# 2014 LaSALLE COUNTY STATION

# INITIAL LICENSE EXAMINATION

# ADMINISTERED EXAM FILES

WRITTEN/ANSWER KEY/
HANDOUTS

# EXAMINATION ANSWER KEY

13-1 NRC RO EXAM

**1** **ID: 055.00.01.01** **Points: 1.00**

What is the reason for an automatic scram when thermal-hydraulic instabilities are sensed during a partial or complete loss of forced circulation core flow?

The reactor scram avoids exceeding ...

A. the MCPR Safety Limit during flux oscillations.

B. the MFLPD operating limit due to low coolant flow.

C. the MAPRAT operating limit due to low coolant flow.

D. the Reactor Pressure Safety Limit during flux oscillations.

Answer: A

**Answer Explanation:**

Correct Answer: Per Basis statement of TS B.3.3.1.3 for OPRM's "General Design Criteria 10 & 12 require that fuel design limits will not be exceeded during any condition of normal operation, including the effects of anticipated operational occurrences, and that power oscillations are either prevented by design or reliably detected and suppressed". MCPR is the thermal limit that is of concern during abnormal operating transients.

Distractor B: The MFLPD thermal limit is in place to prevent fuel damage during normal operation due to plastic strain on the cladding.

Distractor C: The MAPRAT thermal limit is in place to prevent fuel damage during accidents when the fuel becomes uncovered, not low coolant flow. MAPRAT is the thermal limit that is of concern during accidents, not normal operations or abnormal operating transients.

Distractor D: Flux oscillations can also affect RPV pressure, but not to the extent that the RPV Pressure safety limit is challenged. This reason is not included with the purpose of OPRMs.

Reference: TS B.3.3.1.3 Basis, LOA-RR-101 Reactor Recirculation System Abnormal rev 33 and LP 055, OPRMs,

Reference provided during examination: None

Cognitive level: Memory

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

KA Number and Statement: 295001 K3.04
Knowledge of the reasons for the following responses as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Reactor SCRAM

Learning Objective: 55.00.01 Recall the design bases while operating the OPRM System or on an exam in accordance with the UFSAR and procedures/student text.

Question Source: Bank
Question History: Question #1 on the 2010 NRC Exam at River Bend

**Associated objective(s):**

Given a RRFC System lineup and various plant conditions, evaluate system indications/responses and determine if the indications/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.

Recall the design bases while operating the OPRM System or on an exam in accordance with the UFSAR and procedures/student text.

**2** **ID: 06.00.16.04** **Points: 1.00**

Operators are performing DC Load shedding IAW LOA-AP-101 "AC SYSTEM ABNORMAL" during a station Blackout event.

After 6 hours into the event, operators will maintain...

A. availability of Reactor Building emergency lighting.

B. ability to operate Emergency Seal Oil Pump.

C. Plant Process Computer availability.

D. ADS operation.

Answer: D

**Answer Explanation:**

Explanation: ADS is the correct answer. IAW ATTACHMENT "N" OF LOA-AP-101 SPECIFIES loads that are never disconnected from the batteries. and ADS is one of these loads. Since the Fukishima event loss of power events have high operational validity.

Distractor A: The Reactor Building lighting cabinet is secured within 5.5 hours of a station blackout event, IAW LOA-AP-101 Attachment "N" DC LOAD SHEDDING plausible because the candidate may assume importance of RB emergency lighting for personnel safety while performing actions of Emergency and abnormal procedures in the reactor building.

Distractor B: The Emergency Seal Oil Pump (ESOP) is secured within 3 hours of a station blackout event IAW LOA-AP-101 Attachment "N" DC LOAD SHEDDING. This distractor is plausible if the candidate remembers when the ESOP is secured H2 from the generator seals will escape to the turbine deck.

Distractor C: In a station blackout condition the Process Computer is secured within 30 minutes during a station blackout event IAW LOA-AP-101 Attachment "N" DC LOAD SHEDDING. This answer is plausible if the candidate assumes the plant process computer is too important for monitoring of plant equipment in the main control room.

Reference: LOA-AP-101 "AC SYSTEM ABNORMAL" Revision 45
Reference provided during examination: None

K/A Number/IR: 295003 K2.06/ 3.4 3.5
K/A Statement: Partial or Total Loss of AC Power: Knowledge of the interrelations between Partial or Complete Loss of AC and the following: DC electrical loads
Safety Function:6
CFR 41.
PRA: No

Cognitive level: Memory
Level: RO
Tier: 1 Group: 1

Question Source: New
Question History: N/A

SRO Justification: N/A

Comments

**Associated objective(s):**

Given various plant conditions, predict the DC Distribution System response to a loss of the major power supplies while operating the system, or on an exam in accordance with student text.

**3** **ID: 415.00.01.01** **Points: 1.00**

Both Units are at full power.
U-2 SBGT is OOS for maintenance.

- Unit 2 has a Loss of Div 2 DC
- The Unit-1 NSO notes the U-1 SBGT is in standby

(1) What LGA will be entered on Unit 1?
(2) What is the correct action/report for the Unit-1 NSO?

A. (1) LGA-001
(2) Start U-1 SBGT

B. (1) LGA-002
(2) Start U-1 SBGT

C. (1) LGA-002
(2) Report U-1 SBGT is unavailable due to the loss of U-2 Div 2 DC

D. (1) LGA-001
(2) Report U-1 SBGT is unavailable due to the loss of U-2 Div 2 DC

Answer: B

**Answer Explanation:**

Explanation: LGA-002 is the correct procedure because on a loss of U-2 Div 2 DC, both Units 1 and 2 VR (Reactor Building Ventilation) will isolate on a group 4 signal due to the loss of DC power. Group 4 logic is de-energize to actuate. With both Units VR isolated and VR fans shutdown and with no SBGT ventilation running, Reactor Building DP will rise to 0" and that is a LGA-002 entry condition. Starting the U-1 SBGT is the correct response, and is an Operator Immediate Action IAW OP-LA-101-111-1002 LaSalle Operations Philosophy Handbook, "If equipment fails to auto start when required, THEN START the equipment". The reactor building ventilation is common to both Units and this requires action from both Unit"s NSO's.

Distractor A: Entering LGA-001 is incorrect. The correct LGA to enter is LGA-002 based on a loss of Reactor Building ventilation. This answer is plausible because a direction from LOA-DC-201 has the Operators scram U-2 on a loss of DC but the other Unit should remain in operation. The second part of this distractor is correct because starting the U-1 SBGT is the correct response, starting the U-1 SBGT is an Operator Immediate Action IAW OP-LA-101-111-1002 LaSalle Operations Philosophy Handbook "If equipment fails to auto start when required, THEN START the equipment"

Distractor C: LGA-002 is the correct procedure because on a loss of U-2 Div 2 DC, both Units 1 and 2 VR (Reactor Building Ventilation) will isolate on a group 4 signal due to the loss of DC power. Group 4 logic is de-energize to actuate. With both Units VR isolated and VR fans shutdown and with no SBGT ventilation running, Reactor Building DP will rise to 0" and that is a LGA-002 entry condition. Reporting U-1 SBGT is unavailable is incorrect, the SBGT system initiation logic is de-energize to actuate, with a failure of U-2 Div 2 DC the U-1 SBGT should be in operation and per Operator Immediate Action IAW OP-LA-101-111-1002 LASALLE OPERATIONS PHILOSOPHY HANDBOOK, "If equipment fails to auto start when required, THEN START the equipment"

Distractor D: Entering LGA-001 is incorrect, the correct LGA to enter is LGA-002 based on loss of Reactor Building ventilation. This answer is plausible because a direction from LOA-DC-201 has the Operators scram U-2 on a loss of DC but the other Unit should remain in operation.Reporting U-1 SBGT is unavailable is incorrect, the SBGT system initiation logic is to de-energize to actuate, with a failure of U-2 Div 2 DC the U-1 SBGT should be in operation and per Operator Immediate Action IAW OP-LA-101-111-1002 LASALLE OPERATIONS PHILOSOPHY HANDBOOK , "If equipment fails to auto start when required, THEN START the equipment".

Reference: LOA-DC-201 rev 16, LGA-002 rev 6
Reference provided during examination: None

K/A Number/IR: 295004 G4.01
K/A Statement:Partial or Total Loss of DC PWR: Knowledge of EOP entry conditions and immediate action steps

Safety Function: 6
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given plant conditions and LGA entry with Reactor Building ventilation isolated, verify operation of VG and/or VQ, while operating the plant or on an exam, IAW LGA-VG-101.

**4** **ID: 071.00.10.01** **Points: 1.00**

Unit 1 was at 100% power with RR FCV matched at 90% open indication when a generator lockout occurred.

- The Unit scrammed with all rods inserted
- EHC Bypass valves failed to respond on turbine trip
- HPCS and RCIC actuated to restore reactor level
- Reactor level is being controlled per level band of LGA-001 at 20-50 inches
- NO other operator action has been taken

What is the status of Reactor Recirculation?

A. Both pumps tripped to zero speed
Both FCV at 90% position

B. Both pumps operating in slow speed
Both FCV at 90% position

C. Both pumps tripped to zero speed
Both FCV at minimum position

D. Both pumps operating in slow speed
Both FCV at minimum position

Answer: A

**Answer Explanation:**

Explanation: A Generator Lockout will cause the Main Turbine to trip, with a loss of TSV RETS pressure reactor recirc will receive a EOC-RPT trip and should downshift to slow speed but if the bypass valves fail to respond open then reactor level will shrink due to the pressure spike and cause a level 2 condition in the reactor, this level 2 will be an initiation signal for the ATWS-RPT logic causing both reactor recirc pumps to trip to zero speed. In this scenario the reactor recirc flow control valves will remain in the original position at the start of the event, level 2 is a group 2 PCIS isolation signal which will lock up the flow control valves at the position in the beginning of the event.

Distractor B: This distractor is plausible because the first trip signal to the reactor recirculation pump will be the EOC RPT downshift trip but the level 2 signal will trip both pumps to zero speed.

Distractor C: This distractor is plausible because the pumps will trip to zero speed and there are a number of potential FCV runback signals but this event would not produce one and the FCV would be unable to run back due the group 2 level 2 isolation signal.

Distractor D: This distractor is plausible because the first trip signal to the reactor recirculation pump will be the EOC RPT downshift trip but the level 2 signal will trip both pumps to zero speed, and there are a number of potential FCV runback signals but this event would not produce one and the FCV would be unable to run back due the group 2 level 2 isolation signal.

Reference: LOR-1H13-P602-A302 rev 4, LOP-CX-06 rev 8
Reference provided during examination: None

K/A Number/IR: 295005 A1.01/ RO 3.1 SRO 3.3
K/A Statement:Main Turbine Generator Trip Ability to operate and/or monitor the following as they apply to MAIN TURBINE GENERATOR TRIP: Recirculation System
Safety Function:3
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the signals which cause a Main Turbine and Auxiliary Systems component trip, including setpoints, logic, how and when bypassed and how reset, and predict system response while operating the system on an exam in accordance with the student text and station procedures.

**5** **ID: 031.00.05.04** **Points: 1.00**

The reason for Setpoint Setdown of the RWLC (Reactor Water Level Control) System is to:

A. Momentarily lower the reactor water level setpoint when transferring from three element control to single element control.

B. Lower the reactor water level setpoint when there is only one feedpump running.

C. Ensure the feedpump turbines do NOT overspeed following a SCRAM.

D. Help maintain reactor water level below level 8 following a scram.

Answer: D

**Answer Explanation:**

Explanation:The setpoint setdown functions occurs if level falls below 20 inches and then recovers to above 20 inches or the post scram profile de-activates. This feature prevents overfeeding the vessel after a scram or if level drops below 20 inches. For example: When the turbine trips or MSIV's close the pressure spike causes the voids in the vessel to collapse and indicated level to drop, feedwater in automatic control would see this delta in actual level and level demand, this delta creates a large feedwater demand signal, the feed pumps will quickly overshoot the demanded level and level will go high before the feed pumps can respond. The setpoint set down feature dampens this large level error and allows the system to slowly bring level back to the level demand signal without overshooting.

Distractor A: this distractor is wrong because level is a bumpless transfer when operating in either single element, three element or in manual modes. Each mode of operation tracks the other to ensure level remains stable, if a mode of operation is changed, level will not change when swapping in single element control.

Distractor B:Level setpoint is unaffected by the amount of feed pumps running, there is an interlock that looks at reactor power and available feedpump capacity, and it affects the reactor recirc system which will run back the recirculation Flow Control Valves in the close direction, when reactor power is too high and not there is not enough feed pump capacity to supply the vessel.

Distractor C: this distractor is wrong because the Turbine Driven Reactor Feed Pump (TDRFP) high speed stop interlock enforced by the digital speed control system prevents the TDRFP from overspeeding,

Reference: LOP-FW-16 1DS001 OPERATOR STATION ALARM MESSAGE INTERPRETATION rev 27, LOP-RL-01 OPERATION OF THE REACTOR LEVEL CONTROL SYSTEM rev 21, RWLC lesson plan #31,
Reference provided during examination: None

K/A Number/IR: 295006 K3.04 / SRO 3.3 RO 3.1
K/A Statement: SCRAM: Knowledge of the reasons for the following responses as they apply to SCRAM: Reactor water level setpoint setdown.
Safety Function:1

CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 1 Group: 1

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips, and characteristics of the following Reactor Water Level Control System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. FRV M/A Transfer Station
b. TDRFP M/A Transfer Stations
c. High Level Reset
d. Low Flow FRV M/A Transfer Station
e. FRV M/A Transfer Station Lockout Reset
f. Level Setpoint Station
g. Min Flow M/A Station

**6** **ID: 054.00.05.09** **Points: 1.00**

Of the following choices, which choice ONLY lists SRVs that are available to use from the Remote Shutdown Panel?

A. 1B21-F013H and 1B21-F013K

B. 1B21-F013U and 1B21-F013S

C. 1B21-F013K and 1B21-F013U

D. 1B21-F013P and 1B21-F013S

Answer: A

**Answer Explanation:**

Explanation: SRVs, 1(2)B21-F013H, and-F013K,." is correct. There are control switches for these SRVs 1(2)B21-F013H, -F013K, and -F013P located on the remote shutdown panel and when control is established at the RSP (remote shutdown panel) then the emergency transfer switch is in the emergency position, this reposition of the switch will disconnect the main control room circuity from the SRV.

Distractor B: This distractor is plausible because it list two SRVs, both SRVs are the TRM 3.5.b low and medium function of LOW LOW SET (LLS), these SRVs are the first to open on a pressure transient and normally control reactor pressure in POST Scram transient, making them plausible distracters.

Distractor C: This distractor is plausible because it list one SRV that is on the RSP and the other SRV is a TRM 3.5.b low function of LOW LOW SET (LLS). This distractor is wrong based on the other SRV is in the main control room and if control is established at the RSP then the Emergency transfer switch has been re-positioned to emergency position.

Distractor D: This distractor is plausible because it list one SRV that is on the RSP and the other SRV is a TRM 3.5.b medium function of LOW LOW SET (LLS). This distractor is wrong based on the other SRV is in the main control room, and if control is established at the RSP then the Emergency transfer switch has been re-positioned to emergency position.

Reference: LOA-FX-101 UNIT 1 SAFE SHUTDOWN WITH A FIRE IN THE CONTROL ROOM OR AEER rev 26
Reference provided during examination: None

K/A Number/IR: 295016 2.4.34 / SRO 4.1 RC 4.2
K/A Statement:Control Room Abandonment: Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.
Safety Function:
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO

Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips, and characteristics of the following Remote Shutdown Panel components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. Main Steam Components
b. RHR B Components
c. Transfer Switches
d. RBCCW Components
e. RCIC Components
f. RR Components
g. Service Water Components
h. RHR Service Water Components

**7** **ID: 073.00.20.01** **Points: 1.00**

Unit 1 is at 100% power when the following occurred.

- 1PM10J-A303 TURBINE BUILDING CLOSED COOLING WATER (TBCCW) EXPANSION TANK 1WT01T LEVEL LOW alarm is received
- 1PM02J B505 EHC MINOR alarm is received.
- The following EHC work station alarms are received:
- EHC LEVEL INCREASING OVER TIME
- EHC RESERVOIR HI LEVEL
- The Unit rounds EO reports that the U-1 and common station air compressor oil temperatures have risen by 5 degrees from the previous shift

The operating crew will...

A. swap EHC coolers and isolate the affected EHC cooler.

B. swap EHC pumps, to isolate the online cooler.

C. start the U-2 Station Air Compressor.

D. scram U-1 and close MSIVs.

Answer: A

**Answer Explanation:**

Explanation: The correct answer to swap EHC coolers and isolate the affected cooler. Operations will take action based on OP-AA-101-111 ROLES AND RESPONSIBILITY OF ON-SHIFT PERSONNEL SECTION 4.2.10 "ENSURE abnormal conditions are investigated, including initial troubleshooting, verifying proper information is gathered and verifying appropriate corrective actions are established".. A low TBCCW expansion tank level alarm annunciating with a EHC Minor Trouble Alarm directs actions per LOP-EH-11 EHC WORKSTATION ALARM RESPONSE AND OTHER INFORMATION which provides direction to look for EHC cooler leaks.The cooler is located on the low pressure drain side of system and TBCCW is at a higher pressure and if there was a leak in the heat exchanger then the system would leak into the EHC reservoir. With this information the candidate should deduct a TBCCW leak into EHC condition is present.

Distractor B: This answer is plausible because other hydraulic systems at LaSalle that use fryquel have features with an integrated coolers and pumps on the same subloop, so that when the pump is swapped then the cooler is also swapped. This distractor is wrong because the cooler for EHC is on the low pressure drain side of the system, and it is on a common return. Pump swapping is independent of the coolers.

Distractor C:This answer is plausible because it anticipates actions for a loss of TBCCW and then losing the Unit 1 and U-0 station air compressors. A loss of TBCCW should be avoided by directing actions to swap coolers and other LOR actions are available to prevent the loss of TBCCW.

Distractor D: This answer is plausible because it anticipates loss of station air and a loss of EHC with the inability to use the bypass valves, but is incorrect because the crews actions to swap cooler can prevent a loss of EHC and TBCCW.

Reference: LOP-EH-11 EHC WORKSTATION ALARM RESPONSE AND OTHER INFORMATION rev 18, LOR-1PM01J-A303 TBCCW EXPANSION TANK 1WT01T LEVEL LOW, LOR-1PM02J-B505 EHC MINOR ALARM rev 4
Reference provided during examination: None

K/A Number/IR: 295018 A1.03 / RO 3.3 SRO 3.2
K/A Statement:Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING: AFFECTED SYSTEM so as to isolate damaged portions
Safety Function:
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the reasons for the EHC-Mechanical Systems' precautions and limitations while operating the system or on an exam in accordance with station procedures.

