EXAMINATION ANSWER KEY

U.S. Nuclear Regulatory Commission 2016 RO/SRO Written Exam (Quad Cities)

1	ID: 1243295	Points: 1.00

Given the following:

- Unit 1 is operating at 100% power
- Annunciator 901-5 H-5, "RX VESSEL HIGH PRESSURE" alarms
- Reactor pressure is 1010 psig and rising

Based on the above conditions, which of the following will be performed FIRST?

A. Lower pressure setpoint until reactor pressure is $\leq$ 1005 psig.

B. Select the alternate pressure control mode by selecting DOME OR THROTTLE as needed.

C. Verify Reactor scram and refer to applicable QGAs.

D. Initiate Emergency Power Reduction to reduce Reactor pressure.

Answer: D

Answer Explanation

Per QCOA 0201-03
"C. IMMEDIATE OPERATOR ACTIONS
C.1. ©IF Reactor pressure is > 1010 psig, THEN initiate Emergency Power Reduction to reduce Reactor pressure.© (G.7.a)"

This question tests the operator's knowledge of Immediate Operator actions for high reactor pressure to meet the selected K/A.

Distractor 1 is incorrect: Plausible because the action to lower reactor pressure below 1005 is required within 15 minutes. Therefore, not an immediate action.
Distractor 2 is incorrect: Plausible because the action to select the alternate pressure control mode is a Subsequent Operator Action
Distractor 3 is incorrect: Plausible because verifying the Reactor scram and entering QGAs are viable actions. However, the reactor scram setpoint is much higher than the given 1010 psig and the QGA entry is 1060 psig.

Reference: QCOA 0201-03 Rev. 29
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295007 High Reactor Pressure
G 2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls (RO 4.6 / SRO 4.4)

(CFR: 41.8 / 41.10)
IMPORTANCE RO 4.6 / SRO 4.4

SRO Justification: N/A

Question Source: Bank
Question History: Exam Bank ID 1236877

Comments: This is a Bank question reformatted for readability. Two distractors replaced.

Associated objective(s):

SR-5652a-K20 (Freq: LIC=B) Given a Main Turbine Control - EHC Logic System operating mode and various plant conditions, EVALUATE the following Main Turbine Control - EHC Logic System indications/responses and DETERMINE if the indication/ response is expected and normal.

a. Main steam pressure
b. Pressure setpoint A/B
c. Turbine speed
d. Load set percent
e. Bypass jack open demand
f. System status lights
   (1) Speed
   (2) Pressure control
   (3) Bypass valve position
   (4) Load Limit Limiting
   (5) 901(2)-31 trip/status indicating lights
g. EHC power supplies (PMG/Inst Bus fed) voltage
h. Main turbine tripped/Reset Indication
i. Main turbine valve positions / servo currents

2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls (RO=4.6 / SRO=4.4)

2 **ID: 1243289** **Points: 1.00**

Unit 1 was operating at rated power.
1A and 1B ASD controllers were in MANUAL at 96% speed.

The NSO depressed the LOWER SLOW pushbutton on the 1B ASD controller.
The pushbutton became stuck and the recirc pump controller output continued to lower.

With NO operator action, which set of conditions shows the expected response to this failure?

A. 1B ASD speed: 20%
Total core flow approximately: 50 Mlb/hr
Annunciator 901-4 A-7, RECIRC PUMP B LOW DP in alarm

B. 1B ASD speed: 20%
Total core flow approximately: 64 Mlb/hr
Annunciator 901-4 A-5, RRCS/ASD MINOR FAILURE in alarm

C. 1B ASD speed: 32%
Total core flow approximately: 64 Mlb/hr
Annunciator 901-4 A-1, RRCS MAJOR FAILURE in alarm

D. 1B ASD speed: 32%
Total core flow approximately: 73 Mlb/hr
Annunciator 901-4 A-7, RECIRC PUMP B LOW DP in alarm

Answer: B

Answer Explanation

By design the minimum speed the ASD controller can be lowered to is 20%. The Recirc System Controllers also have an operational limit of 32% programmed into their logic. As a result, Minimum Allowable Limit (ASD output) for pump operation is 20%. In the correct answer the Total core flow is correct for 1A at 96% speed and 1B at 20% speed. The 901-4 A-5 alarm results from the speed mismatch.

Distractor 1 is incorrect: Plausible because the pump speed lower limit is correct, however the core flow is low and the annunciator is incorrect.
Distractor 2 is incorrect: Plausible because the core flow for that pump speed is incorrect, the low speed limit, and annunciator are all incorrect.
Distractor 3 is incorrect: Plausible because the annunciator is incorrect and the low speed limit are incorrect. The core flow for that pump speed is correct.

Reference: LN-0202 Rev.4, QCAN 901-4 A-5 Rev. 6, QCOP 0202-01, Rev. 24
Reference provided during examination: None

Cognitive level: High

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

K/A: 295001 AA1.05 Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION :
Recirculation flow control system.

(CFR 41.7 / 45.6)
IMPORTANCE RO 3.3 / SRO 3.3

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments:

Associated objective(s):

SR-0202-K22 (Freq: LIC=B) Given a Reactor Recirculation System operating mode and various plant conditions, PREDICT how key Reactor Recirculation / plant parameters (including power/flow map shifts) will respond to the following failures:

a. RRCS major failure
b. Reactor recirc pump seal failure (one or both)
c. Reactor recirc pump trip (one or both)
d. Single loop operation with operating pump speed above/below 40%
e. Jet pump or shroud access hole cover failure
f. Recirc flow controller fails high or low
g. ASD Cell failure/bypass
h. Reactivity additions
i. Core instabilities exist

295001.AA1.05 Recirculation flow control system. (RO=3.3 / SRO=3.3)

3 **ID: 1222052** **Points: 1.00**

Unit 1 is operating at full power when the following annunciators are received:

- 901-8 D-3, 4KV BUSES 13/14 LOW VOLTAGE
- 901-8 C-4 DIESEL GEN 1/2 FAIL TO START
- 901-8 G-5 DIESEL GEN 1/2 RELAY TRIP

With NO OPERATOR ACTION, what is the status of the Instrument Bus?

A. De-energized

B. Energized from MCC 15-2

C. Energized from MCC 18-2

D. Energized from MCC 19-2

Answer: A

Answer Explanation

With a loss of Bus 13 and failure of the 1/2 Diesel to supply Bus 13-1 there is a loss of Busses 18 and 15 which support the normal and alternate power supplies to the Instrument Bus.

Distractor 1 is incorrect: Plausible because MCC 15-2 is the reserve supply to the Instrument Bus.
Distractor 2 is incorrect: Plausible because MCC 18-2 is the normal supply to the Instrument Bus.
Distractor 3 is incorrect: Plausible because MCC 19-2 is an emergency supply to the 120 VAC ESS Bus.

Reference: QCOA 6800-01 Rev. 3
Reference provided during examination: None

Cognitive level: High

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

K/A: 295003 AK2.03 Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF A.C. POWER and the following:
A.C. electrical distribution system.

(CFR 41.7 / 45.8)
IMPORTANCE RO 3.7/ SRO 3.9

SRO Justification: N/A

Question Source: Bank
Question History: None
Comments:

Associated objective(s):

295003.AK2.03 A.C. electrical distribution system (RO=3.7 / SRO=3.9)

SRN-6800-K23 (Freq: LIC=B NF=B)
Given an Essential Service/Instrument Bus Systems operating mode and various plant conditions, PREDICT how the Essential Service/Instrument Bus Systems will be impacted by the following support system failures:

a. Loss of Bus 17 or 18
b. Loss of MCC 18-2 or 15-2
c. Loss of 250 VDC

4	ID: 1243393	Points: 1.00

Given the following:

- Unit 2 is in Mode 2 starting up after a refueling outage
- The NSO is withdrawing control rods to achieve criticality
- The Estimated Critical Position (ECP) is in the current rod sequence step and is at the control rod being notched out
- A malfunction of the Feedwater Level Control system causes reactor water level to rise rapidly by 12"
- The ANSO is able to stabilize reactor water level at +39"

The NSO should expect the reactor to go critical ___(1)___ in the rod sequence.

Technical Specifications entry will be required if the reactivity difference between the monitored core k_{eff} and the predicted core k_{eff} is NOT within ___(2)___.

A. (1) LATER
(2) ± 1% Δk/k

B. (1) LATER
(2) ± 10% Δk/k

C. (1) SOONER
(2) ± 10% Δk/k

D. (1) SOONER
(2) ± 1% Δk/k

Answer: D

Answer Explanation

The K/A tests the examinee's knowledge of the effect of an inadvertent reactivity addition on a reactivity anomaly. The question poses a cold water transient during a start up. The second part of the question tests the examinee's knowledge of a TS reactivity anomaly LCO.

Distractor 1 is incorrect: Plausible because it poses the opposite response of the reactor and retains the TS reactivity anomaly LCO
Distractor 2 is incorrect: Plausible because it poses the opposite response of the reactor and contains a flawed TS reactivity anomaly LCO
Distractor 3 is incorrect: Plausible because it poses the proper response of the reactor and contains a flawed TS reactivity anomaly LCO

Reference: LCO 3.1.2 TS Amendment No. 199/195, QCOA 0400-01 rev. 24
Reference provided during examination: None

Cognitive level: High

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

K/A: 295014 Inadvertent Reactivity Addition AK1.02 Knowledge of the operational implications of the following concepts as they apply to INADVERTENT REACTIVITY ADDITION : Reactivity anomaly.

(CFR: 41.8 / 41.10)
IMPORTANCE RO 3.3 / SRO 3.7

SRO Justification: N/A

Question Source: New
Question History: N/A

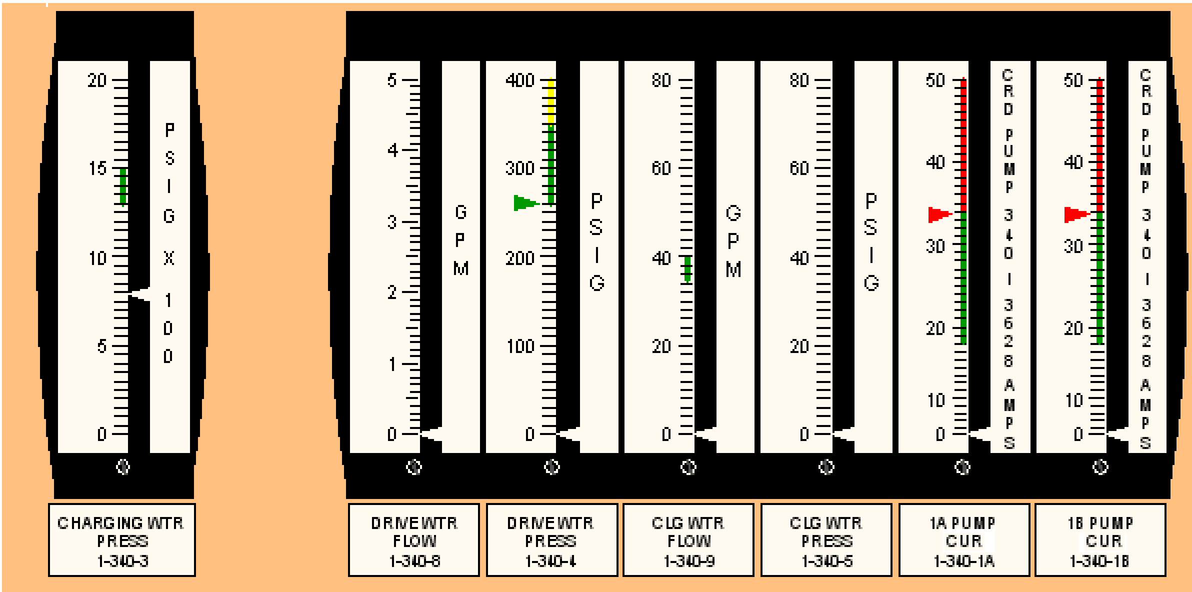
Comments:

Associated objective(s):

SR-0800-K30 (Freq: LIC=I)
Given Nuclear Fuel key parameter indications and various plant conditions, DETERMINE, from memory, if the Nuclear Fuel related Tech Spec Safety Limits or LSSS's have been exceeded.

295014.AK1.02 Reactivity anomaly. (RO=3.3 / SRO=3.7)

5 | **ID: 1243751** | **Points: 1.00**



Unit 1 is operating at 100% power

Based on the indications shown, the Unit 1 CRD system...

A. has had a trip of the running CRD pump.

B. Flow Controller output has failed low.

C. on line Flow Control Valve (FCV) has failed shut.

D. Drive Water filters are clogged (little or no flow).

Answer: A

Answer Explanation

The indications given are for a tripped CRD pump. The seemingly anomalous indication is the Charging Water Header. The pressure sensed at the Charging Water Header goes to reactor pressure when no pump is running. This question meets the K/A for monitoring the CRDH with a loss of CRD pumps.

Distractor 1 is incorrect: Plausible because the indicated parameters are nearly identical to a tripped pump. The significant differences are the Charging Water Header pressure is higher and the pump amps are low in the band.
Distractor 2 is incorrect: Plausible because the indicated parameters are nearly identical to a tripped pump. The significant differences are the Charging Water Header pressure is higher and the pump amps are low in the band.
Distractor 3 is incorrect: Plausible because the indicated parameters are nearly identical with the exception of the pump amps.

Reference: QCOA 0300-01 rev. 18, QCOP 0300-01 rev. 30
Reference provided during examination: None

Cognitive level: High

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

K/A: 295022 Loss of Control Rod Drive Pumps. AA1.01 Ability to operate and/or monitor the following as they apply to LOSS OF CRD PUMPS: CRD hydraulic system

(CFR: 41.7/45.6)
IMPORTANCE RO 3.1/ SRO 3.2

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments: None

Associated objective(s):

295022.AA1.01 CRD hydraulic system (RO=3.1 / SRO=3.2)

SR-0302-K20 (Freq: LIC=B)
Given a Control Rod Drive Hydraulics operating mode and various plant conditions, EVALUATE the following Control Rod Drive Hydraulics indications/responses and DETERMINE if the indication/ response is expected and normal.

a. Control room
  (1) CRD pump motor status and amps
  (2) CRD flow
  (3) Charging water pressure
  (4) CRD FCV position
  (5) Drive water flow and pressure
  (6) Cooling water flow and pressure
  (7) CRD pump discharge valve position
  (8) MO 1(2)-302-8 valve position
  (9) Scram air header pressure
  (10) Scram inlet and outlet valves position
  (11) Scram discharge volume vents and drains position

b. Local
  (1) Pump suction pressure
  (2) CRD flow
  (3) Suction and drive water filter dp's
  (4) Charging water pressure
  (5) Drive pressure
  (6) Stabilizing flow
  (7) Accumulator pressure
  (8) Accumulator gas/water trouble lights

6 **ID: 1243879** **Points: 1.00**

NOTE: The annunciators are in solid.

Given the following for Unit 1:

- Operating at 100% power
- HPCI spuriously initiated
- The ANSO trip latched HPCI

After 30 minutes, the 901-3 annunciators are as shown. Based on these indications the ANSO will take which ONE of the following actions?

A. Lower the flow controller setpoint to zero.

B. Close the MO 1- 2301-14, "MIN FLOW BYP VLV", and place it in PTL.

C. Verify the HPCI pump suction swaps from the CCST to the Torus.

D. Add water to the Torus in accordance with QCOP 1300-3, "FILLING TORUS FROM CCST THROUGH RCIC MINIMUM FLOW LINE."

Answer: B

Answer Explanation

The HPCI initiation will result in opening the MO 1- 2301-14, "MIN FLOW BYP VLV". This in turn will ultimately result in a rising Torus level. The K/A associated with this question requires the examinee to prioritize alarms. The question stem shows the annunciator panel. The examinee needs to discern the cause and effect relationship of the HPCI initiation and the Torus high level

Distractor 1 is incorrect: Plausible because lowering the flow controller setpoint to zero is another immediate action for the spurious HPCI initiation. In this case, it would have no effect.
Distractor 2 is incorrect: Plausible because the high-high Torus level results in these actions. The conditions in the question stem pose only the high level
Distractor 3 is incorrect: Plausible because the examinee may incorrectly assume the Torus level is low based on the "TORUS HIGH/LOW" annunciator.

Reference: QCOA 2300-01 rev. 23
Reference provided during examination: None

Cognitive level: High

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

K/A: 295029 High Suppression Pool Water Level:
SG 2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.

(CFR: 41.8 to 41.10)
IMPORTANCE RO 4.1 / SRO 4.3

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

SR-1601-K06 (Freq: LIC=I)
Given a Containment Systems annunciator tile inscription, DESCRIBE the condition causing the alarm and any automatic actions which occur when the alarm actuates. EXPLAIN the consequences of the condition if not corrected.

2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm. (RO=4.1 / SRO=4.3)

7	**ID: 1243880**	**Points: 1.00**

Given:

- A Station blackout concurrent with a LOCA on Unit 1 has occurred.
- AC power cannot be restored to either Unit within 4 hours.

Which of the following loads must be shed to maintain the design function of the safety related 250 VDC system?

A. Emergency Bearing Oil Pump

B. Emergency Hydrogen Seal Oil Pump

C. HPCI Turbine Aux Oil Pump

D. RCIC Turbine Vacuum Pump

Answer: B

Answer Explanation

Per QCOA 6900-05, Loss of Safety Related 250VDC Battery Chargers concurrent with a DBA:

The 250 VDC Battery sizing calculations assumed that specific loads (Emergency H2 Seal Oil Pump) are shed from the bus during the analyzed four-hour period at the specified time.

Distractor 1 is incorrect: Plausible because it is a 250 VDC load but it is fed from the 250 VDC Non-Essential bus.
Distractor 2 is incorrect: Plausible because it is a 250VDC load but HPCI will isolate on low reactor pressure and the Aux Oil pump will be interlocked off.
Distractor 3 is incorrect: Plausible because it is a 250 VDC load however, it is not credited in the DBA LOCA analysis.

Reference: QCOA 6900-05 Rev. 14; QCOA 6100-04, Rev. 22 ;QCOP 0050-01, Rev.1
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295004 Partial or Complete Loss of D.C. Power AK3.01 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Load shedding: Plant-Specific

(CFR 41.5, 45.6)
IMPORTANCE RO 2.6 / SRO 3.1

SRO Justification: N/A

Question Source: Bank
Question History: None

Comments:

Associated objective(s):

SRN-6900-K26 (Freq: LIC=B N=B)
EVALUATE given key Station DC Electrical Systems parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):
a. Battery charger trip
b. DC breaker trip

295004.AK3.01 Load shedding: Plant-Specific (RO=2.6 / SRO=3.1)

8	ID: 1243913	Points: 1.00

The Max Safe values for temperature, radiation, and water level in the reactor building per QGA-300 "SECONDARY CONTAINMENT CONTROL" are based on the highest value(s)...

A. at which equipment needed for safe shutdown of the plant will operate.

B. expected to be seen during an accident.

C. expected to be seen during normal operations.

D. at which equipment can be considered operable by the Technical Specifications.

Answer: A

Answer Explanation

The definition of Maximum Safe values for QGA 300 control parameters is found in BWROG EPG/SAG Rev. 3 and the Training Material. The BWROG EPG/SAG Rev. 3 discussion of the Maximum Safe values is contained within the Secondary Containment Temperature (SC/T) section of the EPG. The discussion is applicable to the control parameters of area temperatures, area water levels, and area radiation levels. The Maximum Safe value discussion is not replicated in the area water level or area radiation sections of the EPG. The structure of QGA 300 also duplicates this convention. The area temperatures, area water levels, and area radiation legs of QGA 300 combine into one set of remedial actions when any one of the control parameters cannot be maintained below the Maximum Normal threshold.

Distractor 1 is incorrect: Plausible because QGAs address accident conditions
Distractor 2 is incorrect: Plausible because the distractor gives the definition for Max Normal
Distractor 3 is incorrect: Plausible because because the distractor gives a definition from another controlling document (TS)

Reference: Lesson Plan: L-QGA300 rev. 9, BWROG EPG/SAG Rev. 3
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295033 High Secondary Containment Area Radiation Levels EK1.03 Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS: Radiation releases.

(CFR: 41.8 to 41.10)
IMPORTANCE RO 3.9 / SRO 4.2

SRO Justification: N/A

Question Source: Bank
Question History: None

Comments: Bank question reformatted for readability. Pedigree added.

Associated objective(s):

295033.EK1.03 Radiation releases. (RO=3.9 / SRO=4.2)

SR-0001-K02 (Freq: LIC=I)
DEFINE the standard terms and phrases used in the QGA procedures.

9 **ID: 1265469** **Points: 1.00**

Given the following:

- Both Units are operating at full power.
- An EO reports there is 10" of water in the Unit 1 HPCI sump and the level is rising.

With NO operator action, what will be the FIRST result of the rising water level in the Unit 1 HPCI Room?

A. Unit 1 HPCI will become unavailable for use.

B. Flooding will spread to the Torus Area and other ECCS rooms.

C. Unit 1 HPCI Room Cooler will become unavailable for use.

D. The HPCI Room Secondary Containment Interlock Doors will become inoperable.

Answer: A

Answer Explanation

The K/A is the knowledge of the reasons for isolating discharges into the Secondary Containment. In this case, water discharging into the HPCI room.. The stem and correct answer combine to make the reason stated in BWROG EPGs/SAGs, Appendix B, rev. 3. The first effect of the rising water level in the Unit 1 HPCI Room will be flooding of electrical equipment for HPCI at 50" water level. The vital equipment is located below the floor grating, but above the sump level.

Distractor 1 is incorrect: Plausible because the examinee may determine the ECCS rooms are cross-connected and the flooding will spread throughout the basement before reaching the vital HPCI components.
Distractor 2 is incorrect: Plausible because the examinee may determine the HPCI rooms will flood to the level of the Room Cooler. The Room Cooler is actually at a level above the Max Safe for HPCI.
Distractor 3 is incorrect: Plausible because the examinee may determine the Unit 1 HPCI room will flood up to the level of the Secondary Containment Interlock doors. The examinee may remember there is only an Interlock Door on the Unit 1 side. The Interlock doors will not be affected by rising water level at 50" water level.

Reference: BWROG EPGs/SAGs, Appendix B, rev. 3
Reference provided during examination: None

Cognitive level: High

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

K/A: 295036.EK3.03 Knowledge of the reasons for the following responses as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: Isolating affected systems

(CFR: 41.5/45.6)
IMPORTANCE RO 3.5/ SRO 3.6

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments: None

Associated objective(s):

SR-0001-K29 (Freq: LIC=B)
Given QGA 300, 'Secondary Containment Control', EXPLAIN the reasons for the actions.

295036.EK3.03 Isolating affected systems (RO=3.5 / SRO=3.6)

10 **ID: 1236771** **Points: 1.00**

Unit 2 is at 100% power when the main turbine TRIPS due to a loss of main turbine lube oil header pressure.

If RPS fails to de-energize on the turbine trip, which of the following describes reactor power response immediately following the closing of the Main Turbine Control Valves?

Reactor power will...

A. LOWER due to lowering feedwater flow to the reactor.

B. LOWER due to the water level inside the core lowering.

C. RISE due to steam voids collapsing in the core.

D. RISE due to the loss of feedwater heating.

Answer: C

Answer Explanation

As turbine control valves close, reactor pressure rises. This will collapse voids, add positive reactivity and subsequently increase reactor power. That is why there is an anticipatory scram when stop valves are <90% open or when FASTC header pressure at control valves <460# to prevent a large increase in reactor power.

Distractor 1 is incorrect: Plausible because a turbine trip results in a lowering of feedflow to the reactor.
Distractor 2 is incorrect: Plausible because a collapse in core voids will result in a lowering level within the core.
Distractor 3 is incorrect: Plausible because a trip of the turbine will result in a loss of feedwater heating and reduced feedwater temperature to the reactor. Incorrect because this will not occur immediately after the turbine trip.

Reference: UFSAR 15.2 Rev 7
Reference provided during examination: None

Cognitive level: High

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

KA: 295005 Main Turbine Trip AK1.01 Knowledge of the operational implications of the following concepts as they apply to MAIN TURBINE GENERATOR TRIP : Pressure effects on reactor power

(CFR: 41.8 / 41.10)
IMPORTANCE: RO 4.0 / SRO 4.1

Question Source: Modified from River Bend ILT Exam Bank
Question History: Original version on 2008 River Bend ILT NRC Exam. Used on 2011 Quad Cities ILT NRC Exam.

SRO Justification: N/A

Comments: None

Associated objective(s):

SR-5600-K24 (Freq: LIC=B)
Given a Main Turbine and Auxiliary Systems operating mode and various plant conditions, PREDICT how each supported system will be impacted by the following Main Turbine and Auxiliary Systems failures:

a. Turbine trip
b. Loss of lube oil pressure

295005.AK1.01 Pressure effects on reactor power (RO=4.0 / SRO=4.1)

11	ID: 1249467	Points: 1.00

Unit 2 was operating at 100% power.

Equipment malfunctions resulted in a loss of EHC pumps and subsequent reactor scram.

NO operator action was taken.

FIVE minutes after the reactor scram, which of the following will control RPV pressure?

A. Bypass Valves ONLY

B. Main Steam Relief Valves ONLY

C. Bypass Valves
Main Steam Relief Valves

D. Main Steam Relief Valves
Main Steam Safety Valves

Answer: B

Answer Explanation

The K/A addresses the interrelations of RPV pressure control and a reactor scram. The question targets the coordination of automatic pressure control systems, reactor scram, and a loss of EHC. This question tests the examinee's understanding of system interrelations and response to a casualty with no operator action. When EHC pressure is lost the Bypass Valves will function for a time using their installed accumulators. When the accumulators lose pressure the Main Steam Relief Valves will act to control pressure. The question asks for a time frame after the Bypass Valve accumulators have been depleted. Therefore, the Main Steam Relief Valves will be controlling pressure. The Main Steam Safety Valves will not open since there is not a sudden pressure spike as if there was a turbine trip with no Bypass Valve actuation.

Per UFSAR section 10.4.4.3 Safety Evaluation
The bypass valves will close automatically on low condenser vacuum of 7 in. Hg vacuum to prevent over-pressurizing the condenser. In the event of the loss of EHC hydraulic pressure, the check valve in the hydraulic system allows the accumulator to keep the turbine bypass valves open for approximately 1 minute to discharge steam to the condenser. The turbine bypass valves then fail close on loss of EHC hydraulic pressure. On turbine trip or generator load reject, the turbine bypass valves open in approximately 0.15 seconds. The event of turbine trip coincident with the failure of the bypass system is discussed in Section 15.2. [10.4-30]

Distractor 1 is incorrect: Plausible if the examinee determines the BPV accumulators are of sufficient size to control RPV pressure five minutes after the scram..
Distractor 2 is incorrect: Plausible if the examinee determines the BPV accumulators will control pressure for a sustained period of time and Main Steam Safety Valves will be needed.
Distractor 3 is incorrect: Plausible if it is determined the Main Steam Safety Valves will open from a sudden pressure spike as if there was a turbine trip with no Bypass Valve actuation.

Reference: UFSAR Sections 10.4.4.3 and 15.2, Lesson Plan LN-5650, Rev. 8
Reference provided during examination: None

Cognitive level: High

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

K/A: 295006 SCRAM K2.07: Knowledge of the interrelations between SCRAM and the following: Reactor pressure control

(CFR 41.7, 45.8)
IMPORTANCE RO 4.0 / SRO 4.1

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments:

Associated objective(s):

SRN-5650-K22 (Freq: LIC=B N=B) Given a Main Turbine Control - EHC Hydraulic System operating mode and various plant conditions, PREDICT how Main turbine/EHC systems and plant parameters will respond to the following failures:

a. EHC leak / loss of EHC pressure
b. EHC pump trip
c. High EHC fluid pressure
d. Turbine trip

295006.AK2.07 Reactor pressure control (RO=4.0 / SRO=4.1)

12 ID: 1244334 Points: 1.00

Given the following for Unit 1:

- Day 1 of Refueling Outage
- Shutdown Cooling is in service on "B" loop of RHR (Div II)
- The "A" loop of RHR (Div I) is in a Standby lineup

Bus 14-1 trips on overcurrent.

Which Unit 1 RHR pumps are available for shutdown cooling?

A. A and B ONLY

B. C and D ONLY

C. None

D. A, B, C, and D

Answer: A

Answer Explanation

The question requires the examinee to determine the overcurrent trip of an ECCS Bus prevents the EDG from re-energizing and powering the Div II RHR pumps.

Distractor 1 is incorrect: Plausible because the pumps listed are Div II and the correct answer are Div I pumps.
Distractor 2 is incorrect: Plausible because the examinee may determine there is a total loss of power to RHR pumps
Distractor 3 is incorrect: Plausible because the examinee may determine the EDG will re-energize the bus.

Reference: QOA 900-8 F-3 rev. 6, and QOA 6500-06 rev. 22
Reference provided during examination: None

Cognitive level: HIGH

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

K/A: 205000 Shutdown Cooling System (RHR Shutdown Cooling Mode) K2.01 Knowledge of electrical power supplies to the following: Pump motors

(CFR: 41.7)
IMPORTANCE RO 3.1 / SRO 3.1

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

205000.K2.01 Pump motors (RO=3.1 / SRO=3.1)

SR-1000-K19 (Freq: LIC=B)
LIST the plant systems which support the RHR system and DESCRIBE the nature of support. (Includes power supplies)

13 **ID: 1244352** **Points: 1.00**

Given:

- Unit 1 is operating at rated power.
- Unit 2 is in a refueling outage.

Security reports a large chemical spill has occurred just north of the plant. Shortly after, control room personnel report a very strong odor of ammonia. The Shift Manager determines a control room evacuation is required. QCOA 0010-05, "Plant Operation With The Control Room Inaccessible" is entered.

Which of the actions listed below will the Unit 1 NSO complete prior to leaving the control room?

A. Place the Mode Switch in Shutdown.
Verify proper operation of the Feedwater Level Control system.

B. Place the Mode Switch in Shutdown.
Verify RPV water level returns to +30 inches, then close the Feed Reg Isolation valves.

C. Depress both Manual Scram pushbuttons.
Verify proper operation of the Feedwater Level Control system.

D. Depress both Manual Scram pushbuttons.
Verify RPV water level returns to +30 inches, then place the Feedwater Level Control System in MANUAL.

Answer: C

Answer Explanation

Per QCOA 0010-5, Plant Operation With The Control Room Inaccessible, step D.2. states:

a.) "IF possible before Control Room evacuation, THEN:
Manually scram the Reactor from Panel 901-5. Leave Mode Switch in RUN.
b.) Observe proper operation of the Feedwater Level control system during the post scram transient. It is desirable to leave the system in automatic on the low flow bypass valve...

Distractor 1 is incorrect: Plausible because a scram is inserted and the Feedwater Level Control system is in the proper mode of operation. But the Mode Switch is not in the correct position.
Distractor 2 is incorrect: Plausible because a scram is inserted but the Mode Switch is not in the correct position and Feedwater Level Control system is the desired configuration.
Distractor 3 is incorrect: Plausible because the scram is inserted per procedure, but the Feedwater Level Control system is incorrectly placed in MANUAL.

Reference: QOA 0010-05 Rev. 25
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295016 Control Room Abandonment

G2.1.31: Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.

CFR: (41.10 / 45.12)
IMPORTANCE: RO 4.6 / SRO 4.3

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments:

Associated objective(s):

295016.2.1.31 Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup. (RO=4.2 / SRO=3.9)

SR-EVAC-K10 (Freq: LIC=B)
Given a situation where plant operation is required with the Control Room inaccessible, STATE the immediate operator actions of QOA 0010-05.

14	**ID: 1244351**	**Points: 1.00**

Unit 1 is in a Refueling Outage with Shutdown Cooling (SDC) in service on the "A" RHR Loop (Div I).

In order to LOWER the reactor cooldown rate the NSO may throttle the MO 1-1001-16A, A RHR HX BYP VLV ___(1)___.

The reactor cooldown rate may further be LOWERED by throttling the 1-1001-17A, RHR HX OUTLET VLV ___(2)___.

A. (1) open

(2) open

B. (1) shut

(2) shut

C. (1) shut

(2) open

D. (1) open

(2) shut

Answer: D

Answer Explanation

The K/A is associated with the SDC design features which allow for adjusting reactor cooldown rate. The SDC system has a heat exchanger bypass valve operated from the Main Control Room and a heat exchanger outlet valve operated locally. The procedure references using one or both of the valves to vary the cooldown rate. Opening the bypass valve lowers the cooldown rate by sending less flow through the heat exchanger and shutting the heat exchanger outlet valve has the same effect.

Distractor 1 is incorrect: Plausible because this is one of the variations of valve manipulations. Opening the bypass valve lowers the cooldown and opening the discharge valve raises the cooldown rate.
Distractor 2 is incorrect: Plausible because this is one of the variations of valve manipulations. Shutting the bypass valve raises the cooldown and shutting the discharge valve lowers the cooldown rate.
Distractor 3 is incorrect: Plausible because this is one of the variations of valve manipulations. Shutting the bypass valve raises the cooldown and opening the discharge valve raises the cooldown rate.

Reference: QCOP 1000-05 rev. 52
Reference provided during examination: None

Cognitive level: High

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

K/A: 205000.K4.05 Knowledge of SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) design feature(s) and/or interlocks which provide for the following: Reactor cooldown rate

CFR: (41.7)

IMPORTANCE: RO 3.6 / SRO 3.7

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments: None

Associated objective(s):

205000.K4.05 Reactor cooldown rate (RO=3.6 / SRO=3.7)

LF-1000-K02a (Freq: NF=B)
DESCRIBE the major flowpaths for the following RHR modes of operation:
a. LPCI (injection)
b. Shutdown Cooling (SDC)
c. Fuel Pool Cooling Assist

15 **ID: 1244454** **Points: 1.00**

Unit 1 was operating at 100% power when a rupture occurred in the TBCCW system.

Current plant status:

- Reactor Mode Switch in SHUTDOWN
- Reactor pressure is 900 psig and steady
- Several control rods did NOT insert due to a hydraulic ATWS
- Reactor power is 5% and lowering at 0.25% per minute
- Annunciator 912-1 E-2, TURB BLDG COOLING WATER HIGH TEMP, is in alarm
- Annunciator 912-1 D-2, TURB BLDG COOLING WATER LOW PRESS, is in alarm

The Unit Supervisor has directed the ANSO to remove equipment cooled by TBCCW from operation per QCOA 3800-03, "Loss of TBCCW."

Which of the following TBCCW system loads WILL be removed LAST?

A. Circulating Water Pumps

B. EHC Pumps

C. CRD Pump

D. Reactor Feed Pumps

Answer: C

Answer Explanation

The K/A addresses TBCCW loads and the operators ability to operate/monitor those loads. The question poses plant conditions where the only equipment the procedure allows to remain in service are the CRD pumps.

QCOA 3800-03, Loss of TBCCW, directs all loads cooled by TBCCW to be tripped.
The CRD pump cannot be secured since all control rods are NOT inserted to position 00.

Distractor 1 is incorrect: Plausible because the examinee may determine the Main Condenser is needed as a heat sink and delay removing the Circ Water Pumps from service. However, RPV pressure can be controlled by relief valves, HPCI, RCIC, etc.
Distractor 2 is incorrect: Plausible because the examinee may determine the Main Turbine and BPVs are needed as a heat sink and delay removing the EHC Pumps from service. However, RPV pressure can be controlled by relief valves, HPCI, RCIC, etc
Distractor 3 is incorrect: Plausible because the examinee may determine RFPs are essential for RPV level control and delay removing them from service. However, HPCI, RCIC, and SSMP can provide adequate RPV makeup for the given plant conditions

Reference: QCOA 3800-03, Rev. 10
Reference provided during examination: None

Cognitive level: High

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

K/A: 295018 A1.02: Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : System loads

CFR: (41.7 / 45.6)
IMPORTANCE: RO 3.3 / SRO 3.4

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments:

Associated objective(s):

SR-3800-K26 (Freq: LIC=B)
EVALUATE given key TBCCW parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):

a. High or low expansion tank level
b. High TBCCW temperature
c. Low TBCCW pressure

295018.AA1.02 System loads (RO=3.3 / SRO=3.4)

16	ID: 1244556	Points: 1.00

Given:

· U1 and U2 are at 100% power
· Instrument Air Compressors 1/2B and U2 are in operation.
· The 1A Instrument Air Compressor is in a Normal Standby Lineup
· The 1/2 Instrument Air Compressor is OOS for maintenance.

