with rules of application requirements (Section 1)
- Application of generic LCO requirements (LCO 3.0.1 thru 3.0.7 and SR 4.0.1 thru 4.0.4)
- Knowledge of TS bases that is required to analyze TS required actions and terminology

Can question be answered *solely* by knowing ≤ 1 hour TS/TRM Action? NO
Can question be answered *solely* by knowing the LCO/TRM information listed “above-the-line?” NO
Can question be answered *solely* by knowing the TS Safety Limits? NO

AND

Unique to the SRO position.

The question is linked to a learning objective that is specifically labeled in the lesson plan as being SRO-only

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

S-2300-K27 (Freq: LIC=B)
ANALYZE a given condition that may impact the operability of the HPCI System (ie component/controller failure, Clearance) using P&ID/C&IDs, E-prints and Tech Specs, if necessary, and DETERMINE it the HPCI System meets Tech Spec operability requirements.

206000.2.4.46 Ability to verify that the alarms are consistent with the plant conditions. (RO 4.2 / SRO 4.2)

88 **ID: 88** **Points: 1.00**

Unit 1 received a scram signal due to a LOCA in the Drywell.

There was NO rod motion as a result of the scram.

Two minutes after the scram, the following conditions/control bands have been established:

- Reactor pressure is being maintained between 800-1000 psig with Turbine Bypass Valves
- Reactor water level is being maintained between -142 and -166 inches with Condensate and Feed
- Initial SBLC tank level is 85%

Based on the given conditions, how many SBLC pumps are running, and when will the Unit Supervisor direct terminating Boron injection?

A. There is ONE SBLC pump running.
Boron injection will be terminated at 0% SBLC tank level.

B. There are TWO SBLC pumps running.
Boron injection will be terminated at 0% SBLC tank level.

C. There is ONE SBLC pump running.
Boron injection will be terminated at 53% SBLC tank level (Cold Shutdown Boron Weight).

D. There are TWO SBLC pumps running.
Boron injection will be terminated at 53% SBLC tank level (Cold Shutdown Boron Weight).

Answer: A

Answer Explanation

With the reactor in an ATWS condition, Boron is injected using one SBLC pump.

IF a LOCA is in progress, then not all Sodium Pentaborate injected will remain in the Reactor and the injection of SBLC should continue until the SBLC tank reaches 0%.

With reactor water level being maintained with Condensate and Feed, SBLC is not needed as an alternate injection source, and only one pump will be used to inject boron.

The decision to terminate SBLC injection is made by the Unit Supervisor, and is dependent on plant conditions. With a LOCA in progress, the US must realize that the required concentration of SBLC to bring the reactor to a shutdown condition are beyond the analyzed calculations for shutdown boron weight and continue to inject until tank level reaches 0%.
Although SBLC can continue to inject after the tank level indicates 0% (tank level indication does not go all the way to the physical bottom of the tank), there is no way to determine how long the pumps can run after 0% indication, therefore the pumps are turned off to prevent damage due to running the pumps dry.

Distractor 1 is incorrect: Plausible if assumed that SBLC is needed for reactor level control (level is suppressed intentionally).
Distractor 2 is incorrect: Plausible because this would be the correct answer if there was not a LOCA in progress (corresponds to Cold Shutdown Boron weight of 32% being injected).
Distractor 3 is incorrect: Combination of distractors 1 and 2.

Reference: QCOP 1100-02 Rev 12, QGA 101 Rev 13
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 2 **Group:** 1

K/A: 211000 Standby Liquid Control System
2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.
(CFR: 41.5 / 43.5 / 45.12 / 45.13)
IMPORTANCE RO 4.4 SRO 4.7

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

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

- Assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed
- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps
- Knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific subprocedures or emergency contingency procedures
- Knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures

Can the question be answered solely by knowing “systems knowledge”, i.e., how the system works, flowpath, logic, component location? NO

Can the question be answered solely by knowing immediate operator actions? NO

Can the question be answered solely by knowing entry conditions for AOPs or plant parameters that require direct entry to major EOPs? NO

Can the question be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure? NO

AND

Unique to the SRO position.

The question is linked to a learning objective that is specifically labeled in the lesson plan as being SRO-only

Question Source: New
Question History: N/A

Comments: Per NRC: added a time frame of "two minutes after the scram" to enhance importance of using only one pump during a LOCA. Removed statement from stem that 50% of control rods were still withdrawn for plausibility.

Associated objective(s):

211000.2.1.07 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. RO 4.4 SRO 4.7

S-0001-K62 (Freq: LIC=B)
Given QGA 101, RPV Control, and various conditions, EVALUATE the conditions and DESCRIBE how to proceed through the flowchart including transitions within QGA 101, to other QGA procedures, to station operating procedures, or to SAMGs.

89 **ID: 89** **Points: 1.00**

Unit 1 is in a refueling outage with Bus 14-1 Out Of Service.

Unit 2 was at 50% power when an inadvertent Group 1 Isolation and reactor scram occurred.

The Group 1 Isolation signal has sealed in and cannot be reset.