**8** **ID: 093.00.05.07** **Points: 1.00**

Unit 1 and 2 are at 100% power, U-2 was in the process of re-inerting, when the following occurred

- A rupture of the 4" instrument air headers is reported

(1) Without operator actions predict the response of the U-2 VQ air-operated dampers?
(2) What is the containment isolation status of VQ dampers?

A. (1) Fail as-is
(2) Isolation capability maintained

B. (1) Fail closed
(2) Isolation capability maintained

C. (1) Fail as-is
(2) Isolation capability NOT maintained

D. (1) Fail closed
(2) Isolation capability NOT maintained

Answer: A

**Answer Explanation:**

Explanation: With the stated conditions, with a rupture of the 4" Instrument air (IA) header the IA header pressure will depressurize after several minutes.The dampers are designed to FAIL as is on a loss of IA. When VQ valve loses air without a loss of power, a check valve in the air supply line maintains system air pressure thus keeping the dampers in their current position. The isolation capability is maintained for this damper because control power is available to the solenoid on the operator. Containment Isolation logic when actuated de-energizes the actuator solenoid which would re-postion spool piece on the actuator and depressurize the actuator and the damper would close. VQ damper isolation capability is part of containment integrity.

Distractor B: This is a plausible distractor because this is a common failure mode for air operated valves/dampers to fail closed on a lost of instrument air, the candidate is required to remember failure positions.

Distractor C: This is a plausible distractor because it states the correct mode of failure on a lost of instrument air and test the candidates knowledge of the VQ damper actuator operation.

Distractor D: This is a plausible distractor because this is a common failure mode for air operated valves/dampers to fail closed on a lost of instrument air, the candidate is required to remember failure positions. It also plausible if student does not understand how a VQ damper works and if candidate confuses a VQ dampers as air to load closed similar to the 1(2)B21-F032A/B feed water check valves which are containment isolation valves and air load closed.

Reference: LP#93 Primary Containment Vent and Purge, Lesson Plan #091 PCIS Primary Cojntainment Isolation System
Reference provided during examination: None

K/A Number/IR: 295019: K2.09 / SRO 3.3 RO 3.3
K/A Statement:Partial of Total Loss of Inst Air: Knowledge of the interrelations between Partial or Total Loss of Instr. air and the following: Containment
Safety Function:8
CFR 41.
PRA: No

Cognitive level: High 2 RI Comprehension: Recognizing interaction between systems
Level: RO
Tier:1 Group: 1

Question Source: New
Question History:

SRO Justification:N/A

Comments: This question meets the K/A because VQ containment isolation dampers maintain containment integrity

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips, and characteristics of the following VQ System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:
a. Vent and Purge Filter Train
b. Liquid Nitrogen Storage Tanks
c. Nitrogen Storage Tank Pressure Buildup Circuit
d. Ambient Vaporizer
e. Water Bath Vaporizer
f. Purge Dampers and Valves
g. Supply-Makeup Selector Switch
h. Pressure Controller
i. Charcoal Filter Deluge Valves

**9** **ID: 020.00.21.01** **Points: 1.00**

Unit 2 is in mode 4 with Shutdown Cooling (SDC) in operation.

- The Reactor Recirculation pumps are shutdown.
- Due to a spurious isolation of SDC, the system isolates and will NOT reset.

Which one of the following is an operational requirement?

Monitor...

A. to verify less than 25 gpm bottom head drain flow.

B. to detect if there is a loss of adequate core cooling.

C. for excess Reactor Recirculation Loop Delta temperatures.

D. for excessive thermal stresses between vessel bottom head and vessel top head flange.

Answer: D

**Answer Explanation:**

Explanation: The correct answer is to monitor for stratification per step 13 of LOA-RH-201, due to the loss of shutdown cooling, circulation in the core is lost, the crew is directed to restore circulation via natural circulation when shutdown cooling is unavailable. Until natural circulation is restored the operating crew needs to monitor vessel metal temperatures and the concerns as addressed by attachment "B" of this procedure is excess heating in the upper vessel head area versus the lower head area creating an excess thermal stress on the vessel.

Distracter A: This distracter is wrong but plausible because the number comes from the Attachment "B" flow requirement and is to be greater than 25 gpm to allow for a more accurate reading of reactor vessel bottom head drain flow which is used to determine stratification

Distracter B: This distractor is wrong but plausible because on a loss of shutdown cooling temperatures are a concern but the first concern is vessel stratification and not loss of adequate core cooling, adequate core cooling is maintained due to core submergence

Distracter C: This distractor is wrong but plausible it comes from LOA-RR-201 Section E.2 to monitor for RR loop delta temperatures, this procedure may be addressed in this situation with no reactor recirc pumps in operation, if procedure is followed correctly it would also lead the candidate to monitor for stratification and perform a similar special log that is used in this procedure.

Reference: LOA-RH-201 LOSS OF SHUTDOWN COOLING rev 18, LOA-RR-101 REACTOR RECIRCULATION TROUBLE rev 33, LGA-001 RPV CONTROL rev 33
Reference provided during examination: None

K/A Number/IR: 295021 AK1.04 / RO 3.6 SRO 3.7

K/A Statement: LOSS OF SHUTDOWN COOLING: Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING: Natural Circulation
Safety Function:4
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 1 Group:1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

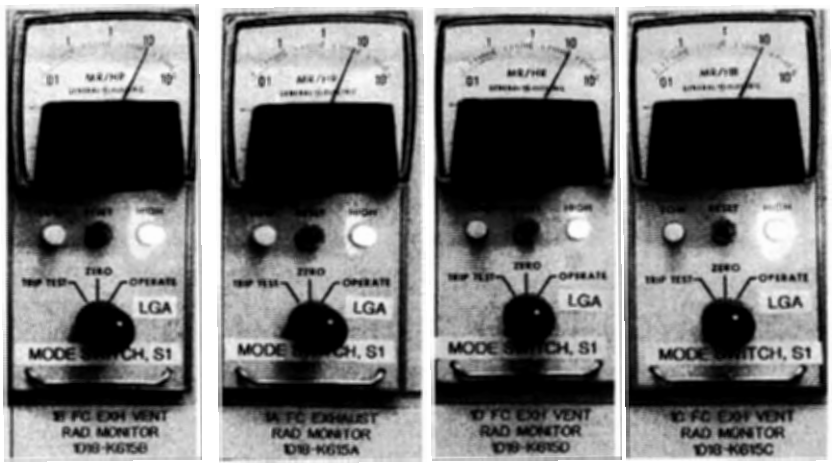
Given various plant conditions, predict how the Reactor Pressure Vessel and Internals System will respond to various system component failures while operating the system or on an exam in accordance with student text.

**10** **ID: 052.00.14.04** **Points: 1.00**

During Core Alterations on Unit 1, a spent fuel assembly is dropped.

- Bubbles are immediately seen rising from the area of the dropped fuel assembly

On Unit 1, the following readings are observed on 1H13-P635 and 1H13-P636.




The appropriate annunciators activate for the above conditions.

Based on the above information only,
VERIFY that (1) _____ auto started and verify (2) _____.

A. (1) **ONLY** Unit 1 SBGT train
(2) **ONLY** U-1 VQ Primary Containment Isolation Dampers/Valves close

B. (1) **ONLY** Unit 1 SBGT train
(2) **BOTH** U-1 and U-2 VQ Primary Containment Isolation Valves/Dampers close

C. (1) **BOTH** Unit 1 and Unit 2 SBGT trains
(2) **ONLY** U-1 VQ Primary Containment Isolation Valves/Dampers close

D. (1) **BOTH** Unit 1 and Unit 2 SBGT trains
(2) **BOTH** U-1 and U-2 VQ Primary Containment Isolation Valves/Dampers close

Answer: C

**Answer Explanation:**

Correct Answer: The picture shows the 1A and 1B FC Exhaust Rad Monitors with the HIGH lights on and reading 10 and 9 Mr/Hr respectively, both ae above the 8 Mr/Hr Trip setpoint. The picture also shows the 1C and 1D FC Exhaust Rad Monitors with the HIGH lights on and reading 10 Mr/Hr and 10 Mr/Hr respectively. This condition would result in annunciator 1H13-P601-F205/E205 alarming,

Per LOR-1H13-P601-F205/E205, when both channels trip, RB Ventilation inboard and outboard dampers close on both Units, secondary containment vent and purge inboard and outboard dampers close on both Units, both Unit 1 and Unit 2 VG trains start, but **Only** the primary containment valves/dampers on the affected Unit close.

Distractor A: Per LOR-1H13-P601-F205/E205, both Unit 1 and Unit 2 VG trains start. SBGT Trains start on both Units, but the second part of the answer is correct, a group 4 isolation only closes primary containment valves/dampers on the affected Unit.

Distractor B: Per LOR-1H13-P601-F205/E205, both Unit 1 and Unit 2 VG trains start. **Only** the affected Units **Primary** containment isolation dampers/valves and not both units.

Distractor D: Per LOR-1H13-P601-F205/E205, both Unit 1 and Unit 2 VG trains start is correct but only **Only** the affected Units **Primary** containment isolation dampers/valves close.

Reference: LOR-1H13-P601-F205 (& E205) Div 1 (& Div 2) FUEL POOL RAD HI-HI, Rev. 4;
LGA-002, Rev. 6; LOP-CX-06 PRIMARY CONTAINMENT ISOLATION STATUS DISPLAY rev 8

Reference provided during examination: None

KA Number: 295023, A2.01 / SRO 4.0 RO 3.6
Statement: Refueling Accidents; A2.01, Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS: Area Radiation levels Cognitive level: Higher (2-DR)

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification:N/A

Comments:

Learning Objective: 52.00.14 Given a Process Radiation Monitoring System lineup and various plant conditions, evaluate system indication/responses and determine if the indication/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.

**Associated objective(s):**

Given a Process Radiation Monitoring System lineup and various plant conditions, evaluate system indications/responses and determine if the indications/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.

**11** **ID: 064.00.14.12** **Points: 1.00**

LGA-003 PRIMARY CONTAINMENT CONTROL is in progress:

With regards to starting Suppression chamber sprays **ONLY**.

What is the impact of starting Suppression chamber sprays with suppression pool water level between 723' and 723.5'?

A. Challenge containment integrity when using drywell sprays.

B. Inability to Quench steam may result in containment failure.

C. Limiting the scrubbing action of the suppression pool if venting was required.

D. Hydraulic forces caused by chamber spray operation could damage the SRV tail pipes.

Answer: B

**Answer Explanation:**

Explanation: If suppression pool level is above 723' suppression pool level, the spray spargers would be submerged, and placing chamber sprays into operation would not provide the benefit of cooling the atmosphere. This is required to condense any steam in the chamber and to ensure that at 12# chamber pressure the chamber air space contains 95% of the Drywell atmosphere's nitrogen.

Distractor A: This answer is incorrect because the question ask concerning chamber spray operation ONLY, this is plausible because it is a concern if operating Drywell sprays at this elevation. The VQ vacuum breakers will be partially covered limiting pressure equalization between chamber air space and the drywell. In this condition if drywell sprays were operated then high differential pressure could exist between the chamber air space and drywell challenging containment integrity.

Distractor C: This answer is incorrect, at 724' suppression pool level,the VQ vent damper opening start to become covered, and this would limit the scrubbing action of the suppression pool, this limitation is addressed lower in the LGA leg prior to venting the containment per LGA-VQ-02 to keep pressure below the PCPL LGA-003 curves. The stem states level between 723' and 723.5'

Distractor D: This answer is incorrect, at 723' suppression pool level, the SRV tail pipes are submerged but the intent of the SRVTPL is limit hydraulic forces on the tailpipes from RPV blowdown, and not from chamber spray operation. Answer is plausible because it is a limitation from LGA-003 "PRIMARY CONTAINMENT CONTROL".

Reference: LGA-003 PRIMARY CONTAINMENT CONTROL rev 14, LGA-003 Lesson Plan pages 5,
Reference provided during examination: None

K/A Number/IR: 295024 A2.03/ SRO 3.8 RO 3.8
K/A Statement: High Drywell Pressure: Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE:

suppression Pool Level
Safety Function:5
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History: N/A

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given a Residual Heat Removal System operating mode and various plant conditions, evaluate system indications/responses and determine if the indications/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.

**12** **ID: 26.00.01.01** **Points: 1.00**

The reason for the automatic actuation of Alternate Rod Insertion (ARI) on high reactor pressure is to...

A. act in conjunction with the Recirculation pumps to prevent exceeding the RPV pressure safety limit.

B. utilize the RPS trip units to provide an alternative vent path for the scram air header as a backup to RPS.

C. anticipate a reactor scram and assists RPS by establishing alternate vent paths for the scram air header.

D. act independently of RPS to establish alternate vent paths during conditions that should have resulted in a reactor scram.

Answer: D

**Answer Explanation:**

Explanation: ARI is an independent system to RPS which utilizes separate units to open multiple independent vent paths in the event reactor pressure exceeds 1038 Reactor Scram setpoint. The ARI setpoint is 1143 psig which is sufficiently above the scram setpoint to minimize inadvertent trips.

Distracter A: This distractor is incorrect because the safety relief valves will prevent challenging the RPV pressure safety limit

Distractor B: This distractor is incorrect because ARI uses separate trip units from those used by RPS.

Distractor C: This distractor is incorrect because ARI actuation setpoints are higher than the RPS actuation setpoints

Reference: LIS-NB-120A rev 12, ARI Lesson Plan #26
Reference provided during examination: None

K/A Number/IR: 295025 K3.06 / RO 4.2 SRO 4.4
K/A Statement: Knowledge of the reason for the following responses as they apply to HIGH REACTOR PRESSURE: Alternate rod insertion
Safety Function: 3
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

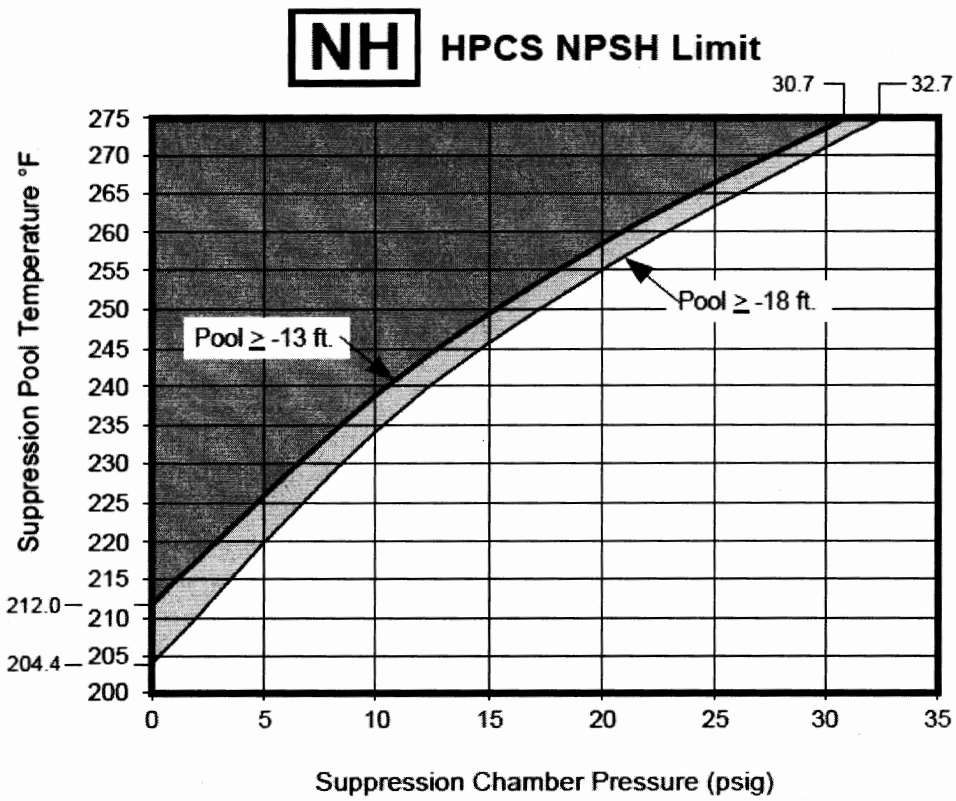
Recall the purpose while operating the Alternate Rod Insertion System and identify the transient it was designed to protect against or on an exam in accordance with the UFSAR and procedures/student text.

**13** **ID: 413.00.03.03** **Points: 1.00**

U-2 was at rated power when a plant transient created the following conditions:

- Suppression Pool Level is -13'
- Suppression Pool Temperature is 221°F
- Suppression Chamber Pressure is 5 psig

Which one of the following changes in Suppression Pool parameters would most likely cause HPCS pump damage while operating the pump based on the graph below?




A. Suppression Pool Level drops by 18 inches

B. Suppression Pool Level is raised by 1 foot

C. Suppression Chamber Pressure lowers by 1 psig

D. Suppression Pool Temperature rises by 4°F.

Answer: A

**Answer Explanation:**

Explanation: Based on the graph if suppression pool level is lowered by 18 inches then it is not bounded(under the curve) by upper curve on the graph. The operator has to use the lower curve on the graph. Then if Suppression Pool Temperature is 221°F, Suppression Chamber Pressure is 5 psig and suppression pool level is -14.5 feet these parameters would place the candidate into the restricted region of the graph.

Distractor B: If pool is raised by 1 foot operation is still bounded by the graph's curve, this distractor is plausible because it test the candidates ability to read and understand the graph.

Distractor C: If pool temperature goes up by 4°F operation is still bounded by the graph's curve. This distractor is plausible because it test the candidates ability to read and understand the graph.

Distractor D: If Chamber pressure drops by 1 psig operation is still bounded by the graph's curve. This distractor is plausible because it test the candidates ability to read and understand the graph.

Reference: LGA-001 RPV CONTROL rev 14
Reference provided during examination: None

K/A Number/IR: 295026 K1.01
K/A Statement:Suppression Pool High Water Temperature: Knowledge of the operational implications of the following concepts as they apply to Suppression Pool High Water Temperature: Pump NPSH
Safety Function:5
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier:1 Group: 1

Question Source: New
Question History: N/A

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given plant conditions and LGA entry, compare and prioritize the use of RPV injection systems, while operating the plant or on an exam, IAW the LGAs.

**14** **ID: 420.00.01.01** **Points: 1.00**

Unit-1 was manually scrammed due to a small break LOCA in the primary containment. The following conditions exist:

- Drywell pressure is 2.0 psig and slowly rising
- Drywell temperature is 215°F and slowly rising

Which one of the following identifies the operational implications of using LGA-VP-01, "PRIMARY CONTAINMENT TEMPERATURE REDUCTION"?

A. Use of LGA-VP-01 is NOT acceptable; its use could cause possible breach of the primary containment from water hammer.

B. Use of LGA-VP-01 is acceptable; it is required to reduce containment temperatures to prevent level reference leg boiling.

C. Use of LGA-VP-01 is NOT acceptable; its use could cause possible breach of the primary containment due to evaporative cooling effect.

D. Use of LGA-VP-01 is acceptable; it is required to reduce containment temperatures to preserve SRV solenoid operability.