The U2 Instrument Air Compressor trips due to a faulted control power transformer.

Bus 23-1 trips on overcurrent.

The Unit 1 ANSO reports Instrument Air Receiver pressures as:

1A	95 psig
U2	100 psig
1/2B	105 psig

Which of the following statements describes the status of the Instrument Air System?

Assume NO OPERATOR ACTIONS have been taken.

A. NO Instrument Air Compressors are running.

B. Instrument Air Compressors 1A AND 1/2B are running.

C. Instrument Air Compressor 1A is running ONLY.

D. Instrument Air Compressor 1/2B is running ONLY.

Answer: A

Answer Explanation

The question stem indicates that the 1/2 & U2 Instrument Air Compressors are unavailable. When Bus 23-1 trips on overcurrent, Bus 28 is de-energized and remains so because of the overcurrent condition. The only Instrument Air Compressor available is the 1A but it remains in standby because there is NO autostart signal from low receiver pressure. The power supplies for the IACs are as follows: 1A IAC--Bus 17, 1/2B IAC--Bus 28, 1/2 IAC--Bus 18, and U2 IAC--Bus 27.

Distractor 1 is incorrect: Plausible if it is incorrectly assumed the 1A IAC autostarts and the 1/2 EDG re-energizes Bus 23-1 and the 1/2B IAC restarts.
Distractor 2 is incorrect: Plausible if it was determined that the 1A IAC autostarted. (There is no autostart signal present for the IA IAC.)
Distractor 3 is incorrect: Plausible if the power supplies for the 1A IAC and 1/2B were thought to be Bus 28 and Bus 18 respectively and it autostarts.

Reference: QCOP 4700-01, Rev. 20
Reference provided during examination: None

Cognitive level: High

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

K/A: 295019 A1.03 Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : Instrument air compressor power supplies

(CFR 41.7, 45.6)
IMPORTANCE RO 3.0 / SRO 3.0

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments:

Associated objective(s):

SRN-4701-K19 (Freq: LIC=I NF=B) LIST the plant systems which support Instrument Air System and DESCRIBE the nature of support (Includes power supplies).

295019.AA1.03 Instrument air compressor power supplies (RO=3.0 / SRO=3.0)

17	**ID: 1237252**	**Points: 1.00**

Unit 2 is in Mode 3:

- Both Recirc pumps are off
- RPV water level is +30 inches
- Condensate System is out of service
- Main Condenser is at 30" Hg Back Pressure
- QCOS 0201-02, Primary System Boundary Thermal Limitations, is in progress

Shutdown Cooling isolated and the isolation CANNOT be reset.

The temperature difference between the RPV bottom head temperature and the RPV coolant temperature is 150°F.

Which one of the following actions will <u>reduce</u> <u>thermal</u> stratification <u>without</u> the possibility of exceeding RPV metal heat-up rate limits?

(Consider each action separately.)

A. Open Main Turbine Bypass valves

B. Raise reactor water level to +95"

C. Start a Recirc pump

D. Reject to Main Condenser via RWCU system

Answer: B

Answer Explanation

Rx vessel water temperature stratification is indicated iaw QCOA 1000-02, Loss Of Shutdown Cooling as, increases in Rx water temps/ Rx metal temps/or an unexpected increase in Rx pressure. Raising reactor water level will allow natural circulation to occur without violating heatup rates.

Distractor 1 is incorrect: Plausible this is a step in QCOA 1000-02 done to maintain RPV pressure <100 psig, but done concurrently while trying to restore. However, per the stem, the there is no vacuum in the Main Condenser. This will prevent opening the BPVs.
Distractor 2 is incorrect: Plausible because starting a Reactor Recirc pump would alleviate stratification. However based on the question stem the present ΔT between bottom head coolant and RPV coolant is 150°F. This exceeds the startup limitation of <145°F.
Distractor 3 is incorrect: Plausible because a feed and bleed with the Condensate system and RWCU reject will remove decay heat. However, per the question stem, the Condensate system is unavailable. Other makeup systems may be used, but they are relatively low capacity, thereby limiting effectiveness of this method. Additionally, a feed and bleed should be started after some method of circulation (natural or forced) has been established or the condition could become worse.

Reference: QCOA 1000-02 Rev. 20, QCGP 2-3 Rev. 84
Reference provided during examination: None

Cognitive level: High

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

K/A: 295021 K1.02: Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING : Thermal stratification

CFR: (41.8 / 41.10)
IMPORTANCE: RO 3.3 / SRO 3.4

SRO Justification: N/A

Question Source: Bank
Question History: None
Comments:

Associated objective(s):

SR-0201-K16 (Freq: LIC=I)
DESCRIBE the following operational characteristics of the Reactor Vessel and Internals components:
a. Core floodability
b. Flow orificing
c. Water level effects on moisture separation
d. Natural circulation
e. Thermal stratification

295021.AK1.02 Thermal stratification (RO=3.3 / SRO=3.4)

18 **ID: 1244647** **Points: 1.00**

Given:
- Unit 2 is in a refueling outage
- The fuel pool gates are removed
- The Reactor Cavity is flooded
- Refueling is in progress

Annunciator 901-5 D-24 "SKIMMER SURGE TANK LOW LEVEL" alarms, followed by a report of the Fuel Pool Cooling Water pumps tripping.
Moments later, the Fuel Handling Supervisor calls the control room and reports a large leak in the RPV to Drywell Bellows and Spent Fuel Pool level is lowering rapidly.

With NO OPERATOR ACTION, at what point will level in the Unit 2 fuel pool stop lowering?

A. The bottom of the Refueling Slot (keyway).

B. 19 feet above the top of the irradiated fuel assemblies seated in the Spent Fuel Pool.

C. The bottom of the Fuel Pool adjustable weir plates.

D. The bottom of the Spent Fuel Pool.

Answer: A

Answer Explanation

Per the Refuel Floor drawings (M-9), if the RPV to Drywell refueling bellows were to leak, level would drop to the bottom of the Refueling Slot by plant design.

Distractor 1 is incorrect: Plausible because it is the Technical Specification minimum required fuel pool level.
Distractor 2 is incorrect: Plausible because the Fuel Pool level would lower to this point if there was a rupture of the Spent Fuel Pool Cooling System.
Distractor 3 is incorrect: Plausible if it is assumed the bottom of the Spent Fuel and reactor cavity are at the same elevation.

Reference: UFSAR 9.1.2.2.3 Rev. 12, M-9 Rev. D
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295023 Refueling Accidents 295023.AA2.02 Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS Fuel pool level

CFR: (41.10 / 43.5 / 45.13)
IMPORTANCE RO 3.4 / SRO 3.7

SRO Justification: N/A

Question Source: Bank
Question History: N/A

Comments:

Associated objective(s):

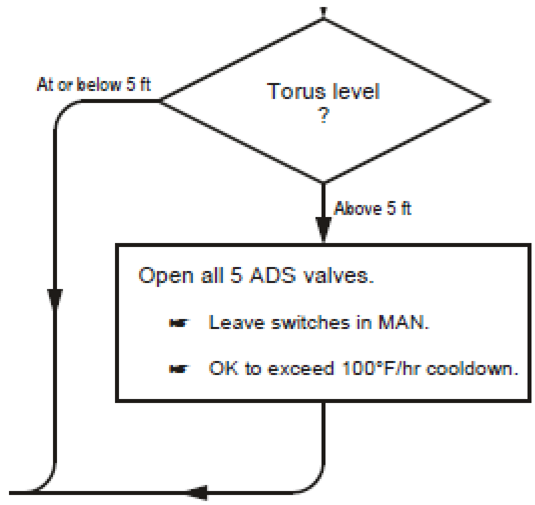
SRN-0801-K22 (Freq: LIC=I N=B)
Given a Refueling Floor operating mode and various plant conditions, PREDICT how Refueling Floor and plant parameters will be impacted by the following failures:

a. Loss of Fuel Pool Cooling
b. Loss of ventilation
c. Loss of pool or cavity water level
d. Increasing pool or cavity water level
e. High radiation

295023.AA2.02 Fuel pool level (RO=3.4 / SRO=3.7)

19 **ID: 1236073** **Points: 1.00**

QGA 500-1, RPV BLOWDOWN, provides the following decision block:



Which of the following states the reason ADS valves are NOT opened when Torus water level is "At or below 5 ft", as depicted above?

A. Heat Capacity Limit may be EXCEEDED because Torus water volume is LOW.

B. Containment may be DEINERTED because Reactor Building-to-Torus vacuum breakers will be OPEN.

C. Torus downcomer openings may experience CHUGGING because Drywell noncondensible gas content is LOW.

D. Containment may be OVERPRESSURIZED because ADS valve T-quenchers are UNCOVERED.

Answer: D

Answer Explanation

An RPV blowdown would result in a direct pressurization of the Torus due to exposure of the T-quenchers with Torus level <5 ft. The Drywell-Torus Vacuum breakers would actuate, resulting in a Drywell pressure increase as well.

Distractor 1 is incorrect: Plausible because the Heat capacity Limit (HCL) is based on Torus water volume. However, the HCL is already exceeded if Torus water level is < 11 ft.
Distractor 2 is incorrect: Plausible cycling of the Reactor Building-to-Torus vacuum breakers will deinert containment, but the differential pressure between the Reactor building and Torus resulting from a blowdown would prevent operation. They are designed to open with Torus pressure < Reactor Building pressure.

Distractor 3 is incorrect: Plausible because chugging is a function of water level in the downcomers and non-condensible content in the drywell atmosphere. With Torus level extremely low (<5 ft.), steam would not be quenched by the Torus as efficiently. But the mechanism for chugging requires water in the downcomer region which is at 11 ft. Torus level.

Reference: BWROG EPG/SAG Rev. 3
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295024 EA2.03: Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: Suppression pool level

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

SRO Justification: N/A

Question Source: Bank
Question History: ILT 12-1 Comp Exam #2
Comments: None.

Associated objective(s):

SR-0001-K40 (Freq: LIC=B)
Given QGA 500-1, 'RPV Blowdown', EXPLAIN the reasons for the limits, cautions and notes.

295024.EA2.03 Suppression pool level (RO=3.8 / SRO=3.8)

20 **ID: 1244707** **Points: 1.00**

Unit 2 is operating at 100% power. The following annunciators are in alarm and have been acknowledged:

- 902-8 F-8, "ESS SERV UPS TROUBLE"
- 902-8 E-8, "ESS SERV UPS ON DC OR ALT AC"
- 902-8 E-9, "ESS SERV BUS ON EMERG SPLY"

Based on the annunciators, the NSO will do which ONE of the following?

A. Place HPCI AND RCIC flow controllers in AUTO

B. Close the RFP minimum flow valves

C. Verify RWCU did NOT isolate

D. Dispatch personnel to operate Feedwater Regulator(s) in local manual

Answer: A

Answer Explanation

The K/A for this question is the ability to predict impact of AC power failures and based on the prediction use procedures to correct the consequences. In this case, the ESS bus ABT transferred causing a momentary loss of power to the ESS bus. The examinee will be required to analyze this failure by the annunciators given in the stem. The correct answer is to place the flow HPCI flow controller in AUTO to restore the operability of HPCI. QOA 6800-03 directs this action.

Distractor 1 is incorrect: Plausible because the RFP minimum flow valves will automatically reclose. No operator action needed.
Distractor 2 is incorrect: Plausible because RWCU will isolate.
Distractor 3 is incorrect: Plausible because the FWRV valves can be reset from the Main Control Room.

Reference: QOA 6800-03 rev. 45
Reference provided during examination: None

Cognitive level: Higher

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

K/A: 206000 A2.04 Ability to (a) predict the impacts of the following on the HIGH PRESSURE COOLANT INJECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A.C. failures: BWR-2,3,4

CFR: (41.5 / 45.6)
IMPORTANCE: RO=2.7 / SRO=3.0

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

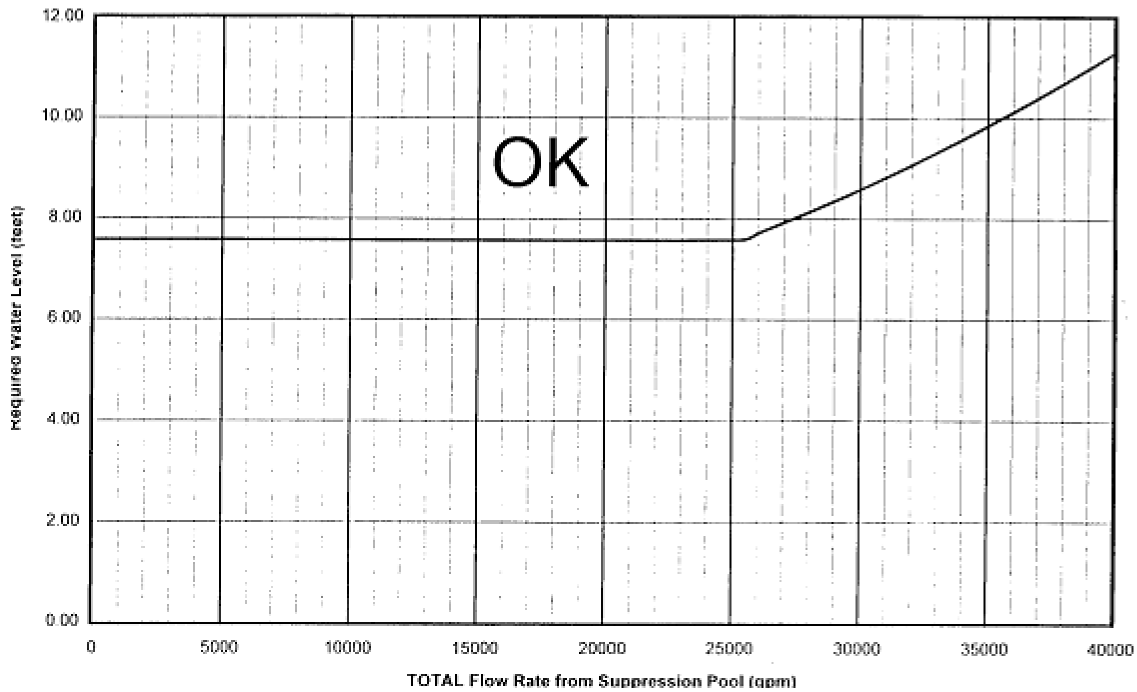
206000.A2.04 A.C. failures: BWR-2,3,4 (RO=2.7 / SRO=3.0)

SR-2300-K23 (Freq: LIC=B)
Given a HPCI System operating mode and various plant conditions, PREDICT how the HPCI System will be impacted by the following support system failures:

a. Loss of CCST
b. Loss of 250 vdc
c. Loss of 125 vdc
d. Loss of ESS power
e. Loss of instrument air
f. Loss of diesel cooling water
g. Feedwater leak

21 **ID: 1244712** **Points: 1.00**

VORTEX LEVEL LIMIT FOR PUMP SUCTION FROM SUPPRESSION POOL



(Refer to the graph above.)

Operating the Core Spray system BELOW the line can lead to pump ___(1)___ and would result in ___(2)___ .

A. (1) cavitation

(2) tripping the pump on over current.

B. (1) runout

(2) tripping the pump on over current.

C. (1) runout

(2) overheating the pump.

D. (1) cavitation

(2) overheating the pump.

Answer: D

Answer Explanation

The selected K/A is knowledge of operational implications of pump cavitation and the indications of cavitation. The question presents the vortex limit graph and asks the examinee to determine pump cavitation is the basis of the graph and how cavitation is indicated.

From the EPG concerning vortex limits: "The vortex limits are defined to be the lowest suppression pool water level above which air entrainment is not expected to occur in pumps taking suction on the pool. These levels are functions of ECCS flow. Exceeding the limits can lead to air entrainment at the pump suction strainers."

Distractor 1 is incorrect: Cavitation is correct, but cavitation does not cause high motor current
Distractor 2 is incorrect: Runout is not correct, but runout can trip a pump on high current
Distractor 3 is incorrect: Runout is not correct, but run out will not over heat the pump.

Reference: QCAP 200-10 rev. 49, BWROG EPG/SAG rev. 3, BWR Generic Fundamentals-Pumps
Reference provided during examination: None

Cognitive level: Higher

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

K/A: 209001.K5.01 Knowledge of the operational implications of the following concepts as they apply to LOW PRESSURE CORE SPRAY SYSTEM: Indications of pump cavitation

(CFR 41.5 / 45.3)
IMPORTANCE RO 2.6 / SRO 2.7

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

209001.K5.01 Indications of pump cavitation (RO=2.6 / SRO=2.7)

SR-0001-K09 (Freq: LIC=B)
DESCRIBE the purpose of the following QGA curves/tables:

a. QGA Detail A, RPV Water Level Instruments
   1. Figure B, RPV Saturation Curve
   2. Table C, RPV Level Instrument Criteria

b. QGA Figure D, Primary Containment Pressure Limit
c. QGA Detail E, Alternate Injection Systems
d. QGA Detail F, Injection Subsystems
e. QGA Detail G, Preferred ATWS Systems
f. QGA Detail H, Alternate ATWS Systems
g. QGA Table J, Minimum Steam Cooling Pressure
h. QGA Figure K, Drywell Spray Initiation Limit
i. QGA Figure L, Pressure Suppression Pressure
j. QGA Figure M, Heat Capacity Limit
k. QGA Detail O, Emergency Depressurization Systems
l. QGA Detail P, RPV Injection Sources
m. QGA Detail Q, Alternate Flooding Systems
n. QGA Table S, Reactor Building Area Temperatures
o. QGA Table T, Reactor Building Area Radiation Levels
p. QGA Table U, Reactor Building Area Water Levels
q. QCAP 0200-10 Attachments S,T,U,V and W, RHR and CS NPSH Curves
r. QCAP 0200-10 Attachment X, HPCI NPSH Curves
s. QCAP 0200-10 Attachment Y, RCIC NPSH Curves
t. QCAP 0200-10 Attachment Z, ECCS Vortex Limit
u. Cold Shutdown Boron
v. Hot Shutdown Boron
w. Maximum Subcritical Banked Withdrawal Position
x. Minimum Number Of SRVs Required For Emergency Depressurization
y. Minimum Number Of ADS Valves For Decay Heat Removal
z. Decay Heat Removal Pressure
aa. Minimum Steam Cooling RPV Water Level
ab. Minimum Zero-Injection RPV Water Level

22 **ID: 1248927** **Points: 1.00**

Unit 1 was operating at rated power when the following transient occurred:

- Spurious Group I Isolation with <u>failure</u> of the MSIV position scram signal
- RPV pressure peaked at 1360 psig for 5 seconds
- RPV pressure was stabilized between 800 - 1000 psig
- RPV water level lowered to -135 inches for 10 seconds
- RPV water level was stabilized between +35" and +45"

Which of the following describes the Technical Specification Safety Limit concern and the REQUIRED operator actions?

(1) The Reactor Coolant Pressure Safety Limit was violated.

(2) The Reactor Vessel Water Level Safety Limit was violated.

(3) Verify all insertable control rods are fully inserted into the core within the next two hours.

(4) Enter LCO 3.0.3 within one hour.

A. (1) and (3)

B. (2) and (3)

C. (1) and (4)

D. (2) and (4)

Answer: A

Answer Explanation

Per Tech Spec Safety Limits

2.1.1 Reactor Core SLs

2.1.1.3
Reactor vessel water level shall be greater than the top of active irradiated fuel.

2.1.2 Reactor Coolant System Pressure SL
Reactor steam dome pressure shall be $\leq$ 1345 psig

2.2 SL Violations
With any SL violation, the following actions shall be completed within 2 hours:
2.2.1
Restore compliance with all SLs; and
2.2.2
Insert all insertable control rods

Distractor 1 is incorrect: Plausible because verifying all insertable control rods are inserted is correct, but RPV level did not reach the SL of TAF
Distractor 2 is incorrect: Plausible because the RPV pressure is above the SL, but there is no requirement to enter LCO 3.0.3

Distractor 3 is incorrect: Plausible because while RPV level is low, RPV level did not reach the SL of TAF and there is no requirement to enter LCO 3.0.3

Reference: TS SL 2.1.2 Amendment 250/245, TS Bases Pressure SL B 2.1.2 Rev. 31
Reference provided during examination: None

Cognitive level: High

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

Question Source: Bank
Question History: ILT 11-1

10 CFR Part 55 Content: 41(b)(8-10)
SRO Justification: N/A

KA: 295025 High Reactor Pressure SG 2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation.

IM{PORTANCE RO 3.9 / SRO 4.0

Comments: None

Associated objective(s):

295025.2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation. (RO=3.9 / SRO=4.0)

SR-0201-K32 (Freq: LIC=B)
Given Reactor Vessel and Internals operability status OR key parameter indications, various plant conditions and a copy of Tech Specs, DETERMINE Tech Spec compliance and required actions, if any.

23 **ID: 1244774** **Points: 1.00**

Unit 1 is at 100% power.

QCOS 2300-05, HPCI Pump Operability Test, has been in progress for approximately 1 hour. The extra NSO is monitoring Torus temperature per QCOS 1600-31, Suppression Pool Temperature Monitoring. Torus temperature is 80°F.

What is the MAXIMUM Suppression Pool Average Temperature that if reached, would require the Reactor Mode Switch to be placed in Shutdown, and what is the reason for that action?

Place the Mode Switch to Shutdown if Torus temperature reaches ___(1)___ because ___(2)___.

A. (1) 105°F

(2) continued plant operation could lead to structural damage resulting in containment failure from direct pressurization.

B. (1) 105°F

(2) the pool is designed to absorb decay heat and sensible heat, but could be heated beyond design limits by the steam generated if the reactor is not shut down.

C. (1) 110°F

(2) continued plant operation could lead to structural damage resulting in containment failure from direct pressurization.

D. (1) 110°F

(2) the pool is designed to absorb decay heat and sensible heat, but could be heated beyond design limits by the steam generated if the reactor is not shut down.

Answer: D

Answer Explanation

B 3.6 CONTAINMENT SYSTEMS
B 3.6.2.1 Suppression Pool Average Temperature Technical Specification

Bases states:

b.
Average temperature $\leq$105ºF with THERMAL POWER >1% RTP and testing that adds heat to the suppression pool is being performed. This required value ensures that the unit has testing flexibility, and was selected to provide margin below the $\leq$110ºF limit at which reactor shutdown is required. When testing ends, temperature must be restored to $\leq$ 95ºF within 24 hours according to Required Action A.2. Therefore, the time period that the temperature is $\leq$ 95ºF is short enough not to cause a significant increase in unit risk.

c.
Average temperature $\leq$110ºF with THERMAL POWER >1% RTP. This requirement ensures that the unit will be shut down at $\leq$110ºF. The pool is designed to absorb decay heat and sensible heat but could be heated beyond design limits by the steam generated if the reactor is not shut down.

Distractor 1 is incorrect: Plausible because 105°F is the TS limit for testing. However, the reason given is the basis for the SRV Tail Pipe Limit in the EOPs. The use of this reason in the distractor gives a failure mode of the containment, but not the bases for scramming the plant on high Torus temperature.
Distractor 2 is incorrect: Plausible because 105°F is the TS limit for testing. However, the reason given in the distractor is the basis for taking the reactor mode switch to shutdown.
Distractor 3 is incorrect: Plausible because Torus temperature of $\geq$110°F requires the Mode Switch in Shutdown. However, the reason given is the basis for the SRV Tail Pipe Limit in the EOPs. The use of this reason in the distractor gives a failure mode of the containment, but not the bases for scramming the plant on high Torus temperature..

Reference: Quad Cities 1 and 2 TS Bases 3.6.2.1-1 Rev. 9 BWROG EPG/SAG Rev. 3
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295026 EK3.05: Knowledge of the reasons for the following responses as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Reactor SCRAM.

CFR: (41.5 / 45.6)
IMPORTANCE: (RO 3.9 / SRO 4.1)

SRO Justification: N/A

Question Source: Bank
Question History: N/A
Comments: None.

Associated objective(s):

295026.EK3.05 Reactor SCRAM. (RO=3.9 / SRO=4.1)

SR-1601-K28 (Freq: LIC=B)
EXPLAIN the reasons for given Containment Systems operating limits and precautions.
a. Torus temperature limits (95/110/160)
b. Torus level limits (+2/-2 adjusted for dp)
c. Drywell/torus differential pressure limitations
d. Drywell Spray Initiation Limit
e. Primary Containment Pressure Limit
f. Pressure Suppression Limit
g. Heat Capacity Limit

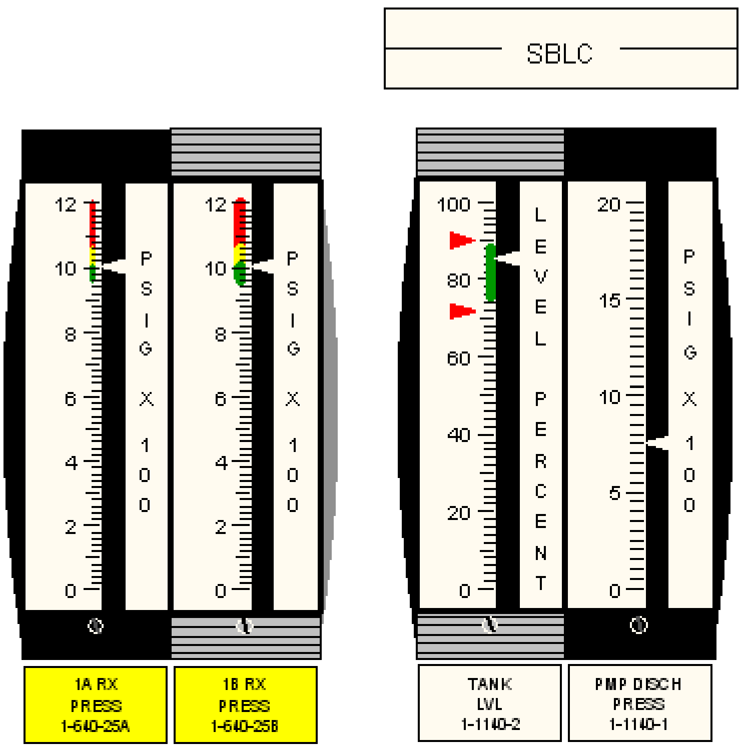
24 **ID: 1244772** **Points: 1.00**

Unit 1 was operating at 100% power on the 100% FCL.
The turbine tripped resulting in an ATWS with NO rod motion.

The NSO placed the Standby Liquid Control (SBLC) switch to SYS 1.

Two minutes later, 901-5 panel indications are as shown below.

What is the status of the SBLC system and what actions will the NSO take?



Based on the given indications, the SBLC ___(1)___ shutting down the reactor.
The NSO will ___(2)___.

A. (1) is NOT
(2) select SYS 1 and SYS 2

B. (1) is
(2) maintain reactor pressure within the directed band

C. (1) is
(2) lower reactor pressure to the low end of the band to raise SBLC flow rate

D. (1) is NOT
(2) select SYS 2

Answer: D

Answer Explanation

The K/A is the knowledge of the effect of a malfunction of the SBLC system on the ability to shutdown the reactor. The question stem shows a failure of the relief valve such that the system discharge pressure is below reactor pressure. SBLC will not shutdown the reactor in this case. The NSO should select the other system as their first action. With the given failure, selecting SYS 2 will cause SBLC to shutdown the reactor.

Distractor 1 is incorrect: Plausible because selecting SYS 1 and SYS 2 would start the other train, but is not procedurally allowed when SBLC is not needed as an alternate RPV injection system.
Distractor 2 is incorrect: Plausible because pump discharge pressure is shown and the examinee may determine nothing further needs to be done.
Distractor 3 is incorrect: Plausible because pump discharge pressure is shown and the examinee may determine system flow rate will be increased by lowering RPV pressure. This would be the case if the SBLC pump were not positive displacement.

Reference: QCOP 1100-02 rev. 12
Reference provided during examination: None

Cognitive level: High

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

K/A: 211000.K3.01 Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on following: Ability to shutdown the reactor in certain conditions

(CFR 41.7)
IMPORTANCE RO 4.3 / SRO 4.4

SRO Justification: N/A

Question Source: New
Question History: N/A

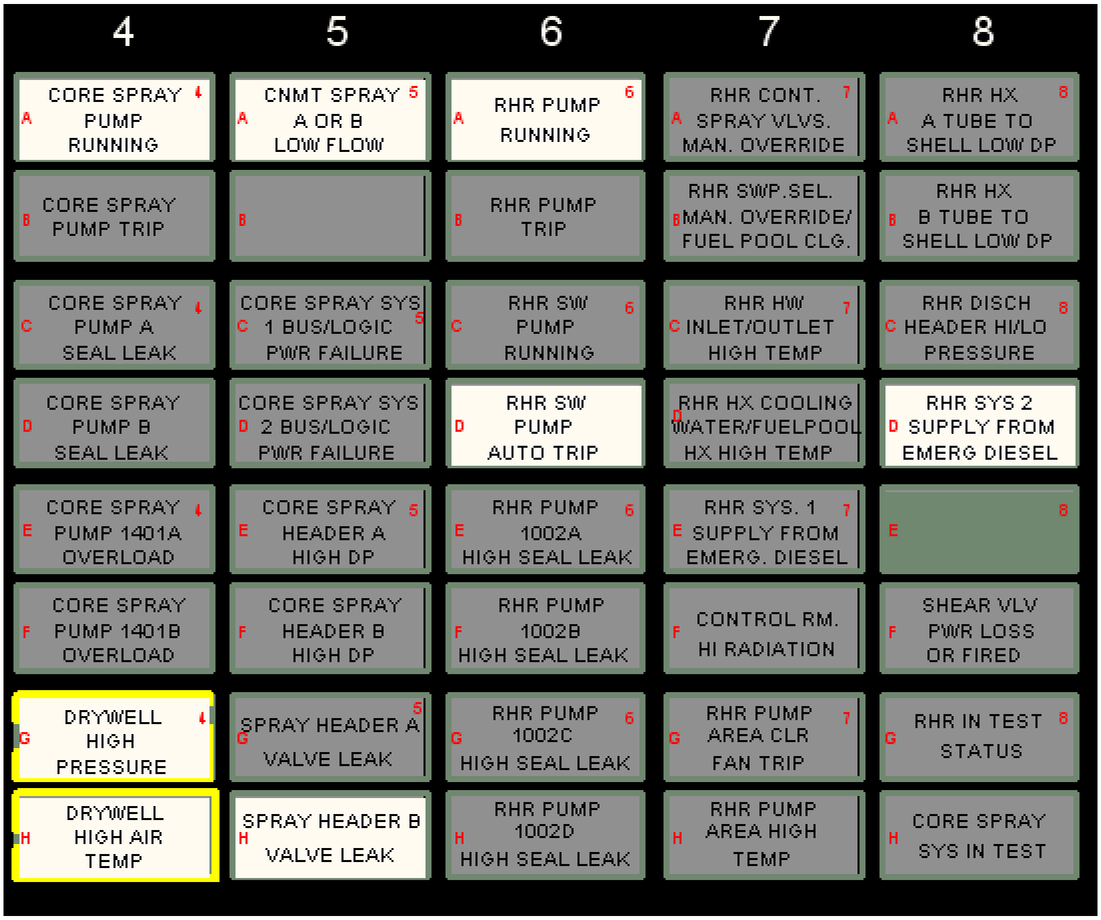
Comments: None

Associated objective(s):

211000.K3.01 Ability to shutdown the reactor in certain conditions (RO=4.3 / SRO=4.4)

SR-1100-K26 (Freq: LIC=B)
EVALUATE given key SBLC parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):
a. Abnormal Storage Tank\Suction Piping Temperature
b. Squib Valve failure

25 **ID: 1244863** **Points: 1.00**



NOTE: Annunciators are in solid.

(Refer to the preceding page.)

Given:
- Unit 1 was operating at rated power
- Torus Cooling running on Division I

A transient occurred, resulting in an automatic reactor scram. The ANSO is verifying automatic actions and addressing annunciators.

Which alarm(s) on the 901-3 panel have the highest reporting priority?

A. D-8

B. D-6

C. G-4 and H-4

D. A-4 and H-5

Answer: C

Answer Explanation

Annunciators 901-3 G-4 and H-4 are QGA entry conditions and are a high priority for the Unit Supervisor. The implementation of QGA actions to mitigate the transient and minimize the challenge to containment should not be delayed.

Distractor 1 is incorrect: Plausible because the Unit Diesel is now supplying Bus 14-1, however there are many other indications that the bus was momentarily deenergized then reenergized by the Unit EDG.
Distractor 2 is incorrect: Plausible because it is a pump trip, however, it is an expected auto action at 2.5 psig drywell pressure with the RHRSW system. It is included in the general direction in QGA 100 to verify auto actions and would be reported if it did NOT trip.
Distractor 3 is incorrect: Plausible because it is a pump auto start and expected for the plant conditions. As above, it would be included in the direction to verify auto actions and reported if it failed to occur. Annunciator H-5 is expected for a Core Spray pump running on minimum flow.

Reference: QCAN 901(2)-3 G-4 rev.9, and QCAN 901(2)-3 H-4 rev. 5
Reference provided during examination: None

Cognitive level: High

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

K/A: 295028 G2.4.45: High Drywell Temperature: 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: N/A

Question Source: New

Question History: N/A
Comments:

Associated objective(s):

295028.2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm. (RO=3.3 / SRO=3.6)

SR-1601-K06 (Freq: LIC=I)
Given a Containment Systems annunciator tile inscription, DESCRIBE the condition causing the alarm and any automatic actions which occur when the alarm actuates. EXPLAIN the consequences of the condition if not corrected.

26	ID: 1244873	Points: 1.00

Given the following:

- Unit 1 was at 100% power in a normal line up
- Bus 13 tripped on overcurrent
- Operators have stabilized the plant at 50% power
- NO OPERATOR ACTION has been taken on the electric plant beyond verifying systems responded as designed

Which of the following power supplies are available to restore RPS "A" one minute after the onset of the transient with NO further Main Control Room actions?

A. MCC 15-2

B. MCC 16-2

C. MCC 18-2

D. MCC 19-2

Answer: C

Answer Explanation

The K/A is how RPS is affected by a malfunction of AC electrical distribution. The stem gives conditions where MCC 18-2 was lost and then regained by the 1/2 EDG. The examinee should recognize the normal power supply is available (MCC 18-2)

Distractor 1 is incorrect: Plausible because the examinee might not realize MCC 15-2 is normally fed from Bus 13. Without powering Bus15 from the alternate supply, MCC 15-2 is unavailable
Distractor 2 is incorrect: The examinee may select the incorrect alternate power supply for RPS
Distractor 3 is incorrect: The examinee may select the Div II power supply.

Reference: QOA 6500-03 rev.19, QOA 7000-01 rev. 37
Reference provided during examination: None

Cognitive level: High

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

K/A: 212000.K6.01 Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR PROTECTION SYSTEM :A.C. electrical distribution

CFR: (41.7 / 45.7)
IMPORTANCE: RO 3.6 / SRO 3.8

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

212000.K6.01 A.C. electrical distribution (RO=3.6 / SRO=3.8)

SR-0500-K23 (Freq: LIC=B)
Given a Reactor Protection System operating mode and various plant conditions, PREDICT how the Reactor Protection System will be impacted by the following support system failures:
(Includes power supplies)
a. Loss of instrument air
b. Loss of 125 vdc
c. Loss of 480 vac

27 **ID: 1244884** **Points: 1.00**

Given the following for Unit 1:

- Startup in progress per QCGP 1-1, "NORMAL UNIT 1 STARTUP"
- Mode Switch is in STARTUP
- All IRMs are OPERABLE
- All IRMs are on Range 8
- All IRMs are selected
- All SRMs are de-selected

Which of the following describes the FIRST plant response if the NSO depresses and holds the DRIVE OUT pushbutton?