Plant conditions on Unit 2 are as follows:

- HPCI is in pressure control mode
- RCIC is being lined up for injection
- 3 control rods are stuck at position 04
- All other control rods are full in
- Reactor water level is +20 inches and steady
- Reactor pressure is 990 psig and steady
- Feed pumps are secured due to a leak at the Feed Reg Valve station

The feeder breaker to Reactor Building 250 VDC MCC 2B trips on overcurrent.

Which one of the following identifies the effect this loss of power will have on Unit 2 operation, and the required actions to mitigate these effects?

A. HPCI is inoperable.
Transition pressure control to ADS valves per QCOP 0203-01, Reactor Pressure Control Using Manual Relief Valve Actuation.

B. HPCI is inoperable.
Transition pressure control to Main Steam Line Drains per QCOP 0250-05, Reactor Pressure Control Using Main Steam Line Drains.

C. RCIC is inoperable.
Transition level control to Safe Shutdown per QCOP 2900-02, Safe Shutdown Makeup Pump System Start Up.

D. RCIC is inoperable.
Transition level control to Standby Liquid Control System per QCOP 1100-02, Injection Of Standby Liquid Control.

Answer: C

Answer Explanation

A loss of Reactor Building 250 VDC MCC 2B renders Unit 2 RCIC DC valve operators and motors inoperable.

The Unit Supervisor must then assess the conditions of plant given the loss of current injection source to the reactor, and make a decision of which available sources to inject with next.

Both SSMP and SBLC are available for injection. The correct choice for the given conditions is to order the transition of reactor level control to SSMP, which has the same injection capacity as RCIC.

SBLC is designated as an Alternate Injection Source on QGA 100. The use of Alternate Injection Sources is only authorized if reactor level cannot be maintained greater than 0 inches.

Reactor water level was being maintained above 0 inches, so the use of Alternate Injections Systems is not authorized.

The determination of reactor water level trend and the corresponding source use is an SRO only function.

Distractor 1 is incorrect: Plausible because this would be the correct answer if the loss of DC was from RB 250 VDC MCC 2A, and it was desired to maintain reactor pressure below 1000 psig utilizing a pressure control method that can quickly lower pressure.
Distractor 2 is incorrect: Plausible because this would be the correct answer if the loss of DC was from RB 250 VDC MCC 2A, and it was desired to lower maintain reactor pressure utilizing a pressure control method that does not add heat to the containment.
Distractor 3 is incorrect: Plausible because SBLC is used in an ATWS (there are 3 rods still out, but at position 04, so no ATWS), and is an Alternate Injection Source that can be used if determined that reactor water level cannot be maintained greater than 0 inches. Also, Bus 14-1 is the normal power supply to SSMP, which is OOS in the question stem.

Reference: QOA 6900-01 Rev 20, QGA 100 Rev 9
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 2 **Group:** 1

K/A: 217000 A2.05
Ability to (a) predict the impacts of the following on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: D.C. power loss
(CFR: 41.5 / 45.6)
IMPORTANCE RO 3.3 SRO 3.3

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

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

- Assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed
- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps
- Knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific subprocedures or emergency contingency procedures
- Knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures

Can the question be answered solely by knowing “systems knowledge”, i.e., how the system works, flowpath, logic, component location? NO

Can the question be answered solely by knowing immediate operator actions? NO

Can the question be answered solely by knowing entry conditions for AOPs or plant parameters that require direct entry to major EOPs? NO

Can the question be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure? NO

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

217000.A2.05 D.C. power loss (RO=3.3 / SRO=3.3)

S-1300-K25 (Freq: LIC=B)
ANALYZE given key RCIC System parameter indications and/or responses depicting a RCIC System specific abnormality/failure using P&ID/C&IDs and E-prints, if necessary, and DETERMINE the most probable cause for the following abnormal condition(s):

a. Inadvertent auto start
b. Failure to auto start

90	ID: 90	Points: 1.00

Unit 2 was at rated power when a LOCA occurred. Plant conditions include the following:

- One control rod is at position 48; all other control rods are full in
- RPV pressure is 890 psig and lowering
- RPV water level is -59 inches and lowering
- Drywell pressure is 5 psig and rising
- Drywell temperature is 170ºF and rising
- Torus pressure is 4 psig and rising
- Torus temperature is 130ºF and rising
- Torus Oxygen is 3% and rising

Given the above conditions, which one of the following must the Unit Supervisor direct NEXT?

A. Inhibit ADS per QGA 100, RPV CONTROL

B. Bypass MSIV Isolations (QCOP 0250-02) per QGA 101, RPV CONTROL (ATWS)

C. Vent the Torus per QGA 200-5, HYDROGEN CONTROL

D. Start Drywell Sprays per QGA 200, PRIMARY CONTAINMENT CONTROL

Answer: A

Answer Explanation

The given indications describe a condition where a LOCA occurred and the plant is now shutdown. The reactor can be considered shutdown under all conditions without boron if all rods, except one, are full in.

Since RPV water level is at -59 inches and lowering, QGA 100, RPV Control, has been entered (at 0 inches) and ADS is now required to be inhibited.

Distractor 1 is incorrect: Plausible because this would be correct if the conditions required the use of QGA 101, RPV CONTROL ATWS.
Distractor 2 is incorrect: Plausible because this would be correct if Hydrogen was detected in the containment. An Oxygen concentration of 3% by itself with no Hydrogen does not require any action in the QGAs.
Distractor 3 is incorrect: Plausible because Torus sprays are required to initiated, but Drywell sprays cannot be initiated until Torus pressure exceeds 5 psig. The initial conditions state Torus pressure is 4 psig with Drywell pressure at 5 psig.