Answer: A

**Answer Explanation:**

Explanation: Use of VP under these conditions is prohibited. The reason is with a high drywell pressure, the VP system has isolated, with temperatures above 212 degrees F. the water in the piping can boil lifting the reliefs on the piping. The piping has the potential for voiding and if system is un-isolated and restarted these actions may cause water hammer and VP piping damage, and potentially creating a leak in the drywell or a release path outside the primary containment.

Distractor B: This distractor is plausible because reference leg flashing is a concern for elevated temperatures in the drywell, but is incorrect answer based on LGA-003 PRIMARY CONTAINMENT CONTROL and the precautions from LGA-VP-01 PRIMARY CONTAINMENT TEMPERATURE REDUCTION.

Distractor C: This distractor is plausible because in a small break LOCA scenario, drywell temperature is expected to get very high without a large rise in containment pressure. With these conditions evaporative cooling is a concern. This issue is addressed further down the temperature leg of LGA-003 with the use of drywell sprays and using the "Drywell Spray Initiation Limit" curve as a guideline, but is incorrect answer based on directions from the LGA-003 and the precautions from LGA-VP-01.

Distractor D: This distractor is plausible because in a small break LOCA scenario, drywell temperature is expected to get very high and challenge SRV solenoid operability. Actions to address this concern is included further down the temperature control leg, but is incorrect answer based on the directions from the LGA-003 and the precautions from LGA-VP-01.

Reference: LGA-003 PRIMARY CONTAINMENT CONTROL rev 14, LGA-VP-01 PRIMARY CONTAINMENT TEMPERATURE REDUCTION rev 8, LGA-003 lesson plan.
Reference provided during examination: None

K/A Number/IR: 295028 G4.20/ RO 3.8 SRO 4.3
K/A Statement:HIGH DRYWELL TEMPERATURE: Knowledge of the operational implications of EOP warnings, cautions and notes
Safety Function:5
CFR 41.
PRA: No

Cognitive level: High 2DR Describing or recognizing relationships

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

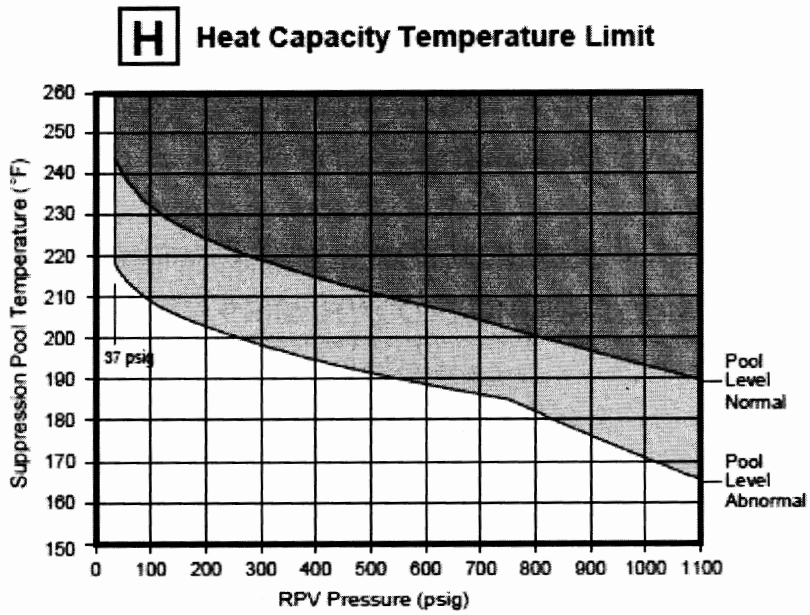
Given LGA-003, Primary Containment Control, in progress, mitigate the consequences if unable to restore and hold Drywell Temperature below 340°F while operating the plant or on an exam, IAW LGA-003.

**15** **ID: 421.00.04.01** **Points: 1.00**

Unit 2 is in LGA-003 PRIMARY CONTAINMENT CONTROL procedure, due to a plant transient.

- RPV pressure is 500 psig.
- A Group 1 isolation has occurred.
- A and B RHR systems are not available.

At what Suppression Pool Water Temperature and Level will a RPV blowdown be required?




Normal Level--For suppression pool level between +5 ft. and -1 ft.
Abnormal Level -- For pool levels outside the normal level band, bounding up to +14 ft. and down to -12 ft.

A. Suppression Pool level -0.5 ft.,
Suppression Pool temperature 210□□F.

B. Suppression Pool level - 8.0 ft.,
Suppression Pool temperature 190□ F.

C. Suppression Pool level - 4.0 ft.,
Suppression Pool temperature 200° F.

D. Suppression Pool level +1.0 ft.,
Suppression Pool temperature 200□ F.

Answer: C

**Answer Explanation:**

Explanation: With suppression pool level at -4.0', reactor pressure at 500# and temperature of suppression pool of 200□ F At this point, plant parameters are above the pool level abnormal curve and per LGA-003 pool temperature leg if exceed the Heat Capacity Temperature limit a blowdown is required

Distractor A: With suppression pool level at -0.5', reactor pressure at 500# and temperature of suppression pool of 210□ F At this point on the graph, plant parameters are above the abnormal suppression pool level but still within the bounds of the Heat Capacity Temperature limit and a blowdown is not required

Distractor B: With suppression pool level at -8.0', reactor pressure at 500# and temperature of suppression pool of 190□ F At this point on the graph, plant parameters are within the bounds of the Heat Capacity Temperature limit and a blowdown is not required

Distractor D: With suppression pool level at +1.0', reactor pressure at 500# and temperature of suppression pool of 200□ F At this point on the graph, plant parameters are within the bounds of the Heat Capacity Temperature limit and a blowdown is not required

Reference: LGA-003 PRIMARY CONTAINMENT CONTROL rev 14
Reference provided during examination: None

K/A Number/IR: 295030 K1.03
K/A Statement:Suppression Pool Water Level: Knowledge of the operational implications of the following concepts as they apply to LOW SUPPRESSION POOL WATER LEVEL: Heat capacity
Safety Function:5
CFR 41.
PRA: No

Cognitive level: High

Level: RO (Per M. Bielby ability to interpret charts is a RO responsibility)
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given plant conditions and LGA entry, recall the basis for each portion of the Heat Capacity Temperature Limit curve and identify actions when limit is exceeded, while operating the plant or on an exam, IAW the LGA procedures.

**16** **ID: 413.00.03.04** **Points: 1.00**

Unit 2 was at 100% power with HPCS OOS
Then a LOCA with a loss of the SAT occurred.

- Drywell pressure is 3 psig
- RPV level is -30 inches and dropping 10 inches/minute
- RPV pressure is 900 psig and dropping 50#/minute

Assuming NO operator action select the highest value below that would result in a rising Reactor Water Level.

A. 800 psig

B. 650 psig

C. 300 psig.

D. 200 psig

Answer: C

**Answer Explanation:**

Explanation: The rate of reactor level drop is 2000 gpm, at 300 psig reactor pressure the LPCS pump will be at its rated flow of 6350 gpm. With LPCS at rated flow and level dropping at 2000 gallons/minute reactor level would start to rise.

Distractor A: This distractor is plausible because 800 psig represent the pressure that RCIC would start injecting into the vessel. This is calculation is determined by calculating rate of reactor pressure drop versus the rate of reactor level drop when it reaches the initiation setpoint of RCIC. This answer is incorrect because RCIC injects at 600 GPM and reactor level will still be dropping at 1400 gpm

Distractor B:This distractor is plausible because 650 psig represent the shut off head of the condensate/condensate booster pumps but the candidate has to understand that these pumps are not available. This pressure is above the shut off head of the LPCI pumps and the LPCS pump.

Distractor D: This distractor is plausible because 200 psig represent is below the shut off head of the LPCI pumps. This distractor is incorrect because when reactor pressure reaches 300# the LPCS pump will have turned level first.

Reference: LGA-001 RPV CONTROL rev 14, TS 3.5.1 ECCS Operability
Reference provided during examination: None

K/A Number/IR: 295031 A2.03 / RO 4.2 SRO 4.2
K/A Statement: ABILITY to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL: Reactor Pressure
Safety Function:2
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

LGA-001

**17** **ID: 049.00.21.02** **Points: 1.00**

An ATWS is in progress:

- The Mode switch is in shutdown
- "A" RPS failed to actuate
- ARI failed to actuate
- The SDV fuses were pulled per LGA-NB-01
- The "A" RPS Fuses were pulled per LGA-NB-01, method 1 with some control rod movement
- Reactor power is at 15%

The MCR has just been notified that jumpers are installed per LGA-NB-01 method 4.

Of the choices below, the next action is to...

A. install Scram Solenoid fuses

B. vent off the scram air header

C. install SDV Vent and Drain Valves fuses

D. re-scram reactor using manual push buttons

Answer: C

**Answer Explanation:**

Explanation: Install SCRAM DISCHARGE VOLUME (SDV) Vent and Drain fuses is the correct answer. With an electrical ATWS in progress, fuses are pulled to complete the scram and then jumpers are installed to bypass scram setpoints. The next action is to reset the scram and drain the scram discharge volume. The correct method for resetting the scram is to re-install the Scram Discharge Volume fuses per LGA-NB-01. To expediate getting control rods inserted the operators will reset the scram with the "A" scram fuses removed. The scram will reset with the "A" RPS bus de-energized. This is important action because by performing these actions in this order provides the operators with indication of the SDV vent and drain valves. This help ensure that when the scram is reset that an uncontrolled release of reactor water into the secondary containment via the SDV vent and drain valves to the reactor building equipment drain tank does not occur. The ROs are trained to take ownership of this task and knowledge of step sequence is a required RO level of knowledge.

Distractor A: this answer is plausible because it is part of method 1, but is incorrect based on LGA-NB-01 order of steps and Operators are trained to leave the fuses removed with just one channel failure to de-energize.

Distractor B: this answer is plausible because it is method 2 of LGA-NB-01 but this action is incorrect because the scram air header is de-pressurized because the fuses are pulled.

Distractor D: this answer is plausible because it is part of method 4 but is not the right action because the fuses are still pulled for the SDV vent and drain valves. These valves would not open to drain the SDV when the scram is reset.

Reference: LGA-NB-01ALTERNATE ROD INSERTION rev 17
Reference provided during examination: None

K/A Number/IR: 295037: K2.01
K/A Statement:SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown: Knowledge of the interrelationship between SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown and the following: RPS
Safety Function: 1
CFR 41.
PRA: No

Cognitive level: High 3 SPK Solve a Problem using Knowledge and its meaning Comprehension of how the scram reset circuitry works.

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given a Reactor Protection System Operating Mode and various plant conditions, predict the Reactor Protection response to various system component failures while operating the system or on an exam in accordance with student text.

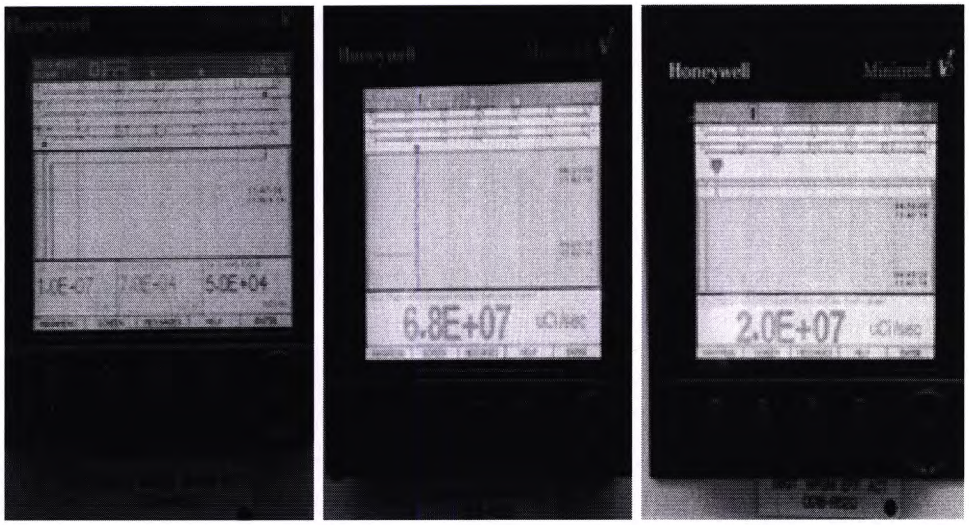
**18** **ID: 400.00.01.03** **Points: 1.00**

Unit 2 was at 100% power when a transient with a high energy line break occurs.

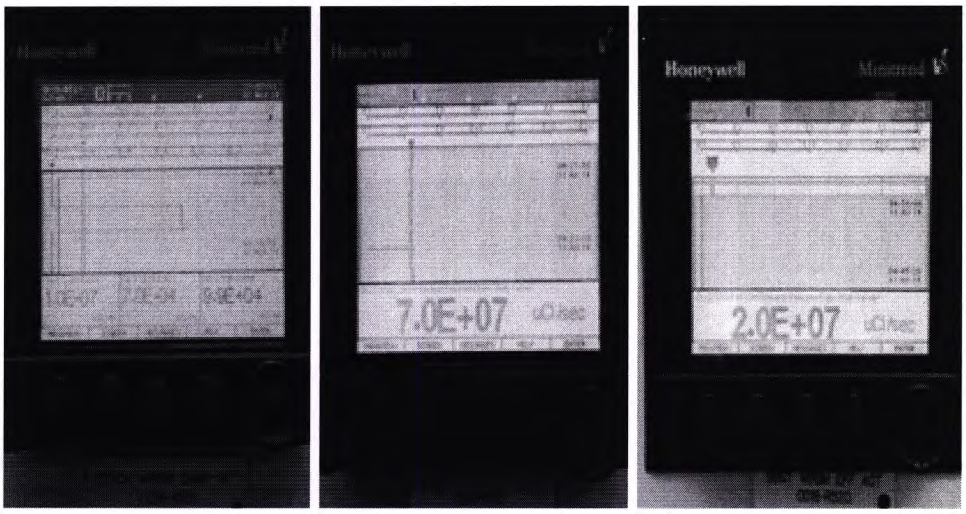
Which one of the following would be the **Minimum** sets of parameters that require entry into LGA-009 "RADIOACTIVITY RELEASE CONTROL"?

**SVS ACTIVITY** **SVS WRGM** **SBGT WRGM**

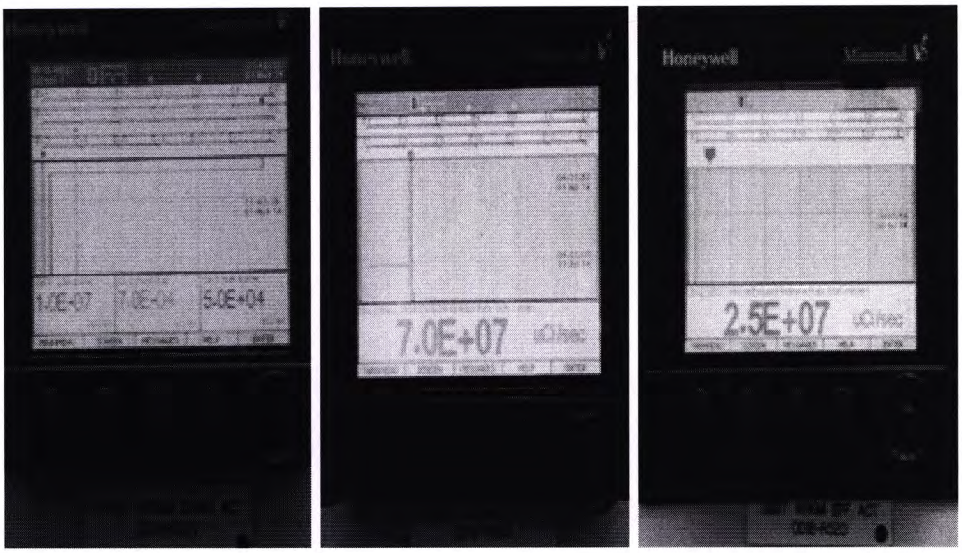
A.



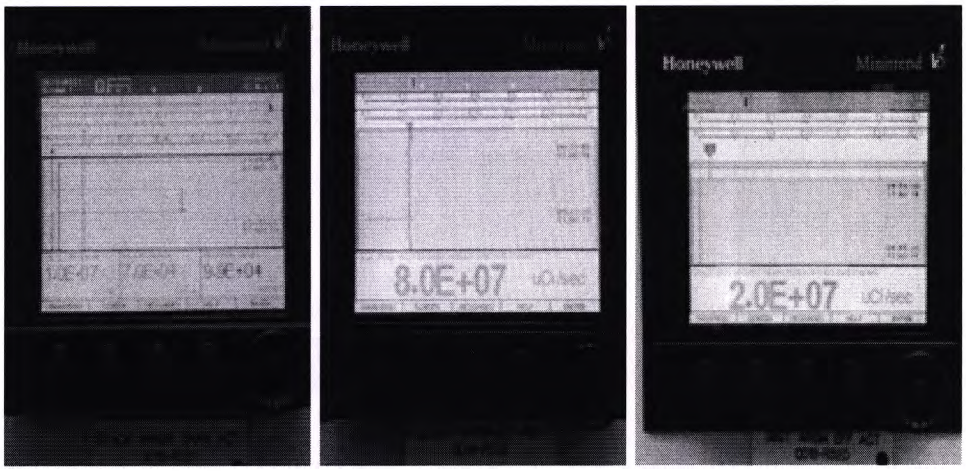

B.



C.




D.




Answer: C

**Answer Explanation:**

Explanation: The LGA-009 entry condition is 9.15 E 07. The off-site release rate is calculated by adding the release rates from SVS and VG WRGMs. The candidate has to choose which readings are required to determine entry conditions thus making question High Cog. C is the correct answer it's sum is 9.5 E07 and is the closest level that is above the entry conditions of LGA-009

Distractor A: This distractor is incorrect the sum is 8.9 E 07 which is below the LGA-009 entry condition

Distractor B: This distractor is incorrect the sum is 9.0 E 07 which is below the LGA-009 entry condition

Distractor D: This distractor is incorrect the sum is 1.0 E. 08 which is above the entry condition but is a higher value then the correct answer and not the lowest reading

Reference: LGA-009 Radioactivity Release Control rev 5, LESSON PLAN LGA-009 RADIOACTIVITY RELEASE CONTROL
Reference provided during examination: None

K/A Number/IR: 295038 A1.01 / RO 3.9 SRO 4.2
K/A Statement:Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE: Stack-gas monitoring system.
Safety Function:9
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Provided initial plant conditions, recognize LGA entry condition(s) and enter the appropriate LGA flow chart, while operating the system or on an exam, IAW LGA procedures.

**19** **ID: 125.00.05.11** **Points: 1.00**

Which of the following describes the response of the Fire Protection system to the activation of an ionization smoke detector in the cable spreading room (Pre-action Sprinkler System)?

A. With FP piping dry and depressurized up to the sprinkler head, a vial at the sprinkler head breaks from high temperature and Fire Protection water immediately flows through the associated piping and the sprinkler head.