A. NO IRM detector motion

B. IRM "DOWNSCALE" rod block signal

C. IRM detector "NOT FULL IN" rod block signal

D. IRM "INOPERABLE" rod block and scram signals

Answer: C

Answer Explanation

IRMs may always be withdrawn. In this case, the Mode Switch is in STARTUP, which enforces the IRM detector "NOT FULL IN" control rod withdrawal block.

Per QCOP 0700-02:

IRM Rod Block setpoints are as follows:
- IRM downscale allowable value:
- > 5/125 of full scale.
- Bypassed when on Range 1.
- IRM high allowable value: < 112/125 of full scale.
- IRM detector "NOT FULL IN" while in MODE 2 (Startup).
- IRM Inoperable

IRM Reactor Scram setpoints are as follows:
- IRM Hi Hi: < 121/125 of full scale.
- IRM Inoperable.
- IRM/APRM Companion Scram (APRM downscale, > 3.5%, AND Companion IRM Hi Hi OR Inop).

Distractor 1 is incorrect: Plausible because the examinee may determine the detector will not move with the given plant conditions
Distractor 2 is incorrect: Plausible because the examinee may determine the IRMs will go downscale when withdrawn and cause a rod block
Distractor 3 is incorrect: Plausible because the examinee may determine the IRMs may generate an INOP signal when withdrawn and the mode switch is in STARTUP.

Reference: QCOP 0700-02 rev. 20
Reference provided during examination: None

Cognitive level: High

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

K/A: 215003.K5.03 Knowledge of the operational implications of the following concepts as they apply to INTERMEDIATE RANGE MONITOR (IRM) SYSTEM: Changing detector position

CFR: (41.5 / 45.3)
IMPORTANCE: RO3.0 / SRO 3.1

SRO Justification: N/A

Question Source: Bank
Question History: From Bank question 1234435

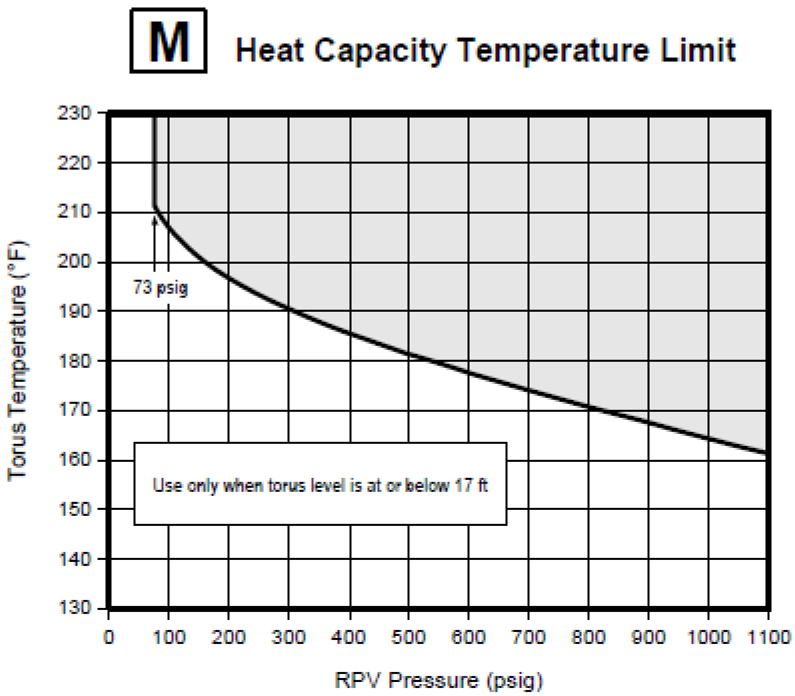
Comments:

Associated objective(s):

215003.K5.03 Changing detector position (RO=3.0 / SRO=3.1)

SR-0702-K13 (Freq: LIC=I)
DESCRIBE the following Intermediate Range Monitor System interlocks, including purpose, setpoints, and when/how they are bypassed.
a. Auto insertion
b. Retract permissive

28 **ID: 1244905** **Points: 1.00**



Complete the following statement describing the Heat Capacity Temperature Limit (HCTL) curve.

The HCTL is ...

A. used to maintain the pressure suppression capability of containment while the RPV is at pressure.

B. the highest Torus temperature from which a blowdown will not raise Torus pressure above the Primary Containment Pressure Limit.

C. used to avoid containment failure or deinertion following the initiation of Drywell sprays.

D. used to preserve primary containment integrity, vent valve operability, and ADS valve operability.

Answer: B

Answer Explanation

From EPG/SAG Rev. 3 and Lesson Plan L-QGADET the definition of the Heat Capacity Temperature Limit curve is:

The HCTL is the highest torus temperature from which an RPV blowdown will not raise:

- Torus temperature above the torus design temperature (281°F), or

- Torus pressure above the Primary Containment Pressure Limit.

while the rate of energy transfer from the RPV to the primary containment is greater than the capacity of the containment vent.

Quad Cities derived a "best fit" curve for the HCTL. The curve is applicable for all Suppression Pool water levels between 17 feet and 11 feet. Therefore, the actions do not vary for different Suppression Pool water levels. The differing actions occur for combinations of Suppression Pool temperature and RPV pressure.

Distractor 1 is incorrect: Plausible because it describes the PSP curve, which is contained in QGA 200.
Distractor 2 is incorrect: Plausible because it describes the DSIL curve also contained in QGA 200.
Distractor 3 is incorrect: Plausible because it describes the PCPL curve in QGA 200 and is related to the HCTL. See answer explanation.

Reference: Lesson Plan. BWROG EPG/SAG Rev. 3, L-QGADET Rev. 10
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295030 Low Suppression Pool Water Level A2.02 Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: Suppression pool temperature

(CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 3.9 / SRO 3.9

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments:

Associated objective(s):

295030.EA2.02 Suppression pool temperature. (RO=3.9 / SRO=3.9)

SR-0001-K09 (Freq: LIC=B)
DESCRIBE the purpose of the following QGA curves/tables:
a. QGA Detail A, RPV Water Level Instruments
    1. Figure B, RPV Saturation Curve
    2. Table C, RPV Level Instrument Criteria
b. QGA Figure D, Primary Containment Pressure Limit
c. QGA Detail E, Alternate Injection Systems
d. QGA Detail F, Injection Subsystems
e. QGA Detail G, Preferred ATWS Systems
f. QGA Detail H, Alternate ATWS Systems
g. QGA Table J, Minimum Steam Cooling Pressure
h. QGA Figure K, Drywell Spray Initiation Limit
i. QGA Figure L, Pressure Suppression Pressure
j. QGA Figure M, Heat Capacity Limit
k. QGA Detail O, Emergency Depressurization Systems
l. QGA Detail P, RPV Injection Sources
m. QGA Detail Q, Alternate Flooding Systems
n. QGA Table S, Reactor Building Area Temperatures
o. QGA Table T, Reactor Building Area Radiation Levels
p. QGA Table U, Reactor Building Area Water Levels
q. QCAP 0200-10 Attachments S,T,U,V and W, RHR and CS NPSH Curves
r. QCAP 0200-10 Attachment X, HPCI NPSH Curves
s. QCAP 0200-10 Attachment Y, RCIC NPSH Curves
t. QCAP 0200-10 Attachment Z, ECCS Vortex Limit
u. Cold Shutdown Boron
v. Hot Shutdown Boron
w. Maximum Subcritical Banked Withdrawal Position
x. Minimum Number Of SRVs Required For Emergency Depressurization
y. Minimum Number Of ADS Valves For Decay Heat Removal
z. Decay Heat Removal Pressure
aa. Minimum Steam Cooling RPV Water Level
ab. Minimum Zero-Injection RPV Water Level

29 **ID: 1244932** **Points: 1.00**

Unit 2 was operating at full power when an electrical transient occurred.

Current Conditions:

- Bus 28 is de-energized
- Reactor scrammed shortly after Bus 28 tripped
- "SRM/IRM DETECTOR POSITION" display switch is SELECTED one minute after the scram

NO other operator actions were taken.

What is the status of the IRMs?

A. All IRMS are fully inserted

B. All IRMs are driving into the core

C. All IRMS are fully withdrawn

D. One-half of the IRMs are driving into the core and one half of the IRMs are fully withdrawn

Answer: D

Answer Explanation

The motors for IRM 11, 12, 13, and 14 are powered from MCC 28-1A-1, and motors for IRM 15, 16, 17 and 18 are powered from MCC 29-1-1. Therfore, with stated conditions 1/2 of the IRMs will be driving into the core and 1/2 will not.

Distractor 1 is incorrect: Plausible because the examinee may believe the detector drives are powered from a different source and one minute is enough time. Per the procedure it takes 3.5 minutes to drive the detectors into the core.
Distractor 2 is incorrect: Plausible because the examinee may believe the detector drives are powered from a different source.
Distractor 3 is incorrect: Plausible because the examinee may believe the detector drives are powered from a different source and the examinee may believe pushing the "SRM/IRM DETECTOR POSITION" display switch at less than 3.5 minutes will cause the detector drives to stop.

Reference: QOM 2-6800-T08 rev. 9
Reference provided during examination: None

Cognitive level: High

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

K/A: 215003.K6.03 Knowledge of the effect that a loss or malfunction of the following will have on the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM Detector drive motor

(CFR 41.7 / 45.7)
IMPORTANCE RO 2.8 / SRO 2.9

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

215003.K6.03 Detector drive motor (RO=2.8 / SRO=2.9)

SR-0702-K26 (Freq: LIC=B)
EVALUATE given Intermediate Range Monitor System parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):

a. Output fails high/low
b. Loss of 24/48 DC power
c. Detector drive failure

30	ID: 1244953	Points: 1.00

- Unit 2 was operating at rated power when a spurious trip of the Main Turbine occurred.
- RPV water level lowered to -10 inches then recovered to +30 inches.
- Containment parameters are normal.

Which of the following sets of automatic actions, or isolations, occurred given the above conditions?

(A)	(B)	(C)	(D)
Group I Group II Group III	Group I Group III EDGs autostart	Group II Group III SBGTS autostart	Drywell Coolers trip Reactor Building Vents isolate SBGTS autostart

A. (A)

B. (B)

C. (C)

D. (D)

Answer: C

Answer Explanation

QCAP 0200-10, Attachment M lists all automatic actions that occur on a reactor water low level signal. The Group II, Group III, and SBGTS auto actions are included. QGA 100, "RPV Control" is entered at 0" RPV level.

Distractor 1 is incorrect: Plausible because two of the functions are correct. The Group I isolation does occur from an RPV water level signal at -59 inches not 0 inches.
Distractor 2 is incorrect: Plausible because they all occur on a water level signal, however the EDG and Group I actions are at -59 inches (low-low level).
Distractor 3 is incorrect: Plausible for the same reasons as above. The Drywell Coolers trip based on a load shed at -59 inches. The Reactor Building Vent isolation and SBGTS functions do occur at 0 inches RPV water level, (low-level).

Reference: QCOA 0201-09 rev. 25
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295031 G2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.
IMPORTANCE RO 4.5 / SRO 4.6

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments:

Associated objective(s):

295031.2.4.02 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. (RO=3.9 / SRO=4.1)

SR-1603-K10 (Freq: LIC=I) LIST the signals which cause the following Primary Containment Isolation (PCI) System isolations including purpose and setpoints. DESCRIBE how they are bypassed AND how they are reset.

a. Group 1
b. Group 2
c. Group 3
d. Group 4
e. Group 5

31 **ID: 1265048** **Points: 1.00**

Unit 2 is starting up after a refueling outage.

The following conditions exist:

- Reactor is critical with a period of 300 seconds
- IRMs are on range 4 or 5
- SRMs shorting links are installed

SRM channels are indicating:

- SRM Channel 21 - 6 x 10^5 cps
- SRM Channel 22 - 1 x 10^6 cps
- SRM Channel 23 - 4 x 10^5 cps
- SRM Channel 24 - 5 x 10^5 cps

What will be the result of these SRM indications?

A. SRM HI and HI-HI alarms ONLY

B. SRM HI and HI-HI alarms and a rod block ONLY

C. SRM HI and HI-HI alarms, a rod block and a half-scram ONLY

D. A full reactor scram

Answer: B

Answer Explanation

The K/A examines the candidates ability to monitor SRM count rate and period in the Main Control Room. The question gives indications during a reactor startup.. The examinee should determine the indications are normal. The determination hinges on the examinee's understanding of the operation of the SRMs. The information provided states IRM range switches are on range 4 or 5. SRM rod blocks are bypassed when IRMs are on range 8 or above, therefore the rod blocks are active. The SRM HI-HI scram is only functional when the Shorting Links are removed for refueling operations. The Analytical Value for the SRM HI-HI is 1X10^6 cps. SRM HI and HI-HI alarms will be received, but they will be accompanied by the rod block.

Per QCAN 901(2)-5 C-3, "ROD OUT BLOCK"

```
SRMs:
a.    Upscale 1.5x10^5 cps.
b.    Downscale 289 cps decreasing if NOT full in.
c.    NOT in Startup position.
d.    INOP.
```

Distractor 1 is incorrect: Plausible because the examinee may determine the SRM protective functions are bypassed. Only alarms will be received.
Distractor 2 is incorrect: Plausible because the examinee may determine the SRM pprotective functions will occur. A half scram signal will be generated since only some of the SRMs are reading high-high.
Distractor 3 is incorrect: Plausible because the examinee may determine the SRM protective functions will generate a reactor scram.

Reference: QCAN 901(2)-5 C-3, Rev. 11

Reference provided during examination: None

Cognitive level: High

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

K/A: 215004.A4.01 Ability to manually operate and/or monitor in the control room: SRM count rate and period

(CFR 41.7 / 45.5 to 45.8)
IMPORTANCE RO 3.9 / SRO 3.8

SRO Justification: N/A

Question Source: Bank
Question History: Dresden 2012 ILT NRC Exam

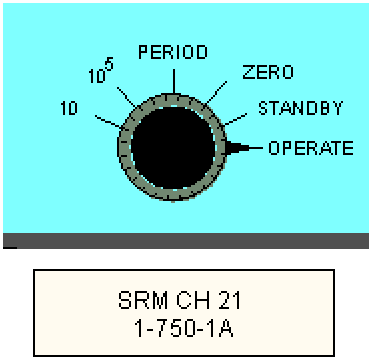
Comments:

Associated objective(s):

215004.A4.01 SRM count rate and period (RO=3.9 / SRO=3.8)

SR-0701-K20 (Freq: LIC=B)
Given the following Source Range Monitor System indications/responses and various plant conditions including startup, shutdown, refueling, and scram, EVALUATE the indications/responses and DETERMINE if the indication/ response is expected and normal.
a. SRM/IRM detector position display lights
b. SRM count rate
c. SRM period
d. SRM trip/status lights

32 **ID: 1245007** **Points: 1.00**



Given the following:

- Unit 1 startup is in progress
- Reactor Mode Switch is in STARTUP
- Control Rod withdrawal began 30 minutes ago
- The reactor is sub-critical

What, if any, is the result of moving the SRM drawer Mode switch to STANDBY?

A. NO effect

B. Rod Block ONLY

C. 1/2 Scram ONLY

D. Rod Block and 1/2 Scram

Answer: B

Answer Explanation

The K/A is the ability to locate and operate components for the SRM system. The question requires the examinee to determine how the SRM system is affected by operating local controls. In this case, the SRM chassis mode switch. There are no other local controls in the SRM system.

The examinee must determine taking the mode switch out of operate generates a rod block signal.

Distractor 1 is incorrect: Plausible because the examinee may believe there is no effect under the given plant conditions

Distractor 2 is incorrect: Plausible because the examinee may believe the SRM system functions like the other NM systems. Other NM systems generate a 1/2 scram when their mode switch is taken out of operate.

Distractor 3 is incorrect: Plausible because the examinee may believe the SRM system functions like the other NM systems. Other NM systems generate a 1/2 scram when their mode switch is taken out of operate. This knowledge coupled with the protective function of a rod block may lead the examinee to this answer.

Reference: QCOP 0700-01 rev.16

Reference provided during examination: None

Cognitive level: Memory

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

K/A: 215004 Source Range Monitor System SG.2.1.30 Ability to locate and operate components, including local controls.

(CFR: 41.7/45.7)
IMPORTANCE RO 4.4 / SRO 4.0

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

215004.2.1.30 Ability to locate and operate components, including local controls. RO 4.4 SRO 4.0

SR-0701-K21 (Freq: LIC=B)
Given various plant conditions, PREDICT how Source Range Monitor System/plant parameters will respond to manipulation of the following Source Range Monitor System controls:
a. SRM/IRM detector position display on/off
b. SRM/IRM detector selector switches
c. SRM/IRM Drive In / Drive Out pushbuttons
d. Function switch
e. Bypass Joy Stick
f. Inop Inhibit pushbutton

33 **ID: 1245008** **Points: 1.00**

Given the following conditions on Unit 1:

- 45% power
- Power acension in progress
- Rod F-8 is selected
- APRM 4 fails DOWNSCALE

With NO operator action, what effect does this have on the Rod Block Monitor (RBM) system?

A. RBM 7 is automatically bypassed.

B. RBM 8 is automatically bypassed.

C. RBM 7 automatically swaps to its backup reference APRM.

D. RBM 8 automatically swaps to its backup reference APRM.

Answer: B

Answer Explanation

The K/A is the knowledge of the effect on RBM if APRM fails. The question asks the examinee to identify the outcome of an APRM downscale failure. When the RBM channel's reference APRM goes downscale the RBM is automatically bypassed. The operator is required to bypass the APRM which in turn forces the backup reference APRM into the circuitry. In this case, APRM 4 is the primary reference APRM and its back up is APRM 5.

Distractor 1 is incorrect: Plausible because the examinee may believe APRM 4 is the reference APRM for RBM 7.
Distractor 2 is incorrect: Plausible because the examinee may believe APRM 4 is the reference APRM for RBM 7 and the reference APRM is automatically placed in the circuit.
Distractor 3 is incorrect: Plausible because the examinee may believe the reference APRM is automatically placed in the circuit.

Reference: QCOP 0700-04, AVERAGE POWER RANGE MONITORING SYSTEM OPERATION, Rev. 17; Rod Block Monitor System (ILT/LIC 0705) rev.11 page 20
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 215005.K3.07 Knowledge of the effect that a loss or malfunction of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM will have on following: Rod block monitor: Plant-Specific

(CFR 41.7 / 45.4)
IMPORTANCE RO 3.2 / SRO 3.3)

SRO Justification: N/A

Question Source: Bank
Question History: Bank system ID 1212599

Comments:

Associated objective(s):

SR-0705-K22 (Freq: LIC=B)
Given an Rod Block Monitor System operating mode and various plant conditions, PREDICT how the RBM system and the plant will be impacted to the following Rod Block Monitor System failures:
a. Loss of flow bias
b. Loss of APRM reference signal
c. Loss of LPRM inputs
d. Loss of RMCS inputs

215005.K3.07 Rod block monitor: Plant-Specific (RO=3.2 / SRO=3.3)

34 **ID: 1245009** **Points: 1.00**

The initial direction in the pressure leg of QGA 101, "RPV CONTROL (ATWS)", is to stabilize and control RPV pressure.

What is the reason for this direction?

A. Prevent actuation of the Safety valves and subsequent pressurization of the Drywell.

B. Prevent a rapid RPV depressurization and a resultant Low Pressure ECCS injection.

C. Prevent pressure and level oscillations which can result in significant power oscillations.

D. Prevent actuating SBLC pump discharge relief valves which can result in delaying reactor shutdown.

Answer: C

Answer Explanation

Per the EPG/SAG step RC/P-1, the RPV pressure is stabilized to prevent relief valve cycling:
“SRV cycling” is defined as multiple, closely sequenced valve actuations with the valves opening as RPV pressure exceeds the lift setpoints and closing as pressure drops below the reset setpoints. Cycling is undesirable and warrants prompt manual action for the following reasons:

- It exerts significant dynamic loads upon the RPV, the SRV tail pipes and supporting structures, and the primary containment.
- Swell and shrink associated with the valve actuations cause RPV water level fluctuations that complicate level control actions.
- Under failure-to-scram conditions, the consequent level and pressure oscillations can result in significant power transients.
- The potential for a stuck open relief valve is increased.

Distractor 1 is incorrect: Plausible because actuation of a safety valve would result in drywell pressurization, but this would only occur when reactor power initially exceeded pressure relief capability through relief valves and and/or main turbine bypass valves. In this case, the operator would not immediately be capable of controlling RPV pressure below the relief valve or scram setpoint.
Distractor 2 is incorrect: Plausible but this is the reason for inhibiting ADS.
Distractor 3 is incorrect: Plausible because if the SBLC relief valves lifted it would result in delaying the reactor shutdown. However, this will not happen if SBLC is injected per the procedural direction even if the RPV pressure rose to the Safety Valve setpoints.

Reference: BWROG EPG/SAG Rev.3, Step RC/P-2
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295037 K1.01 Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Reactor pressure effects on reactor power

(CFR: 41.8 to 41.10)

IMPORTANCE RO 4.1 / SRO 4.3

SRO Justification: N/A

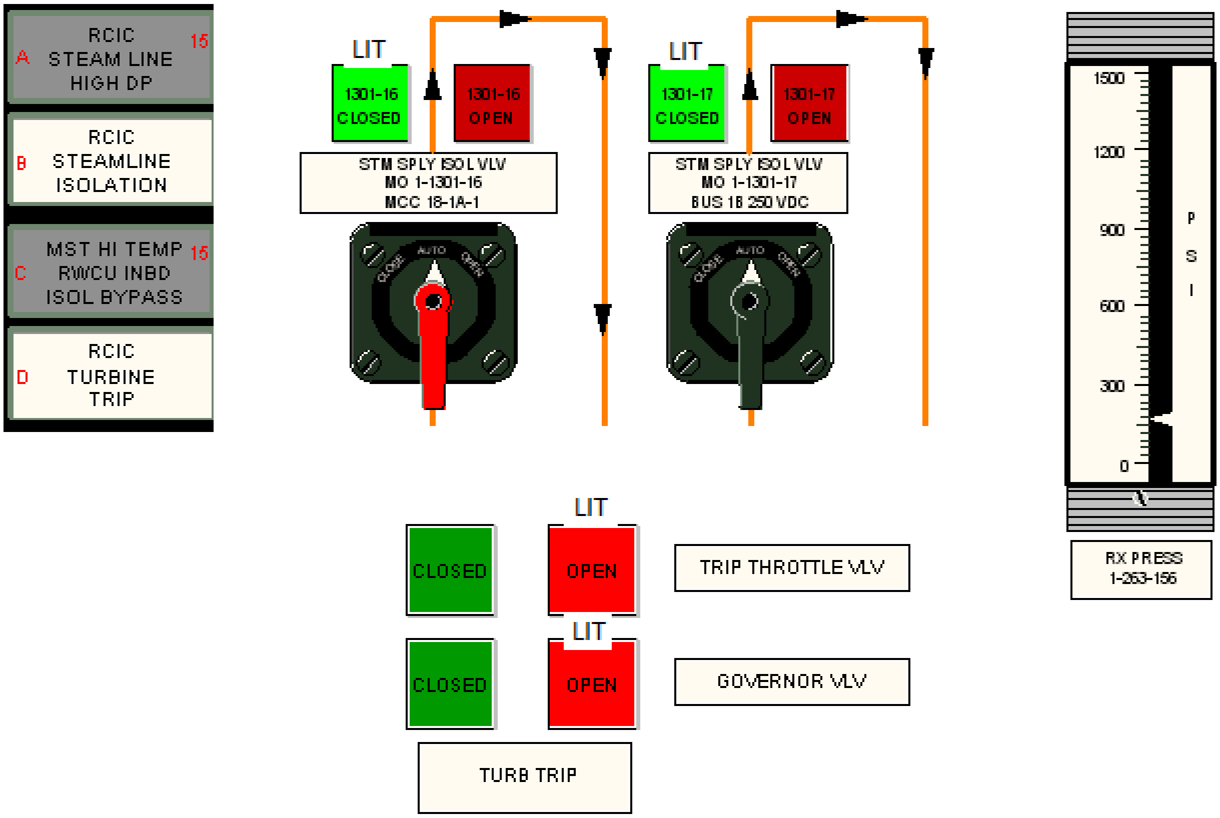
Question Source: New
Question History: N/A
Comments:

Associated objective(s):

295037.EK1.01 Reactor pressure effects on reactor power (RO=4.1 / SRO=4.3)

SR-0001-K61 (Freq: LIC=B)
Given QGA 101, 'RPV Control (ATWS)', EXPLAIN the reasons for the actions.

35	ID: 1245037	Points: 1.00



(Refer to preceding page.)

Unit 1 is starting up, currently at 3% power.
The ANSO had just rolled the RCIC turbine for low pressure testing when a transient occurred.

Main Control Room indications and annunciators are as shown above.

(Lit indications are labeled as such.)

(NOTE: The annunciators are in solid.)

Based on the indications, RCIC isolated on ___(1)___.

The RCIC valves ___(2)___ aligned properly for the given condition.

A. (1) RCIC Turbine area high temperature

(2) are NOT

B. (1) RCIC steam supply line low pressure

(2) are

C. (1) RCIC Turbine area high temperature

(2) are

D. (1) RCIC steam supply line low pressure

(2) are NOT

Answer: C

Answer Explanation

The K/A is knowledge of the physical connections and/or cause- effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and Leak detection. The question presents indications of a RCIC isolation caused by the Leak Detection. The examinee must determine the difference in indication between low RCIC steam line supply pressure and high temperature isolation. The examinee must couple that knowledge with the knowledge an isolation also causes a turbine trip. The examinee must recognize the proper indications for a turbine trip.

Distractor 1 is incorrect: Plausible because the examinee may believe the trip throttle valve trips on an electric turbine trip.
Distractor 2 is incorrect: Plausible because the examinee may believe the isolation was caused by low RCIC steam line supply pressure
Distractor 3 is incorrect: Plausible because the examinee may believe the isolation was caused by low RCIC steam line supply pressure and the trip throttle valve trips on an electric turbine trip.

Reference: QCAN 901(2)-4 B-15 rev. 12
Reference provided during examination: None

Cognitive level: High

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

K/A: 217000.K1.07 Knowledge of the physical connections and/or cause- effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and the following: Leak detection

(CFR 41.2 to 41.9 / 45.7 to 45.8)
IMPORTANCE RO 3.1 / SRO 3.2

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

217000.K1.07 Leak detection (RO=3.1 / SRO=3.2)

SR-1300-K20 (Freq: LIC=B)
Given a RCIC System operating mode and various plant conditions, EVALUATE the following RCIC System indications/responses and DETERMINE if the indication/ response is expected and normal. (limit to normally available indications)

a. MOV and AOV valve positions
b. Condensate pump and vacuum pump run indications
c. Barometric condenser pressure, temperature and hotwell level
d. Turbine inlet and exhaust steam pressures
e. Turbine speed
f. Pump suction and discharge pressures
g. Pump flow rate
h. Turbine bearing oil levels/flows, pressures, temperatures
i. Turbine lube oil cooling water relief valve flow (sightglass)
j. Discharge pipe temperature
k. Reactor water level

36 **ID: 1245047** **Points: 1.00**

Unit 1 has experienced a small line break LOCA with a loss of all RFPs.

- HPCI is OOS.
- RCIC auto-starts and injects into the vessel.
- RCIC operates for several minutes and then trips.
- Several minutes later, RCIC restarts and injects into the vessel.

Assuming NO operator action, what was the cause of the RCIC Turbine trip?

A. High Reactor Water Level.

B. High Turbine Exhaust Pressure.

C. Low Pump Suction Pressure.

D. Turbine Overspeed.

Answer: A

Answer Explanation

The K/A is the ability to monitor automatic RCIC turbine operation. The question asks the examinee to determine which of the turbine trips will automatically reset and allow an automatic restart of the RCIC turbine. RCIC is designed to run on an initiation signal of -59"until tripping off on +48" and then auto restarting at -59" again. The rest of the trips require operator action.

Distractor 1 is incorrect: Plausible because high turbine exhaust pressure is a RCIC turbine trip, but it does not auto reset
Distractor 2 is incorrect: Plausible because low pump suction pressure is a RCIC turbine trip, but it does not auto reset
Distractor 3 is incorrect: Plausible because turbine overspeed is a RCIC turbine trip, but it does not auto reset

Reference: QCOA 1300-01 rev 18
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 217000.A3.02 Ability to monitor automatic operations of the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) including: Turbine startup

(CFR 41.7 / 45.7)
IMPORTANCE RO 3.6 / SRO 3.5

SRO Justification: N/A

Question Source: Bank
Question History: Bank ID 1230171

Comments:

Associated objective(s):

SR-1300-K20 (Freq: LIC=B)
Given a RCIC System operating mode and various plant conditions, EVALUATE the following RCIC System indications/responses and DETERMINE if the indication/ response is expected and normal. (limit to normally available indications)
a. MOV and AOV valve positions
b. Condensate pump and vacuum pump run indications
c. Barometric condenser pressure, temperature and hotwell level
d. Turbine inlet and exhaust steam pressures
e. Turbine speed
f. Pump suction and discharge pressures
g. Pump flow rate
h. Turbine bearing oil levels/flows, pressures, temperatures
i. Turbine lube oil cooling water relief valve flow (sightglass)
j. Discharge pipe temperature
k. Reactor water level

217000.A3.02 Turbine startup (RO=3.6 / SRO=3.5)

37 **ID: 1245067** **Points: 1.00**

The keylock switch for the 1-203-3D, ADS RELIEF VLV, has been placed in OFF.

Which of the following describes the operation of the 1-203-3D valve while the keylock switch is OFF?

A. The valve will NOT open.

B. The valve will open on high reactor pressure ONLY.

C. The valve will open on an ADS initiation signal ONLY.

D. The valve will open on an ADS initiation signal OR high reactor pressure.

Answer: C

Answer Explanation

From QCOP 0203-01

"B.3.
WHEN operating ADS valves, THEN do NOT place controlswitch to OFF unless directed by QGAs. IF an ADS valve control switch is placed to OFF, THEN the ADS valve will NOT open on setpoint pressure, but will still function from ADS initiation logic."

Distractor 1 is incorrect: Plausible because the valve will open on an ADS signal.
Distractor 2 is incorrect: Plausible because the valve will not open on a high reactor pressure.
Distractor 3 is incorrect: Plausible because the valve will operate on an ADS signal, but not manually or on high reactor pressure.

Reference:LIC-0203 rev. 19, QCOP 0203-01, Rev. 15
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 218000.K106. Knowledge of the physical connections and/or cause- effect relationships between AUTOMATIC DEPRESSURIZATION SYSTEM and the following: Safety/relief valves

(CFR 41.2 to 41.9 / 45.7 to 45.8)
IMPORTANCE RO 3.9 / SRO 3.9

SRO Justification: N/A

Question Source: Bank
Question History: Bank question 1230793

Comments:

Associated objective(s):

SR-0203-K16 (Freq: LIC=I)
STATE the physical location and DESCRIBE the operation of the following ADS logic/valve controls:

a. ADS Valve Keylock Control Switches
b. Drywell Pressure Reset Keylock Switch
c. Timer Reset Pushbutton
d. Auto Blowdown Inhibit Keylock Switch (901(2)-3)
e. Acoustic Monitor toggle switches (selector/indicate-threshold/test-reset)
f. Valve Leak/Containment Air Temperature Recorder control pad
g. Auto Blowdown Inhibit Keylock Switch (901-32-3W)

218000.K1.06 Safety/relief valves (RO=3.9 / SRO=3.9)

38 **ID: 1245043** **Points: 1.00**

QGA 400, RADIOACTIVITY RELEASE CONTROL, directs operators to perform an Emergency Depressurization before off-site release rates reach a specified level.

What are the reasons for this action?

(1) To maintain Turbine Building habitability.

(2) To place the primary system in its lowest energy state.

(3) Prevent the spread of radioactive material to the Main Condenser via the bypass valves.

(4) Reduce the discharge rate to the environment.

A. (1) and (3) ONLY

B. (1) and (4) ONLY

C. (2) and (4) ONLY

D. (2) and (3) ONLY

Answer: C

Answer Explanation

EPG guidelines state that release rates above the General Emergency level present a threat to the health and safety of the general public. Before the General Emergency level is reached and only if a primary system is discharging outside primary and secondary containment, is an emergency depressurization performed to reduce the release rate. The reduction in energy will assist in reducing the primary system leakage.

Distractor 1 is incorrect: Plausible because highly radioactive steam flow to other areas would be reduced and result in lower general area dose rates. MSIV closure is designed to prevent the use of the bypass valves, not an RPV blowdown.
Distractor 2 is incorrect: Plausible because it does reduce release rate, however, maintaining Turbine Building habitability is not a basis.
Distractor 3 is incorrect: Plausible because reducing the energy state of the primary system is an action to terminate the primary system leakage, however, the MSIV's should have been isolated at this point preventing the use of Main Turbine bypass valves.

Reference: Lesson plan L-QGA400 rev. 9, EPG/SAG step RR-2 rev. 3
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295038 K3.04 Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: Emergency depressurization

(CFR 41.5, 45.6)

IMPORTANCE RO 3.6 / SRO 3.9

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments:

Associated objective(s):

295038.EK3.04 Emergency depressurization (RO=3.6 / SRO=3.9)

SR-0001-K35 (Freq: LIC=B)
Given QGA 400, 'Radioactivity Release Control', EXPLAIN the reasons for the actions.

39 **ID: 1245107** **Points: 1.00**

The Unit 2 ANSO has been directed to complete QCOP 1200-02, "BYPASSING ALL RWCU ISOLATION SIGNALS" to support QGA actions in an ATWS.

How are these actions completed?

A. Pulling fuses.

B. Lifting leads.

C. Actuating keylock switches.

D. Installing jumpers into banana jacks.

Answer: D

Answer Explanation

The K/A is the knowledge of PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF design feature(s) and/or interlocks which provide for the manual defeating of selected isolations during specified emergency conditions. The question requires the examinee to recall the methodology for defeating the Group III logic in the EOPs Jumpers are installed in banana jacks to accomplish this task. The correct answer is the choice allowing the PCI logic to remain energized. PCI logic is "fail safe" and requires the circuitry to be energized to defeat the isolation signal. There are no keylock bypasses for QGA support procedures.

Distractor 1 is incorrect: Plausible because pulling fuses is a methodology for inserting rods with the same plant conditions.
Distractor 2 is incorrect: Plausible because lifting leads is used by other procedures to defeat isolations.
Distractor 3 is incorrect: Plausible because actuating keylock switches is used by other procedures to defeat isolations

Reference: QCOP 1200-02 rev. 13
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 223002.K4.08 Knowledge of PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF design feature(s) and/or interlocks which provide for the following: Manual defeating of selected isolations during specified emergency conditions

(CFR 41.7)
IMPORTANCE RO 3.3 / SRO 3.7

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

223002.K4.08 Manual defeating of selected isolations during specified emergency conditions (RO=3.3 / SRO=3.7)

SRN-1603-K14 (Freq: LIC=B NF=B)
STATE the physical location and function of the following principal Primary Containment Isolation (PCI) System components:

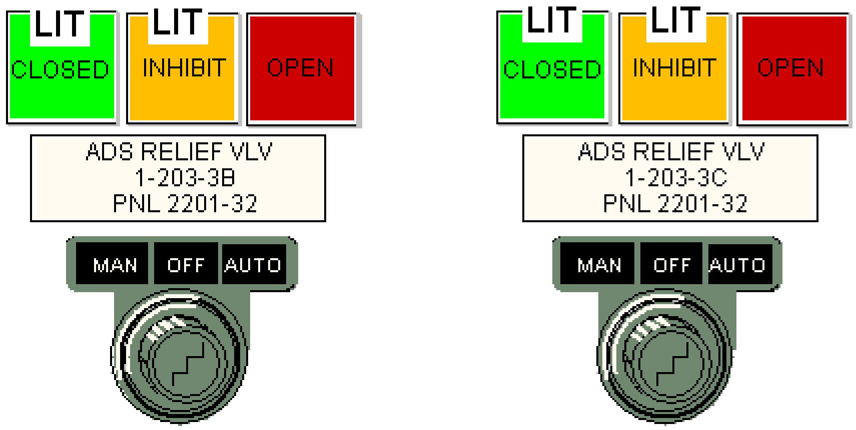
a. 901(2)-4 panels
  (1) Jumper points to defeat Group 1 to allow opening sample valves (220-44/45)

b. 901(2)-15/17 panels
  (1) PCI fuses and relays
  (2) Jumper points for defeating MSIV isolations.
  (3) Jumper points for defeating Group 2 and RB vent isolations

c. 901(2)-40 panel
  (1) PCI fuses and relays
  (2) Fuses pulled to initiate a Group 1 isolation
  (3) Jumper points for defeating Group 3 isolation

d. 901(2)-41 panel
  (1) PCI fuses and relays
  (2) Fuses pulled to initiate a Group 1 isolation

40 **ID: 1210245** **Points: 1.00**



(Lit indications are labeled as such.)