Reference: QGA 100 Rev 9
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 2 **Group:** 1

K/A: 218000 Automatic Depressurization System
2.4.9
Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

(CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 3.8 SRO 4.2

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

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

- Assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed
- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps
- Knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific subprocedures or emergency contingency procedures
- Knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures

Can the question be answered solely by knowing “systems knowledge”, i.e., how the system works, flowpath, logic, component location? NO

Can the question be answered solely by knowing immediate operator actions? NO

Can the question be answered solely by knowing entry conditions for AOPs or plant parameters that require direct entry to major EOPs? NO

Can the question be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure? NO

AND

Unique to the SRO position.

The question is linked to a learning objective that is specifically labeled in the lesson plan as being SRO-only

Question Source: Bank: Oyster Creek 2011 ILT NRC Exam
Question History: N/A

Comments:

Associated objective(s):

218000.2.4.09 Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies. RO 3.8 SRO 4.2

S-0001-K18 (Freq: LIC=B)
Given QGA 100, RPV Control, and various conditions, EVALUATE the conditions and DESCRIBE how to proceed through the flowchart including transitions within QGA 100, to other QGA procedures, station operating procedures, or SAMGs.

91 **ID: 91** **Points: 1.00**

Unit 2 was at full power when the 2A CRD pump tripped.

The RO reports that multiple CRD accumulator alarms associated with withdrawn control rods have been received.

NO operator actions have been taken.

Based on the above conditions, what is the minimum action required to comply with LCO 3.1.5, Control Rod Scram Accumulators, and what is the basis for the allowable time to complete the required action?

A. Restore CRD charging water header pressure above 940 psig within 20 minutes.
20 minutes is short enough that CRD mechanism temperatures will not be adversely affected.

B. Restore CRD charging water header pressure above 940 psig within 20 minutes.
20 minutes is sufficient time to place a CRD pump on service.

C. Declare the affected rods inoperable within 1 hour.
1 hour is reasonable based on the large number of control rods available to provide the scram function and the ability of the affected control rods to scram only with reactor pressure.

D. Declare the affected rods inoperable within 1 hour.
1 hour is reasonable based on the ability of only the reactor pressure to scram the control rods and the low probability of a Design Basis Accident or transient occurring while the affected accumulators are inoperable.

Answer: B

Answer Explanation

LCO 3.1.5 condition B requires actions when two or more control rod scram accumulators inoperable with reactor steam dome pressure greater than or equal to 900 psig. Those actions include restoring charging water header pressure to greater than or equal to 940 psig within 20 minutes and declaring associated control rods inoperable within 1 hour. With the accumulators charged prior to the CRD pump trip, restoring the charging header pressure (such as by starting a CRD pump) will also clear the accumulator low pressure condition.

The basis for LCO 3.1.5 condition B.1 "The allowed Completion Time of 20 minutes is reasonable, to place a CRD pump into service to restore the charging header pressure, if required."

Distractor 1 is incorrect: Restoring charging water header pressure above 940 psig will comply with the LCO, but the basis for doing so is to maintain adequate charging header pressure, not minimizing CRD mechanism temperature.
Distractor 2 is incorrect: Declaring the affected rods inoperable partially complies with the LCO but does not correct the low charging water header pressure. The basis is the reason for the completion time if just 1 accumulator had been inoperable.
Distractor 3 is incorrect: Declaring the affected rods inoperable partially complies with the LCO but does not correct the low charging water header pressure. The basis is the reason for 1 hour to declare the rod inoperable.

Reference: LCO 3.1.5-2 Amendment No 199/195, TS Bases B 3.1.5-3 Rev 0
Reference provided during examination: None

Cognitive level: Memory

K/A: 201001 Control Rod Hydraulic System
2.2.25 Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.
(CFR: 41.5 / 41.7 / 43.2)
IMPORTANCE RO 3.2 SRO 4.2

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

Facility operating limitations in the TS and their bases.

Application of Required Actions (Section 3) and Surveillance Requirements (Section 4) in accordance with rules of application requirements (Section 1)
Application of generic LCO requirements (LCO 3.0.1 thru 3.0.7 and SR 4.0.1 thru 4.0.4)
Knowledge of TS bases that is required to analyze TS required actions and terminology

Can question be answered solely by knowing ä 1 hour TS/TRM Action? NO
Can question be answered solely by knowing the LCO/TRM information listed "above-the-line?" NO
Can question be answered solely by knowing the TS Safety Limits? NO

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

S-0302-K33 (Freq: LIC=I)
DISCUSS the bases for Control Rod Drive Hydraulics Tech Spec LCO's.

201001.2.2.25 Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. RO 3.2 SRO 4.2

92	ID: 92	Points: 1.00

Unit 1 has a steam leak in the Drywell. Drywell sprays were initiated and secured when required. Containment parameters are presently:

- Drywell temperature 120°F
- Drywell pressure 1.80 psig and rising
- Torus temperature 91°F
- Torus pressure 1.80 psig and rising

The NSO reports the following annunciators are in ALARM:

- 901-3 C-13, TORUS VACUUM BKR VALVES OPEN DIV I
- 901-3 G-11, TORUS VACUUM BKR VALVES OPEN DIV II

What is the impact, if any, to the primary containment and why?