B. A deluge valve is automatically opened, water immediately sprays the entire area.

C. A deluge valve is automatically opened, the vials at the sprinkler head breaks from high temperature, and then air in the system will depressurize out of the sprinkler head followed by water.

D. With FP piping filled with water up to the sprinkler head, a vial at the sprinkler head breaks and Fire Protection water immediately flows through the associated sprinkler head.

Answer: C

**Answer Explanation:**

Explanation:A deluge valve is automatically opened, and then the sprinkler system piping is filled and pressurized with air and water up to individual sprinkler heads held shut by vials that break at high temperatures which releases trapped air and then spray to a localize area on the fire.

Distractor A: This distractor is wrong, but is plausible because this describes the operation of a type 3 deluge pipe system

Distractor B: This distractor is wrong, but is plausible because this describes the response of a type 2 deluge valve system

Distractor D: This distractor is wrong, but is plausible because this describes the operation of a wet pipe system

Reference: LOP-FP-03 rev 28 VIKING AUTOMATIC DELUGE VALVE ACTUATION AND RESET, FP System Lesson Plan 125, page 31
Reference provided during examination: None

K/A Number/IR: 600000 K2.01
K/A Statement:Plant Fire On-site: Knowledge of interrelations between PLANT FIRE ON SITE and the following: Sensors/Detectors and valves
Safety Function:8
CFR 41.
PRA: No

Cognitive level: memory

Level: RO

Tier:1 Group: 1

Question Source: Bank
Question History:
09-1 Cert Exam by MAE.

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, and characteristics of the following Fire Protection system components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. Diesel fire pump
   1. Fuel oil day tank
   2. Fuel oil transfer pump
b. Valves
   1.Water deluge
      a. Transformer
      b. Pre-action
   2. CO2 pilot
   3. Sprinkler heads
c. Fire detection sensors
d. CO2 hose reels
e. Jockey pumps
f. Intermediate fire jockey pumps

**20** **ID: 003.00.21.02** **Points: 1.00**

Operators are directed to secure the loads listed in LOA-GRID-001, "Low Grid Voltage", Attachment "A".

What is the reason for this action?

Attachment A loads are secured in order to prevent ...

A. exceeding the generator capability curve.

B. SAT damage in case of a Main Generator trip.

C. grid damage due to instabilities from low voltage.

D. off-site power from becoming inoperable with a Unit scram.

Answer: D

**Answer Explanation:**

Explanation: If below minimum Switchyard voltage and a LOCA with no loss of off-site power occurs then the potential exists for the ESF buses to trip off due to all the pumps starting and the resultant voltage drop causing degraded voltage trips. Block Start calculations show that electrical system will respond to a LOCA without a Loss of off-site power and will remain connected to the Grid as long voltage is maintained above minimum levels as specified. Certain station loads have been analyzed to allow minimum voltage to be lowered if not in operation. Attachment "A" provides direction for what loads are analyzed.

Distractor A: This distractor is plausible based the generator capability curve uses voltage as one of the parameters monitored and a change of voltage will affect location of operation on this curve.

Distractor B: This distractor is plausible because at reduced voltages the current flow does increase and has the potential for adding heat to the windings of the transformer but this is not the driver behind the use of LOA-GRID-001.

Distractor C: This distractor is plausible based on a generator tripping off-line can cause Grid issues(e.g. system is under a RED load alert), and this procedures directs calling the off-site power INOP if below the minimum switch yard voltage, but this is not the driver behind the use of LOA-GRID-001.

Reference: LOA-GRID-001 LOW GRID VOLTAGE rev 14
Reference provided during examination: None

K/A Number/IR: 700000 K 3.02
K/A Statement:Knowledge of the reasons for the following responses as they apply to Generator Voltage and Electric Grid Disturbances: Actions contained in abnormal operating procedure for voltage and grid disturbances

Safety Function:6
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, predict how the Switchyard System will respond to various system component failures while operating the system or on an exam in accordance with student text.

**21** **ID: 118.00.21.04** **Points: 1.00**

Units 1 and Unit 2 are at 100% power with VR in a normal alignment, with the "A" and "B" supply and exhaust fans running on both units, when the following occurs:

- The 2B VR supply fan trips due to overload.

With NO operator action, select the statement describing which automatic actions will occur and why?

A. The 2C VR Supply Fan auto-starts to keep the Leak Detection instrumentation operable on Unit 2.

B. The 2A and 2B VR Exhaust Fans trip to protect against excessive negative Reactor Building pressure.

C. Both Units A and B Exhaust Fans trip to prevent excessive Dp on Reactor Building interlock doors.

D. The 2C VR Supply Fan auto-starts to maintain the Reactor Building air flow from lower to higher potentially contaminated areas.

Answer: B

**Answer Explanation:**

Explanation: The exhaust fan trip due to interlock with differential pressure, with two exhaust fans running, and one supply fan running reactor building DP will continue to go down until the exhaust fan trip setpoint of - 3 inches is reached. The design of reactor building ventilation is to maintain reactor building negative and to prevent radioactive release.

Distractor A: The supply fans do have an auto start feature, but only after the fans trip on excessive positive pressure in the reactor building, and when pressure drops the fans will restart. When the reactor building fans trip leak detection instrumentation will become inoperable due to the loss of air flow. The inoperability of leak detection is addressed by entering applicable Tech Spec action statement.

Distractor C: The exhaust fans do trip due to the interlock with differential pressure, but the concern is excessive negative pressure on the reactor building and not the effect on interlock doors into the reactor building.

Distractor D: The supply fans do have an auto start feature but only after the fans trip on excessive positive pressure in the reactor building. Maintaining negative Dp is to prevent an uncontrolled release outside secondary containment.This answer is plausible because reactor building ventilation is designed for air flow to travel from potentially lower contaminated areas to higher contaminated areas and this is accomplished by combination of ventilation duct work, check dampers, gravity shutters and building structure.

Reference: LOP-VR-01 OPERATION OF REACTOR BUILDING VENTILATION rev 46, TS 3.6.4.1 Secondary Containment bases, Lesson Plan #118 Reactor Building Ventilation
Reference provided during examination: None

K/A Number/IR: 295035 K3.02
K/A Statement: Knowledge of the reasons for the following responses as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: Secondary containment ventilation response
Safety Function:5
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 1 Group: 2

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, predict how the Reactor Building Ventilation System will respond to the various system component failures while operating the system or on an exam in accordance with student text.

**22** **ID: 031.00.18.02** **Points: 1.00**

Unit 2 is at 100% reactor power when the following occurred.

- One of the running feed pumps trip.

(1) Does the initial resultant transient bring the Unit closer to a CARRYOVER or CARRYUNDER condition?
(2) What is the primary concern associated with this condition?

A. (1) CARRYUNDER
(2) Decrease in core plate Dp

B. (1) CARRYOVER
(2) Excess erosion of the head vents

C. (1) CARRYUNDER
(2) Reduction in Recirc Pump Net Positive Suction Head.

D. (1) CARRYOVER
(2) Excess moisture impinging the blades of the Main Turbine

Answer: C

**Answer Explanation:**

Explanation:CARRYUNDER and Loss of NPSH to the Recirculation pumps is the correct answer. Lowering reactor level will cause a CARRYUNDER effect and a loss of NPSH to Recirculation pumps is the prime concern. In this scenario reactor water level will drop to less then level 4 with associated alarm, with steam flow greater then feed flow and with level 4 conditions present, reactor recirculation logic and RWLC logic will run recirculation back to get 5% under the capacity of the feedpumps or greater then level 4, to prevent a loss of NPSH to the reactor recirc pumps.

Distractor A: Plausible because Lowering reactor level will cause a CARRYUNDER effect, core plate Dp will drop with the level decrease but it is not a major concern in this event.

Distractor B: CARRYOVER with excess erosion of the head vent is incorrect but becomes plausible because there will be some overshooting of reactor level by the RWLC system and the design basis of the system per UFSAR is that RWLC system is designed to prevent CARRYOVER, but because this overshoot of level is minor, and reaching reactor level 8 will not be challenged. Excess erosion of the head vent is plausible because the head vent is maintained open during unit operation and if carryover were to occur then water droplets would impinge on the head vent and associated piping causing erosion.

Distractor D: This is CARRYOVER with Excess moisture impinging the blades of the main turbine is incorrect. CARRYOVER becomes plausible because there will be some overshooting of reactor level by the RWLC system and the design basis of the system per UFSAR is that RWLC system is designed to prevent CARRYOVER but because this overshoot of level is minor reaching reactor level 8 will not be challenged. Excess moisture impinging the blades of the main turbine is a symptom of a CARRYOVER condition making this part of the answer plausible.

Reference: UFSAR 7.7.4 Feedwater Control System Instrumentation and Control, UFSAR Appendix "G" RR, RWLC Lesson Plan #31
Reference provided during examination: None

K/A Number/IR: 295009 K102 /RO3.0 SRO 3.1
K/A Statement:LOW REACTOR WATER LEVEL Knowledge of the operational implications of the following concepts as they apply to LOW REACTOR WATER LEVEL: Recirculation pump net positive suction head
Safety Function:
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 1 Group: 2

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, predict the response of the following supported systems to a loss of the Reactor Water Level Control System while operating the system, or on an exam in accordance with station procedures:
a. Reactor Recirculation
b. Feedwater

**23** **ID: 301.00.05.10** **Points: 1.00**

Given the following initial plant conditions:

- The Unit-1 reactor is being shutdown in accordance with the Normal Shutdown procedure
- The mode switch was placed in STARTUP from RUN
- NSOs were monitoring power on the IRMs
- All APRM downscale lights were lit
- Due to a leaking Safety Relief Valve (SRV), reactor pressure has dropped from 920 psig to 700 psig

The control room operator reports that multiple Average Power Range Monitors (APRMs) downscale lights have cleared and reactor power is rising on the Intermediate Range Monitors (IRMs).

(1) Which of the following actions are you expected to take based on the above conditions?
and
(2) What is the reason for these actions?

A. (1) Stop rod movements and range the IRMs to follow the power change.
(2) To terminate a recriticality event

B. (1) Discontinue driving rods and manually scram the reactor.
(2) To prevent violating fuel clad integrity safety limit

C. (1) Stop rod movements and range the IRMs to follow the power change.
(2) To prevent an IRM SCRAM

D. (1) Discontinue driving rods and manually scram the reactor.
(2) To terminate a recriticality event

Answer: D

**Answer Explanation:**

Explanation: Directions are given in the Shut down LGP-2-1 Reactor Shutdown to perform the following "Discontinue driving rods and manually scram the reactor" is correct. If the IRMs increase so that multiple APRM downscales clear due to reactor cooldown, this is an inadvertent recriticality event, the REASON for these actions is Recriticality can occur if positive reactivity is added due to cooldown of reactor coolant with control rods withdrawn, and is greater than the negative reactivity from control rod insertion.

Distractor A: This distractor is plausible based on LGP-2-1 Caution Statement, page 32 to stop rod insertion and range IRM's, but it only applies if reactivity addition is under control.

Distractor B: This distractor is plausible because fuel clad integrity safety limit is a concern at low power levels, with reactor pressure at 700#. This distractor is wrong because the APRM's have just cleared the downscale and power has to be greater than 25% to violate this safety limit.

Distractor C: This distractor is plausible based on LGP-2-1 Caution Statement, page 32 to stop rod insertion and range IRM's, but it only applies if reactivity addition is under control. Trying to prevent an IRM scram is not correct although a likely outcome of the event and guidance is given per LGP-2-1 to terminate the event, by ranging this only prolongs the reactivity event.

Reference: LGP-2-1 Precaution C.3.3 page 5, Step E.4.6.14 page 33
Reference provided during examination: None

K/A Number/IR: 295014 K3.01 SRO 4.1/ RO 4.1
K/A Statement: Inadvertent Reactivity Addition: Knowledge of the reasons for the following responses as they apply to INADVERTENT REACTIVITY ADDITION; Reactor Scram
Safety Function:
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 1 Group: 2

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

While operating the plant, operating the simulator, or on a written examination, determine the reactivity control requirements during LGP 2-1.

**24** **ID: 676.00.01.01** **Points: 1.00**

Due to a security event Both Units are shutdown with the following conditions:

- Both Unit 1 and 2 SATs are NOT available.
- Both Unit 1 and 2 Division 1 and 2 DGs are NOT available.

Which of the following is the **Preferred** action to be taken to mitigate an off-site release?

A. Line up B.5.b pump in Spent Fuel Pool Spray mode to directly cool fuel assemblies per LOA-SY-004 EXTREME DAMAGE MITIGATION STRATEGIES.

B. Line up FC pumps per LOA-FC-101 FUEL POOL COOLING SYSTEM/REACTOR CAVITY LEVEL ABNORMAL to supply cooling to the spent fuel pool.

C. Line up B RH in Fuel Pool Cooling Assist per LOP-RH-15 RHR FUEL POOL COOLING ASSIST AND ALTERNATE FUEL POOL COOLING MODES.

D. Line up B.5.b pump in Spent Fuel Pool Make Up mode to maintain fuel assemblies submerged per LOA-SY-004 EXTREME DAMAGE MITIGATION STRATEGIES.

Answer: D

**Answer Explanation:**

Explanation: Based on OPEX from Fukushima Daiichi accident, due to the sustained station blackout the site experienced boiling in the fuel pools with a subsequent hydrogen explosion and release to the environment. In this question the candidate has to access that a Station Blackout exists and then solve a problem with knowledge. LOA-SY-004 provides guidance to mitigate the effects of a sustained station blackout and the loss of fuel pool cooling. This procedure specifies the use of portable diesel fire pumps and the preferred method Attachment "B", spent fuel pool make-up for keeping the fuel pools covered and cooled.

Distractor A: This distractor is valid because its source is LOA-SY-004 EXTREME DAMAGE MITIGATION STRATEGIES procedure but it is the alternate method of cooling the fuel pool to minimize release and not the preferred method per this procedure.

Distractor B: This distractor is valid because its source is LOA-FC-101 FUEL POOL COOLING SYSTEM/REACTOR CAVITY LEVEL ABNORMAL he attachment from LOA-AP-101 Attachment K Station Blackout Contingencies, directs the Operator to LOA-FC-101 for the loss of cooling to the spent fuel pools, this LOA then directs use of fuel pool cooling pumps from either Unit, but is incorrect because power will not be available to the U-1/2 "A" or "B" fuel pool cooling pumps.

Distractor C: This distractor is valid because its source is LOP-RH-15 RHR FUEL POOL COOLING ASSIST AND ALTERNATE FUEL POOL COOLING MODES, the attachment from LOA-AP-101 Attachment K Station Blackout Contingencies, directs the Operator to LOA-FC-101 for the loss of cooling to the spent fuel pools, this LOA then directs use of LOP-RH-15, but is incorrect because power will not be available to the Div 2 RHR pumps.

Reference: LOA-SY-004 EXTREME DAMAGE MITIGATION STRATEGIES rev 13,
Reference provided during examination: None

K/A Number/IR: 295017 G2.4.9
K/A Statement:HIGH OFF-SITE RELEASE RATE Knowledge of low power/shutdown implications in accident mitigation strategies.
Safety Function:9
CFR 41.
PRA: No

Cognitive level: High 3 SPK Solve a Problem using Knowledge and its meaning

Level: RO knowledge, based on Basic requirements to know LOA-SY-004 EXTREME DAMAGE MITIGATION STRATEGIES
Tier: 1 Group: 2

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Demonstrate understanding of and required plant operations during Security Abnormal and Extreme Damage Mitigation Procedures.

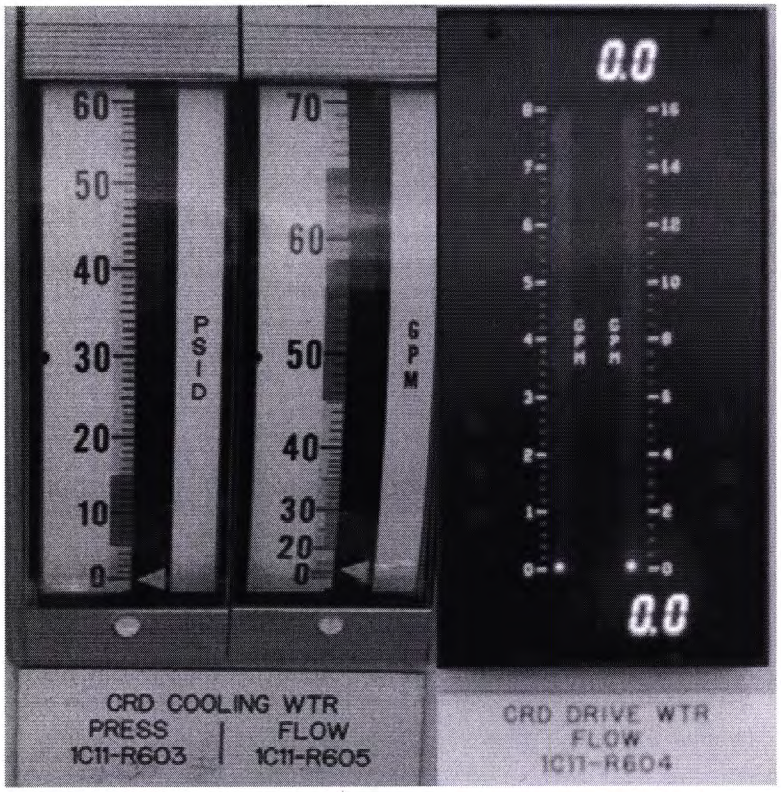
**25** **ID: 025.00.21.07** **Points: 1.00**

Unit-1 is at 100% Reactor power.

The following annunciator is in alarm

- 1H13-P603-A204, CRD Charging Water Pressure Low

The following information is available:




Based on the above conditions, what actions are required?

A. Perform the actions of the LOR for the tripped CRD pump.

B. Perform LOA-RD-101 CONTROL ROD DRIVE ABNORMAL for the Stabilizing Valves that have failed closed.

C. Perform LOA-RM-101 for loss of power to the CRD indications.

D. Perform LOA-RD-101 CONTROL ROD DRIVE ABNORMAL for the CRD Flow Control Valve that has failed closed.

Answer: A

**Answer Explanation:**

Explanation: The Candidate has to make a diagnosis by monitoring the parameters as shown on the question and then decide what action needs to be performed. Performing the actions of the LOR for the tripped CRD pump." is correct. When a CRD pump trips, Charging water pressure will decrease. This will cause some accumulators to alarm on low pressure. Drive water and Cooling water pressure will decrease. Cooling water flow will drop to 0 gpm.

Distractor B: This distractor is plausible because some of listed conditions in the stem are symptoms for loss of stab valves but CRD cooling water flow would indicate approximately 63 gpm making this distractor incorrect.

Distractor C: This distractor is plausible because this could be a symptoms of loss of power to the CRD instrumentation. With Indications downscale on CRD meters could suggest power was lost to the instrumentation and taking actions per LOA-RM-101 RCMS ABNORMAL OPERATIONS would be correct but this distractor is incorrect due to lite indication is still available on the drive water flow instrumentation.