Unit 1 was at full power when a transient caused a reactor scram on high reactor pressure.

Relief valves are cycling to control RPV pressure.

Which ONE of the following describes the operation of relief valves 1-203-3B and 3C during the period of time the indications are as shown?

Relief valves 1-203-3B and 3C will...

A. open on a high reactor pressure signal ONLY.

B. open on an ADS signal ONLY.

C. NOT open manually or automatically.

D. open Manually ONLY.

Answer: D

Answer Explanation

Relief Valves 3B and 3C are interlocked to prevent automatic valve reopening within 10 seconds after valve closing. Actuation of this interlock is indicated by illumination of the amber INHIBIT LIGHT. To prevent reopening of the Relief Valves within 10 seconds following valve closure, the interlock timers have been set for approximately 14.5 seconds to account for potential delays in valve closure.

Distractor 1 is incorrect: Plausible because the examinee may have a misunderstanding of the time delay interlock operation.
Distractor 2 is incorrect: Plausible because the examinee may have a misunderstanding of the time delay interlock operation
Distractor 3 is incorrect: Plausible because the examinee may have a misunderstanding of the time delay interlock operation

Reference: QCOP 0203-01 Rev 15
Reference provided during examination: None

Cognitive level: High

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

K/A: 239002.A3.09 Ability to monitor automatic operations of the RELIEF/SAFETY VALVES including: Low low set logic: Plant-Specific

(CFR 41.7 / 45.7)
IMPORTANCE RO 3.9 / SRO 3.9

SRO Justification: N/A

Question Source: Bank
Question History: Vision System ID 1210245

Comments: Question reformatted for greater readability and picture added for stem clarity.

Associated objective(s):

239002.A3.09 Low low set logic: Plant-Specific (RO=3.9 / SRO=3.9)

SR-0203-K13 (Freq: LIC=I)
DESCRIBE the 14.5 second interlock associated with the 'B' and 'C' electromatic relief valves/ PORVs, including purpose and when/how it is bypassed.

41	ID: 1245120	Points: 1.00

Which ONE of the following states the reason(s) for the 10 minute Quad Cities Appendix R (QCARP) actions?

The 10 minute QCARP actions are designed to...

A. establish reactor vessel injection and maintain level above the scram setpoint.

B. disable specified automatic actions and preserve reactor vessel inventory.

C. maintain containment integrity by establishing the Torus Cooling mode of RHR.

D. establish Torus level monitoring.

Answer: B

Answer Explanation

The QCARPs are designed such that specific actions must be accomplished within specified times. The time clock starts when the reactor is scrammed. The actions are:

a. Within 10 minutes, automatic actuations <u>must</u> be disabled. Most of these actions are to preserve Reactor vessel inventory.
b. Within 32 minutes, Reactor vessel injection <u>must</u> be established.
c. Within 3 hours, Torus Cooling <u>must</u> be established.
d. Within 4 hours, Torus level monitoring <u>must</u> be established.

Distractor 1 is incorrect: Plausible because it is a QCARP 32 minute action.
Distractor 2 is incorrect: Plausible because it is a QCARP 3 hour action.
Distractor 3 is incorrect: Plausible because it is a QCARP 4 hour action.

Reference: Lesson Plan LN-ARP rev. 0, QCARP 0020-02 rev. 18, step E.2.
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 600000 K3.04 Knowledge of the reasons for the following responses as they apply to PLANT FIRE ON SITE: Actions contained in the abnormal procedure for plant fire on site

(No CFR reference in NUREG-1123)
IMPORTANCE RO 2.8 / SRO 3.4

SRO Justification: N/A

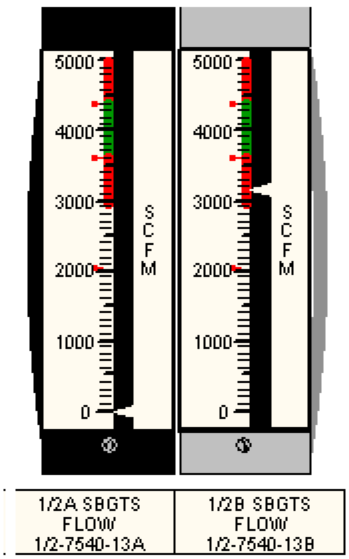
Question Source: New
Question History: N/A
Comments: None

Associated objective(s):

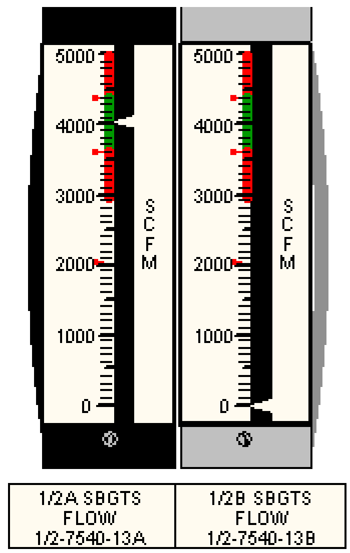
600000.AK3.04 Actions contained in the abnormal procedure for plant fire on site (RO=2.8 / SRO=3.4)

SRN-ARP-K05 (Freq: LIC=B NF=B)
Given a QCARP procedure, EXPLAIN the reasons for the sequence and time limits (if applicable) of the actions.

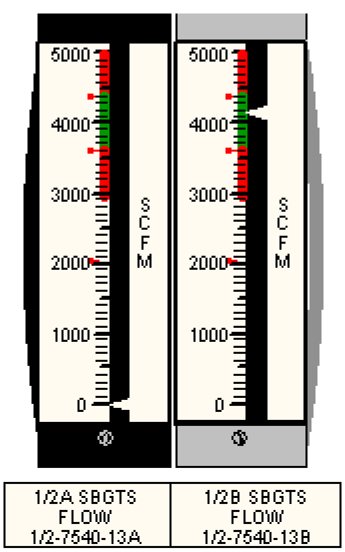
42	ID: 1245151	Points: 1.00



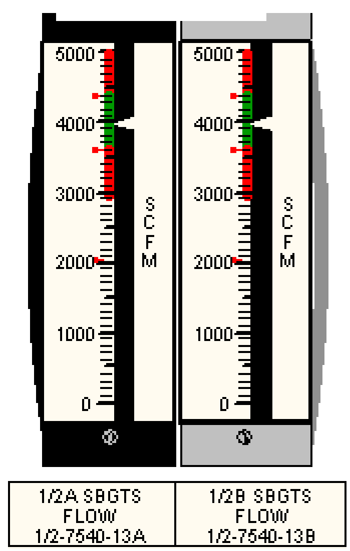
Case 1



Case 2



Case 3



Case 4

(Refer to the preceding page.)

Unit 2 was operating at 100% power when a reactor scram occurred from a Main Turbine trip. There were no other failures.

All systems were in their normal lineups before the transient.

After five minutes, the ANSO checks the Standby Gas Treatment System (SBGTS) for proper operation.

Based on the indications shown above, which ONE of the four cases shows the expected response of the SBGTS?

A. Case 1

B. Case 2

C. Case 3

D. Case 4

Answer: C

Answer Explanation

The Main Control Room indication shown in the question monitors the system flow, per the K/A. The reactor scram will result in a low reactor water level initiation of SBGTS. With no additional failures, Case 3 shows the expected response of the "B" train running at an acceptable flow.

Distractor 1 is incorrect: Plausible because the "B" SBGTS is running, but the flow is not in the acceptable band of 3600 - 4400 scfm.
Distractor 2 is incorrect: Plausible because the "A" SBGTS is running with normal flow. The examinee may determine the "A" train should have started from a Unit 2 transient.
Distractor 3 is incorrect: Plausible because the candidate may have determined both SBGTS trains start on an initiation signal.

Reference: QCOA 7500-01 Rev. 19
Reference provided during examination: None

Cognitive level: High

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

K/A: 261000.A4.07 Ability to manually operate and/or monitor in the control room: System flow

(CFR 41.7 / 45.5 to 45.8)
IMPORTANCE RO 3.1 / SRO 3.2

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

261000.A4.07 System flow (RO=3.1 / SRO=3.2)

SR-7500-K05 (Freq: LIC=B)
Given the following SBGTS key parameters, STATE the physical location of the indicators (local and remote) and DESCRIBE the sensor locations in the system flowpath:

a. System flow
b. Fan and heater indicating lights
c. MOV position
d. Air-operated outlet valve 1/2-7510A/B position
e. Heater inlet and outlet temperatures
f. Heater differential temperature
g. Run-time
h. Train component differential pressures
i. Charcoal adsorber temperature

43 **ID: 1249448** **Points: 1.00**

Both Units are at full power when a Grid Disturbance occurs affecting both Units.

The Unit 1 ANSO reports:

- Annunciator 912-2 D-5 "345KV BUS FREQUENCY LO" is alarming and will not clear
- Frequency indication on the 912-2 panel shows 59.0 Hz and is slowing lowering
- NO other alarms are present on the 912-2 panel

What will be the effect on continued plant operation if grid frequency continues to lower?

The Units will scram due to tripping the...

A. RPS EPAs.

B. Main Generators.

C. Safety Related 480 VAC busses.

D. Safety Related 4160 VAC busses.

Answer: A

Answer Explanation

The UFSAR Section 7.2.2 states:
"In addition, two Class 1E electrical protection assemblies (EPAs) are in series between each RPS power supply and its RPS bus breaker (see Figure 7.2-1). The EPAs protect the Class1E components powered by the RPS buses from abnormal voltage and frequency conditions resulting from failures of the non-Class 1E power supplies (RPS M-G sets or reserve power supply). Each EPA includes a breaker and associated monitoring module consisting of overvoltage, undervoltage, and underfrequency relays which trip the EPA breaker. [7.2-7] "

Distractor 1 is incorrect: Plausible because the examinee may determine the lowering grid frequency would cause the Main Generator to reverse power. Reverse power is a commonly seen cause of a Main Generator trip.
Distractor 2 is incorrect: Plausible because the examinee may determine the lowering grid frequency would cause an overcurrent condition on Safety related busses. The 480 VAC busses would not experience an over current directly from an under frequency condition. A lowering grid voltage would be a more likely cause of over current.
Distractor 3 is incorrect: Plausible because the examinee may determine the lowering grid frequency would cause the an under voltage condition on Safety related busses. The 4160 VAC busses would not experience an under voltage directly from an under frequency condition. A lowering grid voltage would be a more likely cause of over current.

Reference: UFSAR Section 7.2.2.2 Rev. 6
Reference provided during examination: None

Cognitive level: High

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

K/A: 700000 K2.03 Knowledge of the interrelations between GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES and the following: Sensors, Detectors, Indicators

(CFR 41.4/41.5/41.7/41.10/45.8)
IMPORTANCE RO 3.0 / SRO 3.1

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments: None.

Associated objective(s):

SR-6100-K20 (Freq: LIC=B)
Given a 345 KV Switchyard/ Main Transformer System operating mode and various plant conditions, EVALUATE the following 345 KV Switchyard/Main Transformer System indications/responses and DETERMINE if the indication/ response is expected and normal.

a. Bus voltages and status lights
b. Breaker positions
c. 345 KV line current, MW, MVARS and watt-hours
d. System frequency and MW
e. T1 (2) current

700000.AK2.03 Sensors, Detectors, Indicators (RO=3.0 / SRO=3.1)

44 **ID: 1245155** **Points: 1.00**

Given the following for Unit 2:

A small break LOCA and Loss of Off-Site Power (LOOP) have occurred.

Plant system status:
- Bus 23-1 is energized by the 1/2 EDG
- Bus 24-1 is energized by the Unit 2 EDG
- HPCI is injecting
- RCIC is injecting
- SSMP is injecting

The US has directed the ANSO to:
- Back feed Bus 23 from Bus 23-1
- Spray the Torus
- Start Torus Cooling

Under these conditions, what is the MAXIMUM CONTINUOUS loading allowed on the 1/2 EDG?

A. 2600 KW

B. 2860 KW

C. 4350 KW

D. 4785 KW

Answer: A

Answer Explanation

The K/A is the ability to predict and/or monitor changes in parameters associated with operating the A.C. ELECTRICAL DISTRIBUTION controls including: Effects of loads when energizing a bus. The question poses the situation where the ANSO will energize a bus from an EDG. The ANSO will need to assess EDG loading as part of re-energizing the bus.

These events are risk significant. LOOP accounts for 35% of the PRA initiating events.

Per QCOA 6100-03:
Do NOT exceed following EDG ratings:

- 2600 KW (3250 KVA) continuous
- 2860 KW (3575 KVA) 2000 hr/yr.

Do NOT exceed following SBO DG ratings:

- 4350 KW (5437.5 KVA) continuous.
- 4785 KW (5981.2 KVA) 2000 hr/yr

Distractor 1 is incorrect: Plausible because 2860 KW is the short term (<2000 hour/year) EDG rating (Familiar number to operators)
Distractor 2 is incorrect: Plausible because 4350 KW is the long term SBO EDG rating (Familiar number to operators)

Distractor 3 is incorrect: Plausible because 4785 KW is the short term (<2000 hour/year) SBO EDG rating (Familiar number to operators)

Reference: QCOA 6100-03 rev. 41
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 262001.A1.02 Ability to predict and/or monitor changes in parameters associated with operating the A.C. ELECTRICAL DISTRIBUTION controls including: Effects of loads when energizing a bus.

(CFR 41.5 / 45.5)
IMPORTANCE (RO=3.1 / SRO=3.5)

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

SRN-6500-K26 (Freq: LIC=B NF=B) EVALUATE given key 4KV / 480 VAC Distribution Systems parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):

a. Loss of 125 VDC control power (transfer aux power)
b. Turbine/generator trip
c. Loss of 345KV bus
d. Loss of T11 and/or T12 (T21/22)
e. Loss of a 4KV bus
f. Loss of a 480 VAC bus
g. Loss of a 480 VAC MCC

262001.A1.02 Effects of loads when energizing a bus (RO=3.1 / SRO=3.5)

45	ID: 1245160	Points: 1.00

The Unit 2 ESS UPS Manual Bypass is located in the ___(1)___ and powers the ESS bus from ___(2)___ when placed in the LINE position.

A. (1) Cable Spreading Room

(2) Bus 26

B. (1) Cable Spreading Room

(2) Bus 28

C. (1) Aux Electric Room

(2) Bus 26

D. (1) Aux Electric Room

(2) Bus 28

Answer: C

Answer Explanation

QOP 6800-03 F.2.c.(4) Turn MANUAL BYPASS switch to LINE. Red INVERTER light AND white ALT LINE light should be out. ESS Bus now supplied by alternate source Bus 26 through UPS regulator. Inverter AC LOAD ammeter should read zero.

MANUAL BYPASS SWITCH / Located on the 90X-63B Panel in the Aux. Electric Room. In the LINE position the alternate feed is supplying the load through the bypass switch and the static switch is removed from the circuit.

Distractor 1 is incorrect: Plausible because the Cable Spreading Room is the other location for vital equipment
Distractor 2 is incorrect: Plausible because the Cable Spreading Room is the other location for vital equipment and Bus 28 is the AC power feed auctioneered with the 250 VDC supply to the ESS UPS.
Distractor 3 is incorrect: Plausible because Bus 28 is the AC power feed auctioneered with the 250 VDC supply to the ESS UPS.

Reference: QOP 6800-03 rev. 33
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 262002.K4.01 Knowledge of UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) design feature(s) and/or interlocks which provide for the following: Transfer from preferred power to alternate power supplies

(CFR 41.7)

IMPORTANCE RO 3.1 / SRO 3.4

SRO Justification: N/A

Question Source: Bank
Question History: Exam Bank system ID 1233457

Comments:

Associated objective(s):

262002.K4.01 Transfer from preferred power to alternate power supplies (RO=3.1 / SRO=3.4)

N-6800-K16 (Freq: NF=B)
STATE the physical location and DESCRIBE the operation of the following Essential Service/Instrument Bus Systems local controls:

a. ESS Uninterruptable Power Supply (UPS)
   (1) Inverter Sync switch
   (2) DC Filter Charging switch
   (3) Test Toggle switch
   (4) Manual Bypass switch
   (5) Reset Switch for Continuity Monitor pushbutton
   (6) Voltmeter and ammeter selector switches
b. Instrument Bus 901(2)-50
   (1) Voltmeter selector switch

46	ID: 1249247	Points: 1.00

Unit 1 is operating at full power when the Unit NSO reports a loss of ESS has occurred.

If the NSO needed to reduce reactor power, which of the following methods would be REQUIRED?

A. Inserting control rods using EMERG ROD IN position on the ROD OUT NOTCH OVERRIDE switch.

B. Inserting control rods using ROD IN on the ROD MOVEMENT CONT Switch.

C. Lowering Reactor Recirculation Pump speed.

D. Tripping a Reactor Recirculation pump.

Answer: C

Answer Explanation

The stem states a loss of Essential Service has occurred. The Rod Select matrix and Select Relays are energized by Essential Service. The NSO will NOT be able to select a control rod. The only way to insert a control rod is with RPS (scram). The Reactor Recirculation System controllers are not affected and can be used to lower power.

Distractor 1 is incorrect: Plausible because it is a method for reducing reactor power, but a control rod cannot be selected with the Rod Select Matrix and RPIS de-energized.
Distractor 2 is incorrect: Plausible because it is a method for reducing reactor power, but a control rod cannot be selected with the Rod Select Matrix and RPIS de-energized.
Distractor 3 is incorrect: Plausible because several digital control functions are lost when ESS is it would reduce power, however there is no procedural guidance other than an ATWS condition, to perform an emergency power reduction by tripping recirc pumps.

Reference: QOA 6800-03, Rev. 45
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 201002 K3.01 Knowledge of the effect that a loss or malfunction of the REACTOR MANUAL CONTROL SYSTEM will have on following: Ability to move control rods

(CFR 41.7 / 45.4)
IMPORTANCE RO 3.4 / SRO 3.4

SRO Justification: N/A

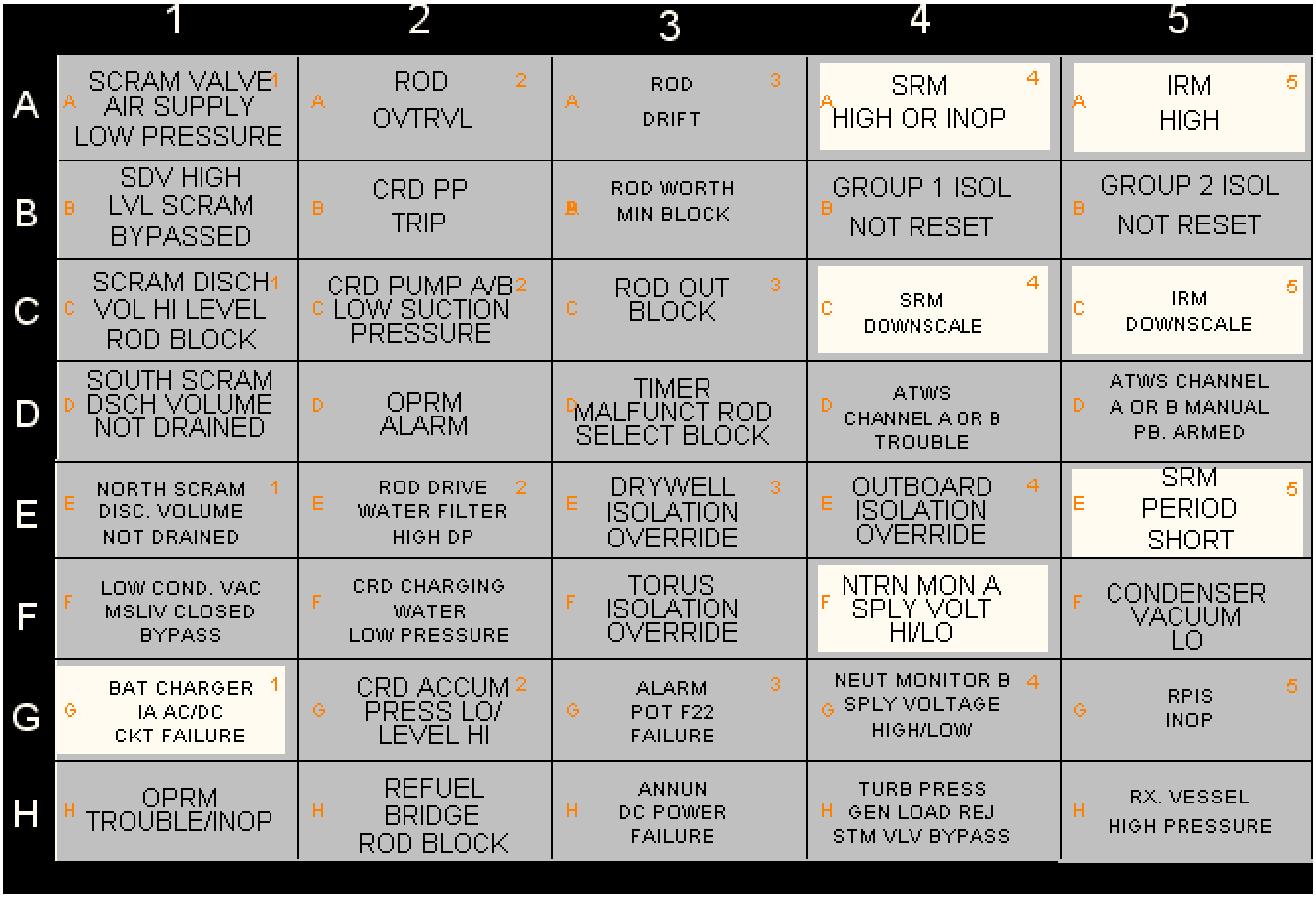
Question Source: Bank
Question History: N/A
Comments: Reformatted the stem to enhance readability (remove window dressing.). This caused the question to go from Higher Order to Memory level.

Associated objective(s):

SR-0280-K23 (Freq: LIC=B)
Given a Reactor Manual Control System (RMCS)/ Rod Position Information System (RPIS) operating mode and various plant conditions, PREDICT how the Reactor Manual Control System (RMCS)/Rod Position Information System (RPIS) will be impacted by the following support system failures: (Includes power supplies)

a. Loss of Essential Service bus
b. Loss of Instrument bus

47	ID: 1245168	Points: 1.00



Unit 1 is at 25% power. One minute ago the annunciators shown above alarmed and were acknowledged.

Which ONE of the following caused the alarms?

The loss of...

A. RPS "A"

B. Essential Service (ESS)

C. Instrument Bus

D. 24/48 VDC Bus A

Answer: D

Answer Explanation

The K/A is knowledge of electrical power supplies to the major D.C. loads. The question gives the annunciators resulting from a loss of 24/48 VDC bus 1A. The examinee must determine what caused the alarm.

Distractor 1 is incorrect: Plausible because RPS powers the LPRMs and APRMs
Distractor 2 is incorrect: Plausible because Essential Service powers systems that yield similar alarms
Distractor 3 is incorrect: Plausible because the Instrument Bus powers the 24/48 VDC battery chargers. In one minute the 24/48 VDC batteries would be supplying the loads

Reference: QOA 6900-03 rev. 13
Reference provided during examination: None

Cognitive level: High

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

K/A: 263000.K2.01. Knowledge of electrical power supplies to the following: Major D.C. loads

(CFR 41.7)
IMPORTANCE RO 3.1 / SRO 3.4

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

263000.K2.01 Major D.C. loads (RO=3.1 / SRO=3.4)

SRN-6900-K22 (Freq: LIC=B N=B)
Given a Station DC Electrical Systems operating mode and various plant conditions, PREDICT how major plant systems/plant parameters will respond to the following Station DC Electrical Systems component failures:
a. Complete loss of U1 or U2 24/48 VDC
b. Complete loss of U1 or U2 125 VDC
c. Complete loss of U1 or U2 250 VDC
d. Loss of Non-Essential 250 VDC to a unit

48 **ID: 1245170** **Points: 1.00**

QCOS 0300-21, CRD Temperature Surveillance has just been completed. The NSO notes several temperatures between 350°F and 450°F.

Continued operation under these conditions can result in which ONE of the following?

A. Higher scram insertion times

B. Loss of RPIS for the control rod

C. Control rod drift OUT due to Collet Housing failure

D. Sticking control rods due to Ball Check Valve failure

Answer: A

Answer Explanation

Per QCOS 0300-21, Limitations and Actions, step F.3:
"Higher scram insertion times resulting from CRD temperatures above 350°F result from water in the drive over-piston area flashing to steam during a scram when the scram outlet valve opens and vents the over-piston area to the Scram Discharge Volume (SDV). Rapid expansion of the steam/water mixture tends to increase backpressure and slow the start of rod motion."

Distractor 1 is incorrect: Plausible because the thermocouple is located within the RPIS probe.
Distractor 2 is incorrect: Plausible because high temperatures may alter small tolerances within the mechanism.
Distractor 3 is incorrect: Plausible because high temperatures may alter small tolerances within the mechanism.

Reference: QCOS 0300-21, Rev. 16
Reference provided during examination: None.

Cognitive level: Memory

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

K/A: 201003 K1.05 Knowledge of the physical connections and/or cause- effect relationships between CONTROL ROD AND DRIVE MECHANISM and the following: CRD mechanism temperature monitor

(CFR 41.2 to 41.9 / 45.7 to 45.8)
IMPORTANCE RO 2.6 / SRO 2.6

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments: None

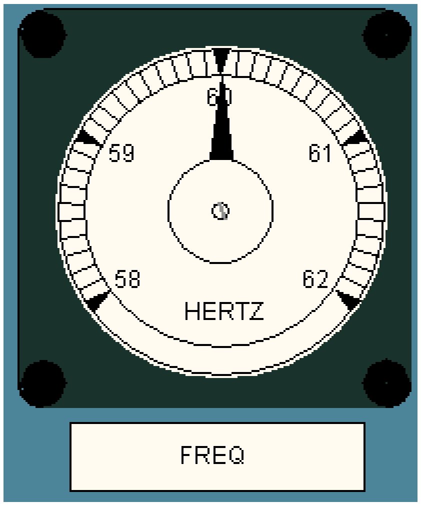
Associated objective(s):

SR-0302-K22 (Freq: LIC=B)
Given a Control Rod Drive Hydraulics operating mode and various plant conditions, PREDICT how key system/plant parameters will respond to the following Control Rod Drive Hydraulics component or controller failures:

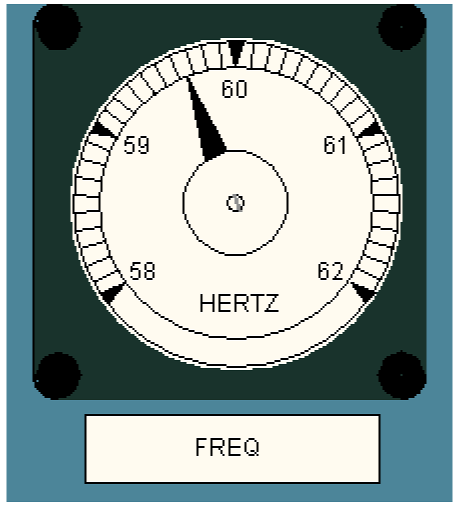
a. CRD pump trip
b. CRD FCV valve failure open/close
c. Leaking scram valves
d. Excessive accumulator gas pressures
e. Excessive charging water pressure
f. Overpiston flowpath isolated
g. Leaking directional control valves (insert or withdrawal)
h. Low cooling water flow
i. High cooling water pressure

201003.K1.05 CRD mechanism temperature monitor (RO=2.6 / SRO=2.6)

49 **ID: 1245195** **Points: 1.00**



Case 1



Case 2

- Unit 1 was operating at 100% power when Bus 14 tripped on overcurrent.
- Operators stabilized the plant
- The Unit 1 EDG energized Bus 14-1.

The MAXIMUM allowable design time for the Unit 1 EDG to energize Bus 14-1 is ____(1)___.

The EXPECTED indications, when the EDG is running at steady state, are shown in ____(2)____.

A. 13 seconds

Case 1

B. 13 seconds

Case 2

C. 10 seconds

Case 1

D. 10 seconds

Case 2

Answer: A

Answer Explanation

The K/A is ability to monitor automatic operations of the EMERGENCY GENERATORS (DIESEL/JET) including:Minimum time for load pick up. The question asks the examinee to identify the design time and identify the expected Main Control Room indications based on supplied pictures. The design time is 13 seconds. The pictures show Case 1 where the indications are expected and Case 2 where the indications show Droop.

Distractor 1 is incorrect: Plausible because Case 2 shows the indications an operator could see for a surveillance.
Distractor 2 is incorrect: Plausible because 10 seconds is a commonly believed time delay. This is a familiar number to operators. Case 2 shows the indications an operator could see for a surveillance.
Distractor 3 is incorrect: Plausible because 10 seconds is a commonly believed time delay. This is a familiar number to operators.

Reference: QOS 6500-03 rev. 44
Reference provided during examination: None

Cognitive level: High

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

K/A: 264000.A3.02 Ability to monitor automatic operations of the EMERGENCY GENERATORS (DIESEL/JET) including: Minimum time for load pick up

(CFR 41.7 / 45.7)
IMPORTANCE RO 3.1 / SRO 3.1

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

264000.A3.02 Minimum time for load pick up (RO=3.1 / SRO=3.1)

SRN-6600-K08 (Freq: LIC=I NF=I)
DESCRIBE how the Emergency Diesel Generators responds to an auto initiation signal.

50 | ID: 1245208 | Points: 1.00

Unit Two is at FULL power.

- The RECIRC PUMP MASTER SPEED CONTROL is set to 94%
- The LOOP A SPEED CONTROLLER is indicating 94% speed in MASTER
- The LOOP B SPEED CONTROLLER is indicating 94% speed in MASTER

If the NSO depresses and HOLDS the RAISE SLOW pushbutton on the Recirc Pump A SPEED CONTROL STATION, what effect (if any) does this have on the Recirculation FLOW Control system and reactor power?

(1) 2A Recirc Pump SPEED
(2) 2B Recirc Pump SPEED
(3) Reactor POWER

A. (1) RISES
(2) RISES
(3) RISES

B. (1) RISES
(2) LOWERS
(3) REMAINS CONSTANT

C. (1) RISES
(2) REMAINS CONSTANT
(3) RISES

D. (1) REMAINS CONSTANT
(2) REMAINS CONSTANT
(3) REMAINS CONSTANT

Answer: B

Answer Explanation

Per QCOP 0202-03, When in MASTER, pressing an individual controller raise/lower P/B will cause that controller to move in the direction demanded and the other in the opposite so as not to change overall system flow, but to adjust the bias between loops.

Distractor 1 is incorrect: Plausible if one assumes depressing the controls on an individual controller while in AUTO would cause both pumps to respond accordingly.
Distractor 2 is incorrect: Plausible if it is believed that the speed controls on the individual controllers will override the Master mode of operation.
Distractor 3 is incorrect: Plausible if it is believed the system must be returned to MANUAL mode for the individual controllers to work.

Reference: QCOP 0202-03, Rev. 24
Reference provided during examination: None

Cognitive level: High

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

K/A: 202002 A1.05 Ability to predict and/or monitor changes in parameters associated with operating the RECIRCULATION FLOW CONTROL SYSTEM controls including: Reactor power

IMPORTANCE RO 3.6 / SRO 3.6

SRO Justification: N/A

Question Source: Bank
Question History: N/A
Comments: None

Associated objective(s):

SR-0202-K21 (Freq: LIC=B) Given a Reactor Recirculation System operating mode and various plant conditions, PREDICT how key Reactor Recirculation/plant parameters (including power/flow map shifts) will respond to manipulation of the following Reactor Recirculation System local/remote controls:

a. Reactor Recirc ASD/FPC cabinet
 (1) HMI local controls
  (a) Start Precharge
  (b) Stop Precharge
  (c) Start Pump
  (d) Stop Pump
  (e) % Speed Demand
  (f) Fault Reset
  (g) Depassivation
  (h) Reset / restart of HMI Computer
 (2) Emergency-Stop
 (3) Local/Remote keylock switch
 (4) Latch Fault Relay Reset Keylock switch
 (5) Coolant pump selector switch
 (6) Coolant pump Mode switch
b. RRCS
 (1) A/B individual speed controllers
  (a) Master/Manual pushbuttons
  (b) Lower/Raise / Fast/Slow pushbuttons
  (c) Biasing controls
 (2) Master Controller
  (a) Lower/Raise pushbuttons
 (3) Operator Work Station (OWS)
  (a) RRCS Overview Display controls
  (b) RRCS Interlocks Display controls
  (c) RRCS Measuring Points Display controls
  (d) Trend Display controls
  (e) Alarm/Event/System List controls
  (f) OWS keyboard key (enable/disable) and keyboard
c. Reactor recirc system (901-4 panel)
 (1) Discharge valve normal control switch and jog open switch
 (2) Suction valve control switch
 (3) Sample valve (220-44/45) control switches
 (4) Reactor recirc pump vibration monitor reset pushbutton
 (5) Reactor Recirc Runback reset pushbutton
 (6) 10% Manual Runback pushbutton
 (7) Recirc Pump Start pushbutton
 (8) Fault Reset pushbutton
 (9) Speed hold/Reset switch
 (10) Emergency-Stop pushbutton
d. ASD UPS (2201-157/8 panel)
 (1) UPS Input / Output Breakers
 (2) UPS Power Module
  (a) Input / Output Breakers
  (b) Bypass Switch
  (c) ON / OFF Button
 (3) Battery Module (Battery Breaker)

202002.A1.05 Reactor power (RO=3.6 / SRO=3.6)

51 **ID: 1245222** **Points: 1.00**

Unit 1 is at rated power when a Service Water leak occurs.

The NSO places the Unit 1 Service Water Header Isolation Switch on the 912-1 panel to CLOSE.

Assuming the NSO's actions successfully ISOLATE the leak, which of the following indications is EXPECTED due to the positioning of the header isolation valve switch?

A. Unit 1 MSIV Room temperature RISES

B. Unit 1 TBCCW temperature RISES

C. Fire Main Header pressure LOWERS

D. Unit 1 Turbine Lube Oil temperature RISES

Answer: B

Answer Explanation

Placing the Unit 1 Service Water header isolation valve to CLOSE will shut the following valves:

MO 1-3903A, TBCCW HX
MO 1-3903B, TBCCW HX
MO 1-3904, U1 ASD COOLERS SW DISCH VLV
MO 1-3905, U1 STATOR SW SUPPLY

With Service Water isolated to the TBCCW heat exchangers, TBCCW temperature will rise.

Distractor 1, 2 and 3: All distractors are plausible based on the candidate's misconception of which loads are isolated and which loads are NOT isolated by the manipulation of the header switch.

Reference: QCOA 3900-01 Rev 22, LN-3900 Rev 6
Reference provided during examination: None

Cognitive level: High

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

KA: 400000.A1.02: Ability to predict and/or monitor changes in parameters associated with operating the CCWS controls including: CCW temperature.