The primary containment...

A. CAN perform its intended safety function. There is NO impact on primary containment operability.

B. may NOT perform its intended safety function because initial conditions are NOT met for ensuring the maximum drywell pressure during a LOCA will remain below the design value.

C. may NOT perform its intended safety function because initial conditions are NOT met for ensuring the negative differential pressure across the drywell wall will remain below the design value.

D. may NOT perform its intended safety function because initial conditions are NOT met for ensuring that an event producing hydrogen and oxygen does NOT result in a combustible mixture inside the primary containment.

Answer: B

Answer Explanation

Technical Specification bases states that all drywell-to-torus vacuum breakers must be closed to satisfy the pressure-suppression function of the containment.

With annunciators 901-3 C-13(G-11) in alarm, one of the 12 Drywell-Torus vacuum breakers is open and compromising the pressure-suppression function of containment.

Candidate must verify that the alarms for the vacuum breakers are consistent with plant conditions (d/p is zero between the drywell and torus when it should be no less than 0.5 psid).

Distractor 1 is incorrect: Plausible to consider primary containment operable because not all 12 vacuum breakers have to open as intended. Also plausible if candidate assumes that there is a second vacuum breaker in the line (similar to torus-to-reactor building vacuum breakers).
Distractor 2 is incorrect: Plausible because the assumptions for closed vacuum breakers control the amount of negative d/p across the containment walls.
Distractor 3 is incorrect: Plausible if candidate confuses the alarm indication for the torus-to-reactor building vacuum breakers (i.e. D-14, Torus Vacuum Relief LVL 20B Not Closed)

Reference: TS B 3.6.1.8 Rev 40, QCAN 901(2)-3 C-13 Rev 12, QCAN 901(2)-3 G-11 Rev 10
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 2 **Group:** 2

KA: 223001 Primary Containment System and Auxiliaries
2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.
(CFR: 41.10 / 43.5 / 45.3 / 45.12)
IMPORTANCE RO 4.1 SRO 4.3

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

Facility operating limitations in the TS and their bases.

- Application of Required Actions (Section 3) and Surveillance Requirements (Section 4) in accordance with rules of application requirements (Section 1)
- Application of generic LCO requirements (LCO 3.0.1 thru 3.0.7 and SR 4.0.1 thru 4.0.4)
- Knowledge of TS bases that is required to analyze TS required actions and terminology

Can question be answered *solely* by knowing ≤ 1 hour TS/TRM Action? NO
Can question be answered *solely* by knowing the LCO/TRM information listed “above-the-line?” NO
Can question be answered *solely* by knowing the TS Safety Limits? NO

Question Source: Quad Cities ILT Exam Bank
Question History: Quad Cities 2011 ILT NRC Exam

Comments: None

Associated objective(s):

S-1601-K33 (Freq: LIC=I)
DISCUSS the bases for Containment Systems Tech Spec LCO's.

223001.2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.
RO 4.1 SRO 4.3

93	ID: 93	Points: 1.00

Both Units are at full power.

A Fire Alarm System (FAS) trouble alarm has been received.

A review of the alarm typer shows that device 64-21, UNIT 1 DG ROOM, is reading "INPUT DEVICE OFF NORMAL".

Instrument Maintenance reports that the cause of the alarm is from a failed detector with the following EPN: 1-7641-9.

Based on the above conditions, what actions, if any, are required?

A. No additional fire watches or backup suppression systems are required.

B. Establish a once per hour fire watch in the affected area within one hour of declaring the system inoperable ONLY.

C. Establish a once per hour fire watch and establish or verify backup suppression in the affected area within one hour of declaring the system inoperable.

D. Establish a continuous fire watch and establish or verify backup suppression in the affected area within one hour of declaring the system inoperable.

Answer: C

Answer Explanation

The given detector failure is one of two required for the detection system to be operable.

With one detector inoperable, the Fire detection system must be declared inoperable.
Also because the detection portion of the EFP Carbon Dioxide system is inoperable, the EFP Carbon Dioxide system must also be declared inoperable.

The actions required are to establish an hourly firewatch within the hour (required for each inoperable system), and verify back-up suppression in area affected within one hour of declaring system inoperable (required for the EFP Carbon Dioxide system inoperable).

Distractor 1 is incorrect: Plausible if not recognized that the given detector is one of two required for the system to be operable.
Distractor 2 is incorrect: Plausible if not recognized that the detections system being inoperable will also cause the EFP Carbon Dioxide system to be declared inoperable as well.
Distractor 3 is incorrect: Plausible if the detector identified is associated with the wrong DG room fire system. This would be a required action for a failed barrier in the DG room.