Distractor D: This distractor is plausible because some of listed conditions in the stem are symptoms for loss of Flow Control Valves but CRD charging water pressure low makes this distractor incorrect.

Reference: LOR-1H13-P603-A204 CRD CHARGING WTR PRESS LO, System Description 025
Reference provided during examination: None

K/A Number/IR: 295022 A1.01
K/A Statement: Loss of CRD Pumps: Ability to operate and/or monitor the following as they apply to LOSS OF CRD PUMPS: CRD hydraulic system
Safety Function:
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 1 Group: 2

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

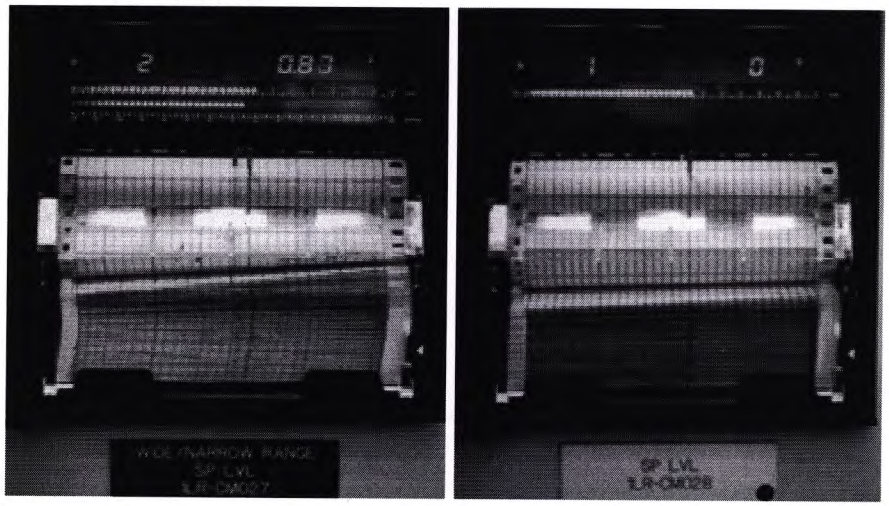
**Associated objective(s):**

predict how the Control Rod Drive Hydraulic System will respond to various system component failures while operating the system or on an exam

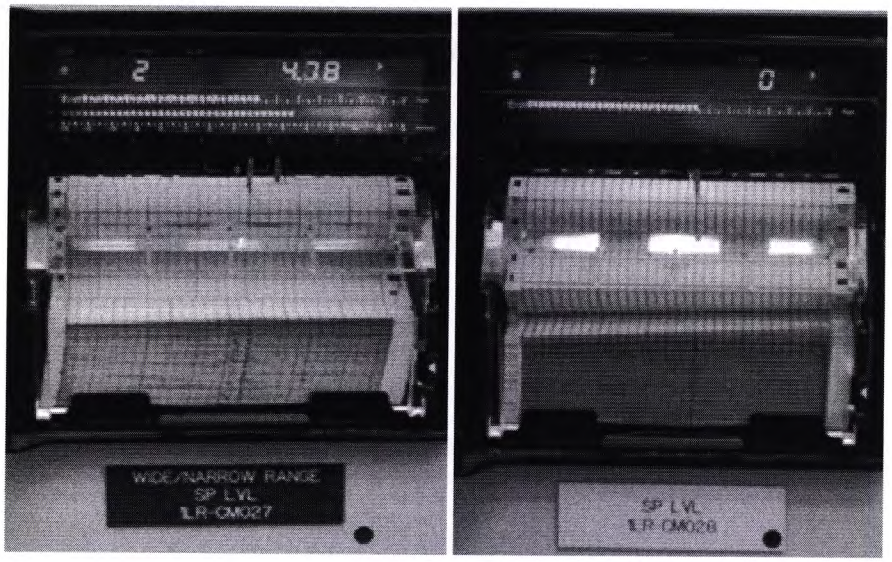
**26** **ID: 092.00.07.02** **Points: 1.00**

Unit 1 is in mode 4 with A RHR in Shutdown Cooling (SDC) operation when the following occurred:

Before the event




After the event




What could have caused this event?

A. RHR SDC flow was lowered to 1400 GPM

B. B RHR Full Flow Test 1E12-F024B leaking by

C. Mis-operation of the Skimmer Surge Tank drain valve 1FC017

D. Mis-operation of RCIC Suction Valves 1E51-F010 and 1E51-F031 at the Remote

Shutdown panel

Answer: A

**Answer Explanation:**

Correct Answer: + 4 inches from normal would raise SP level above the LGA-003 PRIMARY CONTAINMENT CONTROL entry condition of +3 inches. The division 2 on the 1PM13J has a digital readout in inches. Both division 1 and 2 suppression pool recorders are supplied for this question, the candidate has to determine that only one recorder, the division 2 will supply meaningful information due to the level rise. The division 2 recorder has both a narrow and wide range band, the division one recorder only has a wide range band, and is harder to detect the rise in level on the wide range recorder.

Distractor B: Is incorrect because 4 inches as read on the Div 2 narrow range recorder is a entry condition of LGA-003, If B RHR full flow test was leaking by suppression pool level would not rise because it's source of water from the waterleg pump is the suppression pool.

Distractor C: Is incorrect because 4 inches as read on the Div 2 narrow range recorder is a entry condition of LGA-003, This option is selected because mis-operation of the 1FC017 would cause the fuel pool to lower but the water would return to the CY tank

Distractor D: + 4 inches from normal would raise SP level above the LGA-003 PRIMARY CONTAINMENT CONTROL entry condition of +3 inches, but this answer is incorrect because it would appear that a flow path existed between the suppression pool and condensate storage tank with both suction valves open and make plausible but level would not change due to check valves in the system preventing the CY tank to drain with both suction valves open.

Reference: OP-RH-07 SHUTDOWN COOLING SYSTEM STARTUP,OPERATION, TRANSFER rev 71,
Reference provided during examination: None

Cognitive level: High

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

KA Number: 295029 A2.01 / SRO 3.0 RO 3.9
Statement: Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL: Suppression Pool Water Level

Question Source: New
Question History:

10 CFR Part 55 Content: N/A
SRO Justification: N/A

Comments: None

**Associated objective(s):**

Given the following Containment Monitoring System key parameters, recall the physical location of indicators, local and remote that monitor those parameters and describe the sensor location while operating the system, during abnormal conditions, or on an exam in accordance with the student text.

a. Oxygen Concentration
b. Hydrogen Concentration
c. Drywell Temperature
d. Drywell Pressure
e. Suppression Chamber Temperature
f. Suppression Chamber Pressure
g. Suppression Pool Temperature
h. Suppression Pool Level
i. Containment Flood Level
j. Particulate and Noble Gases
k. Drywell Radiation
l. Post-LOCA Heat Trace Temperature

**27** **ID: 091.00.08.02** **Points: 1.00**

Within the Secondary Containment what is the total number of PCIS group isolations that will occur on high area temperature?

(Do NOT include isolations that occur solely due to high delta temperatures)?

A. 2 PCIS groups

B. 3 PCIS groups

C. 4 PCIS groups

D. 5 PCIS groups

Answer: A

**Answer Explanation:**

Correct Answer: There are 2 groups that isolate on high area temperature, and they are Group 5 Reactor Water Clean UP and Group 8 RCIC

Distractor B: Homogeneous distractor Candidate is required to remember areas and associated groups that isolate on high area temperatures.

Distractor C: Homogeneous distractor Candidate is required to remember areas and associated groups that isolate on high area temperatures.

Distractor D: Homogeneous distractor Candidate is required to remember areas and associated groups that isolate on high area temperatures.

Reference: LOP-CX-06 PRIMARY CONTAINMENT ISOLATION STATUS DISPLAY rev 8
Reference provided during examination: None

K/A Number/IR: 295032 K2.06 / RO 3.3 SRO 3.4
K/A Statement:Knowledge of the interrelations between HIGH SECONDARY CONTAINMENT AREA TEMPERATURE and the following: Area Temperature monitoring system
Safety Function:5
CFR 41.
PRA: No

Cognitive level: High 3-CSN Involves multi-part mental process of assembling, sorting, or integrating the parts
Level: RO
Tier:1 Group:2

Question Source: Bank
Question History: 2001 NRC Duane Arnold

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the signals that cause a Primary Containment Isolation System automatic actuation, including purpose, setpoints, logic, how and when bypassed, how reset and the system response while operating the system or on an exam in accordance with procedures/student text.

**28** **ID: 065.00.18.01** **Points: 1.00**

With the 1A RHR system operating in the LPCI injection mode with an ECCS signal present, a TRIP of the Common Diesel Generator Cooling Water Pump will directly result in which of the following?

A. The 0 DG will trip on high coolant temperature.

B. The A RHR pump room ambient temperature will be higher than expected due to the loss of cooling water to the area coolers.

C. The A RHR pump seal temperatures will be higher than expected due to the loss of cooling water to the seal coolers.

D. The A RHR pump motor bearing temperatures will be higher than expected due to the loss of cooling water to the motor cooler.

Answer: B

**Answer Explanation:**

Correct Answer: The A RHR pump room ambient temperature will be higher than expected due to the loss of cooling to the area coolers.

Explanation: This is correct answer as the 0 DG cooling water pump supplies cooling water to the area coolers.

Distractor A: The 0 DG tripping on high coolant temperature is incorrect as the high temperature is bypassed on an ECCS signal but is plausible because if no ECCS signal would trip the DG.

Distractor C: The A RHR pump seal temperatures will be higher than expected due to the loss of cooling water to the seal coolers is incorrect. When the pump is operating in LPCI mode the source of water is the suppression pool which does not require cooling pump seal cooling

Distractor D: The A RHR pump motor bearing temperatures will be higher than expected due to the loss of cooling water to the motor cooler is incorrect as the A RHR pump motor does not have a motor cooler. LPCS in the same division and DOES have a motor cooler making this plausible

Reference: Lesson Plan #65 CORE STANDBY COOLING SYSTEM (CSCS), Lesson Plan #11 Emergency Diesel Generator
Reference provided during examination: None

K/A Number/IR: 203000 K6.10 / RO 3.0 SRO 3.1
K/A Statement: Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI: INJECTION MODE: Component Cooling Water System
Safety Function: 3.2 Reactor Water Inventory Control
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 2 Group: 1

Question Source: Bank
Question History: LaSalle 07-01 NRC ILT Exam

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, predict the response of the following supported systems to a loss of the Core Standby Cooling System/Equipment Cooling Water System while operating the system, or on an exam in accordance with student text:

a. HPCS
b. LPCS
c. RHR
d. Diesel Generators
e. RCIC
f. Reactor/Containment
g. Fuel Pool Level

**29** **ID: 064.00.14.11** **Points: 1.00**

Unit 2 is in Mode 4 following completion of a refueling outage.

- The vessel has been re-assembled.
- The B Loop of RHR is tagged out and drained.
- The C RHR Pump is available.

The A loop of RHR was operating in the Shutdown Cooling mode but the A RHR Pump has just tripped.

The reactor coolant heatup rate will now be___(1)___the heatup rate would have been if this transient occurred just prior to the start of refueling activities this outage.

(2) Of the following decay heat removal lineups, which one has the least potential to damage other equipment?

A. (1) more than
(2) Draining reactor water through the RHR HX to the Suppression Pool and then returning it to the RPV with
the C RHR Pump

B. (1) more than
(2) Pumping Suppression Pool water into the RPV and then returning it to the Suppression Pool through SRVs

C. (1) less than
(2) Draining reactor water through the RHR HX and Full-Flow Test Valve to the Suppression Pool and then returning it to the RPV with
the C RHR Pump

D. (1) less than
(2) Pumping Suppression Pool water into the RPV and then returning it to the Suppression Pool through SRVs

Answer: C

**Answer Explanation:**

Explanation: Following the core refueling, approximately 1/3 of the irradiated fuel will be replaced with new fuel. Therefore, there will be less decay heat and less of a heatup rate now compared to before the refueling. Additionally, the decay heat rate becomes less over time for the irradiated fuel.

A Note at the beginning of the procedure for aligning SRVs in Alternate Decay Heat Removal warns about potential damage to SRVs and recommends that lineup for use only when the SDC suction line in unavailable. With the SDC suction available, LOP-RH-17, Sections E.16 & E.20 is preferred.

Distractors a and b: The decay heat rate is not the same. It is less than it would be if this transient occurred prior to refueling.

Distractor b and d: With the SDC suction available, LOP-RH-17, Sections E.16 & E.20 is preferred. Damage to the opened SRVs could occur in this lineup.

Reference: LOP-RH-17, ALTERNATE SHUTDOWN COOLING REV 33, LOA-RH-101 RHR ABNORMAL REV 18

Reference provided during examination: None

K/A Number/IR: 205000 A2.06 3.4 / SRO 3.5 RO 3.4
K/A Statement:Shutdown Cooling System: Ability to (a) predict the impacts of the following on the Shutdown Cooling; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: SDC/RHR pump trips

Safety Function:4
CFR 41.
PRA: No

Cognitive level: High

Level: RO This would be considered RO knowledge due to basic mitigating strategies on a loss of Shutdown Cooling
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given a Residual Heat Removal System operating mode and various plant conditions, evaluate system indications/responses and determine if the indications/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.

**30** **ID: 063.00.05.16** **Points: 1.00**

Unit 1 was at 100% power when the following occurs:

- Drywell pressure is 2 psig.
- 2 minutes later, Off-site power is lost on Unit 1.

When the diesel generator output breakers close.....

A. A and C RHR pumps start immediately, Low Pressure Core Spray and B RHR pumps start five seconds later.

B. Low Pressure Core Spray and B RHR pumps start immediately, A and C RHR pumps start five seconds later.

C. Low Pressure Core Spray and C RHR pumps start immediately, A and B RHR pumps start five seconds later.

D. A and B RHR pumps start immediately, Low Pressure Core Spray and C RHR pumps start five seconds later.

Answer: C

**Answer Explanation:**

Explanation: To prevent overloading the diesel Generators, the LPCS pump breaker closes onto the division 1 Bus supplied by 0 DG and C RHR pump closes onto the division 2 bus supplied by the 1(2)A Diesel generator, then the A and B RHR pump breakers close five seconds later

Distractor A: This combination has one pump in each division starting, followed by the associated divisional pump
Distractor B: This combination has one pump in each division starting, followed by the associated divisional pump

Distractor D: This is the reverse order of loading sequence.

Reference: LOS-DG-109 Unit 1 INTEGRATED DIVISION 1 RESPONSE TIME SURVEILLANCE rev 20, LOS-DG-110 Unit 1 INTEGRATED DIVISION 2 RESPONSE TIME SURVEILLANCE rev 20, Lesson Plan #064 Residual Heat Removal
Reference provided during examination: None

K/A Number/IR: 209001 K4.09 / RO 3.3 SRO 3.5
K/A Statement:LOW PRESSURE CORE SPRAY: Knowledge of LOW PRESSURE CORE SPRAY SYSTEM design feature(s) and (or) interlocks which provide for the following: Load Sequence
Safety Function: 4
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO

Tier: 2 Group: 1

Question Source: Bank
Question History:

SRO Justification: N/A

Comments

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips, and characteristics of the following Low Pressure Core Spray System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. Low Pressure Core Spray Pump
b. Water Leg Pump
c. Injection Valve
d. Minimum Flow Valve
e. Full Flow Test Valve
f. Suction Isolation Valve
g. Testable Check Valve
h. Suction and Discharge Relief Valves
i. Spray Sparger
j. Suppression Pool Suction Strainer
k. RHR Cross-connect Spoolpiece
l. Minimum Flow and Injection Line Restricting Orifices

**31** **ID: 063.00.05.19** **Points: 1.00**

Unit 2 is in a LOCA with LPCS injecting into the vessel with flow at 1800 GPM the following occurs:

The LPCS pump trips.

What is the status of the LPCS min flow valve?

The valve will...

A. travel to the open position.

B. remain open.

C. travel to the closed position.

D. remain closed.

Answer: D

**Answer Explanation:**

Explanation: The valve will remain closed. To answer this question the candidate has to know the current position of the min flow valve is at the stated flow and have an understanding how the logic works. The valve interlock works as follows, it receives an open signal when the pump breaker is closed and flow is less than 1325 gpm. When flow is greater than 1325 gpm the valve motor-operator overload protection is automatically bypassed and the Minimum Flow Valve automatically closes. In the logic for the min flow the pump breaker closed contacts are only in the open circuit of the motor operated valve. When the pump trips there will be no affect on the valve

Distractor A: This distractor is incorrect but plausible and chosen by the candidate if they do not understand how the min flow logic works.

Distractor B: This distractor is incorrect but plausible and chosen by the candidate if they do not understand how the min flow logic works.

Distractor C: This distractor is incorrect but plausible and chosen by the candidate if they do not understand how the min flow logic works.

Reference: 1E-1-4221AB, AE, and AD, LOR-1H13-P601-C508 rev 5
Reference provided during examination: None

K/A Number/IR: 209001 G2.1.28 / RO 4.1 SRO 4.1
K/A Statement: LOW PRESSURE CORE SPRAY SYSTEM: Knowledge of the purpose and function of major system components and controls
Safety Function: 4
CFR 41.
PRA: No

Cognitive level: High 3 PEO
Level: RO

Tier: 2 Group: 1

Question Source: Bank
Question History:

SRO Justification: N/A

Comments

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips, and characteristics of the following Low Pressure Core Spray System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. Low Pressure Core Spray Pump
b. Water Leg Pump
c. Injection Valve
d. Minimum Flow Valve
e. Full Flow Test Valve
f. Suction Isolation Valve
g. Testable Check Valve
h. Suction and Discharge Relief Valves
i. Spray Sparger
j. Suppression Pool Suction Strainer
k. RHR Cross-connect Spoolpiece
l. Minimum Flow and Injection Line Restricting Orifices

**32** **ID: 061.00.05.14** **Points: 1.00**

Unit-1 was at 100% reactor power when the following occurred:

- Small break LOCA in the drywell
- Drywell Pressure reached 2.0 psig
- HPCS initiated and injected into the vessel
- Reactor level reached level 8
- HPCS responded as designed

If it is desired to keep HPCS running after 30 minutes with these conditions present what actions if any must the NSO take?

A. The NSO must secure the HPCS pump because operation is NOT allowed after thirty minutes.

B. NONE, HPCS can remain in its current configuration since the min flow valve is open.

C. The NSO must depress HI DRYWELL PRESSURE/LO WATER LEVEL pushbutton reset and then open the full flow test valve.

D. The NSO must depress BOTH LEVEL 8 and HI DRYWELL PRESSURE/LO WATER LEVEL pushbutton resets and then open the full flow test valve.