(CFR 41.7 / 45.7)
IMPORTANCE RO 2.8 / SRO 2.8

SRO Justification: N/A

Question Source: Bank
Question History: Exam bank system ID 1235143

Comments:

Associated objective(s):

400000.A1.02 CCW temperature (RO=2.8 / SRO=2.8)

SR-3900-K21 (Freq: LIC=B)
Given a Service Water System operating mode and various plant conditions, PREDICT how service water system/plant parameters will respond to manipulation of the following Service Water System local/remote controls:
a. Pump control switch
b. SW header isolation switch (3905, 3904 1A/1B-3903, 2A/2B-3903)
c. Standby Coolant Supply switches (3901, 3902)
d. Service water supply to firemain valve MO-3906
e. Strainer control panel power switch
f. Strainer mode selector switches
g. Strainer basket selector switches
h. Strainer auto backwash start pushbutton

52 **ID: 1245223** **Points: 1.00**

A control rod has been withdrawn one notch and has latched into the desired position.

Which statement describes how the control rod position is detected for the Full Core Display on the 901-5 panel?

A. The even reed switch at this position is closed.

B. The even reed switch at this position is open.

C. The odd reed switch at this position is closed.

D. The odd reed switch at this position is open.

Answer: A

Answer Explanation

From lesson plan LIC-0301: "There are 25 notch positions in the index tube, one for each latched position (even numbers) every six inches on the index tube from position 00 to 48." Also, "There is a permanent ring magnet in the lower end of the drive piston that triggers the reed switches in the indicator probe for rod position indication."

From UFSAR 7.7.1.2.3, "Control rod position information is obtained from the rod position indication system (RPIS), which utilizes reed switches in the control rod drive that open or close as a magnet attached to the rod drive piston passes during rod movement. Reed switches are provided at each 3-inch increment of piston travel. Since a notch is 6 inches, indication is available for each half-notch of rod travel." Reed switches close when the control rod is at the respective position.

Distractor 1: Reed switches close to indicate position.
Distractor 2: Control rods only latch at even positions, the odd reed switch should be open and not indicating.
Distractor 3: Combination of Distractors 1 and 2.

Reference: UFSAR Section 7.7 Revision 12, LIC-0301 (Control Rod Blade and Drive Mechanism) Rev.11
Reference provided during examination: No

Cognitive level: Memory

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

Question Source: Bank
Question History: 2011 Quad NRC Exam (id. 1210963)

10 CFR Part 55 Content: 41(b)(7)
SRO Justification:

KA: 214000 K4.01: Knowledge of ROD POSITION INFORMATION SYSTEM design feature(s) and/or interlocks which provide for the following: Reed switch locations.
IMPORTANCE RO 3.0 / SRO 3.1

Comments: None

Associated objective(s):

SR-0280-K14 (Freq: LIC=B)
STATE the physical location and function of the following principal Reactor Manual Control System (RMCS)/ Rod Position Information System (RPIS) components:

a. Rod Position Information System
 (1) RPIS power supply and fuses (901(2)-27)
 (2) RPIS probe buffer cards/RPIS input cable and connector (901(2)-27)
 (3) RPIS reed switches

b. Reactor Manual Control System
 (1) Rod select matrix
 (2) Automatic sequence timer
 (3) Auxiliary timer
 (4) Rod drift alarm circuit
 (5) Refueling interlocks
 (6) Rod block jumper points (CRD accummulator low pressure / SRM/IRM FULL IN interlock) (901(2)-28)

c. Standby Sequence Timer

214000.K4.01 Reed switch locations (RO=3.0 / SRO=3.1)

53	ID: 1245230	Points: 1.00

In a non-emergency situation, why is the 1/2 Instrument Air Compressor stopped locally instead of from the Control Room?

Stopping the compressor locally allows the...

A. compressor to unload prior to being stopped.

B. compressor to auto restart on low instrument air system pressure.

C. Air Dryers to fully purge.

D. TBCCW to automatically isolate.

Answer: A

Answer Explanation

From QCOP 4700-10:, "Do NOT stop the Unit 1/2 Instrument Air Compressor from Panel 912 1 except in an emergency. Stopping the compressor from the Control Room will NOT allow the compressor to unload AND could damage the compressor."

Distractor 1 is incorrect: Plausible because auto restarts can occur when resetting IAC locally.
Distractor 2 is incorrect: Plausible because the shutdown procedure contains several steps for shutdown of the IAC and isolating the Air Dryer. However, none of the steps for isolating the Air Dryer are contingent on the Caution concerning shutting down the 1/2 IAC.
Distractor 3 is incorrect: Plausible because TBCCW flow control varies by IAC, but has no effect why the 1/2 IAC is shutdown locally.

Reference: QCOP 4700-10 rev. 12
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 300000.K5.01 Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Air compressors

(CFR 41.5 / 45.3)
IMPORTANCE RO 2.5 / SRO 2.5

SRO Justification: N/A

Question Source: Bank
Question History: Exam Bank Sys ID 06757 and 1218378

Comments:

Associated objective(s):

SRN-4701-K21 (Freq: LIC=B NF=B) Given an Instrument Air System operating mode and various plant conditions, PREDICT how system/plant parameters will respond to manipulation of the following Instrument Air System local/remote controls:

a. Local Compressor control panel
   (1) Unload/Normal toggle
   (2) Reset/start
   (3) Stop
   (4) Manual Unload
   (5) 1A, 1/2B and U2 compressor feed breaker control switch
   (6) 1/2B Electronikon controller

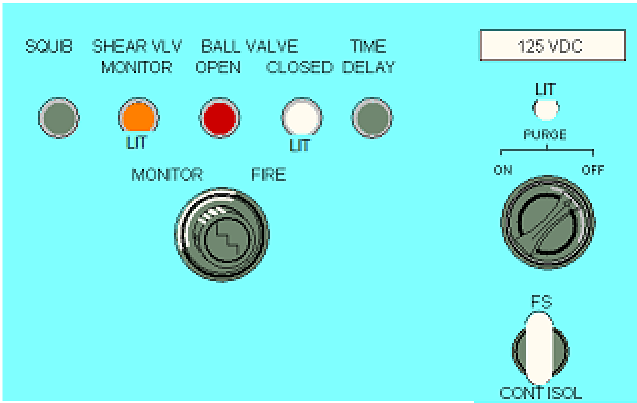
b. Dryer On/Off switch

c. Dryer Reset pushbutton

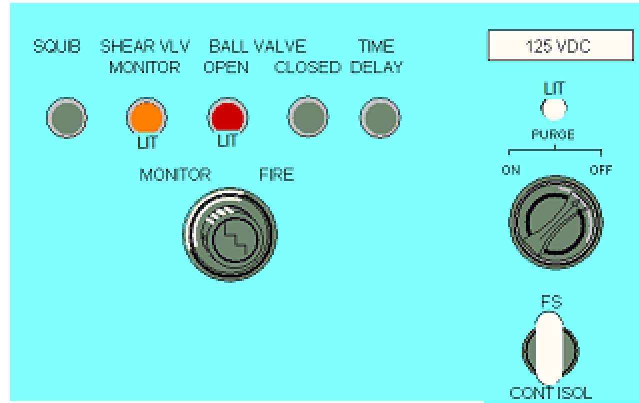
d. Prefilter manual blowdown toggle

300000.K5.01 Air compressors (RO=2.5 / SRO=2.5)

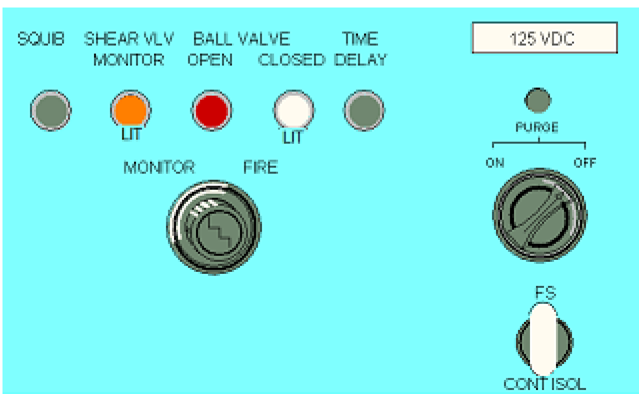
54 | **ID: 1265049** | **Points: 1.00**



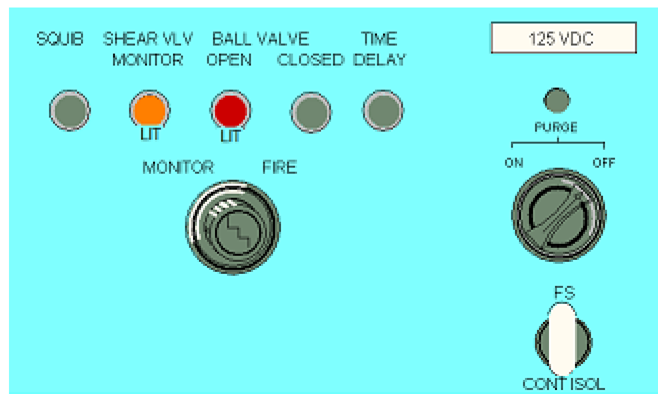
Case 1



Case 2



Case 3



Case 4

A Transversing In-core Probe (TIP) trace was being performed on UNIT ONE TIP Machine #1 when RPV water level LOWERS to -4 inches.

All automatic actions are complete.

Which set of Panel 901-13 indications is expected for the plant conditions?

(LIT indications are labeled as such.)

A. Case 1

B. Case 2

C. Case 3

D. Case 4

Answer: C

Answer Explanation

With a Group II isolation signal present, (0 inches RPV water level), the TIP Drive Machine shifts into reverse and retracts the detector into the shield chamber. The ball valve will attempt to close but rides on the cable until the detector is withdrawn past the ball valve. It will then close completely.

QCAP 0200-10 Attachment M: For a Group II isolation:
- Ball valves close (indicated by CLOSE lights lit)
- Purge vlv SO-0799-3D closes (solenoid valve de-energizes to close, light out

Distractor 1 is incorrect: Plausible because the examinee may determine the Ball Valve closes, but the Purge does not
Distractor 2 is incorrect: Plausible because the examinee may determine there is no change indications
Distractor 3 is incorrect: Plausible because the examinee may determine the Purge closes, but the Ball Valve does not

Reference: QCAP 0200-10, Rev. 49, UFSAR 7.6.1.5.4 Rev. 10
Reference provided during examination: None

Cognitive level: High

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

K/A: 215001 A4.03 Traversing In-Core Probe: Ability to manually operate and/or monitor in the control room: Isolation valves: Mark-I&II(Not-BWR1)

(CFR 41.7 / 45.5 to 45.8)
IMPORTANCE RO 3.0 / SRO 3.1

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments: None

Associated objective(s):

215001.A4.03 Isolation valves: Mark-I&II(Not-BWR1) (RO=3.0 / SRO=3.1)

55 **ID: 1249269** **Points: 1.00**

- A startup is in progress on Unit 1
- Initial SRM count rate was 60 cps
- The reactor is NOT critical
- Turbine Bypass Valves are shut

Under which one of the following conditions is the use of NOTCH OVERRIDE procedurally prohibited (assume count rate given is the HIGHEST)?

A. Withdrawing rods from position 10 to 20 with SRM counts at 180 cps.

B. Withdrawing rods from position 36 to 48 with SRM counts at 450 cps.

C. Withdrawing rods from position 10 to 20 with SRM counts at 800 cps.

D. Withdrawing rods from position 36 to 48 with SRM counts at 1440 cps.

Answer: C

Answer Explanation

Per QCGP 1-1 page 47
To minimize the risk of inadvertent short periods, NOTCH OVERRIDE shall **NOT** be used:
Between positions 06 and 36 from the time the count rate on the SRM with the highest initial reading has doubled 3 times (8 times initial reading) until the
Reactor is critical and at least one Bypass Valve is partially open.

With an initial count rate of 60, notch override is not allowed between 480 cps (8 times 60) until critical. Therefore with count rates above 480 notch override is not allowed.

Distractor 1 is incorrect: Plausible because with count rates below 480 cps notch override is allowed and the notch positions will allow NOTCH OVERRIDE. This distractor has a count rate of 3 times the initial count rate, instead of 3 doublings (8 times the count rate)
Distractor 2 is incorrect: Plausible because with count rates above 480 cps notch override is allowed and the notch positions will allow NOTCH OVERRIDE. This distractor has a count rate of <8 times the initial count rate (3 doublings)
Distractor 3 is incorrect: Plausible because with count rates above 480 notch override is not allowed, but the notch positions will allow NOTCH OVERRIDE. This distractor has a count rate of 24 times (3 doublings times 8) the initial count rate, instead of 3 doublings (8 times the count rate)

Reference: QCGP 1-1 Rev. 104
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): RO
Tier: 3

K/A: 2.1.37 Conduct of Operations 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: N/A

Question Source: Bank
Question History: Exam System ID 1227673

Comments:

Associated objective(s):

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

SR-0002-K04 (Freq: LIC=I)
Given a QCGP procedure and a caution block, EXPLAIN the caution and why it is placed in the procedure where it is.

56	ID: 1227106	Points: 1.00

A Reactor Operator has an active license.

Which of the following describes the MINIMUM watchstanding this operator MUST perform in order to maintain an active license?

(Assume all dates occur within the same calendar year.)

A. Actively perform the functions of their license for seven 8-hour or five 12-hour shifts from April 1 through June 30.

B. Actively perform 40 hours of shift functions in the presence and under the sole direct supervision of an active SRO from April 1 through June 30.

C. Actively perform the functions of their license for seven 8-hour or five 12-hour shifts from May 1 through July 31.

D. Actively perform 40 hours of shift functions in the presence and under the sole direct supervision of an active SRO from May 1 through July 31.

Answer: A

Answer Explanation

Per OP-AA-105-102 4.1.1.
"Maintain an active license by actively performing the functions of RO, SRO, or SROL.
1. RO licenses by performing the duties of the Unit RO and / or Unit Assist RO for a minimum of seven 8 hour or five 12 hour shifts per calendar quarter, including turnover to the next shift. The second Unit Assist RO (fourth RO) can receive watchstanding credit because duties are analogous to the duties of the first Unit Assist RO (third RO -who is required by Technical Specifications) 7 eight hour shifts or 5 Twelve hour shifts per calendar quarter."

Distractor 1 is incorrect: Plausible because the minimum requirements to reactivate a RO license are placed within the context of a calendar quarter.
Distractor 2 is incorrect: Plausible because the watchstanding durations are correct, but the time limit to complete the watchstanding is incorrect.
Distractor 3 is incorrect: Plausible because the distractor states the minimum requirements to reactivate a RO license and the time limit to complete the watchstanding is incorrect

Reference: OP-AA-105-102, Rev. 11
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): RO
Tier: 3

K/A: 2.1 CONDUCT OF OPERATIONS 2.1.4 Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, “no-solo” operation, maintenance of active license status, 10CFR55, etc.

(CFR: 41.10 / 43.2)
IMPORTANCE RO 3.3 / SRO 3.8

SRO Justification: N/A

Question Source: Bank
Question History:

Associated objective(s):

SRL-OPS-K6 (Freq: LIC=I NF=I) DESCRIBE the requirements to maintain an Active License per OP-AA-105-101 and OP-AA-105-102.

2.1.04 Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, “no-solo” operation, maintenance of active license status, 10CFR55, etc. (RO = 3.3 / SRO = 3.8)

57 **ID: 1249568** **Points: 1.00**

Unit 2 is at 75% power when RPS "A" loses power.

Which ONE of the following annunciators will be alarming?

A. 902-4 G-19, ATWS, ECCS, FW, TURB DIV I TRIP SYS PANEL TROUBLE

B. 902-5 B-16, CHANNEL B MAIN STM LINE HI HI RADIATION

C. 902-54 D-6, OG TO STACK VALVE 5407 CLOSED

D. 902-5 A-7, RBM HIGH OR INOP

Answer: D

Answer Explanation

The RBM is part of the Power Range Monitoring system. The Power Range Monitoring cabinets 902-37 panel contain the APRMs, OPRMs, and RBMs. The power supply to these cabinets is RPS A and RPS B. On a loss of power, the Nuclear Instrumentation is designed to fail safe, so the protective functions actuate. This can also be seen on 4E-1473AD.

Distractor 1 is incorrect: Plausible because Instrument Bus and 125 VDC 1B-1 are the power supplies to the ATWS panels. The multiple power supplies make this a plausible choice for a loss of RPS.
Distractor 2 is incorrect: Plausible because Essential Service is the power supply to the B and D MSL Rad Monitors (see 4E-1487 rev. AF) and RPS A is the power supply to the A and C MSL Rad Monitors.
Distractor 3 is incorrect: Plausible because RPS A powers the A SJAE Rad Monitor and other Process Rad Monitors. The OG to Stack 5407 is powered from the ESS bus.

Reference: QOA 7000-01, Rev. 37
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 215002 K6.03 Knowledge of the effect that a loss or malfunction of the following will have on the ROD BLOCK MONITOR SYSTEM Essential power: Plant-Specific

(CFR: 41.7 / 45.7)
IMPORTANCE RO 2.5 / SRO 2.5

SRO Justification: N/A

Question Source: New
Question History: N/A
Comments: None

Associated objective(s):

SR-0705-K06 (Freq: LIC=I)
Given an Rod Block Monitor System annunciator tile inscription, DESCRIBE the condition causing the alarm and any automatic actions which occur when the alarm actuates. EXPLAIN the consequences of the condition if not corrected.

215002.K6.03 Essential power: Plant-Specific (RO=2.5 / SRO=2.5)

58 **ID: 1245273** **Points: 1.00**

Near the end of a Refueling Outage, Operations will conduct the Class 1 Ten Year systems leakage test, required by the ISI program, per QCOS 0201-08, "REACTOR VESSEL CLASS 1 AND ASSOCIATED CLASS 2 SYSTEM LEAK TEST."

Which ONE of the following briefing levels is the MINIMUM required per HU-AA-1211, PRE JOB BRIEFINGS?

A. Standard Pre-Job briefing.

B. Infrequent Plant Activity (IPA) briefing.

C. Tailored Pre-Job briefing.

D. Heightened Level of Awareness (HLA) briefing.

Answer: B

Answer Explanation

Per HU-AA-1211:

Infrequent Plant Activity (IPA) briefings are required for, but not limited to, the following activities:

Evolutions placing the plant in an unusual configuration requiring complex coordination and/or sequencing, or involving complicated sequencing of activities that have potentially significant regulatory political or financial impact.

Examples include:
Rx (RPV) Pressure Test

Distractor 1 is incorrect: Plausible because this is one of the types of briefings before an evolution.
Distractor 2 is incorrect: Plausible because this is one of the types of briefings before an evolution.
Distractor 3 is incorrect: Plausible because this is one of the types of briefings before an evolution.

Reference: HU-AA-1211 rev.11, QCOS 0201-08 rev. 62
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): RO
Tier: 3

K/A: 2.2 07 EQUIPMENT CONTROL Knowledge of the process for conducting special or infrequent tests.

(CFR: 41.10/43.3/45.13)
IMPORTANCE RO 2.9 / SRO 3.6

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

2.2.07 Knowledge of the process for conducting special or infrequent tests. (RO=2.9 / SRO=3.6)

SRN-PGB-K1 (Freq: LIC=I N=I)
From memory, STATE the purpose of the following briefings including when they are used in accordance with HU-AA-1211:
a. Pre-Job
b. Heightened Level of Awareness (HLA)
c. Infrequent Plant Activity (IPA)
d. Post-job

59	ID: 1245315	Points: 1.00

Given:

- Unit 2 is at rated power.
- Drywell temperature sensor 2-5741-43A has failed.
- All other temperature sensors in the same area are reading correctly.

The failed sensor feeds Point 8 on recorder 2-2340-9, DRYWELL TEMPERATURE RECORDER at the 902-3 panel and also inputs to Annunciator 902-3 H-4, DRYWELL HIGH AIR TEMPERATURE.

Which of the following methods is used to track and identify the inoperable alarm point?

A. Affix a TCC Tag to the defective indicator per CC-AA-112, Temporary Configuration Changes.

B. Install a temporary label on the defective indicator per OP-AA-116-101, Equipment Labeling.

C. Post an Information Tag adjacent to the defective indicator per OP-AA-109-101, Clearance and Tagging.

D. Place an Equipment Deficiency Tag adjacent to the defective indicator per OP-AA-108-105, Equipment Identification and Documentation.

Answer: D

Answer Explanation

The failed temperature indicator is an example of a Main Control Room Deficiency from attachment 5 of OP-AA-108-105. An Equipment Deficiency Tag is generated and placed adjacent to the defective indicator per OP-AA-108-105-1001.

Distractor 1 is incorrect: Plausible because CC-AA-112 would be used if the alarm were disabled by the operator or if a temporary modification were to be put in place to monitor the indication.

Distractor 2 is incorrect: Plausible because a temporary label would only be used if the equipment was new and didn't yet have a label or the label was changed or damaged.

Distractor 3 is incorrect: Plausible because 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.

Reference: OP-AA-108-105 rev 11, OP-AA-108-105-1001 rev 5, QCAN 902-3 H-4 rev 5
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): RO
Tier: 3

K/A: 2.2.43 2.2 EQUIPMENT CONTROL Knowledge of the process used to track inoperable alarms.

(CFR: 41.10/43.5/45.13)
IMPORTANCE RO 3.0 / SRO 3.3

Question Source: Bank
Question History: Quad Cities 2012 ILT NRC Exam

Comments: None

Associated objective(s):

SR-CROP-K04 (Freq: LIC=B)
DESCRIBE how the following station operating practices and behaviors contribute to team effectiveness and help prevent events from occurring.
a. Communications
b. Self Check
c. Procedure Adherence
d. A Questioning Attitude
e. Self Assessment
f. Conservatism in Operating Decision Making
g. Heightened Level of Awarenes (HLA) briefings

2.2.43 Knowledge of the process used to track inoperable alarms. (RO=3.0 / SRO=3.3)

60	ID: 1245326	Points: 1.00

Unit 2 was at full power when a major transient occurred.

Unit 2 now has the following conditions:

- All control rods are in
- RPV water level is -5" and lowering slowly
- RPV pressure is 835 psig and lowering slowly

- Drywell pressure is 2.2 psig and rising slowly
- Drywell Temperature is 160°F and rising slowly

- Torus Pressure is 1.7 psig and rising slowly
- Torus Level is +0.5" and steady
- Torus Temperature is 90°F and rising slowly

- RCIC room temperature alarming at 155°F and rising slowly
- HPCI room temperature alarming at 150°F and rising slowly

- Off site Release is at the Unusual Event (UE) level and steady

Which ONE of the following sets of QGAs are currently in use?

A. QGA 100 and QGA 200 ONLY

B. QGA 100 and QGA 300 ONLY

C. QGA 200 and QGA 400 ONLY

D. QGA 300 and QGA 400 ONLY

Answer: B

Answer Explanation

QGA 100 is entered due to entry condition of below 0" RPV water level and as directed by QGA 300.
QGA 300 is entered due to entry condition of high area temperature.

Distractor 1 is incorrect: Plausible because QGA 100 entry conditions are met and QGA 200 entry condition are not met, but are trending to an entry condition.
Distractor 2 is incorrect: Plausible because QGA 200 entry condition are not met, but are trending to an entry condition and QGA 400 entry condition is an ALERT vice an UE.
Distractor 3 is incorrect: Plausible because QGA 300 entry condition are met and QGA 400 entry condition is an ALERT vice an UE.

Reference: QCAP 200-10 rev. 49, QGA 100, Rev. 10, QGA 300 Rev.13
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): RO
Tier: 3

K/A: 2.4.01 EMERGENCY PROCEDURES / PLAN Knowledge of EOP entry conditions and immediate action steps.

(CFR: 41.10/43.5/45.13)
IMPORTANCE RO 4.6 / SRO 4.8

SRO Justification: N/A

Question Source: Bank
Question History: Exam bank system ID 1228524

Comments:

Associated objective(s):

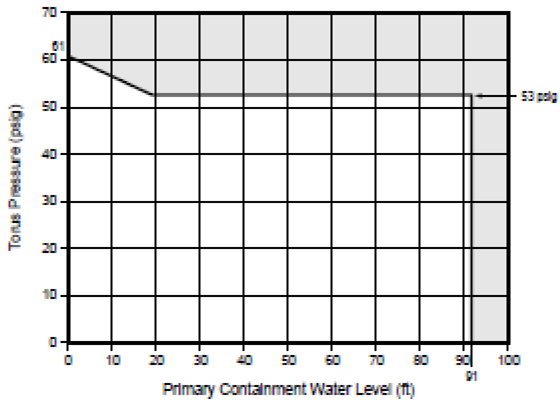
SR-0001-K27 (Freq: LIC=B)
STATE the entry conditions to QGA 300, 'Secondary Containment Control'.

2.4.01 Knowledge of EOP entry conditions and immediate action steps. (RO=4.6 / SRO=4.8)

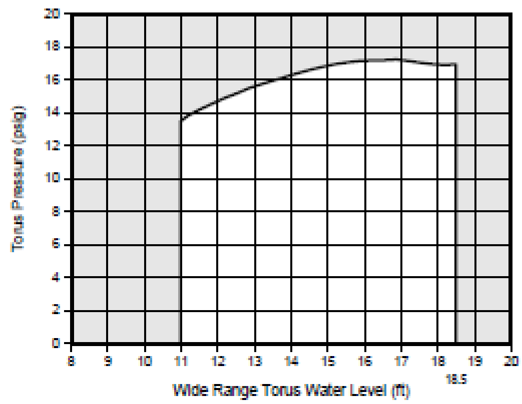
SR-0001-K15 (Freq: LIC=B)
STATE the entry conditions to QGA 100, 'RPV Control'.

61	ID: 1245327	Points: 1.00

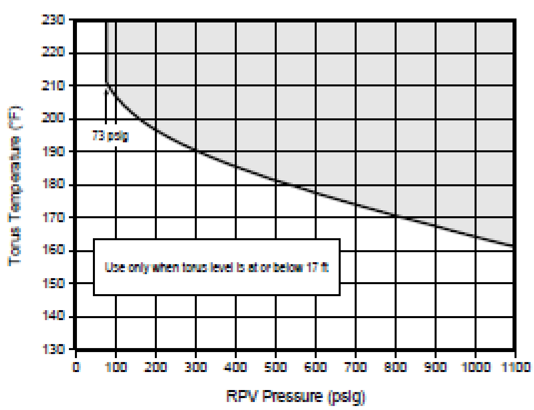
D Primary Containment Pressure Limit



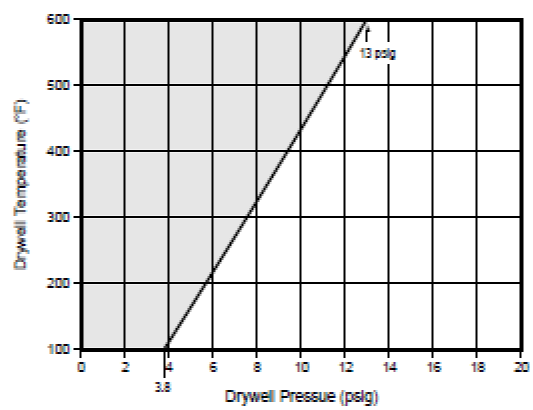
L Pressure Suppression Pressure



M Heat Capacity Temperature Limit



K Drywell Spray Initiation Limit



(See preceding page.)

A small steamline break inside the Drywell has occurred on Unit 2.
The crew is taking actions per QGA 100 and QGA 200.

Plant conditions are as follows:

RPV pressure:	800 psig and lowering at 5.0 psig per minute
RPV water level:	+30 inches and stable
Drywell pressure:	8 psig and rising at 0.5 psig per minute
Torus pressure:	6 psig and rising at 0.5 psig per minute
Drywell temperature:	183°F and rising at 2.0°F per minute
Torus temperature:	83°F and rising at 1.0°F per minute
Torus level:	14 ft and steady

The ANSO has reported that Drywell sprays CANNOT be started on either loop.

If the containment parameters continue to trend as indicated above, which of the following limits will be reached FIRST?

A. Primary Containment Pressure Limit (PCPL)

B. Pressure Suppression Pressure (PSP)

C. Heat Capacity Temperature Limit (HCTL)

D. Drywell Spray Initiation Limit (DSIL)

Answer: B

Answer Explanation

Per the QGA 200 Details, the containment pressure and temperature limits are as follows:

PSP will be exceeded at 16 psig Torus pressure in about 20 minutes.
PCPL is exceeded at 55 psig Torus pressure.
The HCTL is 170°F at 800 psig RPV pressure and increases to approximately. 205°F at 100 psig RPV pressure.
The DSIL is exceeded at 320°F at 8 psig.

Distractor 1 is incorrect: Plausible because Torus pressure is rising, however, the PSP is always reached before the PCPL.
Distractor 2 is incorrect: Plausible because Torus temperature is rising, however, with adequate core cooling, (RPV water level 30 in. and stable), and Torus Cooling available, Torus water temperature will not exceed the HCTL. Even without cooling, the HCTL will not be reached for 87 minutes.
Distractor 3 is incorrect: Plausible because Drywell temperature and pressure are rising and will continue to do so with the steam leak. However, the PSP will be reached first under these conditions.

Reference: QGA 200 Rev. 10
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): RO

Tier: 2 Group: 2

K/A: 226001 K3.03 Knowledge of the effect that a loss or malfunction of the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE will have on following: Containment/drywell/suppression chamber components, continued operation with elevated pressure and/or temperature and/or level

(CFR: 41.7 / 45.4)
IMPORTANCE RO 2.9 / SRO 3.2

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments: None

Associated objective(s):

SR-0001-K09 (Freq: LIC=B)
DESCRIBE the purpose of the following QGA curves/tables:

a. QGA Detail A, RPV Water Level Instruments
   1. Figure B, RPV Saturation Curve
   2. Table C, RPV Level Instrument Criteria
b. QGA Figure D, Primary Containment Pressure Limit
c. QGA Detail E, Alternate Injection Systems
d. QGA Detail F, Injection Subsystems
e. QGA Detail G, Preferred ATWS Systems
f. QGA Detail H, Alternate ATWS Systems
g. QGA Table J, Minimum Steam Cooling Pressure
h. QGA Figure K, Drywell Spray Initiation Limit
i. QGA Figure L, Pressure Suppression Pressure
j. QGA Figure M, Heat Capacity Limit
k. QGA Detail O, Emergency Depressurization Systems
l. QGA Detail P, RPV Injection Sources
m. QGA Detail Q, Alternate Flooding Systems
n. QGA Table S, Reactor Building Area Temperatures
o. QGA Table T, Reactor Building Area Radiation Levels
p. QGA Table U, Reactor Building Area Water Levels
q. QCAP 0200-10 Attachments S,T,U,V and W, RHR and CS NPSH Curves
r. QCAP 0200-10 Attachment X, HPCI NPSH Curves
s. QCAP 0200-10 Attachment Y, RCIC NPSH Curves
t. QCAP 0200-10 Attachment Z, ECCS Vortex Limit
u. Cold Shutdown Boron
v. Hot Shutdown Boron
w. Maximum Subcritical Banked Withdrawal Position
x. Minimum Number Of SRVs Required For Emergency Depressurization
y. Minimum Number Of ADS Valves For Decay Heat Removal
z. Decay Heat Removal Pressure
aa. Minimum Steam Cooling RPV Water Level
ab. Minimum Zero-Injection RPV Water Level

226001.K3.03 Containment/drywell/suppression chamber components, continued operation with elevated pressure and/or temperature and/or level (RO=2.9 / SRO=3.2)

62 **ID: 1245371** **Points: 1.00**

Transient conditions exist.
Several annunciators are lit.
Events are in progess requiring operator actions.
Several procedures are in use.

The ________ procedures take precedence because they are designed to be executed based upon plant parameters (symptoms) rather than being designed to direct operator actions based upon a specific plant transient condition.

A. QGA

B. QCOA

C. QCOP

D. QCAN

Answer: A

Answer Explanation

The K/A is the knowledge of the bases for prioritizing emergency procedure implementation during emergency operations. The question requires the examinee to recognize the QGA basis as the reason for prioritizing QGAs over other procedures. The correct answer is directly from QCAP 0200-10, "EMERGENCY OPERATING PROCEDURE (QGA) EXECUTION STANDARDS

Distractor 1 is incorrect: Plausible because QCOA direct operator actions for transients and casualties. However, they are event based procedures.
Distractor 2 is incorrect: Plausible because QCOP direct general plant actions and they can supplement QGAs. However, they do not deal with transients and casualties.
Distractor 3 is incorrect: Plausible because QCOA direct operator actions for transients and casualties. However, they are event based procedures.

Reference: QCAP 0200-10 rev. 49
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): RO
Tier: 3

K/A: 2.4.23 EMERGENCY PROCEDURES / PLAN: Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.

(CFR: 41.10/43.5/45.13)
IMPORTANCE RO 3.4 / SRO 4.4

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

2.4.23 Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations. (RO=3.4 / SRO=4.4)

SRNLF-PR-K01 (Freq: LIC=I NF=I) DESCRIBE the Exelon Nuclear procedure hierarchy including the relationship between:

a. Policies, Programs, Processes, and Tools
b. Station Procedures
   1. Administrative Procedures
   2. Operating Procedures
   3. Surveillance Procedures
   4. Annunciator Procedures
   5. Emergency Operating Procedures
   6. Safe Shutdown Procedures (as applicable)
   7. General Procedures
   8. Operating Abnormal Procedures
   9. Maintenance Procedures
   10. Technical Procedures

63	ID: 1245387	Points: 1.00

Complete the statement below concerning QGA 300, SECONDARY CONTAINMENT CONTROL.

The __(1)__ Fuel pool temperature entry condition is based on __(2)__.

A. (1) 125°F
(2) an increase in airborne radioactivity due to release of Krypton-85

B. (1) 125°F
(2) an eventual loss of inventory

C. (1) 145°F
(2) an eventual loss of inventory

D. (1) 145°F
(2) an increase in airborne radioactivity due to release of Krypton-85

Answer: B

Answer Explanation

Per EOP Lesson Plan L-QGA300, the bases for the 125°F Fuel pool temperature entry condition is:

- Failure to monitor SFP temp and level within normal operating bands may limit access to plant areas (secondary containment) due to high radiation.
- Spent fuel pool water temperature is of concern because high temperatures may eventually result in loss of inventory. A high temperature alone would not directly restrict access. It is thus a low water level condition that is of primary concern.

Per EPG/SAG Rev. 3:
"Spent fuel pool temperature above the high temperature alarm setpoint is indicative of a loss of spent fuel pool cooling. Continued heatup of the spent fuel pool may result in release of volatile fission products, increased secondary containment humidity, and eventual loss of spent fuel pool inventory due to boiling."

Distractor 1 is incorrect: Plausible because 125°F is the entry condition. However, the release of Kr-85 is stated in QCFHP 110-04, "New/Irradiated Fuel Damage", which makes it a plausible choice

Distractor 2 is incorrect: Plausible because at 145°F, loss of inventory is a concern, however the entry condition is 125°F.

Distractor 3 is incorrect: .Plausible because 145°F is the water temperature at which iodine will volatilize and become airborne (QCOA 1900-02), making it a familiar number to examinees. However, the release of Kr-85 is stated in QCFHP 110-04, "New/Irradiated Fuel Damage", which makes it a plausible choice.