Reference: QCAP 1500-01 Rev 32
Reference provided during examination: QCAP 1500-01 Rev 32 pages 1-86

Cognitive level: High

Level (RO/SRO): SRO
Tier: 2 **Group:** 2

K/A: 286000 A2.01

Ability to (a) predict the impacts of the following on the FIRE PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: System logic failure: Plant-Specific
(CFR: 41.5 / 45.6)
IMPORTANCE RO 2.7 SRO 2.9

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

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

- Assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed
- Knowledge of when to implement attachments and appendices, including how to coordinate these items with procedure steps
- Knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific subprocedures or emergency contingency procedures
- Knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures

Can the question be answered solely by knowing “systems knowledge”, i.e., how the system works, flowpath, logic, component location? NO

Can the question be answered solely by knowing immediate operator actions? NO

Can the question be answered solely by knowing entry conditions for AOPs or plant parameters that require direct entry to major EOPs? NO

Can the question be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure? NO

AND

Unique to the SRO position.

The question is linked to a learning objective that is specifically labeled in the lesson plan as being SRO-only

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

S-4100-K27 (Freq: LIC=B)
ANALYZE a given condition that may impact the operability of the Fire Protection Systems (ie component/controller failure, Clearance) using P&ID/C&IDs, E-prints and QCAP 1500-01, if necessary, and DETERMINE if the Fire Protection Systems meet administrative operability requirements.

286000.A2.01 System logic failure: Plant-Specific (RO=2.7 / SRO=2.9)

94	ID: 94	Points: 1.00

Unit 1 is in Mode 2 performing a normal reactor startup.

Unit 2 is in Mode 5 with the Reactor Vessel Head being lowered into place.

- At time 0400 the STA is informed by their spouse that they must return home immediately for a family emergency
- At 0405, the STA leaves to go home as directed by the Shift Manager (SM)
- At 0410, the SM calls the Operations Manager to inform him of the reduction in crew composition
- At 0420, the SM contacts a relief for the STA and directs him to come in and fulfill the vacant shift position
- At 0615, the STA relief arrives and joins the SM/US turnover
- At 0645, the STA shift turnover briefing is completed

Which of the following describes the SM compliance with the shift manning requirements in accordance with QAP 0300-03 Operations Shift Staffing, and Technical Specifications?

The shift manning requirements...

A. have been fully complied with because the STA function is ONLY required in Mode 1.

B. have NOT been fully complied with because the STA function was vacant for more than 2 hours.

C. have been fully complied with because the relief STA received a complete turnover within 4 hours of the previous STA departure.

D. have NOT been fully complied with because the Plant Manager's permission was not obtained prior to shift staffing falling below the minimum requirements.

Answer: B

Answer Explanation

QAP 0300-03 and T.S. Section 5.2.2.b require the STA in all modes of operation. Shift staffing composition may be less than the minimum requirements for a period NOT to exceed two hours in order to accommodate unexpected absence of an on duty staff member provided immediate action is taken to restore the shift staff composition to within the minimum requirements.

The oncoming STA was not on shift until after he completed his turnover at time 0645, which was greater than 2 hours after the previous STA left.

Distractor 1 is incorrect: The STA is required in all modes. Plausible because not all crew members are required in all modes of operation.
Distractor 2 is incorrect: The vacancy cannot exceed 2 hours.
Distractor 3 is incorrect: There is no permission required from the Plant Manager or Operations Manager. Plausible because the Plant Manager is designated in Tech Spec section 5 as responsible for overall unit operation.

Reference: Tech Spec section 5.2.2.b and f; QAP 0300-03
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 3

K/A: 2.1.5 Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.
(CFR: 41.10 / 43.5 / 45.12)
IMPORTANCE RO 2.9 SRO 3.9

SRO Justification: 10 CFR 55.43(b)(1)

Conditions and limitations in the facility license.

- The required actions for not meeting administrative controls listed in Technical Specification (TS) Section 5 or 6, depending on the facility (e.g., shift staffing requirements)

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

2.1.05 Ability to locate and use procedures and directives related to shift staffing such as minimum crew compliment, overtime limitations, etc. (RO = 2.9 / SRO = 3.9

SRNLF-OPS-K1 (Freq: LIC=I NF=I) State the purpose of the following procedures:
a. QAP 0300-02, Conduct of Shift Operations
b. OP-AA-101-111, Roles and Responsibilities of On-Shift Personnel
c. OP-AA-101-112, Roles and Responsibilities of Off-Shift Personnel
d. OP-AA-101-111-1001, Operations Philosophy Handbook
e. HU-AA-1081-F-05, Operations Fundamentals
f. OP-AA-20, Conduct of Operations Process Description

95 **ID: 95** **Points: 1.00**

Which of the following refuel activities REQUIRES a Licensed SRO to DIRECTLY supervise per QCFHP 0100-01, Master Refueling Procedure?

1. Withdrawal of fuel from the vessel
2. Control rod removal from a defueled cell
3. Insertion of fuel into the vessel
4. Withdrawal of a fuel support piece from an empty cell
5. Insertion of spent fuel into a Fuel Pool rack

A. 2 ONLY

B. 1 and 3 ONLY

C. 1, 2 and 3 ONLY

D. 1, 2, 3, 4 and 5

Answer: B

Answer Explanation

All distractors are plausible but incorrect: All the listed activities are likely to be supervised by a Licensed SRO; however, activities 1 and 3 are REQUIRED to be supervised by a Licensed SRO.