Answer: C

**Answer Explanation:**

Explanation: This is a recent LaSalle OPEX from LaSalle Dual Unit LOOP 2013 concerning operating ECCS pump on min flow. When HPCS system initiates the injection opens and the full flow test is automatically overridden closed, the logic is sealed in until it is reset by the Hi drywell pressure/Lo level reset pushbutton. To keep HPCS running the system is required to be placed in full flow test, this required to prevent damaging system piping under low flow high pressure conditions reference LOP-HP-04, thus the logic will need to be reset prior to performing actions to open the full flow test.

Distractor A: This describes a condition that is true but per OPEX from LaSalle Dual Unit LOOP 2013 precautions have been added to the HPCS procedure to limit operation on the min flow valve.

Distractor B: This is incorrect action full flow operation is allowed IAW LOP-HP-04, it is a Plausible distractor because it test the Candidate knowledge of LOP-HP-04 precautions, 30 minutes is used as a standard for taking action to prevent damaging the min flow line on the HPCS pump and that allows placing the pump on full flow test.

Distractor D: This describes a condition will allow the full flow test to open but the level 8 is not required to be reset to have the ability to open the full flow test, plausible distractor because it test the Candidate knowledge of how HPCS logic works,

Reference: LOP-HP-04 SHUTDOWN OF HIGH PRESSURE CORE SPRAY SYSTEM AFTER AN AUTOMATIC INITIATION rev 13, Electrical Schematics 1E-1-4222AB/AC/AF
Reference provided during examination: None

K/A Number/IR: 209002 A4.14 / RO 3.0 SRO 3.0
K/A Statement:HPCS Ability to manually operate and/or monitor in the control room: Test return valve
Safety Function:2
CFR 41.
PRA: No

Cognitive level: High Level 3 Solve a problem with knowledge

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips, and characteristics of the following HPCS system components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. Injection Valve
b. Injection Check Valve
c. Suction Valve
d. Minimum Flow Valve
e. Full Flow Test Valve
f. HPCS Pump
g. Water Leg Pump
h. Injection Line Integrity Detection
i. Spray Sparger
j. Suppression Pool Suction Strainer
k. High Drywell Pressure Low Level Reset Pushbutton
l. Injection Line Restricting Orifice

**33** **ID: 028.00.05.02** **Points: 1.00**

Unit 2 is in an ATWS condition.

- The keylock switch for the 2B SBLC Pump is placed in "SYS B".

Aside from starting the 2B SBLC pump, what else will this switch movement initiate?

A. ONLY the System B Squib valve energizes and RWCU inboard isolation valve, 2G33-F001 will close.

B. ONLY the System B Squib valve energizes and RWCU outboard isolation valve, 2G33-F004 will close.

C. Squib valves for BOTH System A and System B will energize and RWCU inboard isolation valve, 2G33-F001 will close.

D. Squib valves for BOTH System A and System B will energize and RWCU outboard isolation valve, 2G33-F004 will close.

Answer: D

**Answer Explanation:**

Explanation: When the key switch is taken to the "B" position, both squib valves will energize by passing current thru a bridge wire in each valve, this current will energize the primer and forcing the ram downward shearing off the end cap of valve inlet fitting, thus allowing system flow to pass through the valve. The 2G33-F004 will auto close on an initiation of SBLC to prevent dilution of the boron into the RWCU (Reactor Water Clean Up) system.

Distractor A: This distractor is plausible because only one valve is required to pass the required flow rate for SBLC to perform its design basis, but to make the system more robust two valves are operated. Candidate also has to choose between the outboard or inboard RWCU isolation valve, most system isolations occur with inboard and outboard closing but this system is an exception, thus making this a plausible distractor, but only one valve actuates
Distractor B: This distractor is plausible because only one valve is required to pass the required flow rate for SBLC to perform its design basis, but to make the system more robust two valves are operated.
Distractor C: Candidate also has to choose between the outboard or inboard RWCU isolation valve, most system isolations occur with inboard and outboard closing but this system is an exception, thus making this a plausible distractor, but only one valve actuates

Reference: LGA-SC-201 INITIATION OF STANDBY LIQUID CONTROL (UNIT 2) rev 2
Reference provided during examination: None

K/A Number/IR: 2110000 K5.04
K/A Statement: SLC: Knowledge of the operational implications of the following concepts as they apply to STANDBY LIQUID CONTROL SYSTEM: Explosive valve operation.
Safety Function: 1
CFR 41.

PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 1

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips, and characteristics of the following Standby Liquid Control System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:
a. Storage Tank
b. Drain Tank (55 gallon drums)
c. Injection Pumps
d. Injection Sparger (seven uses)
e. Pump Suction Valves
f. Injection Valves
g. Relief Valves
h. Containment Isolation Valves
I. Storage Tank heaters
j. Head Tank
k. Pipe heat Tracing
l. Test Tank
m. Pulsation Dampers
n. Key Lock Initiation switches
o. Local start switches

**34** **ID: 049.00.05.06** **Points: 1.00**

Unit 2 was operating at rated power when a scram occurred.

- The Reactor Mode Switch is in SHUTDOWN.
- The scram has NOT been reset.

The Backup Scram Valves will be ___(1)___ and ___(2)___ .

A. (1) energized
(2) venting

B. (1) energized
(2) NOT venting

C. (1) de-energized
(2) venting

D. (1) de-energized
(2) NOT venting

Answer: A

**Answer Explanation:**

Explanation: The Backup scram valves are DC powered and energize on a scram to vent the scram air header. They do not reposition until the scram is reset.

Distractor B: Selected if the candidate believes that the Backup Scram valves reset like the ARI valves 2 minutes after RPV water level is restored above -46"

Distractor C: Selected if the candidate believes that the backup scram de-energize with an RPS actuation, backup Scram valves are energized to actuate

Distractor D:Selected if the candidate believes that the backup scram de-energize with an RPS actuation, backup Scram valves are energized to actuate and that the Backup Scram valves reset like the ARI valves 2 minutes after RPV water level is restored above -46"

Reference: 1E-2-4215 AG/AK, REACTOR PROTECTION System Lesson Plan#49
Reference provided during examination: None

K/A Number/IR: 212000 A1.08 3.4/3.4
K/A Statement:RPS: Ability to predict and/or monitor changes in parameters associated with operating the RPS controls including: Valve Position

Safety Function: 7
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO

Tier: 2 Group: 1

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

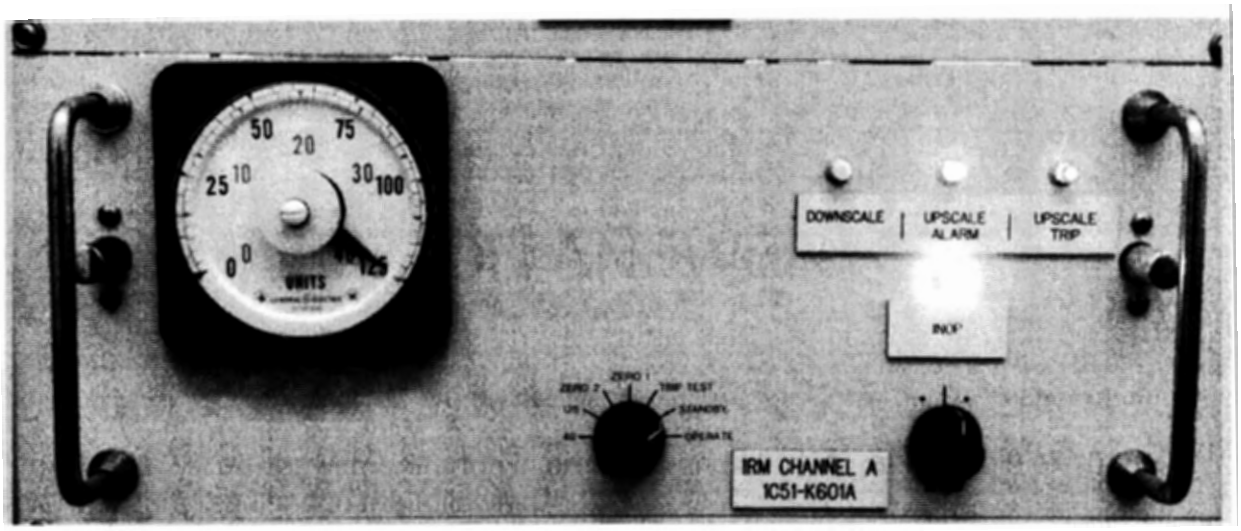
Recall the function, theory of operation, interlocks, trips and characteristics of the following Reactor Protection System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. RPS M/G Sets
b. RPS Alternate Power Supply
c. RPS Electrical Power Monitoring Assemblies (EPMA)
d. Manual Scram Pushbuttons
e. Reactor Mode Switch
f. Scram Reset Switch
g. Scram Discharge Volume Bypass Switch
h. Scram Discharge Volume Test Pushbuttons
i. Scram Valves
j. Backup Scram Valves
k. Scram Pilot Valves
l. Scram Discharge Instrument Volume

**35** **ID: 042.00.21.01** **Points: 1.00**

Unit 2 is at 2% power with a Startup in progress and all IRMs on Range 9 or 10. An event occurs resulting in the following:

- IRM "A" has failed upscale
- IRM "A" Mode Switch placed in STANDBY
- IRM "A" has been bypassed
- The fault has NOT been cleared yet




Predict the final status of the lights/alarms on 2H13-P635 if the conditions above remain as-is and the operator manipulates the IRM "A" reset switch

A. The INOP, UPSCALE HIGH and UPSCALE HIGH HIGH will CLEAR.

B. The INOP, UPSCALE HIGH and UPSCALE HIGH HIGH will REMAIN LIT.

C. The INOP light will CLEAR but the UPSCALE HIGH **and** UPSCALE HIGH HIGH will REMAIN LIT.

D. The INOP light will REMAIN LIT but the UPSCALE HIGH **and** UPSCALE HIGH HIGH will CLEAR.

Answer: B

**Answer Explanation:**

Explanation: With A IRM bypassed, the high and high high alarms on the 2H13-P603 panel will clear and the associated rod blocks and scram signals will clear, however the alarms will remain lit on backpanel 2H13-P635. Even with the IRM bypassed these alarms will remain lit until the actual HIGH HIGH condition shown in the picture clears. The INOP light is only lit because the Mode Switch is in STANDBY.

Distractor A: They will all remain lit as placing the mode switch in standby will not clear these lights.
:
Distractor C: The INOP light will remain lit because the Mode Switch is in STANDBY.

Distractor D: The alarms lights will remain lit because the faulty card is still in the drawer and the high high condition still exist.

Reference: LOR-2H13-P603-B304 Revision 3, INTERMEDIATE RANGE MONITOR (IRM) lesson plan #042

Reference provided during examination: None
K/A Number/IR: 215003 A1.06 / SRO3.2 RO 3.3
K/A Statement:Ability to predict and/or monitor changes in parameters associated with operating the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM controls including: Lights and alarms.
Safety Function: 7
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 2 Group: 1

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given a System lineup and various plant conditions, predict the Intermediate Range Monitor System response to various system component failures while operating the system or on an exam in accordance with student text.

**36** **ID: 041.00.16.01** **Points: 1.00**

A reactor startup is in progress following a refueling outage with NO SRMs or IRMs bypassed. Given the following:

- All IRMs are downscale on Range 1
- SRM A reads 5 X 10,000 CPS
- SRM B reads 3 X 10,000 CPS
- SRM C reads 6 X 10,000 CPS
- SRM D reads 4 X 10,000 CPS
- The shorting Links are installed

Which one of the following identifies the expected plant response if the High Voltage Power Supply for SRM A is lost?

A. A full scram would occur.

B. NO automatic actions would occur.

C. ONLY a control rod block would occur.

D. BOTH a control rod block AND a half scram would occur.

Answer: C

**Answer Explanation:**

Explanation:The loss of the high voltage power supply will cause a SRM INOP trip. The high voltage power supply is fed from the 24/48 VDC bus and this low voltage is stepped up in voltage in the high voltage power supply. With a loss of normal power then the high voltage is gone. The SRM normally will have no scram function. There are provisions in the scram logic; however, so that the SRM High High INOP Trip can be made into a scram signal. There are shorting links which must be removed to accomplish this. This can be done when refueling and then the links would be re- installed during a plant startup. The following SRM trips initiate Rod Withdrawal Blocks in the refuel or startup Modes. These rod blocks hold true for each SRM unless it is bypassed. Only one SRM can be bypassed. All the rod blocks are automatically bypassed if the IRM range switches are above 7, or if the reactor mode switch is in the RUN mode

Distractor A: This would only occur if the SRM shorting links were removed.
:
Distractor B: The SRM INOP will cause a Rod Block in this situation because none of the IRMs are > Range 7

Distractor D: A half scram signal would not be generated because the shorting links are installed.

Reference: LOP-NR-01 SOURCE RANGE MONITOR SRM OPERATION rev 14, LIS-NR-101A SOURCE RANGE MONITOR ROD BLOCK CHANNEL A CALIBRATION rev 7
Reference provided during examination: None

K/A Number/IR: 215004 K6.02 / RO 3.1 SRO 3.3
K/A Statement: Knowledge of the effect that a loss or malfunction of the following will have on the SOURCE RANGE MONITOR SYSTEM: 24/48 volt D.C. power
Safety Function: 7
CFR 41.
PRA: No

Cognitive level: Hi
Level: RO
Tier: 2 Group: 1

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, predict the Source Range Monitoring System response to a loss of the major power supplies or the Intermediate Range Monitor while operating the system, or on an exam in accordance with student text.

**37** **ID: 011.00.21.14** **Points: 1.00**

Unit 2 was at 100% power when the following occurred:

- A loss of off-site power
- The 0 DG auto started and loaded onto Bus 241Y
- The 0 DG is the only source of power to 241Y

LATER:

- Bus power restoration is in progress IAW LOP-AP-16 RETURNING 4160 VOLT BUS 141Y(241Y) FROM DIESEL 0 POWER TO ITS NORMAL SOURCE OF POWER.

(1) What is the impact of leaving the 0 DG speed droop at 0% when synchronizing to the SAT?
(2) If left in this condition while synchronizing the DG to the grid what is the next required action?

A. (1) Maximum instability condition in this mode of operation
(2) Continue to offload DG per shutdown procedure.

B. (1) Minimum instability condition in this mode of operation
(2) Continue to offload DG per shutdown procedure.

C. (1) Maximum instability condition in this mode of operation
(2) Direct Local Operator to place maintenance switch in maintenance position when the DG trips.

D. (1) Minimum instability condition in this mode of operation
(2) Direct Local Operator to place maintenance switch in maintenance position when the DG trips.

Answer: C

**Answer Explanation:**

Explanation: This question ask what is the impact of specifically leaving speed droop at 0% and not less then 50%. IAW LOP-AP-16 RETURNING 4160 VOLT BUS 141Y(241Y) FROM DIESEL 0 POWER TO ITS NORMAL SOURCE OF POWER, precaution C.1 states as follows, Operating the Diesel Generator paralleled with the System Auxiliary Transformer when Speed Droop is set to 0% (normal standby setting), should be avoided due to **complete instability and possible equipment damage in this mode**. If a DG is synchronized to the GRID with the droop at 0 will cause the DG to trip, the first action on a DG shutdown by normal methods or trip is to place maintenance switch into maintenance.

Distractor A: This distractor is plausible because the Operator has to decide what will be the next required action, this answer assumes the operator will continue to off-load the DG per the normal shutdown procedure, but with speed droop set at 0 the DG will trip and the required actions will be to place maintenance switch into maintenance, which is the first action after the DG is shutdown by normal methods or by tripping.

Distractor B: This distractor is plausible because the distractor is from the Limitations section of LOP-AP-16 and its states as follows "Operating with Diesel Generator PARALLELED with the System Auxiliary Transformer should be minimized when speed droop is set less than 50 percent due to slightly less stable conditions in this mode."

Distractor D: This distractor is plausible because 0% speed droop is less than 50% but is incorrect because the stem specifies 0% speed droop/ The distractor is from the Limitations section of LOP-AP-16 and its states as follows " Operating with Diesel Generator PARALLELED with the System Auxiliary Transformer should be minimized when speed droop is set less than 50 percent due to slightly less stable conditions in this mode." but the second half of the question is correct because the first action on a DG shutdown by normal methods or trip is to place maintenance switch into maintenance

Reference: LOP-AP-16 RETURNING 4160 VOLT BUS 141Y(241Y) FROM DIESEL 0 POWER TO ITS NORMAL SOURCE OF POWER rev 7, LOP-DG-03 DIESEL GENERATOR SHUTDOWN rev 33
Reference provided during examination: None

K/A Number/IR: 264000 A2.05 / RO 3.6 SRO 3.6
K/A Statement:Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Synchronization of the emergency generator with other electrical supplies

Safety Function:6
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, predict how the Emergency Diesel Generator System will respond to various system component failures while operating the system or on an exam in accordance with the student text.

**38** **ID: 049.00.14.21** **Points: 1.00**

Unit 2 is operating at 95% power with 80% Recirc Flow on all 4 Flow Units.

If a RPV pressure increase transient began raising power, at which (nominal) value would the Reactor Scram occur?

(Assume NO operator action and that a reactor scram occurs from the APRMs prior to exceeding the RPV high Pressure Scram setpoint)

(Note: The current slope of the APRM Thermal Power Upscale Flow-Biased Scram setpoint is defined as .61W + 68.2%.)

A. 113.5%

B. 117%

C. 118%

D. 129.2%

Answer: A

**Answer Explanation:**

Explanation: The flow Biased trip setpoint is clamped at 113.5%. This feature prevents the trip setpoint from exceeding its Allowable Value should a flow input signal fail in the high flow direction.

Distractor B: The 2 Loop Scram Flow Bias Setpoint would be .61 x 80 + 68.2% = 117% if not for the clamped setpoint value of 113.5% power

Distractor C: 118% is the APRM high flux setpoint, non flow biased scram setpoint.

Distractor D: 129.2% is a calculated by using power in the flow bias equation ((.61 x 100) + 68.2%= 129.2), and if candidate does not understand the equation it makes this a plausible distractor.

Reference: TS 3.3.1.1 Table 3.3.1.1-1 Reactor Protection System Instrumentation, Lesson Plan #44
Reference provided during examination: None

K/A Number/IR: 215005 K5.05/ RO 3.6 SRO 3.6
K/A Statement: Knowledge of the operational implications of the following concepts as they apply to AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM: Core Flow effects on APRM trip setpoints
Safety Function: 7
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given a Reactor Operating Mode and various plant conditions, evaluate Reactor Protection System indications/responses and determine if the indications/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.

**39** **ID: 006.00.16.03** **Points: 1.00**

With U-1 at 100% power:

Which of the following describes the effect of a loss of 125 VDC Bus 111X?

A. Reactor Water Level Control "C" Narrow range level indication will be lost.

B. 1A Diesel Generator field flashing source is lost.

C. 1A TDRFP has lost remote tripping capability.

D. MDRFP has lost auto start capability.

Answer: C

**Answer Explanation:**

Explanation: 1A TDRFP is the only load listed that is supplied by 111X 125 VDC Bus. When power is lost to the 1A TDRFP it can not be tripped from the main control room. The significance of this load to unit operation makes this a major load for the DC system, and the only correct answer to this question.