Reference: BWROG EPG/SAG Rev. 3, L-QGA300, Rev.9, QCOA 1900-02, Rev. 9, QCFHP-0110-04 Rev. 4
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 233000 G2.4.18 Knowledge of the specific bases for EOPs

(CFR: 41.10 / 43.1 / 45.13)
IMPORTANCE RO 3.3 / SRO 4.0

SRO Justification: N/A

Question Source: New
Question History: N/A

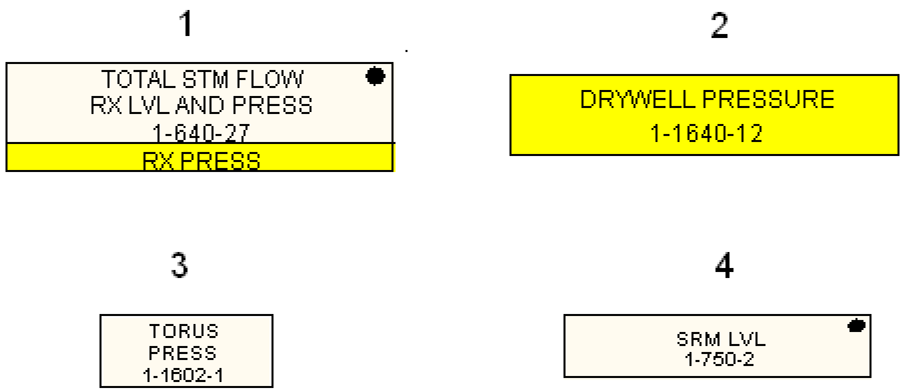
Comments: None

Associated objective(s):

233000.2.4.18 Knowledge of the specific bases for EOPs. RO 3.3 SRO 4.0

SR-0001-K28 (Freq: LIC=B)
Given QGA 300, 'Secondary Containment Control', EXPLAIN the reasons for the limits, cautions, and notes.

64 | **ID: 1245413** | **Points: 1.00**



Which of the instruments above are Post Accident Monitors (PAM)?

A. 1 and 2 only

B. 1 and 4 only

C. 2 and 3 only

D. 3 and 4 only

Answer: B

Answer Explanation

From QAP 300-17, "Regulatory Guide 1.97 instrumentation should be identified by a 1/4" diameter black dot." In this question, choices 1 and 4 are PAM instruments and have a 1/4" black dot affixed. Choice 1 shows PAM labeling and QGA labeling. Choice 2 shows Drywell pressure used in QGA execution. Choice 3 is a common parameter used in QGA execution.

Distractor 1 is incorrect: Plausible because choice 1 is correct. However, choice 2 shows temperature points used for TS surveillances and QGAs.
Distractor 2 is incorrect: Plausible because choice 2 shows temperature points used for TS surveillances and QGAs and choice 3 is a common parameter used in EOP execution.
Distractor 3 is incorrect: Plausible because choice 3 is a common parameter used in QGA execution.and choice 4 is correct.

Reference: QAP 0300-17 rev. 21, QCOS 1600-05 Rev. 19
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): RO
Tier: 3

K/A: 2.4.03 EMERGENCY PROCEDURES / PLAN: Ability to identify post-accident instrumentation.

(CFR: 41.6/45.4)
IMPORTANCE RO 3.7 / SRO 3.9

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

2.4.03 Ability to identify post-accident instrumentation. (RO=3.7 / SRO=3.9)

SR-0263-K29 (Freq: LIC=I)
(Freq: LIC=I) Given Post Accident Monitoring (PAM) key parameter indications and various plant conditions, DETERMINE, from memory, if the RPV Instrumentation System Tech Spec LCOs have been met.

65	ID: 1245464	Points: 1.00

Unit 2 was operating at rated power when a manual scram was inserted.

Per QCGP 2-3, the NSO is to verify the Main Turbine trips ___(1)___, and if NOT ___(2)__.

A. (1) 30 seconds after the Generator reaches 0 MWe
(2) close the MSIVs

B. (1) 30 seconds after the Generator reaches 0 MWe
(2) trip the Turbine from the 902-7 panel

C. (1) 30 seconds after the reactor scram
(2) close the MSIVs

D. (1) 30 seconds after the reactor scram
(2) trip the Turbine from the 902-7 panel

Answer: B

Answer Explanation

Per QCGP 2-3:
IF Main Turbine is NOT to be maintained on line as the heat sink during an ATWS event, AND after 30 seconds from the time Main Generator output reaches zero MWe, THEN verify Main Generator trips AND 345 KV circuit breakers open on Panel 901(2)-8.

(1) IF Main Turbine did NOT trip, THEN trip Main Turbine by simultaneously depressing both trip pushbuttons.

Distractor 1 is incorrect: Plausible because QOA 5600-04, gives guidance on taking the Turbine-Generator off-line when power is >38.5% and the Main Turbine has failed to process a trip signal. In this instance, a scram is inserted and the MSIVs are closed prior to tripping the Main Generator. This sequence would prevent a possible turbine overspeed from occurring by separating from the grid with the Main Turbine Stop valves open.
Distractor 2 is incorrect: Plausible if the 30 seconds is assumed to be after the reactor is scrammed. The second part is plausible for the same reason as Distractor 1.
Distractor 3 is incorrect: Plausible if the 30 seconds is assumed to be after the reactor is scrammed. The second part is plausible because the direction on how to trip the turbine is correct.

Reference: QCGP 2-3 Rev.84, QOA 5600-04 Rev. 29
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 245000 A2.04 Ability to (a) predict the impacts of the following on the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Reactor scram

(CFR: 41.5 / 45.6)
IMPORTANCE RO 3.7 / SRO 3.8

SRO Justification: N/A

Question Source: New
Question History:

Comments: None

Associated objective(s):

SR-5600-K21 (Freq: LIC=B)
Given a Main Turbine and Auxiliary Systems operating mode and various plant conditions, PREDICT how system/plant parameters will respond to manipulation of the following Main Turbine and Auxiliary Systems local/remote controls:

a. Main turbine recorder controls
b. Turning gear manual bypass keylock switch
c. Turning gear and piggy-back motor switches
d. Shaft sealing system
   (1) Pressure regulator
   (2) Feed valve and bypass valve control switches
   (3) Unloading valve and bypass valve control switches
   (4) Gland exhaust condenser LCV
   (5) Gland steam exhauster and discharge valve control switches
e. Hood spray regulating valve bypass valve control switch
f. Turbine oil system
   (1) Filter pump control switches
   (2) Vapor extractor control switch
   (3) Oil cooler TCV setpoint adjust (TIC 1(2)-3941)
   (4) Lift pump control switches
   (5) Lift pump oil pressure interlock test pushbuttons (XA 5620)
   (6) MSP / TGOP / EBOP control switches
   (7) MSP / TGOP / EBOP test pushbuttons

245000.A2.04 Reactor scram (RO=3.7 / SRO=3.8)

66	ID: 1245510	Points: 1.00

Which ONE of the following systems monitors the release of fission products from the fuel and upon an indication of a gross release, initiates automatic actions to limit the offsite and control room doses in the event of a Control Rod Drop Accident?

A. Main Chimney Gas Monitoring

B. Off-Gas Flux Tilt Radiation Monitors (FTRM)

C. Main Steam Line (MSL) Radiation (Rad) Monitors

D. Off-Gas Charcoal Bed Outlet Radiation Monitoring

Answer: C

Answer Explanation

Per the UFSAR:

11.5.2.6 Main Steam Line Monitoring Subsystem
To guard against the significant release of fission products from the fuel to the reactor coolant and subsequently to the turbine, the main steam lines are continuously monitored for gross gamma activity immediately downstream of the primary containment outer isolation valves in these lines. Functions of the main steam line radiation monitoring subsystem are to provide immediate indication of gross radiation in the lines and to initiate automatic action to contain the radiation, or limit the release of radioactivity. [11.5-31]

Distractor 1 is incorrect: Plausible because the Main Chimney Gas Monitoring provides indication when the limits for the release of radioactive material to the environs are approached and provide alarms. There are no protective functions provided by this system.
Distractor 2 is incorrect: Plausible because the FTRM is used following control rod movement to detect a change in the observed radiation level. The FTRM can be used to determine the approximate location of a leaky fuel element.
Distractor 3 is incorrect: Plausible because because the Off Gas Bed Outlet Radiation Monitoring records and alarms the Off-Gas charcoal adsorber outlet for radiation.

Reference: LIC-1701 Rev. 2 UFSAR 11.5.2.6
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): RO
Tier: 3

K/A: 2.3.15 Radiation Control: Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.

(CFR: 41.2/43.4/45.9)
IMPORTANCE (RO=2.9 /SRO=3.1)

SRO Justification: N/A

Question Source: New

Question History: N/A

Comments:

Associated objective(s):

SR-1701-K01 (Freq: LIC=B)
STATE the purpose(s) of the following Process Radiation Monitoring System including applicable design bases.

a. Main Steam Line Radiation Monitors
b. SJAE Monitors (Off-Gas Log Scale)
c. Off-Gas Flux Tilt Monitor (Off-Gas Linear Scale)
d. Off-Gas Filter Building Process Monitors (Charcoal bed)
e. Process Liquid Radiation Monitor System
   (1) Service water
   (2) RBCCW
   (3) Radwaste effluent
f. Reactor Building Vent / Fuel Pool Radiation Monitors

2.3.15 Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. (RO=2.9 /SRO=3.1)

67	ID: 1245527	Points: 1.00

Which of the following statements correctly identifies an activity that would allow Independent Verification to be WAIVED?

During a Return to Service, an operator will be removing a Danger Tag from the ____________ and repositioning the component to the specified line up.

A. 1-1101-4 (SBLC TK OUTLET VLV) with the plant in Mode 3

B. 1-3599-50 (1B3 HTR NORM LCV INLET VLV) with the plant in Mode 1

C. 1-1002A RHR PUMP 1A BKR (BUS 13-1 CUBICLE 9) with the plant in Mode 3

D. MO 1-3703 BKR (U1 RBCCW OUTBOARD RETURN VLV) with the plant in Mode 1

Answer: B

Answer Explanation

The Shift Manager may WAIVE verification requirements for ALARA concerns. This valve is not safety related and is located in the Low Pressure Heater Bay. This room is a locked high radiation area and radiation levels would be high at rated conditions.

Distractor 1 is incorrect: Plausible because Independent Verification (IV) shall be performed when removing danger tags from equipment governed by tech specs. SBLC is required to be operable per tech specs in Mode 3.
Distractor 2 is incorrect: Plausible because IV shall be performed when removing danger tags from equipment governed by tech specs. RHR is required to be operable per tech specs in Mode 3.
Distractor 3 is incorrect: Plausible because IV shall be performed when removing danger tags from safety related equipment. The MO 1-3703 valve is a primary containment isolation valve and is safety related equipment.

Reference: HU-AA-101 rev 9
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): RO
Tier: 3

K/A: 2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

(CFR: 41.2/43.4/45.10)
IMPORTANCE RO 3.2 / SRO 3.7

SRO Justification: N/A

Question Source: Bank Modified from Monticello 2009 ILT NRC Exam
Question History: Quad Cities 2012 ILT NRC Exam

Comments: None

Associated objective(s):

2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (RO=3.2 / SRO=3.7)

SRN-PGH-K3 (Freq: LIC=B N=B)
From memory, DESCRIBE the following Human Performance Tools and Verification Practices in accordance with HU-AA-101 and OP-AA-104-101:

a. Self Check (STAR)
b. Outside Procedures, Parameters, or Processes (OOPS)
c. Peer Check
d. Independent Verification
e. Concurrent Verification
f. Alternate Verification Techniques
f. 3 Way Communication
g. First Check
h. Flagging/Robust Operational Barriers
i. Two Minute Drill

68	ID: 1245528	Points: 1.00

Which ONE of the following types of procedure revisions is utilized to make a non-permanent change that contains a change of intent?

A. Interim

B. Temporary

C. Standard

D. Batch

Answer: A

Answer Explanation

Per AD-AA-101, rev. 27 "Interim Change: A non-permanent document change that contains a change of intent"

Distractor 1 is incorrect: Plausible because this type of change is a non-permanent procedure change that does not contain a change of intent
Distractor 2 is incorrect: Plausible because this is a type of procedure. However, is Standard Procedure is defined as: A procedure that is or may be used at more than one site.
Distractor 3 is incorrect: Plausible because this is a type of procedure revision. However, a Batch Revision is defined as: Document revisions performed on multiple documents to add/revise/remove/cancel for similar requirements (such as to add or change a reference, add or change a precaution/limitation and action, etc.)

Reference: AD-AA-101, rev. 27
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): RO
Tier: 3

K/A: 2.2.06 EQUIPMENT CONTROL: Knowledge of the process for making changes to procedures.

(CFR: 41.10/43.3/45.13)
IMPORTANCE RO 3.0 / SRO 3.6

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

2.2.06 Knowledge of the process for making changes to procedures. (RO=3.0 / SRO=3.6)

SRNLF-PR-K04 (Freq: LIC=I NF=I) STATE the purpose of the following procedures:
a. HU-AA-104-101, Procedure Use and Adherence
b. OP-AA-108-101, Control of Equipment and System Status
c. AD-AA-101, Processing of Procedures and T&RMs

69 **ID: 1245529** **Points: 1.00**

Given:

- Unit-2 is in a Refueling outage
- A fire was reported at the U-2 trackway and the fire has spread to the Bus 21 and Bus 22 area of the Turbine Building
- The 1/2A Fire Diesel autostarted and has been operating for several hours
- An Equipment Operator (EO) is monitoring 1/2A Fire Diesel operation

Upon receiving a report of the 1/2A Fire Diesel Day Tank low level alarm from the EO, the Unit Supervisor has dispatched personnel to fill the Day Tank from the Unit 1 EDG Fuel Oil Storage Tank.

Several minutes later, the EO reports the Unit 1 Diesel Fuel Oil Transfer Pump (FOTP) failed to develop sufficient discharge pressure.

Which of the methods below can be used to fill the Day Tank?

A. Unit 2 EDG Storage Tank

B. SBO Diesel Storage Tank

C. 1/2 EDG Storage Tank

D. Diesel Fire Pump Day Tank Cross-Tie valves

Answer: D

Answer Explanation

Per QCOP 4100-16, Manually Filling the Diesel Fire Pump Day Tank, provides direction on all the different methods for filling the Day Tank. The preferred method is to use the manual fill station located outside of the Crib House. The backup method is to use the Unit-1 or Unit-2 EDG Storage Tanks via the Unit DFOTPs. Finally, during emergencies only, and when only one Fire Diesel is operating, the Fire Diesel Day Tanks may be cross-tied. The question stem describes this circumstance.

Distractor 1 is incorrect: Plausible because it is one of the methods contained in QCOP 4100-16 but it is NOT accessible due to the location of the fire as described in the question stem.
Distractor 2 is incorrect: Plausible because it is a diesel fuel oil storage tank with sufficient capacity, but there is no physical connection to provide for the transfer.
Distractor 3 is incorrect: Plausible for the same reasons as above.

Reference: QCOP 4100-16, Rev.18
Reference provided during examination: None

Cognitive level: High

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

K/A: 286000 K6.04 Knowledge of the effect that a loss or malfunction of the following will have on the FIRE PROTECTION SYSTEM: Diesel fuel transfer system: Plant-Specific

(CFR: 41.7 / 45.7)
IMPORTANCE RO 2.8 / SRO 3.0

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments: None

Associated objective(s):

286000.K6.04 Diesel fuel transfer system: Plant-Specific (RO=2.8 / SRO=3.0)

SRN-4100-K26 (Freq: LIC=B N=B)
EVALUATE given key Fire Protection Systems parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):

a. Loss of diesel fire pump
b. Automatic fire valve opens
c. Loss of EDG fuel oil transfer pump
d. CO2 fire protection system initiation from false signal (will not reset)
e. CARDOX tank low pressure

70 **ID: 1243509** **Points: 1.00**

Given:

· Unit 1 is at 100% power
· 1C Reactor Feed Pump (RFP) trips on overcurrent

Following the trip of the RFP, the Reactor Recirculation system will lower pump speed to prevent a...

A. reactor scram on low water level.

B. riser brace failure.

C. jet pump hold down beam failure.

D. RFP runout condition.

Answer: A

Answer Explanation

The runback to a speed equivalent to 70% rated core flow is designed to prevent a reactor scram on low level in the event of a RFP or Condensate pump trip at higher powers. Higher power is defined as > 85% steam flow and 90% feed flow.

Distractor 1 is incorrect: Single loop operations at a pump speed above 78% could lead to riser brace failure. The examinees are familiar with the need to lower recirc pump speeds when in single loop.
Distractor 2 is incorrect: Jet pump hold down beam failure was an actual event at QCGS. The examinees are trained on this OPEX. However, the jet pump hold down beam failure is not tied to a certain pump speed.
Distractor 3 is incorrect: The FWLC system takes automatic action to prevent RFP runout. This is not a function of the RRCS. However, this is plausible as lowering recirc pump speed does lower reactor power and thereby the feedflow demand.

Reference: QCOA 3200-01 rev.22
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295009.AK3.01 Knowledge of the reasons for the following responses as they apply to LOW REACTOR WATER LEVEL: Recirculation pump run back: Plant-Specific

(CFR: 41.5/45.6)
IMPORTANCE RO 3.2 / SRO 3.3

SRO Justification: N/A

Question Source: Bank
Question History: ILT 12-1 Comp

Comments:

Associated objective(s):

295009.AK3.01 Recirculation pump run back: Plant-Specific (RO=3.2 / SRO=3.3)

SR-0202-K13 (Freq: LIC=I) DESCRIBE the following Reactor Recirculation System interlocks, including purpose and setpoints.

a. Anti-Cavitation Limiter / NPSH Interlocks
b. Start logic
c. Feedwater 70% Runback
d. Speed Hold
e. Master/Manual Mode Interlocks
e. Recirc pump DP / LPCI loop select
f. Jet pump riser DP / LPCI loop select
g. 10% Manual Runback

71 **ID: 1235797** **Points: 1.00**

A storm front is approaching causing atmospheric pressure to drop.

How will this be indicated in the Control Room and what is the expected system response?

RX BLDG TO ATMOS DP as read on 1-5740-22 becomes ___(1)___ and Reactor Building Exhaust Fan Vortex dampers will ___(2)___ further.

A. (1) less negative
(2) open

B. (1) less negative
(2) close

C. (1) more negative
(2) open

D. (1) more negative
(2) close

Answer: A

Answer Explanation

Since the Reactor building is normally less than atmospheric pressure, the D/P control system will sense a lower D/P and compensate by opening the exhaust fan vortex dampers.

Distractor 1 is incorrect: Plausible because the first part is correct and it is incorrectly determined that flow is modulated by the supply fans.
Distractor 2 is incorrect: Plausible if it is assumed that the Reactor Building is operated at a higher pressure than atmosphere.
Distractor 3 is incorrect: Plausible if it is assumed that the Reactor Building is operated at a higher pressure than atmosphere and flow is modulated by the supply fans.

Reference: Ref: LN-5750 pg. 12 Rev. 8, QCOP 5750-02 rev 26
Reference provided during examination: None

Cognitive level: High
Level (RO/SRO): RO
Tier: 2 Group: 2

K/A: 288000 K5.02 Knowledge of the operational implications of the following concepts as they apply to PLANT VENTILATION SYSTEMS Differential pressure control.

(CFR: 41.7 / 45.4)
IMPORTANCE RO 3.2 / SRO 3.4

SRO Justification: N/A

Question Source: Bank
Question History: 2002 NRC Exam

Comments: None

Associated objective(s):

SR-5750-K20 (Freq: LIC=B) Given a Plant Ventilation Systems operating mode and various plant conditions, EVALUATE the following Plant Ventilation Sstems indications/responses and DETERMINE if the indication/ response is expected and normal.

a. Reactor building ventilation
   (1) Differential pressures
   (2) Damper positions
   (3) Building supply/exhaust fan status and amperage
   (4) Supply, exhaust and outside air temperatures
b. Turbine building ventilation
   (1) Differential pressures
   (2) Damper positions
   (3) Building supply/exhaust fan status and amperage
   (4) Main chimney flow rate
   (5) East/west supply, and exhaust air temperatures
c. Radwaste building ventilation:
   (1) Building supply/exhaust fan and damper status
   (2) Differential pressures, temperatures
d. Off-gas filter building ventilation
   (1) Fan status and damper positions
   (2) Differential pressures, temperatures and flow
   (3) Digital Mimic Display on Panel 2212-37B(A)
      (a) Flashing Red Light (computer hardware failure)
e. Off-gas filter building freon leak detector indication

288000.K5.02 Differential pressure control (RO=3.2 / SRO=3.4)

72 **ID: 1245212** **Points: 1.00**

Unit 2 was operating at 50% power when a BREAK of the "A" Feedwater Line IN THE DRYWELL occurred.

Present plant conditions:

- All control rods fully inserted
- Reactor pressure is 850 psig, controlled on Bypass Valves
- RPV water level is -40" and lowering at 1"/min
- Reactor feed pumps secured due to instrumentation faults

Which of the following systems can be used to restore RPV water level?

(1) SSMP
(2) Condensate
(3) RCIC
(4) HPCI

A. (1) and (2) only

B. (2) and (3) only

C. (1) and (4) only

D. (3) and (4) only

Answer: C

Answer Explanation

The SSMP is a critical reactor inventory control system at Quad Cities Station. The function of the SSMP is similar to RCIC in almost every respect. The major difference is SSMP is driven by an electric motor and RCIC is steam driven. Therefore, K/A 217000 is normally used as the basis for SSMP questions on regulatory examinations. Additionally, the SSMP is a risk significant system by the PRA.

The correct answer is a combination of HPCI and SSMP as they both utilize the "B" feedwater line as their connection to the RPV.

Distractor 1 is incorrect: Plausible because SSMP and Condensate are available. However, the Condensate system has insufficient discharge head to inject under these plant conditions.
Distractor 2 is incorrect: Plausible because RCIC and Condensate are available. However, the Condensate system has insufficient discharge head to inject under these plant conditions and RCIC uses the broken feedwater line.
Distractor 3 is incorrect: Plausible because RCIC and HPCI are available. However, the RCIC uses the broken feedwater line.

Reference: M-70 rev. AC and M-87 rev. BN
Reference provided during examination: None

Cognitive level: High

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

K/A: 217000.K1.02 Knowledge of the physical connections and/or cause- effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and the following: Nuclear boiler system

(CFR 41.2 to 41.9 / 45.7 to 45.8)
IMPORTANCE (RO 3.5 / SRO 3.5)

SRO Justification: N/A

Question Source: Modified
Question History: Exam bank question 1230192

Comments: Stem modified. Distractor became the correct answer

Associated objective(s):

SR-2900-K02 (Freq: LIC=B)
DESCRIBE the valve lineups and major flowpaths for each mode of SSMP operation.
a. Standby
b. CCST/Fire header suction
c. RPV injection (Unit 1 or Unit 2)
d. Test

217000.K1.02 Nuclear boiler system (RO=3.5 / SRO=3.5)

73 **ID: 1244183** **Points: 1.00**

Unit 2 was at full power when a small break LOCA occurred.

Annunciator 902-3 H-15 "REACTOR VESSEL LOW PRESSURE" is in alarm.
The alarm is in solid and will not reset.
The US has determined the alarm is from a faulted reactor pressure signal.

Unit 2 has the following Primary Containment Parameters:

- DW pressure is 2.6 psig and rising slowly
- Torus pressure is 2.4 psig and rising slowly
- DW temperature is 145°F and rising slowly

How will the Low Pressure Coolant Injection (LPCI) system be affected?

The selected loop LPCI injection valves will...

A. immediately open and remain interlocked open for five minutes.

B. NOT automatically open. The ANSO must manually operate the valves.

C. open when reactor pressure reaches 325 psig and remain interlocked open for five minutes.

D. immediately open and then re-close.

Answer: A

Answer Explanation

The K/A is knowledge of how Nuclear Boiler Instrumentation loss or malfunction affects LPCI. The question asks the examinee to analyze the effect of a pressure sensor failure. The pressure sensor malfunction is presented in the stem as an anomalous annunciator. The examinee must determine the significance of the alarm and apply the knowledge to LPCI. In this case, the failed pressure sensor completes an interlock at a higher RPV pressure than it should. This causes the LPCI injection valves to open and remain interlocked open for five minutes.

Distractor 1 is incorrect: Plausible because the examinee may determine the failure defeats the automatic opening of the LPCI injection valves.
Distractor 2 is incorrect: Plausible because the examinee may not determine the effect of the failed sensor.
Distractor 3 is incorrect: Plausible because the examinee may determine the opening circuit may function as it would without the failure

Reference: QCOA 1000-04 rev 19
Reference provided during examination: None

Cognitive level: High

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

K/A: 203000.K6. Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI: INJECTION MODE

(CFR: 41.7/45.7)
IMPORTANCE RO 3.4 / SRO 3.4

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

SR-1000-K23 (Freq: LIC=B)
Given an RHR system operating mode and various plant conditions, PREDICT how the RHR system will be impacted by the following support system failures: (Includes power supplies)

a. ECCS Keep Fill high or low pressure
b. Loss of 125vdc to RHR initiation and/or loop select logic
c. Loss of 480vac power to RHR/RHRSW valves and/or room coolers
d. Loss of 250vdc
e. Loss of DGCWP
f. Loss of ADS logic
g. ECCS suction strainer clogging

203000.K6.09 Nuclear boiler instrumentation (RO=3.4 / SRO=3.4)

SR-1000-K12 (Freq: LIC=I)
DESCRIBE how the RHR system responds to an isolation signal.

74	ID: 1245128	Points: 1.00

Unit 2 is at full power when a malfunction of the Feedwater Level Control system causes the Total Feed Flow signal to fail to 1.0 Mlbm/hr.

What effect will this have on the Reactor Recirculation system?

Reactor Recirculation pumps will run back to...

A. 20% Speed.

B. 32% Speed.

C. 50% Speed.

D. 70% Rated Core Flow.

Answer: B

Answer Explanation

From lesson plan LN-0202 rev. 4

Anti-Cavitation/NPSH Runback

This runback prevents damage to the recirc pump by limiting its speed to 32% when its discharge valve is not fully open or feedwater flow is less than 20%. The 20% FW flow has a 15-second time delay on runback. If pump speed was increased with the discharge valve closed, excessive axial thrust could be developed across the pump. If pump speed was greater than 32% with feed flow less than 20% sensed from digital feed water for 15 seconds, a runback of the recirculation pumps will occur to provide protection against cavitation. This runback can be bypassed from the OWS Interlocks display. Any runback signal causes recirc controllers to transfer to Manual.

Distractor 1 is incorrect: Plausible because 20% is another limit on the RRCS system and 20% is the nominal FW value for the 32% runback interlock
Distractor 2 is incorrect: Plausible because 50% is another limit on the RRCS system. This the lowest pump speed the manual runback circuit will allow.
Distractor 3 is incorrect: Plausible because 70% is another limit on the RRCS system. This is the first anti-cavitation interlock setpoint.

Reference: lesson plan LN-0202 rev. 4, QCAN 901(2)-4 G-4 rev. 16
Reference provided during examination: None

Cognitive level: High

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

K/A: 259002.K3.04 Knowledge of the effect that a loss or malfunction of the REACTOR WATER LEVEL CONTROL SYSTEM will have on following: Recirculation system: Plant-Specific

(CFR 41.7 / 45.4)
(CFR 41.7 / 45.5 to 45.8)
IMPORTANCE RO 2.9 / SRO 3.0

SRO Justification: N/A

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

SR-0600-K24 (Freq: LIC=B
Given a Feedwater Level Control System operating mode and various plant conditions, PREDICT how each supported system will be impacted by the following Feedwater Level Control System failures:

a. Feedflow sensor failures
b. Steam flow sensor failures
c. RPV level sensor failures
d. Reactor level SMS value error
e. RFP suction pressure SMS value error
f. Steam flow SMS value error
g. Feedflow error with calculated feedwater flow activated

259002.K3.04 Recirculation system: Plant-Specific (RO=2.9 / SRO=3.0)

75	ID: 1235966	Points: 1.00

Units 1 and 2 are operating at rated power with Control Room Ventilation in a NORMAL lineup.

The following 912-5 panel manipulations are made:

- CONTROL ROOM HVAC ISOL switch is positioned to ISOLATE
- CONTROL ROOM HVAC AFU 1/2A OR 1/2B BOOSTER FAN switch is positioned to FAN A

Which of the following predicts the resultant Control Room Ventilation system status?

	CR B HVAC AHU 0-9400-101	CONT RM VS HALLWAY DPI 1/2-5795-9B (in. H_2O)
A.	GREEN OFF light LIT	Positive
B.	RED ON light LIT	Positive
C.	RED ON light LIT	Negative
D.	GREEN OFF light LIT	Negative

Answer: A

Answer Explanation

Isolation of the control room ventilation results in isolation of the control room but does NOT result in a low flow signal to cause tripping of train A and starting of train B. Starting the air filtration unit will result in pressurizing the Control Room Envelope (CRE).

Distractor 1: Plausible if candidate assumes that the A train will trip and the B train will start on low flow (B train is safety-related train).
Distractor 2: Combination of distractor 1 and 3.
Distractor 3: Plausible if candidate assumes that the control room is normally at a negative d/p with the hallway (similar to the Turbine and Reactor Building to atmosphere d/p).

Reference: QCOP 5750-09 Rev 56
Reference provided during examination: None

Cognitive level: High

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

K/A: 290003 A1.04 Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROOM HVAC controls including: Control room pressure

(CFR: 41.5 / 45.5)
IMPORTANCE RO 2.5 / SRO 2.8

Question Source: Exam Bank
Question History: 2011 Quad ILT Cert Exam

SRO Justification: N/A

Comments: None

Associated objective(s):

SR-5752-K21 (Freq: LIC=B) Given a Control Room Ventilation System operating mode and various plant conditions, PREDICT how the system and key system/plant parameters will respond to manipulation of the following Control Room Ventilation System local/remote controls:

a. A Train
   (1) Air Handling Unit control switch
   (2) Return air fan control switch
   (3) Air conditioning compressor control switch
   (4) Chill water pumps control switches
   (5) Convertor pumps control switches
   (6) CR HVAC Compressor Mode Selector (2212-40X)
b. B train
   (1) Air Handling Unit (AHU) control switch
   (2) RCU compressor control switch
   (3) RCU compressor motor space heater control switch
   (4) Cooling water supply selector switch
c. Air Filtration Unit (AFU) booster fan control switches
d. Toxic gas analyzer inhibit switch
e. Control room ventilation isolation switch
f. Control room vent isolation reset switches
g. Cont Rm and Offices HVAC System Purge control switch

290003.A1.04 Control room pressure (RO=2.5 / SRO=2.8)

76 **ID: 1241415** **Points: 1.00**

Unit 1 is operating at 100% power.

The following indications are reported by the ANSO:

- Circuit Breaker position indication is lost for Buses 11 and 15
- All annunciator windows on Control Room Panels 901-3, 4,5,6,7,8, 912-1 and 5 are extinguished except "ANN DC POWER FAILURE" on each panel
- The 125 VDC bus normally supplying the loads is damaged, requiring the use of an alternate power supply

Per QOA 6900-10, which power source will the US use to re-energize loads and what overall effect will the increased battery loading have on continued plant operation, if any?

A. The US will re-energize loads from Turbine Building Bus 1A-2 which will require declaring the Unit 1 battery INOPERABLE.

B. The US will re-energize loads from Turbine Building Bus 1B-2 which will require declaring the Unit 2 battery INOPERABLE.

C. The US will re-energize loads from Turbine Building Bus 1A-2 and the Unit 1 battery remains OPERABLE.

D. The US will re-energize loads from Turbine Building Bus 1B-2 and the Unit 2 battery remains OPERABLE.

Answer: B

Answer Explanation

The indications given in the stem allow the SRO to determine a loss of Turbine Building 1A-2 125VDC bus. Turbine Building Bus 1A-2 is normally fed from the Unit 1 battery. With bus damage present, the SRO will determine the AC bus control power will need to be fed from Turbine Building Bus 1B-2. According to the TS Bases, when this occurs the Unit 2 battery is declared INOPERABLE. Since the battery inoperablity comes from the assumptions in the TS Bases, a RO will not determine battery operability. The K/A asks the SRO to interpret the extent of the DC bus power supply loss. In this case, cross connecting the Unit's 125 VDC power renders the opposite unit's battery inoperable.

Distractor 1 is incorrect: Plausible because the examinee may determine TB Bus 1B-2 is lost and the alternate power supply for the loads is TB Bus 1A-2. Based on this choice the increased loading would then render the Unit 1 battery inoperable. The examinee may assume TB Bus 1B-2 is lost and loads can be reenergized from TB 1A-2.
Distractor 2 is incorrect: Plausible because the examinee may determine the loads will need to be powered from TB Bus 1B-2 and assume the increased loading will have no effect on the battery operability.
Distractor 3 is incorrect: Plausible because the examinee may determine TB Bus 1B-2 is lost and the alternate power supply for the loads is TB Bus 1A-2. Based on that assumption, the examinee may determine the increased loading has no effect on battery operability.

Reference: QOA 6900-10 Rev. 23, QCOP 6900-38 Rev. 1
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO

Tier: 1 Group 1

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

(CFR: 41.10/ 43.5 / 45.13)
IMPORTANCE RO 3.5 SRO 3.9

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. The SRO must determine the bus that is lost, proper course of action, and TS implications.

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. The SRO must determine the bus that is lost, proper course of action, and TS implications.

Can the question be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of a procedure? NO. The SRO must determine the bus that is lost, proper course of action, and TS implications.

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):

SR-6900-K26 (Freq: LIC=B)
EVALUATE given key Station DC Electrical Systems parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):

a. Partial/complete loss of U1 or U2 24/48 VDC
b. Partial/complete loss of U1 or U2 125 VDC
c. Partial/complete loss of U1 or U2 250 VDC
d. Loss of Non-Essential 250 VDC to a unit

295004.AA2.02 Extent of partial or complete loss of D.C. power. (RO=3.5 / SRO=3.9)

77 **ID: 1241610** **Points: 1.00**

Given the following conditions:

- Unit 1 and Unit 2 are at 100% power
- Bus 14-1 to Bus 24-1 cross tie breaker on Bus 24-1 is out of service

Annunciator 901-8 A-7 "DIESEL GEN #1 TROUBLE" alarms.

- Unit 1 EO reports the cause of the alarm is 2251-10 A-3 "LOW OIL TEMPERATURE"
- The oil temperature is 80° F and slowly lowering
- The immersion heater and circulating lube oil pump breaker on MCC 15-2 is tripped and will not re-close

Which ONE of the following choices describes the required actions?

(Reference provided for this question.)

A. Unit 1 will enter TS 3.8.1 Condition B Only
Unit 2 will enter TS 3.8.1 Condition B Only

B. Unit 1 will enter TS 3.8.1 Condition B Only
Unit 2 has no operational restrictions

C. Unit 1 will enter TS 3.8.1 Condition B and D Only
Unit 2 will enter TS 3.8.1 Condition D Only

D. Unit 1 will enter TS 3.8.1 Condition B and D Only
Unit 2 will enter TS 3.8.1 Condition B and D Only

Answer: A

Answer Explanation

The question poses a situation where the Unit 1 EDG has become INOPERABLE with a one of the unit cross tie breakers out of service. In this condition, two off site lines are still available to both units. Therefore, only the Unit 1 EDG requires TS entry. However, the Unit 1 EDG is a required EDG for Unit 2 equipment (CREV, CREV AC , and B SBGTS) and must be declared INOPERABLE to Unit 2 while the supported equipment is required.

Distractor 1 is incorrect: Plausible because the examinee may incorrectly determine the U1 EDG is INOP to Unit 1 only and also correctly determine the offsite line LCO is met.
Distractor 2 is incorrect: Plausible because the examinee may incorrectly determine the U1 EDG is INOP to Unit 1 only and also incorrectly determine the offsite line LCO is not met for either unit.
Distractor 3 is incorrect: Plausible because the examinee may determine the U1 EDG is INOP to Unit 1 and Unit 2 and also incorrectly determine the offsite line LCO is not met for either unit.

Reference: QCOS 0005-08 Rev.37, QCOS 0005-09, Rev. 40, QCOS 6600-11 rev. 24
Reference provided during examination: TS pages 3.8.1-1, 3.8.1-3, 3.8.1-4 and 3.8.1-5

Cognitive level: High

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

K/A: 295003 Partial or Complete Loss of A.C. Power SG 2.2.22 EQUIPMENT CONTROL 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 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. The examinee must assess the information below the line for both units.
Can question be answered *solely* by knowing the TS Safety Limits? NO

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

SR-6500-K32 (Freq: LIC=B) Given 4KV / 480 VAC Distribution Systems operability status OR key parameter indications, various plant conditions and a copy of Tech Specs, DETERMINE Tech Spec compliance and required actions, if any.