QCFHP 0100-01 states: "The SRO (L)/SRO License Holder shall directly supervise the fuel handling operation when the work being performed could directly affect reactivity."

Reference: QCFHP 0100-01 Rev 34
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): SRO
Tier: 3

K/A: 2.1.37 Knowledge of procedures, guidelines, or limitations associated with reactivity management.
(CFR: 41.1 / 43.6 / 45.6)
IMPORTANCE RO 4.3 SRO 4.6

SRO Justification: 10 CFR 55.43(b)(7)

Fuel handling facilities and procedures.

- Refuel floor SRO responsibilities

Question Source: Bank: Oyster Creek 2011 ILT NRC Exam
Question History: N/A

Comments:

Associated objective(s):

2.1.37 Knowledge of procedures, guidelines, or limitations associated with reactivity management. (RO=4.3 / SRO=4.6)

SRLF-PGRM-K1 (Freq: LIC=A NF=A) Given OP-AA-300, Reactivity Management, DESCRIBE the responsibilities of the different job positions required to complete the procedure. (i.e.Who does what?)

96 **ID: 96** **Points: 1.00**

The Radwaste EO calls into the Control Room and reports the A/C system in the Radwaste Control Room is NOT functioning.

A portable cooling unit will need to be installed to maintain equipment reliability.

What procedure, if any, is required to support the installation?

A. OP-AA-108-101, Control of Equipment and System Status.

B. CC-AA-112, Temporary Configuration Changes.

C. OP-AA-109-101, Clearance and Tagging.

D. No procedural support is required.

Answer: B

Answer Explanation

The installation of temporary cooling is NOT a permanent change to the plant and is in the category of temporary changes. Additionally, CC-AA-112, Temporary Configuration Changes, section 4.2.12, specifically states the temporary cooling is NOT an Exclusion from this procedure.

Distractor 1 is incorrect: The purpose of OP-AA-108-101, Control of Equipment and System Status, is to implement controls involving equipment manipulations, i.e. off-normal alignment of systems, valves, etc.
Distractor 2 is incorrect: OP-AA-109-101, Clearance and Tagging, is the process used to protect personnel while performing work on systems. It is designed for protection, prevention of inadvertent operation, and administrative control when necessary.
Distractor 3 is incorrect: Plausible because Air movers that are not used to replace, augment, or add a design function of permanent HVAC systems are Controlled Exclusions from CC-AA-112.

Reference: CC-AA-112 Rev 20
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): SRO
Tier: 3

K/A: 2.2.14
Knowledge of the process for controlling equipment configuration or status.
(CFR: 41.10 / 43.3 / 45.13)
IMPORTANCE RO 3.9 SRO 4.3

SRO Justification: 10 CFR 55.43(b)(3)

Facility licensee procedures required to obtain authority for design and operating changes in the facility.

- 10 CFR 50.59 screening and evaluation processes
- Administrative processes for temporary modifications
- Administrative processes for disabling annunciators
- Administrative processes for the installation of temporary instrumentation

- Processes for changing the plant or plant procedures

Question Source: Quad Cities ILT Exam Bank
Question History: N/A

Comments:

Associated objective(s):

SR-PGTM-K3 (Freq: LIC=I)
Given a set of conditions regarding changes to the plant configuration, DETERMINE if they fall under the requirements of CC-AA-112, Temporary Configuration Changes.

2.2.14 Knowledge of the process for controlling equipment configuration or status. (RO=3.9 / SRO=4.3)

97	ID: 97	Points: 1.00

REFER TO THE INFORMATION ON THE FOLLOWING PAGE

Unit 2 is in Mode 2 performing a startup.

Chemistry has just completed sampling for Dose Equivalent I-131 Reactor Coolant Specific Activity due to a known fuel leak. Current readings are at 4.2 µci/gm.

What actions, if any, are required? Why or why not?

A. NO actions are required. Main Steam Isolation Valves are still CLOSED.

B. NO actions are required. The Surveillance Requirement for Dose Equivalent I-131 specific activity is not required to be verified within limits until the reactor is in Mode 1.

C. Be in Mode 3 within 12 hours. To ensure that offsite dose release rates are within the limits of 10 CFR 50.67 in the event of a Main Condenser Offgas System Pressure Boundary failure.

D. Be in Mode 3 within 12 hours. To ensure that offsite dose release rates are within the limits of 10 CFR 50.67 in the event of a Main Steam Line Break Design Basis Accident.

Answer: D

Answer Explanation

Limits on the maximum allowable level of radioactivity in the reactor coolant are established to ensure that in the event of a release of any radioactive material to the environment during a DBA, radiation doses are maintained within the limits of 10 CFR 50.67

The specific activity in the reactor coolant (the source term) is an initial condition for evaluation of the consequences of an accident due to a main steam line break (MSLB) outside containment.

The applicability for the LCO is in Mode1, and Modes 2 and 3 with any main steam line not isolated.

The reactor is in Mode 2, and the steam lines are required to be open.

With the given specific activity above 4.0 µci/gm, the unit must be in Mode 3 within 12 hours.

The graphics show the first page of Tech Spec LCO 3.4.6 with the LCO and Applicability statements removed.