Distractor A: The C Narrow range channel of Reactor Water Level control is powered from 111Y. This is an important indication for Unit operation and depending on the equipment line up its loss can be significant operationally, thus makes is a major load for the DC system.

Distractor B: Field flashing for the 1A DG is supplied by Bus 112Y 125 VDC Bus. This is an important/major load due to impact on plant safety.

Distractor D: MDRFP is supplied from Bus 112X. If control power is lost its auto start capability would be gone. This makes it an important/major load due to impact on plant operation.

Reference: LOA-DC-101, Revision 18, Page 164-166, Attachment PNL 111X
Reference provided during examination: None

K/A Number/IR: 263000 K2.01/ RO 3.1 SRO 3.4
K/A Statement:D.C. Electrical Distribution: Knowledge of electrical power supplies to the following; Major D.C. loads
Safety Function: 6
CFR 41.
PRA: No

Cognitive level: High 3PEO, predict an event or outcome

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, predict the DC Distribution System response to a loss of the major power supplies while operating the system, or on an exam in accordance with student text.

**40** **ID: 032.00.14.06** **Points: 1.00**

Unit 1 is in hot shutdown:

- Unit 1 RCIC is operating in pressure control mode in **AUTO** at 600 GPM.

Given the following parameters:

| Time | Rx Pressure |
|---|---|
| 12:00 | 405 PSIG |
| 13:00 | 235 PSIG |

(1) Can your cool down rate be raised and still be within limits?
(2) Based on cool down rate, how would you adjust RCIC operation?

A. (1) Yes
(2) Throttle Open full flow test valve

B. (1) No
(2) Throttle Open full flow test valve

C. (1) Yes
(2) Throttle Closed full flow test valve

D. (1) No
(2) Throttle Closed full flow test valve

Answer: C

**Answer Explanation:**

Explanation: Candidate must base the correct answer on instrument interpretation (RPV Pressure), reactor behavior (decay heat removal rate) and operating characteristics (adjusting RCIC work). After evaluating RCIC performance, the candidate must make the correct operational decision.

Per Steam Tables for Saturated Steam:
405 psig □ 420 psia; Saturation Temperature for 420 psia is 449.43□F
235 psig □ 250 psia; Saturation Temperature for 250 psia is 400.98□F
Cooldown rate is 48.45 □F/Hour, which is well below the 100 □F/Hour limit.

It is given that the RCIC speed controller is in Auto at 600 gpm. By throttling the test valve closed, RCIC discharge pressure is raised and the turbine control must admit more steam to keep the RCIC Pump at 600 gpm. Using more steam raises the cooldown rate.

Distractor A::The cooldown rate can be raised, but the test valve must be closed rather than opened.

Distractor B: It is plausible that cooldown rate is too high because pressure has dropped by 170 psi, so the Steam tables must be utilized. The test valve must be closed rather than opened.

Distractor D: It is plausible that cooldown rate is too high because pressure has dropped by 170 psi, so the Steam tables must be utilized. If the cooldown rate is determined to be too high, then throttling closed the test valve is an incorrect operational decision.

Reference: LOP-RI-09 OPERATION OF THE REACTOR CORE ISOLATION COOLING SYSTEM IN PRESSURE CONTROL rev 11, LGP-2-1 NORMAL UNIT SHUTDOWN rev 103, System Lesson Plan 032 pages 4, 5, 15, 16,
Reference provided during examination: Steam Table

K/A Number/IR: 217000 2.1.07/ SRO 4.7 RO 4.4
K/A Statement:RCIC: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretations.
Safety Function: 4
CFR 41.
PRA: No

Cognitive level: High (3-SPK & SPR)

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

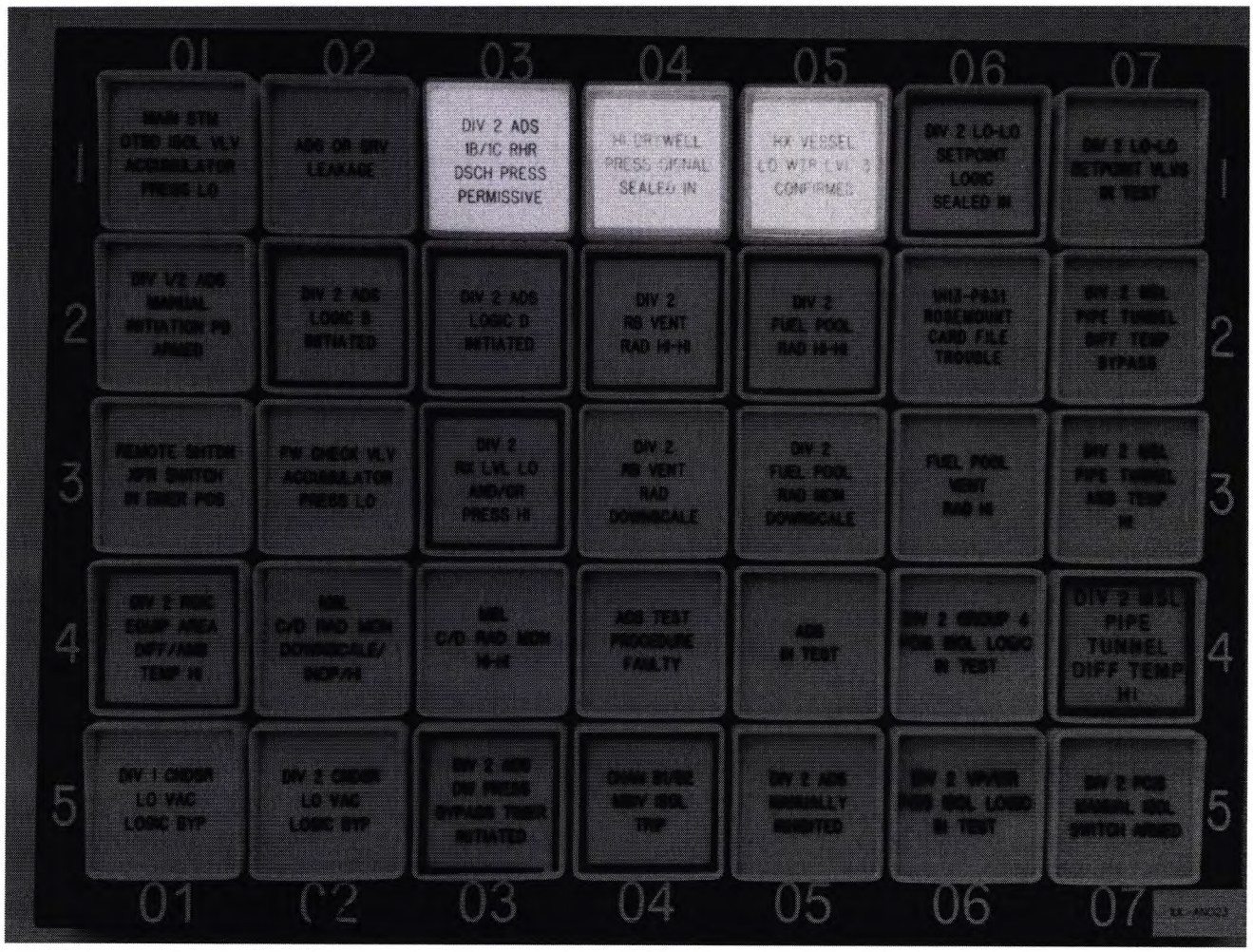
Comments:

**Associated objective(s):**

Given a Reactor Core Isolation Cooling System lineup and various plant conditions, evaluate the following system indications/responses. Determine if the indications/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.
a. Pressure
b. Flow
c. Etc.

**41** **ID: 062.00.05.09** **Points: 1.00**

The panel 1H13-P601-E alarms are as shown below.




Annunciator 1H13-P601-E105 just alarmed.

Which of the following identifies the status of annunciators 1H13-P601-E202 and 1H13-P601-E203 in 12 minutes if plant parameters remain stable?

A. 1H13-P601-E202 will be LIT ONLY

B. 1H13-P601-E203 will be LIT ONLY

C. BOTH 1H13-P601-E202 and 1H13-P601-E203 will be LIT

D. BOTH 1H13-P601-E202 and 1H13-P601-E203 will be EXTINGUISHED

Answer: D

**Answer Explanation:**

Explanation: Each channel of the ADS logic A,B,C, and D requires the following to occur for the logic to initiate: RPV water Level 1 signal, DW high pressure signal or 598 second bypass timer timed out, and ECCS pump discharge pressure established. Channels A and B also require the following: 118 second timer timed out and Level 3 confirmatory signal. For the given conditions, alarm windows E105; RX VESSEL LO WTR LVL 3 CONFIRMED is LIT, but without 1H13-P601E303 DIV 2 RX LVL LO/PRESS HI ALARM in alarm condition, this confirms that reactor level is still greater then level 1, without level 1 conditions, thus alarms 1H13-P601E201 and -E203 will remain EXTINGUISHED.

Distracters A, B, C: Options include the other three possible combinations of annunciators and could be selected by a candidate who does not understand the ADS logic.

Reference: LOR-1H13-P601-E105 rev 3, LOR-1H13-P601-E303 rev 2, LOR-1H13-P601-E203 rev 3 LOR-1H13-P601-E202 rev 3, LOR-1H13-P601-E104 rev 3, System Description 062, ADS with Figure.
Reference provided during examination: None

K/A Number/IR:218000 A3.07
K/A Statement:Automatic Depressurization System; Ability to monitor automatic operations of the AUTOMATIC DEPRESSURIZATION SYSTEM including: Lights and alarms
Safety Function:3 - Reactor Pressure Control
CFR 41.7
PRA: No

Cognitive level: High

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips and characteristics of the following Automatic Depressurization System components and relate these to overall system operation while operating the system or on an exam in accordance with the student text:
a. ADS Valves
b. Reset Switches
c. Inhibit Switches
d. Timers
e. Initiation Pushbuttons
f. Keylock Switches
g. ADS Bottle Banks
h. ADS Defeat Switches (U-2 only)

**42** **ID: 091.00.20.01** **Points: 1.00**

Unit 1 is performing a plant shutdown.

Per LGP-2-1 during the cool down, what RWCU isolation can be affected due to water density changes?

A. High Flow isolation

B. High Delta Flow isolation

C. Blow down flow (1G33-F033) isolation

D. High Demineralizer inlet temperature system isolation

Answer: B

**Answer Explanation:**

Explanation: Based on both precaution from LOP-RT-09 and limitation from LGP-2-1 the possibility exists for a spurious isolation of RWCU due to delta-flow signals due to water density changes. The instrumentation is calibrated at rated conditions, and isolations can be expected during start-ups and shutdowns. This is also a concern with heat-up and is also addresses in LGP-1-1 which states a reduction in RWCU reject flow during reactor heat-ups has been observed to help minimize RWCU HI DIFFERENTIAL FLOW isolation signals, and Attachment E HLA for Reactivity briefing addresses possible RWCU high differential flow isolations.

Distractor A: IAW LGP 2-1 the concern is with differential flow isolations, this distractor is plausible because high system flow is a system isolation signal

Distractor C: IAW LGP 2-1 the concern is with differential flow isolations, this distractor is plausible because the blowdown flow control valve has its own set of closure-isolation setpoints that become a concern during shutdown and start-up activities.

Distractor D: IAW LGP 2-1 the concern is with differential flow isolations, this distractor is plausible because this a system isolation and is a concern if there is too much reject flow then the non-regenerative heat exchange outlet temperature will rise closer to its isolation setpoint.

Reference: LGP-2-1 REACTOR SHUTDOWN rev 103 D.4.7 page 10, LOP-RT-09 REACTOR WATER CLEAN-UP(RWCU)-COOLANT REJECTION rev 15 Precaution C.9 page 4,
Reference provided during examination: None

K/A Number/IR: 223002 K1.02
K/A Statement:Primary Containment Isolation System/Nuclear Steam Shut-off: Knowledge of the physical connections and/or cause-effect relationships between PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SHUT-OFF and the following: Reactor Water Clean-up
Safety Function:5
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments

**Associated objective(s):**

Recall the reasons for the Primary Containment Isolation System precautions and limitations while operating the system or on an exam in accordance with station procedures.

**43** **ID: 070.00.20.02** **Points: 1.00**

With Unit 1 is at 100% power, IAW LOP-MS-10, "Cycling Main Steam Line Safety Relief Valves", the following alarms are expected during the performance of SRV cycling.

- 1H13-P601-E102, ADS or SRV Leakage
- 1H13-P601-F102, ADS Valve Accumulator Press Lo
- 1H13-P601-F201, ADS Valve Fully Open
- 1H13-P601-F302, Safety Relief Valve Fully Open

Assume that an SRV has just been opened, verified open, and then closed during a span of 10 seconds.
All of the above alarms came in while the SRV was open.
Which alarm will CLEAR LAST?

A. 1H13-P601-F102, ADS Valve Accumulator Press Lo

B. 1H13-P601-F302, Safety Relief Valve Fully Open

C. 1H13-P601-E102, ADS or SRV Leakage

D. 1H13-P601-F201, ADS Valve Fully Open

Answer: C

**Answer Explanation:**

Correct Answer: The associated SRV Tailpipe temperature indication on the 1H13-P614 recorder almost instantly exceeds 300 F when the valve is opened. The ADS or SRV Leakage annunciator comes in at 250 F. When the SRV is closed, it takes >1/2 hour (by simulator model) (VERIFY THIS) for the tailpipe to cool down to < 250 F. Candidate must be able to predict this response and relate it to SRV system alarm sensors and setpoints.

Distractor A: The normal pressure for the Instrument Nitrogen header in the Drywell is 165 psig. The setpoint for this alarm is 151 psig. The small amount of IN from the associated accumulator used during the SRV operation is quickly replenished in less than 1 minute. (VERIFY THIS)

Distractors B & D: Limit switches on the individual SRVs are used to activate these annunicators. As soon as the SRV opens, the alarms come in and as soon as the SRV closes the alarm clears.

Reference: LOP-MS-10, CYCLING MAIN STEAM LINE SAFETY RELIEF VALVES, Rev. 0
LOR-1H13-P601-E102, ADS or SRV Leakage, Rev. 1
Reference provided during examination: None

KA Number: 239002 A1.01 / RO 3.3 SRO 3.7
Statement: Ability to predict and/or monitor changes in parameters associated with operating the SRVs controls including: Tail pipe temperature

Cognitive level: High

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

Question Source: New

**Associated objective(s):**

Recall the reasons for the Main Steam System precautions and limitations while operating the system or on an exam in accordance with station procedures.

**44** **ID: 090.00.24.03** **Points: 1.00**

Unit 1 is at 100% power, when the following occurs:

- An SRV spuriously lifts.
- Suppression Pool temperature is currently at 89°F and rising 1°F /minute.
- Both loops of Suppression Pool cooling are in operation.

What is the Maximum amount of time before the mode switch is required to be placed in shutdown?

A. 14 minutes

B. 16 minutes

C. 21 minutes

D. 31 minutes

Answer: C

**Answer Explanation:**

Explanation:Per 21 minutes is the correct length of time to place the mode switch in shutdown per TS 3.6.2.1 RA C.1 this is an immediate completion time.

Distractor A: This distractor is plausible because 14 minutes is when the high temperature alarm comes in at the 1PM13J panel

Distractor B: This distractor is plausible because 16 minutes is TS 3.6.2.1 Required Action A.1 to immediately to stop adding heat to the suppression pool, the panel location is correct IAW LOP-CM-03 SUPPRESSION CHAMBER AVERAGE WATER TEMPERATURE DETERMINATION.

Distractor D; This distractor is plausible because 31 minutes is the amount of time required to take tech spec actions per TS 3.6.2.1 Required action D.1

Reference: TS 3.6.2.1 Suppression Pool Average Temperature
Reference provided during examination: None

K/A Number/IR: 239002 A4.04
K/A Statement: K/A Ability to manually operate and/or monitor in the control room: Suppression pool temperature
Safety Function:3
CFR 41.
PRA: No

Cognitive level: High 3 SPK Solve a Problem using knowledge and its meaning (per Discussion with M Bilelby if one part of answer is hi cog and is required to answer question then the question is Hi Cog)

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, recall Limiting Safety System Settings and One Hour or less LCO action statements and their basis while operating the system or on an exam in accordance with Technical Specifications.

**45** **ID: 070.02.20.02** **Points: 1.00**

Unit 1 was at 80% power with Feed Flow and Steam Flow matched when the following occurred:

- The 1C Inboard MSIV failed closed
- No scram setpoints were exceeded when the MSIV closed
- 10 seconds have passed since the MSIV closed

1) On the 1H13-P603 panel recorder for Feed Flow and Steam Flow, will the Steam
Flow indication read LOWER or HIGHER than Feed Flow?
2) Assuming NO operator action, will Unit 1 trip on the RPV water LEVEL 3 or LEVEL 8
signal?

A. 1) LOWER than Feed Flow
2) LEVEL 3

B. 1) LOWER than Feed Flow
2) LEVEL 8

C. 1) HIGHER than Feed Flow
2) LEVEL 3

D. 1) HIGHER than Feed Flow
2) LEVEL 8

Answer: D

**Answer Explanation:**

Explanation: : IAW LOA-FW-101, "Reactor Level/ Feedwater Pump Control Trouble", it is an immediate operator action to place RWLC in Single Element when an MSIV closes as described. However, the abnormal procedure does not provide a reason for this action or the expected response of RPV water level.
It is counter intuitive, but the RPV Steam Flow indication used by RWLC goes UPSCALE. This is because the RWLC uses the soft majority selector, which disregards the low steam flow signal, calculates an average from the remaining 3 indicators, and multiplies by 4 to achieve the Steam Flow signal displayed on the P603 recorder and used in for level control. Feed Flow is then automatically raised to match the higher Steam Flow, and without operator action, the Main Turbine will trip on the Level 8 (High level) signal, resulting in a reactor scram.

Distractor A: : Steam flow is now going down 3 lines rather than 4, so it is plausible that total Steam flow will have lowered to less than Feed Flow if the "soft majority" feature of RWLC is not understood. If Feed Flow were matched to a lower Steam Flow signal, actual RPV water level could lower to the Level 3 (Scram) setpoint.

Distractor B: Steam flow is now going down 3 lines rather than 4, so it is plausible that total Steam flow will have lowered to less than Feed Flow if the "soft majority" feature of RWLC is not understood. If actual Feed Flow was higher than actual Steam Flow, RPV water level could rise to the Level 8 (Turbine Trip) setpoint.

Distractor C: If actual Steam Flow was higher than actual Feed Flow, RPV water level could lower to the Level 3 (Scram) setpoint.