2.2.22 Knowledge of limiting conditions for operations and safety limits. (RO=4.0 / SRO=4.7)

78	ID: 1241527	Points: 1.00

Unit 2 was operating at rated power when a loss of Bus 24 occurred and a manual reactor scram was inserted. The conditions presently are:

- Hydraulic ATWS, 1/2 of the control rods initially inserted
- RPV pressure band is 800 to 1000 psig with bypass valves
- RPV water level is -45 in. and stable
- Drywell pressure is 1.4 psig and steady
- Torus pressure is 0.1 psig and steady
- Drywell temperature is 150˚F and rising at 1˚F per minute
- Main Condenser backpressure is 5 in. Hg and rising at 0.5 in. Hg per minute

As Unit Supervisor, which of the following in-plant actions has the highest priority?

A. Dispatch an operator to close the 2C Circ Water Pump discharge valve per QCAN 901(2)-7 A-15, CIRC WTR PUMP AUTO TRIP.

B. Valve in the 1/2C RBCCW pump to Unit 2 per QCOP 3700-02, RBCCW SYSTEM STARTUP AND OPERATION.

C. Vent the Scram Air Header per QCOP 0300-28, ALTERNATE CONTROL ROD INSERTION.

D. Pull the RPS scram fuses per QCOP 0300-28, ALTERNATE CONTROL ROD INSERTION.

Answer: A

Answer Explanation

The 2C Circ Water pump trips on the loss of Bus 24. Its discharge valve will not close. The 2A and 2B Circ Water Pumps will continue to operate and with the loss of power to the pump discharge valves, the Circ Water flow will recirculate through the Main Condenser and back pressure will continue to rise. If no action is taken, the BPVs will not control pressure and a threat to containment will emerge. Dispatching an operator to manually shut the 2C Circ Water discharge valve will lower Main Condenser back pressure.

Distractor 1 is incorrect: Plausible because the U-2 EDG is supplying Bus 24-1 and two RBCCW pumps will be in operation.
Distractor 2 is incorrect: Plausible because it is a QGA 101 Power leg action contained in QCOP 0300-28. But it is a Hydraulic ATWS and the Scram Air Header was depressurized on the manual scram inserting 1/2 of the control rods. This is a correct action for an Electric ATWS.
Distractor 3 is incorrect: Plausible because it is a QGA 101 Power leg action contained in QCOP 0300-28. But it is a Hydraulic ATWS and the Scram Air Header was depressurized on the manual scram inserting 1/2 of the control rods. This is a correct action for an Electric ATWS

Reference: QGA 101 rev. 14, QGA 200 rev. 10, QOM 2-6700-T22, Rev. 5, QOM 2-6700-T02, Rev. 7
Reference provided during examination: None

Cognitive level: High

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

K/A: 295002.2.4.35 Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications

(CFR: 41.10/ 43.5 / 45.13)
IMPORTANCE RO 3.3 SRO 3.5

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. The SRO must prioritize the Crew's actions to successfully avoid challenging the Primary Containment.

Question Source: New
Question History: N/A

Comments: None.
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Associated objective(s):

SR-3200-K26 (Freq: LIC=B)
EVALUATE given key Condensate/Feedwater System parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):
a. Loss of instrument air
b. Loss of condensate reject flow
c. Loss of TBCCW
d. Loss of vacuum
e. Condenser tube rupture

295002.2.4.35 Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications. (RO=3.3 / SRO=3.5)

79 **ID: 1241716** **Points: 1.00**

Unit 2 is at 100% power.

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Annunciator 912-1 E-1, "RX BUILDING COOLING WATER HIGH TEMP" is in alarm and will not clear.

No other alarms are present.

The ANSO reports:

- RBCCW temperature is 115°F and rising at 2°F per minute
- RBCCW pressure is 53 psig and steady
- 2A and 2B Reactor Recirculation Pump Seal Cooling Water temperatures are 115°F and rising at 1°F per minute

(1) What is the cause of this alarm?

(2) At this point, what is the FIRST action the SRO will direct?

A. (1) RBCCW Heat Exchanger Temperature Control Valve stem to disc separation

(2) Placing the standby RBCCW Heat Exchanger in operation

B. (1) RBCCW Heat Exchanger Temperature Control Valve stem to disc separation

(2) Tripping both Reactor Recirculation pumps

C. (1) RBCCW leak

(2) Closing MO 2-3701, U-2 RBCCW HDR ISOL

D. (1) RBCCW leak

(2) Tripping both Reactor Recirculation pumps

Answer: A

Answer Explanation

The question is based on an actual plant event. The crew swapped RBCCW Heat Exchangers to combat the casualty. Based on the procedural direction, the SRO will first direct placing the standby RBCCW Heat Exchanger in service. The lack of other annunciators and a steady RBCCW pressure indicates there is no RBCCW leak. The RBCCW system temperatures and Recirc Pump temperatures are based on Simulator data.

Per QCOA 3700-03

D.2. IF Unit is at Power Operation, THEN:

a. Inspect RBCCW Heat Exchangers and their associated temperature Control Valve.

b. IF Closed Cooling Water Temperature does NOT decrease, THEN place standby RBCCW Heat Exchanger in operation per QCOP 3700 02.

Distractor 1 is incorrect: Plausible because the Reactor Recirc pump seal temperatures will rise. However, based on the rate of cooling water temperature rise, tripping the reactor recirculation pumps is not the first action the SRO will direct.

Distractor 2 is incorrect: Plausible because rising temperatures can be caused by a system leak. However, a system leak would be accompanied by a low pressure alarm. Closing the MO 2-3701 will not correct the RBCCW temperature.
Distractor 3 is incorrect: Plausible because rising temperatures can be caused by a system leak. However, a system leak would be accompanied by a low pressure alarm. Tripping the reactor recirculation pumps is not the first action the SRO will pursue.

Reference: QCOA 3700-03, Rev. 9
Reference provided during examination: None

Cognitive level: High

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

K/A: 295018.AA2.02 Ability to determine and/or interpret the following as the apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Cooling water temperature.

(CFR: 41.10/ 43.5 / 45.13)
IMPORTANCE RO 3.1 SRO 3.2

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

Can question be answered *solely* by knowing "systems knowledge"? NO
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. The SRO will make the analysis of the plant conditions and give direction based on the analysis.

AND

Unique to the SRO position.

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

SR-3700-K26 (Freq: LIC=B)
EVALUATE given key RBCCW parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):

a. High or low expansion tank level
b. High RBCCW temperature
c. Low RBCCW pressure

295018.AA2.02 Cooling water temperature (RO=3.1 / SRO=3.2)

80	ID: 1241706	Points: 1.00

A large LOCA has occurred on Unit 1 with all control rods inserted to position 00.

QGA 500-4 RPV Flooding is in progress.

Containment parameters are:

· Drywell temperature	280ºF
· Drywell pressure	20 psig
· Torus temperature	115ºF
· Torus pressure	20 psig
· Torus level	15 ft.

Which of the following sets of indications can be used to determine that the RPV water level is at the Main Steam lines?

(Consider each set of conditions separately.)

Condition set 1:
- LI 1-263-101, Upper Wide Range on the 901-4 panel indicates +300 inches
- Main Steam Relief valves are closed

Condition set 2:
- All LPCI and 2 Core Spray pumps are injecting
- All RPV water level instruments are upscale
- Torus water level is lowering
- RPV pressure is 30 psig and slowly lowering

Condition set 3:
- RPV pressure is 60 psig
- 3 Main Steam Relief valves open
- Main Steam Relief Valve Tail pipe temperature is 230ºF

Condition set 4:
- Annunciator 901-3 E-14, ACOUSTIC MON SAFETY RLF VALVES OPEN, in alarm
- RPV pressure rises from 75 psig to 85 psig as the 1B FRV is opened

A. Condition set 1 and Condition set 2

B. Condition set 1 and Condition set 4

C. Condition set 2 and Condition set 3

D. Condition set 3 and Condition set 4

Answer: D

Answer Explanation

Condition set 3 is correct because the Main Steam Relief valves are open and the tail pipes are subcooled. The saturation pressure for 230F is ~6 psig.

Condition set 4 is correct because the acoustic monitor alarms indicate open ADS valves with flow from either water, steam, or both occurring. The relief valve acoustic monitor alarming and a change in RPV pressure coincident with the opening of 1B FRV indicates the RPV is completely flooded to the Main Steam Lines.

Condition set 1 is incorrect because merely having the Upper Wide Range pegged upscale is not an indication of a flooded RPV. This is especially, true with the ADS Valves closed.
Condition set 2 is incorrect because merely having low pressure ECCS pumps injecting and their suction source with their suction source (i.e. Torus) level lowering is not an indication of RPV flooding. Torus level lowering is expected while trying to establish flooding conditions as the water to fill the RPV is drawn from the Torus.

Distractor 1 is incorrect: Plausible because of the reasons stated for Condition sets 1 and 2 above.
Distractor 2 is incorrect: Plausible because of the reasons stated for Condition sets 2 and 3 above.
Distractor 3 is incorrect: Plausible because of the reasons stated for Condition sets 1 and 4 above.

Reference: QCAP 0200-10 Rev. 49
Reference provided during examination: None

Cognitive level: High

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

K/A: 295008 295008 High Reactor Water Level AA2.01 Ability to determine and/or interpret the following as they apply to HIGH REACTOR WATER LEVEL : Reactor water level

(CFR: 41.10/ 43.5 / 45.13)
IMPORTANCE (RO 3.9 SRO 3.9)

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. The assessment of when RPV flooding conditions are achieved is an SRO/STA task.

Question Source: New
Question History: N/A

Comments: None

Associated objective(s):

S-0001-K56 (Freq: LIC=B)
Given QGA 500-4, RPV Flooding, and various conditions, EVALUATE the conditions and DESCRIBE how to proceed through the flowchart including transitions within QGA 500-4, to other QGA procedures or to SAMGs.

295008.AA2.01 Reactor water level (RO=3.9 / SRO=3.9)

81	ID: 1236927	Points: 1.00

Unit 2 is at full power with all systems in a normal lineup.

A failure of PIC 2-1640-11, CONTAINMENT PRESS occurs.

The NSO takes manual control of Drywell pressure and reports the following:

- Drywell pressure is 1.6 psig and stable
- Torus pressure is 0.4 psig and stable
- Drywell temperature is 132° F and stable

Based on these conditions, what is the potential effect?

If this condition is NOT corrected...

A. the pressure suppression function of the containment could be bypassed due to a lower water level in the downcomers.

B. cyclic stresses imposed on the downcomers during LOCA blowdown could result in failure of torus internal structures.

C. leakage through the Drywell air lock doors during a DBA LOCA may result in a radioactive release exceeding 10CFR 100 limits.

D. the maximum Drywell pressure that occurs during a DBA LOCA may exceed the Drywell design pressure.

Answer: D

Answer Explanation

From TS Bases 3.6.1.4:

The DBA LOCA analysis assumes an initial drywell pressure of 1.5 psig. This limitation ensures that the safety analysis remains valid by maintaining the expected initial conditions and ensures that the peak LOCA drywell internal pressure does not exceed the maximum allowable of 62 psig.

Distractor 1 is incorrect: Plausible because Drywell pressure affects the downcomer water level. The pressure-suppression function is lost if the downcomer is uncovered which occurs with a Torus water level of less than 11 ft. not elevated Drywell pressure.
Distractor 2 is incorrect: Plausible because cyclic stresses will occur during the LOCA blowdown phase, but these stresses are mitigated by the transfer of non-condensibles back to the Drywell via the Drywell-Torus vacuum breakers not initial Drywell pressure.
Distractor 3 is incorrect: Plausible because the Drywell air-lock doors are a leakage path to the environment and are designed to limit the release of radioactive material through a range of postulated accidents. The doors are designed to withstand pressures in excess of those generated by a DBA LOCA. In addition, they are pressure seated doors,(ie. increase in pressure results in increased seal force).

Reference: TS Bases 3.6.1.4
Reference provided during examination: None

Cognitive level: High

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

K/A: 295010 AA2.02 Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: drywell pressure

(CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 3.8 SRO 3.9

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: Bank
Question History: Used in ILT Comprehensive Exam 1

Comments: None

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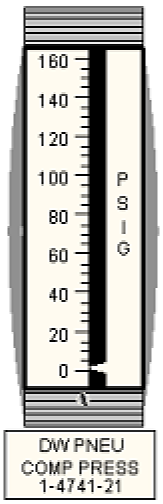
Associated objective(s):

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

295010.AA2.02 Drywell pressure (RO=3.8 / SRO=3.9)

82 | **ID: 1241962** | **Points: 1.00**



901-4 Annunciator

CAUTION: Exceeding NPSH/Vortex Limits may cause system damage (QCAP 0200-10).

Stabilize RPV pressure below 1060 psig using main turbine bypass valves.

- Use Alternate Pressure Control Systems (listed below) if needed.

Alternate Pressure Control Systems

- ADS valves…<u>only if</u> torus level is above 5 ft (QCOP 0203-01)
  - Use preferred sequence if you can.
  - If Drywell Pneumatics lost, place switch for "A" ADS valve in OFF.
  - OK to use alternate power sources (QCOP 0203-02).
- HPCI (QCOP 2300-06)
  - Use <u>CCST</u> suction if you can.
    - OK to defeat high torus level transfer (QCOP 2300-09).
  - OK to defeat high area temperature isolation (QCOP 2300-14).
- RCIC (QCOP 1300-02)
  - Use <u>CCST</u> suction if you can.
    - OK to defeat high torus level transfer (QCOP 2300-09).
    - Use <u>torus</u> suction for FLEX (QCOP 0050-12).
  - OK to defeat:
    - Low RPV pressure and high area temperature isolations (QCOP 1300-10).
    - High steam flow isolation (QCOP 0201-10).
    - High exhaust pressure, high RPV water level, and low suction pressure trips (QCOP 1300-13).
- RWCU, blowdown mode (QCOP 1200-07)
- RWCU, recirculation mode (QCOP 1200-11)
  - Bypass filter/demins.
  - OK to defeat isolations, including SBLC (QCOP 1200-02).
- Main steam line drains (QCOP 0250-05)

(Refer to the preceding page.)

The alarm is in solid.

Unit 1 was operating at 100% power when DW Pneumatics suffered a casualty.

Based on the given 901-4 panel indication, the alarm shown above, and QGA 100, RPV CONTROL, what direction will the SRO give as the transient continues?.

.

A. Control RPV pressure between 800 -1000 psig using Main Turbine Bypass Valves.

Supplement RPV pressure control with Alternate Pressure Control Systems as needed. There are no restrictions on the use of Alternate Pressure Control Systems.

B. Control RPV pressure between 800 -1000 psig using Main Turbine Bypass Valves.

Supplement RPV pressure control with Alternate Pressure Control Systems as needed. Place switch for "A" ADS Valve in OFF.

C. Control RPV pressure between 800 -1000 psig using ADS valves.

Supplement RPV pressure control with Alternate Pressure Control Systems as needed. Place switch for "A" ADS Valve in OFF.

D. Control RPV pressure between 800 -1000 psig using ADS valves.

Supplement RPV pressure control with Alternate Pressure Control Systems as needed. There are no restrictions on the use of Alternate Pressure Control Systems use.

Answer: C

Answer Explanation

The question tests the examinee's ability to assess off normal conditions in the DW Pneumatics system and apply this assessment to EOP actions. In this case, the inboard MSIVs are shut and the "A" Safety/Relief valve has impaired function. Therefore, the SRO would direct the use of Alternate Pressure Control Systems and placing the "A" relief valve in OFF. The need to place the "A" switch in OFF comes from EOP bases.

Distractor 1 is incorrect: Plausible because the examinee may not recognize the inboard MSIVs are shut. There is a restriction on the use of ADS valves.
Distractor 2 is incorrect: Plausible because the examinee may not recognize the inboard MSIVs are shut and the examinee may elect to supplement main turbine bypass valves with alternate pressure control systems.
Distractor 3 is incorrect: Plausible because the examinee may choose to use alternate pressure control systems. However, there is a restriction on the use of ADS valves.

Reference: QGA 100 rev. 10, EPG/SAG Rev. 3 page B-6-38
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 G2.37 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)(5)

Can question be answered *solely* by knowing "systems knowledge"? NO. The SRO must also use the procedure to determine the proper course of action based on their assessment of the DW Pneumatic System status and EOP bases.

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. The SRO must assess the system status.

AND

Unique to the SRO position.

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

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.

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

83 **ID: 1242150** **Points: 1.00**

Given the following:

- The Reactor is currently in Cold Shutdown with the Reactor Vessel head tensioned.
- Normal shutdown cooling has been lost. Other means of shutdown cooling have been unsuccessful and it is decided to establish a cooling flow path through the Torus.

Based on the above conditions:

(1) What is the MINIMUM allowable Technical Specification temperature for the Reactor Vessel Flange Region metal temperature?

AND

(2) What is the MINIMUM temperature based on?

A. (1) 83°F

(2) Shell to Flange DT

B. (1) 83°F

(2) Nil Ductility Temperature + 60°F

C. (1) 68°F

(2) Shell to Flange DT

D. (1) 68°F

(2) Nil Ductility Temperature + 60°F

Answer: B

Answer Explanation

The loss of Shutdown Cooling causes a loss of forced circulation in the RPV and the commencement of a non-critical heat up. The loss of forced circulation leads to thermal stratification which in turn induces stress into the RPV metal. Technical Specifications (TS) denote a minimum temperature and the Bases provide the description of the minimum temperature. Knowledge of TS Bases is SRO only knowledge.

Distractor 1 is incorrect: Plausible because the minimum temperature is 83°F. However, the minimum temperature is based on NDT for the RPV, not a temperature difference between two components.

Distractor 2 is incorrect: Plausible because 68°F is the minimum Bottom Head temperature. The minimum temperature is based on NDT for the RPV, not a temperature difference between two components.

Distractor 3 is incorrect: Plausible because 68°F is the minimum Bottom Head temperature.

Reference: T.S. Bases 3.4.9 RCS Pressure and Temperature Limits and T.S.3.4.9 Tables
Reference provided during examination: None

Cognitive level: Memory

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

K/A: 295021 AA2.05 Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING: Reactor vessel metal temperature

(CFR: 41.10/ 43.5 /45.13)
IMPORTANCE RO 3.4 SRO 3.5

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: Bank
Question History:

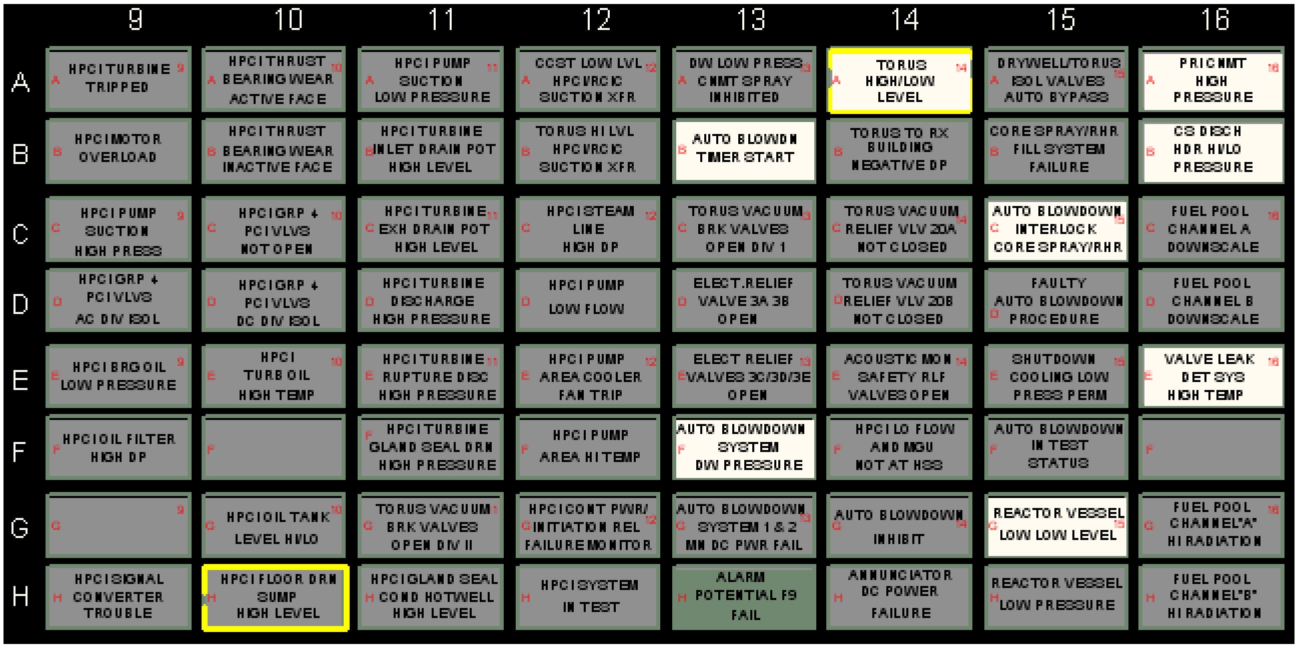
Comments: Reformatted from a Bank question to enhance readability.

Associated objective(s):

SR-0201-K28 (Freq: LIC=B)
STATE and EXPLAIN the reasons for the following Reactor Vessel and Internals operating limits and precautions.
a. Head tensioning limitations
b. Heatup/cooldown rate limits
c. RPV vessel flange/head flange temperatures
d. RPV venting

295021.AA2.05 Reactor vessel metal temperature (RO=3.4 / SRO=3.3)

84 **ID: 1242387** **Points: 1.00**



All alarms shown are in solid.

Given the following for Unit 1:

- LOCA in progress
- All Rods are fully inserted
- Drywell Pressure is 12.6 psig and rising at 0.1 psig per minute
- Drywell Temperature is 225°F and rising at 3°F per minute
- Torus Pressure is 11.6 psig and rising at 0.1 psig per minute
- Torus Level is +4.0 inches and steady
- Reactor Water level is -60 inches and lowering at 1 inch per minute
- Feedwater is unavailable

Based on the annunciators shown above, the SRO will prioritize which ONE of the following actions?

A. Restore RBCCW and Drywell Coolers per QGA 200, PRIMARY CONTAINMENT CONTROL.

B. Manually start HPCI per QGA 100, RPV CONTROL.

C. Spray the Torus per QGA 200, PRIMARY CONTAINMENT CONTROL.

D. Inhibit ADS per QGA 100, RPV CONTROL.

Answer: D

Answer Explanation

Based on the annunciators presented, the examinee should determine the ADS timer is running and all conditions are met for ADS to initiate. The SRO should prioritize inhibiting ADS.

Distractor 1 is incorrect: Plausible because annunciator 901-3 E-16 is in alarm. The examinee may determine there is a need to lower Drywell temperature based on the alarm.
Distractor 2 is incorrect: Plausible because HPCI is already running as indicated by the absence of HPCI annunciators and the high Drywell pressure annunciator.
Distractor 3 is incorrect: Plausible because if the examinee determines the Primary Containment pressure is the highest priority, direction will be given to spray the Torus. The higher priority is to inhibit ADS due to the 110 second timer running. ADS actuation will cause a plant transient before the need to spray the Torus.

Reference: QGA 100 rev. 10, QGA 200 rev. 10
Reference provided during examination: None

Cognitive level: High

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

K/A: 295024 High Drywell Pressure SG2.4.46 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)(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-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.

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

85 **ID: 1242351** **Points: 1.00**

QCOS 5750-09, ECCS ROOM AND DGCWP CUBICLE COOLER MONTHLY SURVEILLANCE, has just been completed on Unit 1. The Unit Supervisor has reviewed the results and determined the 1A Core Spray Room Cooler flow did NOT meet the Performance Acceptance Criteria requirement of $\geq$ 68 gpm.

ALL other system and room cooler flows met their acceptance criteria.

Select the required action(s):

A. Enter TS 3.7.2 Condition A, for one DGCW system INOPERABLE

B. Enter LCO 3.0.3, for One Core Spray subsystem INOPERABLE and RCIC system INOPERABLE

C. Enter TS 3.5.1 Condition B, for One Core Spray subsystem INOPERABLE and TS 3.5.3 Condition A, for RCIC system INOPERABLE

D. Enter TS 3.7.2 Condition A, for one DGCW system INOPERABLE, TS 3.5.1 Condition B, for One Core Spray subsystem INOPERABLE, and TS 3.5.3 Condition A, for RCIC system INOPERABLE

Answer: C

Answer Explanation

Per UFSAR Section 6.3.2.1.2, the ECCS Room Coolers are required to maintain the qualification temperature of ECCS system components during a Design Basis accident. This is implicit in the LOCA Analysis. The Core Spray system is included in the Safety Analysis. Additionally the RCIC room cooler is discussed in UFSAR 5.4.6.3. The loss of cooling water flow to the 1A CS room causes a loss of support system to the equipment. However, the DGCW system is still OPERABLE since it meets the overall flows.

Distractor 1 is incorrect: Plausible because the examinee may determine the DGCW system is INOPERABLE.
Distractor 2 is incorrect: Plausible because the examinee may determine the loss of one CS and RCIC places the plant in TS 3.0.3. This is similar to the result of one CS pump and many other core cooling systems (e.g. HPCI and RHR).
Distractor 3 is incorrect: Plausible because the examinee may determine all of the systems associated with the DGCW are INOPERABLE and all of the associated TS are applicable.

Reference: UFSAR Section 6.3.2.1.2, TS Base 3.7.2, QCOS 5750-09, Rev. 36
Reference provided during examination: None

Cognitive level: High

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

K/A: 209001 A2.07 Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of Room Cooling

(CFR: 41.5 / 45.6)
IMPORTANCE RO 2.6 SRO 2.8

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

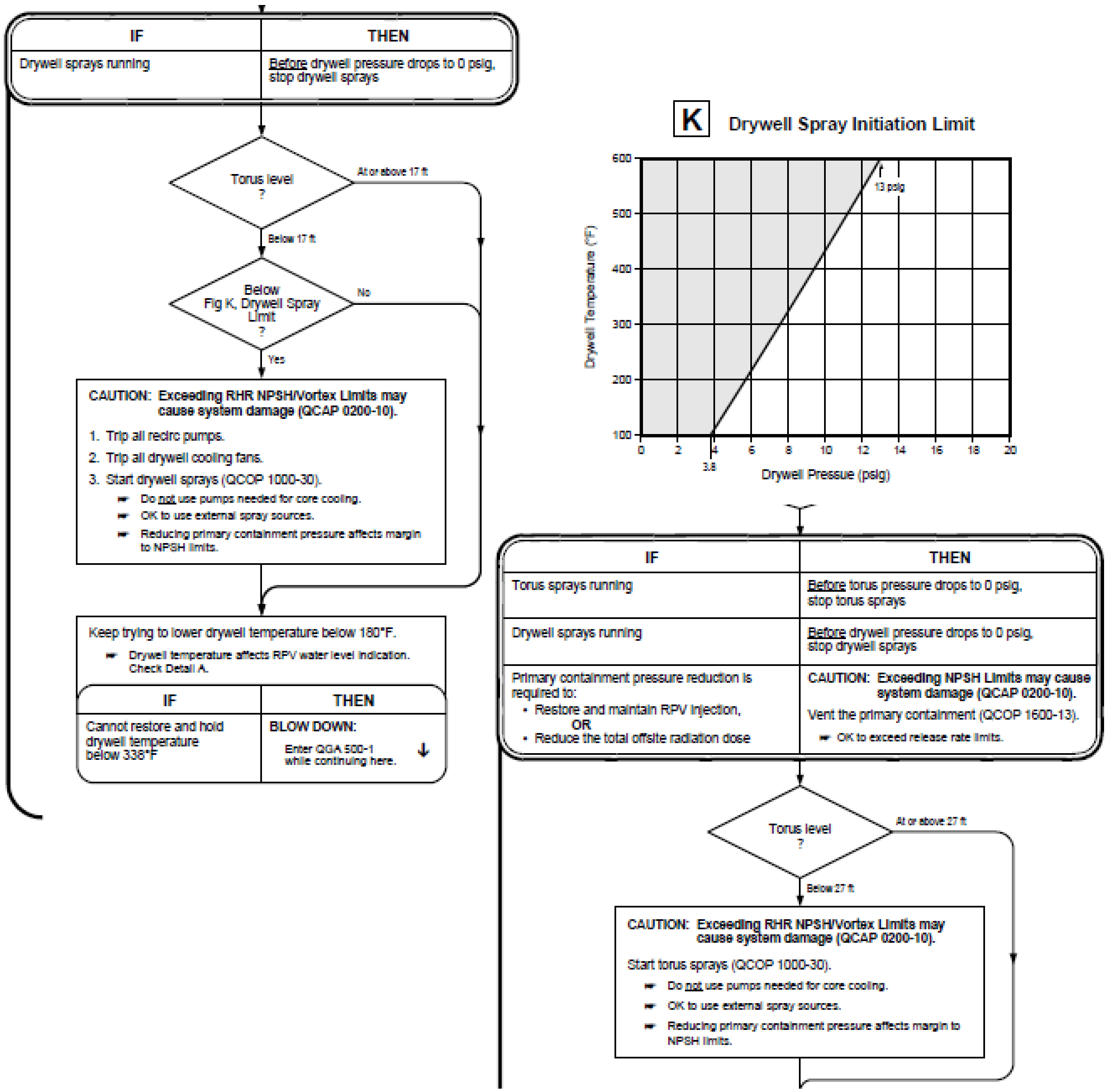
Comments: None

Associated objective(s):

SR-1400-K32 (Freq: LIC=B)
Given Core Spray System operability status OR key parameter indications, various plant conditions and a copy of Technical Specifications, DETERMINE Tech Spec compliance and required actions, if any.

209001.A2.07 Loss of room cooling (RO=2.6 / SRO=2.8)

86 **ID: 1242468** **Points: 1.00**



(Refer to the preceding page.)

A steam line break has occurred in the Unit 2 Drywell during plant start up.
The Crew is executing QGA 100, RPV CONTROL and QGA 200, PRIMARY CONTAINMENT CONTROL.

Plant conditions are as follows:

RPV Parameters:
- RPV level is -10" and rising slowly
- RPV Pressure is 500 psig and lowering slowly
- All control rods are inserted

Containment Parameters:
- DW pressure is 6 psig and rising slowly
- Torus pressure is 4 psig and rising slowly
- Drywell temperature is 275°F and rising slowly
- Torus level is +1 inch and rising slowly

Plant system status:
- Bus 23-1 is de-energized
- HPCI is injecting
- Feedwater is injecting

Based on the current plant status, which of the following actions is required to be directed NEXT?

A. Keep trying to lower drywell temperature below 180°F

B. Spray the Drywell

C. Vent the Containment

D. Blow Down

Answer: A

Answer Explanation

This question is based on interpreting the effect of high drywell temperature on the mitigation strategies used in the EOPs. The answer is predicated on the SRO not prematurely entering RPV blow down based on Drywell temperature when most of the means of cooling the Drywell have been removed.

Distractor 1 is incorrect: Plausible because the DWT leg of QGA 200 directs spraying the DW. However, the plant conditions violate the DSIL curve.
Distractor 2 is incorrect: Plausible because venting the Containment would lower Containment pressure. however, this action would not lower DW temperature and is required with the given plant conditions.
Distractor 3 is incorrect: Plausible because blow down is the ultimate end point of the DWT leg. However, there is no need to blow down at this point since DW temperature is 275F and rising slowly. This is 63F until the blow down is required.

Reference: QGA 200 rev. 10
Reference provided during examination: None

Cognitive level: High

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

K/A: 295028 High Drywell Temperature EA2.01 Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell temperature

(CFR: 41.10/43.5/45.13)
IMPORTANCE RO 4.0 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. The SRO must determine the plant status and determine the correct course of action.

Question Source: New
Question History: N/A

Comments:

Associated objective(s):

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

295028.EA2.01 Drywell temperature (RO=4.0 / SRO=4.1)

87	ID: 1234214	Points: 1.00

Given:

Unit 1 is in Mode 5 on day 4 of a Refueling outage.
- At 0650, cavity flood up to normal refueling level, per QCOP 0201-06, was completed.
- At 0700 a misalignment of the RHR Shutdown Cooling system resulted in a 7 inch drop in cavity level. The RHR system was secured and cavity level was stabilized within 4 minutes.

Unit 2 is operating at 100% power.
- At 0900, APRM #6 fails upscale and Bus 23-1 trips on overcurrent.
- The reactor scrams.
- All other systems performed as designed.

The FIRST ENS notification is due at:

(Reference provided for this question.)

A. 0715

B. 0800

C. 1300

D. 1700

Answer: C

Answer Explanation

Answer is correct because Unit 2 is critical, therefore a 4 hour notification is required when the scram occurs at 0900 per SAF 1.6.

Distractor 1 is incorrect: Plausible because the examinee may determine an EAL has been met on Unit 1. Using this assumption, the examinee may determine the earliest notification is 15 minutes based on their knowledge of E Plan actions for Local authority notifications.
Distractor 2 is incorrect: Plausible because the examinee may determine an EAL has been met on Unit 1. Using this assumption, the examinee may determine the earliest notification is 60 minutes based on their knowledge of E Plan actions for NRC notifications
Distractor 3 is incorrect: Plausible because it is based on an eight hour reportable for Unit 2. The scram is a four hour reportable

Reference: LS-AA-1110 Reportability Manual, Rev. 22 SAF 1.6, LS-AA-1020 Rev. 23
Reference provided during examination: LS-AA-1020 Pages 96-99, LS-AA-1110 - SAF 1.1, 1.5, 1.6, 1.7 and Cold EAL sheet QC 2-15.

Cognitive level: High

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

K/A: 212000 Reactor Protection System SG. 2.4.30 Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.

(CFR: 41.10 / 43.5 / 45.11)
IMPORTANCE RO 2.7 SRO 4.1

SRO Justification:
SRO Only - 10CFR55.43(b) Site Specific Exemption - SRO only training objective.

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
Question History:

Comments:

Associated objective(s):

S-0500-K70 (Freq: LIC=B ILT=NA) Given a RPS system operating mode and various plant conditions and a copy of EP-AA-111 and EP-AA-1006, CLASSIFY the event/abnormal condition including correct EALs and PARs in accordance with EP-AA-111 and EP-AA-1006.

212000.2.4.30 Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. RO 2.7 SRO 4.1

88	ID: 1249011	Points: 1.00

Unit 1 is in a refuel outage with fuel moves in progress when an IRRADIATED fuel bundle is accidentally raised ABOVE the normal up position limit.

Numerous alarms are in solid, including:

- 901-3 G-16, FUEL POOL CHANNEL A HI RADIATION
- 901-5 D-8, CONTROL ROOM VENT ISOLATED
- 912-5 A-1, RX BLD 1 VENT/EXH FAN TRIP
- 912-5 A-6, STANDBY GAS TREATMENT SYS A TROUBLE

Which ONE of the following actions must the SRO prioritize to complete FIRST, based on the above annunciators?

A. Verify and/ or re-establish Secondary Containment.

B. Return the fuel bundle to below its normal up position.

C. Direct personnel to leave the refuel platform, control access to the refuel floor, and contact radiation protection.

D. Request that the Main Control Room start a Control Room AFU Booster Fan per QCOP 5750-09, Control Room Ventilation System.

Answer: C

Answer Explanation

QCFHP 0110-07
C. IMMEDIATE OPERATOR ACTIONS
WARNING

"IF at any time during this event an area radiation monitor alarms, THEN leave the refuel platform and control access to the refuel floor and contact radiation protection."

The ARMs are alarming by the conditions given in the stem. Therefore, the SRO directing fuel moves would direct the actions of QCFHP 0110-07.

Distractor 1 is incorrect: Plausible because this is an action in QCFHP 0110-04 for New/Irradiated Fuel Damage. However, it is not the highest priority in this case.
Distractor 2 is incorrect: Plausible because this is a subsequent action in the procedure. However, it is not the highest priority in this case.
Distractor 3 is incorrect: Plausible because this is an action for several accident sequences.