Distractor 1 is incorrect: Plausible because the MSIVs can still be closed in Mode 3, but are required to be open prior to transitioning to Mode 2.
Distractor 2 is incorrect: Plausible because the surveillance for determining Dose Equivalent I-131 is not required to be performed until Mode 1. However, conditions reported indicate that the LCO is not met, regardless of the SR frequency. LCO 3.0.1 states that LCOs shall be met during the MODES specified in the Applicability.
Distractor 3 is incorrect: Plausible because the first part is correct, however the reason given is the basis for the Noble Gas specific activity as it applies to the Offgas system, not Dose Equivalent I-131.

Reference: LCO 3.4.6, TS Bases B 3.4.6-1 Rev 31, LCO 3.0.1
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 3

K/A: 2.3.11 Ability to control radiation releases.
(CFR: 41.11 / 43.4 / 45.10)
IMPORTANCE RO 3.8 SRO 4.3

SRO Justification: 10 CFR 55.43(b)(4)

Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

- Process for gaseous/liquid release approvals, i.e., release permits
- Analysis and interpretation of radiation and activity readings as they pertain to selection of administrative, normal, abnormal, and emergency procedures
- Analysis and interpretation of coolant activity, including comparison to emergency plan criteria and/or regulatory limits

AND

10 CFR 55.43(b)(2)

Facility operating limitations in the TS and their bases.

- Application of Required Actions (Section 3) and Surveillance Requirements (Section 4) in accordance with rules of application requirements (Section 1)
- Application of generic LCO requirements (LCO 3.0.1 thru 3.0.7 and SR 4.0.1 thru 4.0.4)
- Knowledge of TS bases that is required to analyze TS required actions and terminology

Can question be answered *solely* by knowing ≤ 1 hour TS/TRM Action? NO
Can question be answered *solely* by knowing the LCO/TRM information listed “above-the-line?” NO
Can question be answered *solely* by knowing the TS Safety Limits? NO

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

2.3.11 Ability to control radiation releases. (RO=3.8 / SRO=4.3)

S-0202-K33 (Freq: LIC=I) DISCUSS the bases for Reactor Recirculation System Tech Spec LCO, related safety limits and LSSS's.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 RCS Specific Activity

LCO 3.4.6

APPLICABILITY:

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Reactor coolant specific activity > 0.2 µCi/gm and ≤ 4.0 µCi/gm DOSE EQUIVALENT I-131.	-------------NOTE------------ LCO 3.0.4.c is applicable. -----------------------------	
	A.1 Determine DOSE EQUIVALENT I-131.	Once per 4 hours
	AND	
	A.2 Restore DOSE EQUIVALENT I-131 to within limits.	48 hours
B. Required Action and associated Completion Time of Condition A not met. OR Reactor Coolant specific activity > 4.0 µCi/gm DOSE EQUIVALENT I-131.	B.1 Determine DOSE EQUIVALENT I-131.	Once per 4 hours
	AND	
	B.2.1 Isolate all main steam lines.	12 hours
	OR	
	B.2.2.1 Be in MODE 3.	12 hours
	AND	
	B.2.2.2 Be in MODE 4.	36 hours

98 **ID: 98** **Points: 1.00**

Both Units are operating at rated power.

An Equipment Operator has a Clearance Order that requires Verification.

In which of the following conditions can the Shift Manager WAIVE the requirement for Verification in accordance with HU-AA-101, Human Performance Tools and Verification Practices?

A Clearance Order card to be hung on a...

A. Stator Cooling Water valve when Stator Cooling Water is posted as Protected Equipment.

B. LP Heater Drain valve located in LP Heater Bay.

C. 1/2 Diesel Generator 'A' Starting Air Compressor control switch for the air start motor that will be replaced.

D. Service Air isolation valve located 8 feet off the floor in the Turbine Building Mezzanine level.

Answer: B

Answer Explanation

The Shift Manager may waive verification requirements for ALARA concerns in accordance with HU-AA-101 section 4.3.1.1. With the unit at power (and Hydrogen injection taking place), a valve in the Heater Bay would be of a dose concern.
Distractor 1 is incorrect: With a system protected, ensuring the right equipment is taken out of service is key to sustained operation and would be verified. Plausible because work is not normally allowed on protected equipment per OP-AA-108-117, Protected Equipment Program.
Distractor 2 is incorrect: A component (safety related) in the EDG room also does not meet the criteria for waiving IV.
Distractor 3 is incorrect: The valve located above 7' [where RP would not normally survey for contamination] is not a valid reason to waive IV. As part of the original hanging, RP would have surveyed the area.

Reference: HU-AA-101 Rev 8
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): SRO
Tier: 3

K/A: 2.3.14
Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.
(CFR: 41.12 / 43.4 / 45.10)
IMPORTANCE RO 3.4 SRO 3.8

SRO Justification: 10 CFR 55.43(b)(4)

Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

- Process for gaseous/liquid release approvals, i.e., release permits
- Analysis and interpretation of radiation and activity readings as they pertain to selection of administrative, normal, abnormal, and emergency procedures
- Analysis and interpretation of coolant activity, including comparison to emergency plan criteria and/or regulatory limits

Question Source: Quad Cities ILT Exam Bank
Question History: N/A

Comments:

Associated objective(s):

SRNLF-PGH-K2 (Freq: LIC=B NF=B)
From memory, DESCRIBE your responsibilities regarding the Human Performance Tools and Verification Practices in accordance with HU-AA-101 and OP-AA-104-101.