Reference: QCFHP 0110-07, Rev. 0
Reference provided during examination: None

Cognitive level: High

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

KA: 234000 A2.01 Ability to (a) predict the impacts of the following on the FUEL HANDLING EQUIPMENT and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: †Interlock failure

(CFR: 41.5/45.6)
IMPORTANCE RO 3.3 SRO 2.9

SRO Justification:
10 CFR 55.43(b)(7) Fuel handling facilities and procedures.
These actions are directed by the SRO supervising refueling. An RO would have no method of assessing the conditions and determining the correct course of action. The RO may be aware of the alarms from the transient, but the RO would have way of knowing the cause and the correct action to take in response to alarms.

Question Source: Bank
Question History: 2011 ILT NRC Exam

Comments: This question uses the stem from the 2011 NRC ILT exam , but the answer and distractors were revised.

Associated objective(s):

SR-805-K17 (Freq: LIC=B)
Given a refueling abnormal operation procedure, DESCRIBE the actions taken to correct or mitigate the following abnormal conditions and EXPLAIN the reasons for the sequence (order) of the actions performed to accomplish the tasks:

a. Fuel bundle/assembly binding while raising or lowering
b. Incorrect fuel move (incorrect assembly/incorrect location)
c. New/irradiated fuel damage
d. Tornado
e. Loss of Fuel Pool Cooling
f. Loss of ventilation
g. Loss of pool or cavity water level
h. Increasing pool or cavity water level
i. High radiation
j. Criticality
k. Refueling mast section to section binding

234000.A2.01 Interlock failure (RO=3.3 / SRO=3.7)

89 **ID: 1242587** **Points: 1.00**

A LOCA has occurred on Unit 1.

The following conditions exist:

- QGA 500-4 "RPV FLOODING" is in progress
- RPV flooding conditions are met
- All control rods are fully inserted

A Station Blackout then occurs on Unit 1.

In order to re-establish RPV flooding, the Unit Supervisor will direct which of the following alternate injection systems?

A. Portable pumps (QCOP 4100-19) and HPCI Cooling Water Pump (QCOP 2300-10)

B. SBLC (QCOP 1100-02) and Fire System through RHR (QCOP 4100-11)

C. FLEX (QCOP 0050-06) and Condensate cross tie (QCOP 3300-12)

D. CRD Crosstie (QCOP 0300-33) and Standby Coolant (QCOP 3200-09)

Answer: C

Answer Explanation

This question tests the SRO's ability to select the proper RPV injection sources based on the plant conditions. In this case, accident conditions requiring the continual injection of water to maintain QGA RPV flooding conditions. This question also tests the SRO's knowledge of the FLEX strategy.

Distractor 1 is incorrect: Plausible because Portable pumps are viable, but the HPCI Cooling Water Pump needs 450 VAC power.
Distractor 2 is incorrect: Plausible because Fire system through RHR is viable, but the SBLC needs 450 VAC power.
Distractor 3 is incorrect: Plausible because CRD cross tie is viable, but Standby Coolant needs the Condensate system. The need for the Condensate system can be easily overlooked when selecting Standby Coolant.

Reference: QGA 500-4 rev. 13
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 2 Group 2
K/A: 256000 A 2.05 Reactor Condensate System. Ability to (a) predict the impacts of the following on the REACTOR CONDENSATE SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Inadequate system flow

(CFR: 41.5/45.6)
IMPORTANCE RO 2.9 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

Question Source: New
Question History: N/A

Comments:
:

Associated objective(s):

256000.A2.05 Inadequate system flow (RO=2.9 / SRO=2.9)

SR-3200-K26 (Freq: LIC=B)
EVALUATE given key Condensate/Feedwater System parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):
a. Loss of instrument air
b. Loss of condensate reject flow
c. Loss of TBCCW
d. Loss of vacuum
e. Condenser tube rupture

90	ID: 1249113	Points: 1.00

Unit ONE is operating at 100% power.

System Engineering contacts the Shift Manager and reports discrepancies have been identified associated with test results for the installed 1-203-3A Target Rock Relief Valve.

Bench test data review reveals the results were not within acceptable limits and the valve will not open at the appropriate pressure setpoint.

What is the effect on continued plant operation?

Plant operation is....

(Reference provided for this question.)

A. permitted for 14 days.

B. NOT permitted. Enter LCO 3.0.3 immediately.

C. permitted indefinitely, provided HPCI remains OPERABLE.

D. NOT permitted. The plant must be in Mode 3 in 12 hours and Mode 4 in 36 hours.

Answer: D

Answer Explanation

The question poses the situation where a Safety Valve is INOPERABLE. The SRO must determine the correct Required Action for the given plant conditions

Per T.S. 3.4.3 Action C

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two or more relief valves inoperable. OR One or more safety valves inoperable.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

Distractor 1 is incorrect: Plausible because this is the Required Action if an ADS valve is INOPERABLE
Distractor 2 is incorrect: Plausible because this is the Required Actinon if an ADS valve and an ECCS system is INOPERABLE.
Distractor 3 is incorrect: Plausible because the examinee may determine there is no time limit for one INOPERABLE ADS valve.

Reference: TS 3.4.3 Amendment No. 245/240
Reference provided during examination: Modified TS 3.4.3, TS 3.5.1, TS 3.6.1.6

Cognitive level: High

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

K/A: 239000 SG2.22 Safety Relief Valves 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 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. The required action has a 12 hour limit
Can question be answered *solely* by knowing the LCO/TRM information listed "above-the-line?" NO. The SRO must go down to Action C to determine the correct answer.
Can question be answered *solely* by knowing the TS Safety Limits? NO

Question Source: Modified
Question History: Bank question 1210386

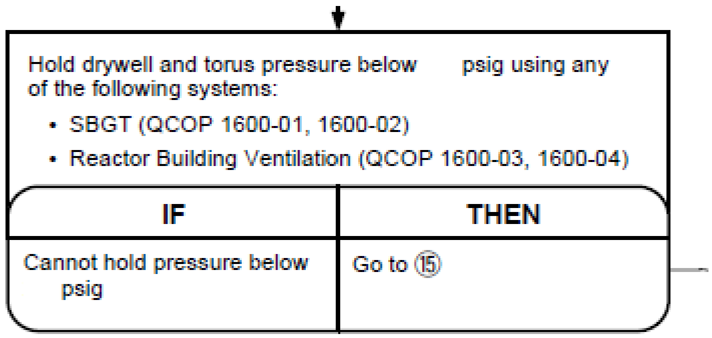
Comments:

Associated objective(s):

239002.2.2.22 Knowledge of limiting conditions for operations and safety limits. RO 4.0 SRO 4.7

SR-0203-K32 (Freq: LIC=B)
Given ADS logic and/or electromatic relief valve/ PORV/ Target Rock safety-relief valve operability status OR key parameter indications, various plant conditions and a copy of Tech Specs, DETERMINE Tech Spec compliance and required actions, if any.

91	ID: 1242769	Points: 1.00



Unit 2 was operating at 100% power. The SJAE Radiation Monitors readings rose by 75% in the last two hours.
A small break LOCA occurred leading to a manual scram.

Plant conditions:

RPV water level	+25 inches and slowly lowering
RPV pressure	900 psig and slowly lowering
Drywell pressure	2.0 psig and slowly rising
Torus pressure	0.6 psig and slowly rising
Torus level	+2.0 inches and slowly rising

For the given plant conditions, the SRO will direct which ONE of the following actions to control containment pressure?

Venting the...

A. Torus through the Standby Gas Treatment system.

B. Drywell through the Reactor Building Ventilation system.

C. Torus through the Reactor Building Ventilation system.

D. Drywell through the Standby Gas Treatment system.

Answer: A

Answer Explanation

From EPG/SAG Rev. 3 bases

"The initial action taken to control primary containment pressure employs the same methods typically used during normal plant operations: monitoring its status and using containment and drywell pressure control systems (including Standby Gas Treatment System) as required to maintain containment pressure below the high drywell pressure scram setpoint. "

This question is centered on the first step of QGA 200 "Primary Containment Control" pressure leg. The SRO must choose between SBGTS and Reactor Building Ventilation. The SRO must then also elect whether to vent the Drywell directly or vent from the Torus. By venting through the Torus, a decontamination factor of up to four is attained. Additionally, it helps prevent the Torus to Drywell Vacuum Breakers from cycling. The use of the SBGTS allows a further filtering of the gases since fuel damage is present and the fission products are being released to the Primary Containment atmosphere.

Distractor 1 is incorrect: Plausible because the Drywell is a viable vent path and a vent recommendation is on hand. However, the Torus is the preferred vent path. Additionally, with a LOCA the RB Vents would not be used.
Distractor 2 is incorrect: Plausible because the RB Vents are a viable vent path and a vent recommendation is on hand, but with a LOCA the RB Vents would not be used.
Distractor 3 is incorrect: Plausible because Drywell is a viable vent path, but the Torus is the preferred vent path.

Reference: QCOP 1600-13 Rev. 28 Discussion Section B.3
Reference provided during examination: None

Cognitive level: High

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

K/A: 261000 A2.11 Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High containment pressure

(CFR: 41.5 / 45.6)
IMPORTANCE RO 3.2 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: None.

Associated objective(s):

261000.A2.11 High containment pressure (RO=3.2 / SRO=3.3)

SR-7500-K26 (Freq: LIC=B)
EVALUATE given key SBGTS parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):

a. High charcoal temperature
b. Failure to start automatically
c. Low or high system flow
d. Low or high system differential pressure

92 **ID: 1242941** **Points: 1.00**

Given the following:

· Unit 1 is in MODE 3
· Unit 2 is in MODE 1

The Unit 1 EO calls the control room and reports the "EMERGENCY SOURCE ACCEPTED" light on the ESS ABT is NOT lit.

What actions (if any) are required?

(Reference provided for this question.)

A. Unit 1 must enter LCO 3.8.8 Condition A. Unit 2 will not enter a LCO.

B. Unit 1 must enter LCO 3.8.7 Condition A. Unit 2 will not enter a LCO.

C. Unit 1 must enter LCO 3.8.8 Condition A and Unit 2 must enter LCO 3.8.7 Condition C.

D. Unit 1 must enter LCO 3.8.7 Condition A and Unit 2 must enter LCO 3.8.7 Condition C.

Answer: D

Answer Explanation

The Essential Service Bus is a 120 VAC subsystem that is required per LCO 3.8.7 when in Modes 1, 2 and 3. It is an opposite unit required bus and required to be capable of being energized from Bus 18-2.

Distractor 1 is incorrect: Plausible because the Unit One LCO is incorrect and the examinee may determine there is no entry for Unit Two.
Distractor 2 is incorrect: Plausible because Unit One entry condition is correct and the examinee may determine there is no entry for Unit Two.
Distractor 3 is incorrect: Plausible because both units enter an LCO, however, the Unit one LCO is incorrect. LCO 3.8.7 is applicable in Modes 1, 2, and 3.

Reference: TS 3.8.7 and TS Bases 3.8.7 (B 3.8.7-3) Amendment 199/195
Reference provided during examination: TS 3.8.7 and TS 3.8.8

Cognitive level: High

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

K/A: 262002.2.2.40 Uninterruptable Power Supply (A.C. /D.C.) 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.

- 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: Modified
Question History: Exam Bank system ID 1221471

Comments: None.

Associated objective(s):

SR-6500-K32 (Freq: LIC=B) Given 4KV / 480 VAC Distribution Systems operability status OR key parameter indications, various plant conditions and a copy of Tech Specs, DETERMINE Tech Spec compliance and required actions, if any.

262002.2.2.40 Ability to apply technical specifications for a system. (RO=2.9 / SRO=4.0)

93	ID: 1242490	Points: 1.00

CY-QC-160-200
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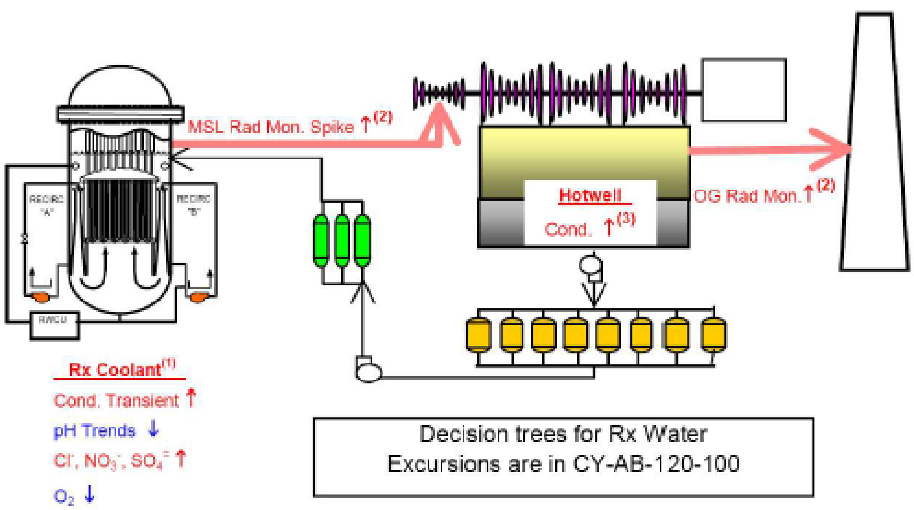
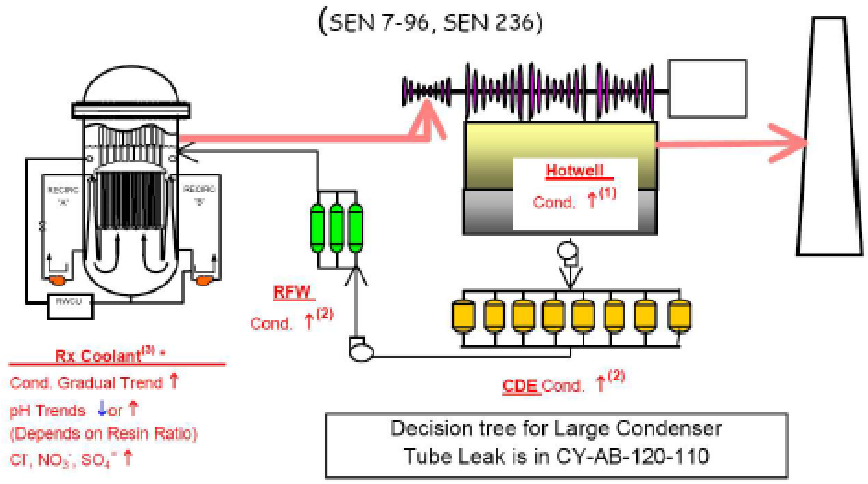
ATTACHMENT 5
Chemical Intrusion Troubleshooting Guide
Page 1 of 4

Resin Intrusion - RWCU



Condenser Tube Leak

(SEN 7-96, SEN 236)



*It is likely that reactor water Cl^- and $SO4^=$ will increase first <u>IF</u> tube leak is small (concentrates in reactor).

(Refer to the preceding page.)

Unit 2 is at full power.
Three Circulating Water pumps are in operation.
Main Condenser back pressure is 0.8" Hg.
Both RWCU Filter Demins are on-line.

The following sequence of events occurred on Unit 2 over the last hour:

- 2A RWCU Filter/Demin back wash and pre-coat
- Main Condenser Flow reversal

The following trends are noted:

- Main Steam line radiation readings spiked from an initial value of 200 units to 300 units and they remain elevated
- SJAE radiation monitor readings have risen from an initial value of 110 units to 200 units and they continue to rise slowly

Chemistry confirms:

- Condensate Conductivity has risen by 0.05 to a value of 0.10 micromho/cm
- RWCU Filter/Demin conductivity has risen by 0.07 to a value of 0.12 micromho/cm

The cause of the chemical excursion is a ___(1)___ .

The required course of action is to ___(2)___ .

A. (1) RWCU Resin Intrusion

(2) remove the RWCU system from service per QCOP 1200-08, RWCU SYSTEEM SHUTDOWN.

B. (1) Main Condenser Tube Leak

(2) commence Unit 2 shutdown per QCGP 2-1, NORMAL UNIT SHUTDOWN.

C. (1) Main Condenser Tube Leak

(2) secure one of the running Circulating Water pumps per QCOP 4400-02, CIRCULATING WATER SYSTEM STARTUP AND SHUTDOWN.

D. (1) RWCU Resin Intrusion

(2) remove the recently pre-coated Filter Demin from service per QCOP 1200-03, REMOVAL OF A RWCU FILTER DEMINERALIZER FROM OPERATION.

Answer: D

Answer Explanation

The conditions given in the question are indication in of RWCU resin intrusion. The SRO should be able to determine the higher than normal MSL and Off Gas radiations levels are caused by resin and not a Condenser Tube leak from the Main Condenser flow reversal. The SRO must take their initial condition assessment and develop the correct course of action.

Per QCOP 1200-06:
"E.1. An increase in Reactor or RWCU outlet conductivity of > 0.05 micromhos/cm within an hour of placing a Demin on line is sufficient evidence of resin intrusion to warrant isolating Demin and notifying Chemistry."

Per QCOA 3300-03:
"a. IF Chemistry confirms conductivity is > 0.4 micromho/cm, THEN refer to CY AB 120 100 AND CY-AB-120-110.
b. IF three Circulating Water Pumps are in operation, THEN shut down one pump per QCOP 4400-02."

Distractor 1 is incorrect: Plausible because the examinee may believe the RWCU system needs to be removed from service and not just the filter/demin. Per QCOP 1200-06 the correct course of action is to remove the Filter Demin from service when conductivity has risen ≥0.05 micromho in an hour.
Distractor 2 is incorrect: Plausible because the examinee may incorrectly assess there is a Main Condenser tube leak and the plant must be shutdown. However, the indications show a RWCU Filter Demin failure. Additionally, the small rise in Condensate conductivity would not warrant a plant shutdown.
Distractor 3 is incorrect: Plausible because the examinee may incorrectly assess there is a Main Condenser tube leak. Securing a Circ Water pump would be the correct action if a Condenser Tube Leak existed.

Reference: CY-QC-160-200 rev. 1, QCOP 1200-06 Rev. 24, QCOA 3300-03, Rev. 7
Reference provided during examination: None

Cognitive level: High

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

K/A: 204000 SG 2.1.23 Reactor Water Cleanup System Ability to perform specific system and integrated plant procedures during all modes of plant operation.

(CFR: 41.10/43.5/45.2/45.6)
IMPORTANCE RO 4.3 SRO 4.4

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-1200-K26 (Freq: LIC=B) EVALUATE given key Reactor Water Cleanup System parameter indications and/or responses depicting a system specific abnormality/failure and DETERMINE a course of action to correct or mitigate the following abnormal condition(s):
a. Reactor water exceeds Exelon chemistry action levels
b. RWCU high or low flow
c. NRHX high temperature
d. Resin exhaustion
e. Resin intrusion
f. RWCU system leak
g. RWCU transient that could result in loss of precoat

204000.2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. RO 4.3 SRO 4.4

94 **ID: 1228935** **Points: 1.00**

Unit 2 is at 100% power when a transient occurs, resulting in a HIGH reactor pressure condition.

Which of the following conditions, if any, will require the Shift Manager to declare an ALERT due to meeting the threshold values of MA2? If neither condition requires a declaration, why?

Condition 1: RPV pressure reaches 1060 psig and reactor shutdown is achieved by automatic scram solenoid pilot valve operation.

Condition 2: RPV pressure reaches 1150 psig and reactor shutdown is achieved by manual ARI initiation.

(Note: Consider each condition separately.)

MA2 Automatic Scram fails to shutdown the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor. 1 2

EAL Threshold Values:

1. Automatic scram was **not** successful as indicated by Reactor Power **> 5%.**

   AND

2. Manual scram/ARI actions were successful from Reactor Console as indicated by Reactor Power **≤ 5%.**

A. Condition 2 only

B. Condition 1 and 2

C. NEITHER because MA2 is NOT applicable for the initial operating condition.

D. NEITHER because the reactor was shutdown in both conditions.

Answer: A

Answer Explanation

The candidate must determine:
1) if reactor pressure is above the RPS scram setpoint.
2) if ARI and scram solenoid pilot valves are normal or alternate means of rod insertion.
3) if MA2 is applicable if the reactor is shutdown and in Mode 3.

The UFSAR analytical value for RPS scram on high RPV pressure is 1060 psig (actual is 1024 psig). Therefore, anything less than 1024 psig does not meet threshold value one (1).

The second condition of this EAL indicates a failure of the automatic RPS scram function to rapidly insert a sufficient number of control rods to achieve reactor shutdown. The Alternate Rod Insertion (ARI) system provides an automatic and alternate method of completing the scram function. This backup, however, inserts control rods at a much slower rate than the automatic RPS scram function. For the purpose of emergency classification at the Alert level, reactor shutdown achieved by ARI initiation does not constitute a successful RPS automatic scram.

Since the ATWS condition (for Condition 2) was initially present with the plant in Mode 1, MA2 is applicable (even if ARI places the plant in Mode 3).

Distractor 1: Plausible if candidate does not recognize that reactor shutdown from automatic scram solenoid pilot valve operation is the normal method of control rod insertion.
Distractor 2: Plausible if candidate incorrectly applies the applicability of MA2 to the initial condition of the plant.
Distractor 3: Plausible if candidate assumes that declaring an alert is not required because the reactor was automatically shutdown in both conditions.

Reference: EP-AA-1006 Addendum 3 Rev. 1
Reference provided during examination: None

Cognitive level: High

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

Question Source: Bank
Question History: Quad ILT Bank (QDC.ILT.760618)

10 CFR Part 55 Content: 41(b)(10)
SRO Justification: Unique to SRO position (reference facility objective)

KA 2.4.41: Knowledge of the emergency action level thresholds and classifications.

Comments: None

Associated objective(s):

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

S-0302-K70 (Freq: LIC=B ILT=NA) Given a CRD Hydraulic System operating mode and various plant conditions and a copy of EP-AA-111 and EP-AA-1006, CLASSIFY the event/abnormal condition including correct EALs and PARs in accordance with EP-AA-111 and EP-AA-1006.

95 **ID: 1243148** **Points: 1.00**

Which of the following would be classified as a "Controlled Exclusion" in the Temporary Configuration Change (TCC) process per CC-AA-112 "TEMPORARY CONFIGURATION CHANGES", and therefore do not require a Temporary Configuration Change Package (TCCP) for installation?

(1) Placing a temporary portable fan at the Feedwater Reg Valve hydraulic skid to aid in cooling.

(2) Attaching a drain hose to the "A" RHR heat exchanger with RHR removed from service under a Clearance Order for on-line maintenance.

(3) Installing digital pressure instruments for an upcoming RHR surveillance.

(4) Placing a temporary sump pump in the Crib House basement to prevent localized flooding.

A. (1) and (2)

B. (2) and (3)

C. (1) and (4)

D. (3) and (4)

Answer: B

Answer Explanation

This question tests the candidate's ability to recognize TCCs. SROs on shift need to be cognizant of plant configuration changes that qualify as TCCs. A fan providing supplemental cooling is a TCC. A temporary sump pump are not "Controlled Exclusions" in the TCC process. The word "temporary" appears in a correct choice and an incorrect choice to remove the examinee's ability to automatically select the answer based on the word alone.

Distractor 1 is incorrect: Plausible because a temporary cooling fan is a TCC, but a drain hose used for maintenance is a Controlled Exclusion
Distractor 2 is incorrect: Plausible because a temporary cooling fan is a TCC and a temporary sump pump is a TCC.
Distractor 3 is incorrect: Plausible because installation of digital pressure instruments for an upcoming RHR surveillance is a Controlled Exclusion, but a temporary sump pump is a TCC

Reference: CC-AA-112 rev. 23
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): SRO
Tier: 3

K/A: 2.2.11 Knowledge of the process for controlling temporary design changes.

(CFR: 41.10/43.3/45.13)
IMPORTANCE RO 2.3 SRO 3.3

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

This question addresses the bulleted items of "temporary modifications" and "installation of temporary instrumentation". The combination of these two elements from 10CFR 55.43(b)(3) results in a SRO only question.

Question Source: New
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.

2.2.11 Knowledge of the process for controlling temporary changes. (RO=2.3 / SRO=3.3)

96	ID: 1227663	Points: 1.00

You have been assigned to SUPERVISE fuel moves on the refuel floor for the outage.

Which of the following activities is required EVERY SHIFT, before fuel moves can begin?

A. Sign on as a HOLDER of the Clearance Order that is placed to prevent cavity draining.

B. NOTIFY the Drywell control point Radiation Technician that fuel moves are about to begin.

C. VERIFY both Fuel Pool Cooling Pumps and associated heat exchangers are functional on both Units.

D. VERIFY from the QNE that Shutdown Margin requirements of Technical Specification 3.1.1 are met for all fuel movements.

Answer: B

Answer Explanation

Prerequisite C.8 of QCFHP 0100-01 states:

Prior to the start of moving fuel within the confines of the Reactor vessel or cavity, the SRO (L) / SRO Licensed Supervisor shall contact the drywell point Radiation Technician (or RP Supervisor).

Distractor 1 is incorrect: Plausible because it is a QCFHP 0100-01 prerequisite, but NOT a once a shift requirement. The clearance order is placed and held by the Operations department. There is no requirement for individuals moving fuel to sign on.
Distractor 2 is incorrect: Plausible because it is a requirement for a full core off load and it is NOT a once a shift requirement.
Distractor 3 is incorrect: Plausible because it is a QCFHP 0100-01 prerequisite, however, this is NOT a once per shift requirement.

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

Cognitive level: Memory

Level (RO/SRO): SRO
Tier: 3

K/A: Generic 2.1.35 Knowledge of the fuel handling responsibilities of SROs

(CFR: 41.10 / 43.7)
IMPORTANCE RO 2.2 SRO 3.9

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

Fuel handling facilities and procedures.

? Refuel floor SRO responsibilities
? Assessment of fuel handling equipment surveillance requirement acceptance criteria
? Prerequisites for vessel disassembly and reassembly
? Decay heat assessment

- Assessment of surveillance requirements for the refueling mode
- Reporting requirements
- Emergency classifications

Question Source: Bank
Question History: N/A

Comments: None

Associated objective(s):

2.1.35 Knowledge of the fuel handling responsibilities of SROs. (RO=2.2 / SRO=3.9)

SR-805-K05 (Freq: LIC=B)
Given refueling operation and administrative procedures for the following tasks, EXPLAIN the reasons for the prerequisites.

a. Moving fuel to or from the reactor
b. Moving blade guides to or from the reactor
c. Moving fuel support pieces to or from the reactor
d. Moving control rod blades to or from the reactor

97	ID: 1249173	Points: 1.00

The Unit 2 ANSO begins a surveillance to stroke a normally open motor operated containment isolation valve.

- 0800, the ANSO begins the surveillance procedure.
- 0830, the Unit Supervisor is informed the valve will NOT stroke in the closed direction.
- 0900, Unit Supervisor completes the failed surveillance paperwork and the surveillance is logged as UNSAT.
- The valve was last satisfactorily tested 90 days ago at 1000.

When does the Technical Specification COMPLETION TIME for the REQUIRED ACTIONS start?

A. Today at 0800

B. Today at 0830

C. Today at 0900

D. 90 days ago at 1000

Answer: B

Answer Explanation

Answer: .LCO 3.0.2
"LCO 3.0.2 establishes that upon discovery of a failure to meet an LCO, the associated ACTIONS shall be met. The Completion Time of each Required Action for an ACTIONS Condition is applicable from the point in time that an ACTIONS Condition is entered."
This question requires the SRO to apply their knowledge of LCO Completion Times to a given set of circumstances. ROs do not perform this action.

Distractor 1 is incorrect: Plausible because the examinee may determine the time clock starts when the surveillance procedure commences.
Distractor 2 is incorrect: Plausible because the examinee may determine the time clock starts when the paperwork is complete and the log entry is made.
Distractor 3 is incorrect: Plausible because the examinee may determine the time clock start must take past OPERABILITY into consideration and move the COMPLETION TIME to the last known date of OPERABILITY.

Reference: TS LCO Applicability 3.0.2 Amendment 223/218
Reference provided during examination: None

Cognitive level: Memory

Level (RO/SRO): SRO
Tier: 3 Group: N/A

K/A: 2.2 Equipment Control 2.2.12 Knowledge of surveillance procedures

(CFR: 41.10 / 45.13)
IMPORTANCE RO 3.7 SRO 4.1

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: Bank, Nine Mile Point ILT Bank (22334)
Question History: NMP 2002 NRC ILT Exam, Prairie Island 2004 ILT NRC Exam, Quad Cities ILT 10-1 Comp Exam

Comments: Bank question revised for readability.

Associated objective(s):

2.2.12 Knowledge of surveillance procedures. (RO=3.7 / SRO=4.1)

(Freq: LIC=I-SRO Only) Given the Improved Technical Specifications (ITS) and the associated Bases, the trainee shall:
GIVEN PLANT CONDITIONS, APPLY THE RULES OF ITS SECTION 1.3 TO ENSURE COMPLIANCE WITH TECHNICAL SPECIFICATIONS.

98 **ID: 1243187** **Points: 1.00**

Unit 2 has sustained a DBA LOCA.

The following conditions exist:

RPV Parameters
- RPV Water level is -135" and slowly rising
- RPV pressure is 1.0 psig and steady
- Control Rod H-8 indicates position 48
- Div II ECCS pumps are injecting at rated flow
- Div I ECCS pumps are unavailable

Containment Parameters
- Drywell pressure is 20 psig and steady
- Torus pressure in 20.5 psig and steady
- Drywell temperature is 245°F and steady
- Torus level is 14.5 feet and steady
- 902-55 A-1 DRYWELL HIGH RAD CONC is in alarm and will not clear
- Drywell radiation monitors are above the EAL threshold for a loss of the Fuel Clad fission product barrier and are rising slowly

The Unit Supervisor orders the NSO to inject Standby Liquid Control.

Why did the Unit Supervisor direct this action?

A. To shutdown the reactor.

B. In preparation for the transition to SAMG.

C. To supplement RPV water level control.

D. To control Torus pH above 7 and retain iodine in solution.

Answer: D

Answer Explanation

The third performance objective of the SBLC system is to maintain the pH of the suppression pool at a value greater than 7 in the event of a design basis LOCA. Following a DBA LOCA, the required volume of sodium pentaborate is injected into the reactor (and ultimately flushed to the suppression pool via ECCS flow) to maintain the suppression pool pH at a value greater than 7. This action ensures that the iodine deposited into the pool during a DBA LOCA does not re-evolve and become airborne as elemental iodine. This SBLC function is credited in the radiological assessments performed as part of Alternative Source Term (AST) – see UFSAR Section 15.6.5.5

Distractor 1 is incorrect: Plausible because the examinee may determine with one rod out the reactor is not shutdown
Distractor 2 is incorrect: Plausible because the examinee may believe the low water level will call for entering the SAMG. In the SAMG, SBLC is injected regardless of the state of the reactor
Distractor 3 is incorrect: Plausible because the examinee may determine SBLC is needed to restore RPV level to TAF. However, adequate core cooling exists with stated conditions.

Reference: UFSAR section 9.3.5 Rev. 10, QOA 900-55 A-1 Rev. 11

Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 3

K/A: Generic 2.3.11 Ability to control radiation releases
(CFR: 41.10/43.4/45.10)
IMPORTANCE RO 3.8 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.

- 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):

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

SR-1100-K01 (Freq: LIC=B)
STATE the purpose(s) of SBLC including applicable design bases.

99 **ID: 1243271** **Points: 1.00**

Both Units are operating at rated power when a fire is reported at the Hydrogen Seal Oil pump area. The Unit Supervisor has directed actions of QCOA 0010-12, FIRE / EXPLOSION. Fifteen minutes later, the Fire Brigade Leader reports the fire is spreading to the ground floor and Main Turbine floor.

The ANSO then reports:

- Bus 13 and Bus 14 have tripped
- 1A EHC pump has tripped and the standby pump has autostarted
- 1A and 1B Feedwater Regulator valves have locked up
- Spurious valve actuations are occuring on "A" Loop of RHR
- 1A Core Spray pump autostarted

Which set of procedures should the Unit Supervisor direct to mitigate the transient?

A. QGAs

B. QCOAs

C. QCOPs

D. QCARPs

Answer: D

Answer Explanation

The reported indicatons with the knowledge of a spreading fire indicate the Circ Water system (Bus 13 / 14) and the RHR valve actuations are leading toward an inability to bring the Unit to a hot shutdown or cold shutdown condition. Since the QGAs would be ineffective, the QCARPs are required.

Distractor 1 is incorrect: Plausible because the QGAs are designed for abnormal conditions and provide direction on bring the reactor to cold shutdown.
Distractor 2 is incorrect: Plausible because QCOA 0010-12 is specifically written for a fire or explosion. The given conditions/reports indicate those actions are not sufficient to control the plant.
Distractor 3 is incorrect: Plausible because QCOPs do provide guidance on locally operating equipment, but does not have steps to prevent spurious actuations.

Reference: QCOA 0010-12 Rev. 47
Reference provided during examination: None

Cognitive level: High

Level (RO/SRO): SRO
Tier: 3

K/A: 2.4.11 Knowledge of abnormal condition procedures

(CFR: 41.10/ 43.5 / 45.13)
IMPORTANCE RO 4.0 SRO 4.2

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

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

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: None.

Associated objective(s):

2.4.11 Knowledge of abnormal condition procedures. (RO=4.0 / SRO=4.2)

SRN-ARP-K01 (Freq: LIC=B NF=B)
State the purposes of the QCARP procedures.

100	ID: 1227660	Points: 1.00

Unit 2 is at 100% power when Chemistry determines that reactor coolant specific activity is 0.6 mCi/gm Dose Equivalent Iodine (I-131).

Complete the following statements:

· This is ___(1)___ the Technical Specification limit for reactor coolant specific activity.

· Per the bases of TS 3.4.6, RCS Specific Activity, the reactor coolant specific activity limit ___(2)___.

A. (1) below
(2) ensures the source term assumed in the safety analysis for the Main Steam Line Break (MSLB) is not exceeded

B. (1) above
(2) prevents stress corrosion cracking of the stainless steel reactor materials that are in contact with the coolant

C. (1) below
(2) prevents stress corrosion cracking of the stainless steel reactor materials that are in contact with the coolant

D. (1) above
(2) ensures the source term assumed in the safety analysis for the Main Steam Line Break (MSLB) is not exceeded

Answer: D

Answer Explanation

The specific iodine activity is limited to < 0.2 mCi/gm Dose Equivalent Iodine (I-131). This limit ensures the source term assumed in the safety analysis for the MSLB is not exceeded, so the dose consequence of any release of radioactivity to the environment during a MSLB is less than a small fraction of the 10 CFR 50.67 limits at the site boundary and less than 10 CFR 50.67 limits for the control room.

Distractor 1 is incorrect: Plausible if the candidate assumes that the DEI limit is 1.0 mCi/gm. In Mode 1, the TLCO 3.4.b limit for RCS conductivity is 1.0 mmhos/cm at 25°C.
Distractor 2 is incorrect: Plausible because chloride limits listed in TLCO 3.4.b, RCS Chemistry, are to prevent stress corrosion cracking of the stainless steel materials that are in contact with the coolant.
Distractor 3 is incorrect: Combination of distractor 1 and 2.

Reference: TS LCO 3.4.6 and bases Amendment 223/218
Reference provided during examination: N/A

Cognitive level: Memory

Level (RO/SRO): SRO
Tier: 3 Group: N/A

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. The answer is derived from the LCO and the LCO bases.
Can question be answered *solely* by knowing the TS Safety Limits? NO

Question Source: Crystal River ILT Exam Bank
Question History: Crystal River 2007 ILT NRC Exam, Quad Cities 2009 ILT NRC Exam
Comments: None

Associated objective(s):

S-1200-K33 (Freq: LIC=I)
DISCUSS the bases for Reactor Water Cleanup System related Tech Spec LCO's.

2.1.34 Knowledge of primary and secondary plant chemistry limits. (RO=2.7 / SRO=3.5)