2.3.14 Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.(RO=3.4 / SRO=3.8)

99	**ID: 99**	**Points: 1.00**

Unit 1 was initially at full power when a transient caused an automatic reactor scram.
QGA 101, RPV CONTROL (ATWS) has been entered and the following conditions now exist:

- Reactor power is lowering on intermediate range 2 with a -80 second period
- Reactor water level is -10 inches and rising
- Reactor pressure is 920 psig and rising
- Five Control Rods remain fully withdrawn
- Boron has NOT been injected

Based on the current conditions, which procedure(s) will be used for controlling the above parameters?

A. Remain in QGA 101, RPV Control (ATWS), ONLY

B. Exit QGA 101, RPV Control (ATWS), and Enter QCGP 2-3, Reactor Scram, AND QGA 100, RPV Control

C. Exit QGA 101, RPV Control (ATWS), and Enter QGA 100, RPV Control ONLY

D. Exit ONLY the POWER leg of QGA 101, RPV Control (ATWS), and Enter QCGP 2-3, Reactor Scram

Answer: D

Answer Explanation

Reactor water level is below 0", which requires entry into QGA 100. However, since not all control rods are inserted to position 04 or less, QGA 100 is then exited to QGA 101. With Reactor power less than IRM range 7 and no boron injected, the power leg of QGA 101 is exited and QGCP 2-3 is entered.

Distractor 1 is incorrect: Plausible if it is not recognized that the power leg of QGA 101 is exited and QCGP 2-3 is entered.
Distractor 2 is incorrect: Plausible if assumed the reactor will stay shutdown under all conditions because reactor power is low.
Distractor 3 is incorrect: Plausible if assumed QGA 100 remains in effect while entering QGA 101.

Reference: QGA 101 Rev 13
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 3

K/A: 2.4.05 Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.
(CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 3.7 SRO 4.3

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

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations:

- Knowledge of diagnostic steps and decision points in the emergency operating procedures (EOP) that involve transitions to event specific subprocedures or emergency contingency procedures.
- Knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures.

Can the question be answered solely by knowing "systems knowledge", i.e., how the system works, flowpath, logic, component location? NO

Can the question be answered solely by knowing immediate operator actions? NO

Can the question be answered solely by knowing entry conditions for AOPs or plant parameters that require direct entry to major EOPs? NO

Can the question be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure? NO

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

2.4.05 Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions. (RO=3.7 / SRO=4.3)

S-0001-K62 (Freq: LIC=B)
Given QGA 101, RPV Control, and various conditions, EVALUATE the conditions and DESCRIBE how to proceed through the flowchart including transitions within QGA 101, to other QGA procedures, to station operating procedures, or to SAMGs.

100	ID: 100	Points: 1.00

At time 1200 the Emergency Action Level Threshold Value for a Site Area Emergency was met.

At 1205, the Emergency Action Level Threshold Value for a General Emergency was met.

Based on the above conditions, which one of the following meets the minimum declaration requirements?

Declaring a...

A. Site Area Emergency at 1215 AND General Emergency at 1230.

B. General Emergency ONLY at 1215.

C. Site Area Emergency AND General Emergency at 1220.

D. General Emergency ONLY at 1220.

Answer: B

Answer Explanation

When two or more Emergency Action Levels are determined, declaration will be made on the highest classification level for the Unit.
If a higher classification is made prior to transmitting an event notification, then notification for the higher classification can supersede the previous event notification, provided that it can be performed within the 15 minute timeframe of the previous event.
If the notification of a higher classification cannot be performed within the 15-minute timeframe of the previous event, then the previous event notification is required within its 15 minute timeframe, and the subsequent event notification is required within its 15-minute timeframe.

Distractor 1 is incorrect: Plausible if assumed the 15 timeframe for declaring the General Emergency starts after the declaration of the first event, similar to how the 15 minute timeframe for performing a notification starts after the event is declared.
Distractor 2 is incorrect: The timeframe to declare the first event does not extend after a second event occurs. Only the higher EAL classification must be declared, but it must either happen prior to the first event timeframe elapses, or as a separate declaration.
Distractor 3 is incorrect: Plausible if assumed the declaration time is reset with the second EAL condition and because only the higher EAL classification must be declared.

Reference: EP-AA-1006 Rev 35, EP-AA-114 Rev 12
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): SRO
Tier: 3

K/A: 2.4.41
Knowledge of the emergency action level thresholds and classifications.
(CFR: 41.10 / 43.5 / 45.11)
IMPORTANCE RO 2.9 SRO 4.6

SRO Justification: Unique to the SRO position.

The question is linked to a learning objective that is specifically labeled in the lesson plan as being SRO-only:

S-EP-P01 (Freq: LIC=A) (ILT-MP) Given an event, classify the event and activate the Emergency Response organization in accordance with EP-AA-111 and EP-AA-112.

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

2.4.41 Knowledge of the emergency action level thresholds and classifications. (RO=2.9 / SRO=4.6)

S-EP-P01 (Freq: LIC=A) (ILT-MP) Given an event, classify the event and activate the Emergency Response organization in accordance with EP-AA-111 and EP-AA-112.