Reference: LOA-FW-101 REACTOR LEVEL/FEEDWATER PUMP CONTROL TROUBLE rev 10 LOA-MS-101 MAIN STEAM ABNORMAL rev.10 section B.4, RWLC (REACTOR WATER LEVEL CONTROL SYSTEM Lesson Plan #31
Reference provided during examination: None

K/A Number/IR: 259002 A3.03
K/A Statement: REACTOR WATER LEVEL CONTROL:
ability to monitor automatic operations of the REACTOR WATER LEVEL CONTROL SYSTEM including: Changes in Main Steam Flow.
Safety Function:2
CFR 41.
PRA: No

Cognitive level: HIGH 2-RI

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

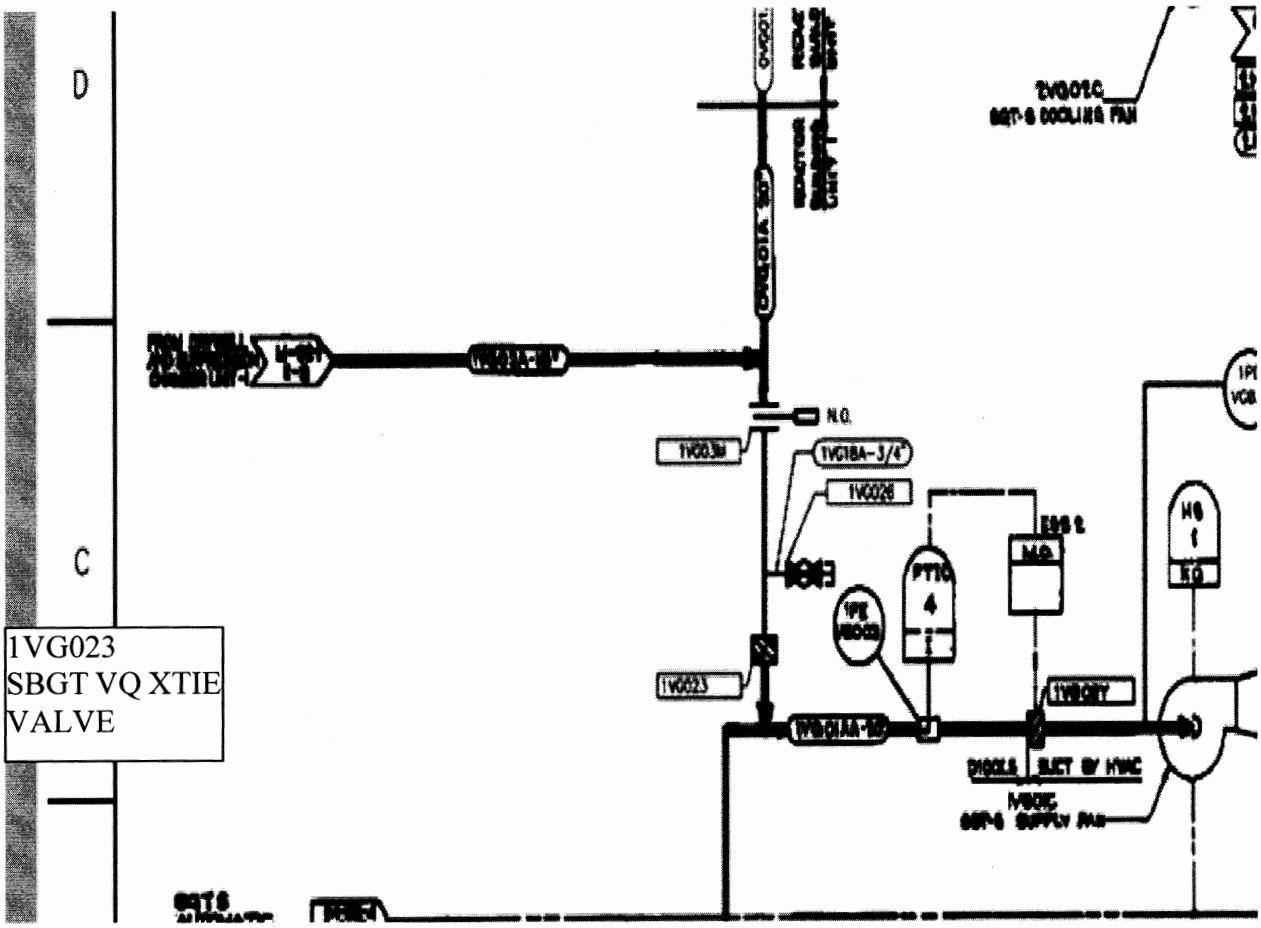
Comments:

**Associated objective(s):**

Given various plant conditions, recall major action categories and selected step basis while operating the system or on an exam, in accordance with the student text.

**46** **ID: 093.00.20.02** **Points: 1.00**

What is the purpose of the 1VG023 SBGT VQ XTIE VALVE on the Standby Gas Treatment System (SBGT)?




A. Enhance the ability to perform on-line maintenance.

B. Provide an isolation point for Local Leak Rate testing.

C. Prevent over pressurizing the VG System during the onset of a LOCA.

D. Prevent collapsing VG system ductwork during Normal VQ system start-up.

Answer: C

**Answer Explanation:**

Explanation:Modifications (DCP 9700402, and 9700403) installed the 1VG023 damper. The damper is normally locked closed and isolates the VG system from the Primary Containment ventilation header, thus preventing over pressurizing the VG train during LOCA conditions. This damper is manipulated in containment vent procedures if using the SBGT to treat drywell gases.

Distractor A: This answer is plausible because due to online maintenance requirements additional dampers and valves have been installed on various systems to allow preventive or corrective maintenance but this damper was installed to protect the VG train from over-pressurization from a LOCA

Distractor B: This answer is plausible because Spectacle flanges are installed for Local Leak Rate Testing (LLRT) but these flanges were installed for convenience and this damper was not specifically installed for LLRT

Distractor D: This answer is plausible because collapsing VQ ductwork is a concern during VQ system operation, the VQ fan has a low suction trip preventing duct work collapse.

Reference: P&ID M-89, LGA-VQ-03 PRIMARY CONTAINMENT PURGE Rev 13,
Reference provided during examination: None

K/A Number/IR: 261000 K1.02
K/A Statement:Knowledge of the physical connections and/or cause-effect relationship between STANDBY GAS TREATMENT SYSTEM and the following: Drywell
Safety Function:9
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments

**Associated objective(s):**

Recall the reasons for the VQ System precautions and limitations while operating the system or on an exam in accordance with station procedures.

**47** **ID: 095.00.21.01** **Points: 1.00**

Following a loss of coolant accident, the Standby Gas Treatment system has been in service purging the Drywell, per LGA-VQ-03, PRIMARY CONTAINMENT PURGE:

- SBGT WRGM release rates were stable and then began to rise.

Which one of the following explains the elevated release?

A. Relative Humidity in the drywell has lowered from 80% to 50%.

B. Charcoal Adsorber access door is NOT fully closed.

C. The Electric Heater is de-energized.

D. The SBGT stack loop seal is blown.

Answer: C

**Answer Explanation:**

Explanation:"Electric Heater is de-energized is correct. The purpose of the electric heater is to remove the moisture entering the charcoal train. The heater is designed to remove relative humidity levels up to 100%. If the train heater was not in operation relative humidity of process gas would rise, this would cause a wetting of the charcoal adsorbers and lower the adsorption capability of the charcoal, resulting in less iodine being held-up in the train, causing release rates to increase.

Distractor A: The train is designed to remove process gases at 100% relative humidity in the drywell, humidity lowering from 80% to 50% would still be within the design criteria of the SBGT heater moisture removal capability and release rates would not go upward.

Distractor B: This is a LaSalle OPEX, during a monthly train run flow rate was below the required surveillance criteria, a door was discovered open on the train, this would not drive release rates upward but release rates would drop or stay the same, the escaped gases would be reprocessed in the SBGT train as the train continues to run

Distractor D: The SBGT has four loop seal associated with each train, if the stack loop seal blows, post treated gas from the SBGT would escape to the auxiliary building and since these are already treated gases, release rates would not rise

Reference: LGA-VQ-03 PRIMARY CONTAINMENT PURGE rev 13, SBGT Lesson Plan #95 Off-Gas Lesson Plan #80
Reference provided during examination: None

K/A Number/IR: 261000 K4.05 / RO 2.6 SRO 2.8
K/A Statement: Knowledge of SGTS design feature(s) and/or interlocks which provide for the following: Fission product gas removal

Safety Function:9
CFR 41.

PRA: No

Cognitive level: High

Level: RO
Tier: 2 Group: 1

Question Source: Bank
Question History: LaSalle 2002-01 NRC License Exam

SRO Justification:

Comments:

**Associated objective(s):**

Given a System lineup and various plant conditions, predict the Standby Gas Treatment System response to various system component failures while operating the system or on an exam in accordance with student text.

**48** **ID: 003.00.02.08** **Points: 1.00**

Given the following initial plant information:

- Unit-1 is in a refueling outage.
- Unit-1 UAT is a qualified off-site source.
- Bus 13 is de-energized.
- Unit-2 is in Mode 2 with a start-up in progress.

Given this initial lineup, which one of the following combinations of failures would result in a loss of all Off-Site AC power to both units?

A. Unit 2 Ring Bus and TR-81

B. Unit-1 UAT and Unit-2 SAT

C. Unit-1 UAT and Lines L0101 and L0104

D. Unit-2 SAT and Lines L0102 and L0103

Answer: B

**Answer Explanation:**

Explanation:The 2 qualified Off-site sources of power when both Units are shutdown are normally both Unit's SAT but with Bus 13 de-energized the Unit 1 SAT is dead, this makes the "Qualified" U-1 UAT as the only available source of power for U-1, with the U-1 UAT and U-2 SAT would result in a station black out.

Distractor A: Plausible, If the Unit 2 ring bus is de-energized, this would de-energize the U-2 SAT and with if TR-81 de-energized this would eliminate a source of power to Bus 1 (common Bus to Unit 1 and 2 ring bus) but TR-81 is not a qualified source of power to either Unit 1 or 2. A qualified Unit-1 UAT would have the capability to supply both units, either directly or thru the Unit tie breakers.

Distractor C: This is plausible based on a loss of the Unit-1 UAT would be one source of power as being unavailable and with a loss of both Lines L0101 and L0104 the Unit 1 ring bus would lose two potential sources of power but Unit 2 ring bus still has L0102 and L0103.

Distractor D: This is plausible based on a loss of the Unit-2 SAT would be one source of power as being unavailable and with a loss of both Lines L0102 and L0103 the Unit 2 ring Bus would lose two potential sources of power but Unit 1 ring bus still has L0101 and L0104.

Reference:LP #003 page 02, figure 03-02,
Reference provided during examination: None

K/A Number/IR: 262001 K2.01
K/A Statement:AC Electrical Distribution: Knowledge of electrical power supplies to the following: Off-site sources of power

Safety Function:6
CFR 41.
PRA: No

Cognitive level: High (2DR and RW)

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the Switchyard System power distribution during all modes of operation or by drawing a one line diagram on an exam in accordance with Figure 03-02.

**49** **ID: 012.00.16.05** **Points: 1.00**

Which of the following completes the statements?

The Unit 1 and Unit 2 Process Computer are fed from_____(1 )_____UPS (Uninterruptable Power Supply).
If Inverter output is lost, describe the effect on the Unit 1 and Unit 2 Process computer?
The alternate power supply swaps____(2)____.

A. (1) a common
(2) without interruption

B. (1) separate
(2) without interruption

C. (1) a common
(2) after a 5 second time delay

D. (1) separate
(2) after a 5 second time delay

Answer: B

**Answer Explanation:**

Explanation: Unit 1 and Unit 2 Plant Process Computers are fed from different UPS Inverters. Unit 1 Process Computer UPS works as follows. Rectified AC from MCC135X-3 is fed parallel with a DC supply from 250 VDC MCC 121Y to an inverter, which then supplies AC to the system. Upon failure of the normal AC supply, the DC supply will automatically pick up the load. The computer system's power will automatically shift over to the alternate source (MCC 235X-2) if the normal AC and DC sources fail via the static switch. The Unit 2 Process Computer UPS is supplied by MCC 235X-3, 250 VDC MCC 221Y and alternate supply MCC 135X-2, each UPS operates like for like.

Distractor A: This answer is plausible because both the Unit's process computers are located in a common location, but with each having a separate power supply. Unit 1 Process Computer UPS works as follows. Rectified AC from MCC135X-3 is fed parallel with a DC supply from 250 VDC MCC 121Y to an inverter, which then supplies AC to the system. Upon failure of the normal AC supply, the DC supply will automatically pick up the load. The computer system's power will automatically shift over to the alternate source (MCC 235X-2) if the normal AC and DC sources fail via the static switch. The Unit 2 Process Computer UPS is supplied by MCC 235X-3, 250 VDC MCC 221Y and alternate supply MCC 135X-2, each UPS operates like for like.

Distractor C: Unit 1 and Unit 2 Plant Process Computers are fed from different UPS Inverters, Unit 1 Process Computer UPS works as follows. Rectified AC from MCC135X-3 is fed parallel with a DC supply from 250 VDC MCC 121Y to an inverter, which then supplies AC to the system. Upon failure of the normal AC supply, the DC supply will automatically pick up the load. The computer system's power will automatically shift over to the alternate source (MCC 235X-2) if the normal AC and DC sources fail via the static switch. The Unit 2 Process Computer UPS is supplied by MCC 235X-3, 250 VDC MCC 221Y and alternate supply MCC 135X-2, each UPS operates like for like. There is no time delay in operation of the static transfer switch.

Distractor D: This answer is plausible because both the Unit's process computers are located in a common location but with each having a separate power supply. Unit 1 Process Computer UPS works as follows. Rectified AC from MCC135X-3 is fed parallel with a DC supply from 250 VDC MCC 121Y to an inverter, which then supplies AC to the system. Upon failure of the normal AC supply, the DC supply will automatically pick up the load. The computer system's power will automatically shift over to the alternate source (MCC 235X-2) if the normal AC and DC sources fail via the static switch. The Unit 2 Process Computer UPS is supplied by MCC 235X-3, 250 VDC MCC 221Y and alternate supply MCC 135X-2, each UPS operates like for like. There is no time delay in operation of the static transfer switch.

Reference: LOP-CX-08 rev 9, Lesson Plan #50 Plant Process Computer page 43, Power Point Lesson Plan #12 TSC/Security DG/ UPS systems slide 46 and 49
Reference provided during examination: None

K/A Number/IR: 262002 K3.08/ SRO2.8 RO 2.7
K/A Statement: Knowledge of the effect that a loss or malfunction of the UNINTERRUPTABLE POWER SUPPLY will have on following: Computer Operations: plant specific
Safety Function:6
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 1

Question Source: Bank
Question History: Browns Ferry 2010 NRC

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, predict the TSC Diesel Generator, Securiy Diesel Generator and UPS Systems response to a loss of the major power supplies and Fire Protection Systems while operating the system, or on an exam in accordance with student text:

**50** **ID: 006.00.20.01** **Points: 1.00**

Which ONE of the following completes the statements relating to Station Battery Room HVAC Systems?

If these systems are NOT operating properly, the Operational impact is that__(1)__.

Because of this, provisions are provided in plant procedures to __(2)__.

A. (1) lead-calcium batteries tend to release sulfuric gas into the atmosphere at temperatures above 90□□
(2) Install Portable Temporary Ventilation Equipment

B. (1) lead-calcium batteries tend to release sulfuric gas into the atmosphere at temperatures above 90□□
(2) start a special log, monitoring with portable gas monitor equipment

C. (1) the design limit for hydrogen concentration in the rooms may be reached during battery charging operations
(2) start a special log, monitoring with portable gas monitor equipment

D. (1) the design limit for hydrogen concentration in the rooms may be reached during battery charging operations
(2) Install Portable Temporary Ventilation Equipment

Answer: D

**Answer Explanation:**

Explanation: IAW LOP-VX-02 the battery rooms should have a portable fan with flow > 1000 CFM installed when the room ventilation is impaired due to the buildup of hydrogen gases while the batteries are on charge otherwise the batteries are required to be open circuited prior to impairing ventilation

Distractor A: LOP-VX-02 precautions specify that hydrogen buildup is the concern for an impaired ventilation system, but installing a temporary fan is the correct compensatory action.

Distractor B: LOP-VX-02 precautions specify that hydrogen buildup is the concern for an impaired ventilation system, but installing a temporary fan is the correct compensatory action. The procedure does not address using portable gas monitoring equipment but is plausible under these conditions.

Distractor 3: LOP-VX-02 precautions specify that hydrogen buildup is the concern for an impaired ventilation system, but installing a temporary fan is the correct compensatory action, and the procedure does not address using portable gas monitoring equipment but is plausible under these conditions.

Reference: LOP-VX-02 SWITCH GEAR HEAT REMOVAL SYSTEM SHUTDOWN rev 17
Reference provided during examination: None

K/A Number/IR: 263000 A.2.02/ SRO 2.9 RO 2.6

K/A Statement: D.C. Electrical Distribution: Ability to (a) predict the impacts of the following on the D.C. ELECTRICAL DISTRIBUTION; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequence of those abnormal conditions or operations: Loss of ventilation during charging
Safety Function:6
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 1

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the reasons for the DC Distribution System precautions and limitations while operating the system or on an exam in accordance with the student text.

**51** **ID: 011.00.20.01** **Points: 1.00**

LOS-DG-M2, 1A/2A DIESEL GENERATOR OPERABILITY TEST is in progress for the 1A Diesel Generator.

While performing this surveillance, you must NOT go below (1)_____ load in order to (2)_____ .

A. (1) 200 kW
(2) prevent excessive wear to turbocharger gear drive

B. (1) 400 kW
(2) prevent excessive wear to turbocharger gear drive

C. (1) 200 kW
(2) prevent the Diesel Generator from tripping on reverse power due to large load changes on the grid

D. (1) 400 kW
(2) prevent the Diesel Generator from tripping on reverse power due to large load changes on the grid

Answer: C

**Answer Explanation:**

Explanation: Per LOS-DG-M2 rev 91 Section D. Limitations D.8 When the DG is loaded in parallel to bus, a minimum of 200 kW load must be maintained to prevent DG from tripping on Reverse Power due to large load changes on grid.

Distractor A: 200 KW is correct, per section D. Limitations of LOS-DG-M2 200 KW load is the minimum requirement, but per section D.12 the requirement for operation of turbocharger is for **extended** operation below 2200 kw.

Distractor B: 400 KW is incorrect, per section D. Limitations of LOS-DG-M2 200 KW load is the minimum requirement, and per section D.12 the requirement for operation of turbocharger is for **extended** operation below 2200 kw.

Distractor D: 400 KW is incorrect, per section D. Limitations of LOS-DG-M2 200 KW load is the minimum requirement,

Reference: LOS-DG-M2, page 8, Step D.8 revision 91

Reference provided during examination: None

K/A Number/IR: 264000 2.1.32/ RO 3.8 SRO 4.0
K/A Statement:EDGs: Ability to explain and apply system limits and precautions.
Safety Function:6
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: Group:

Question Source: Bank
Question History:

SRO Justification: N/A

Comments

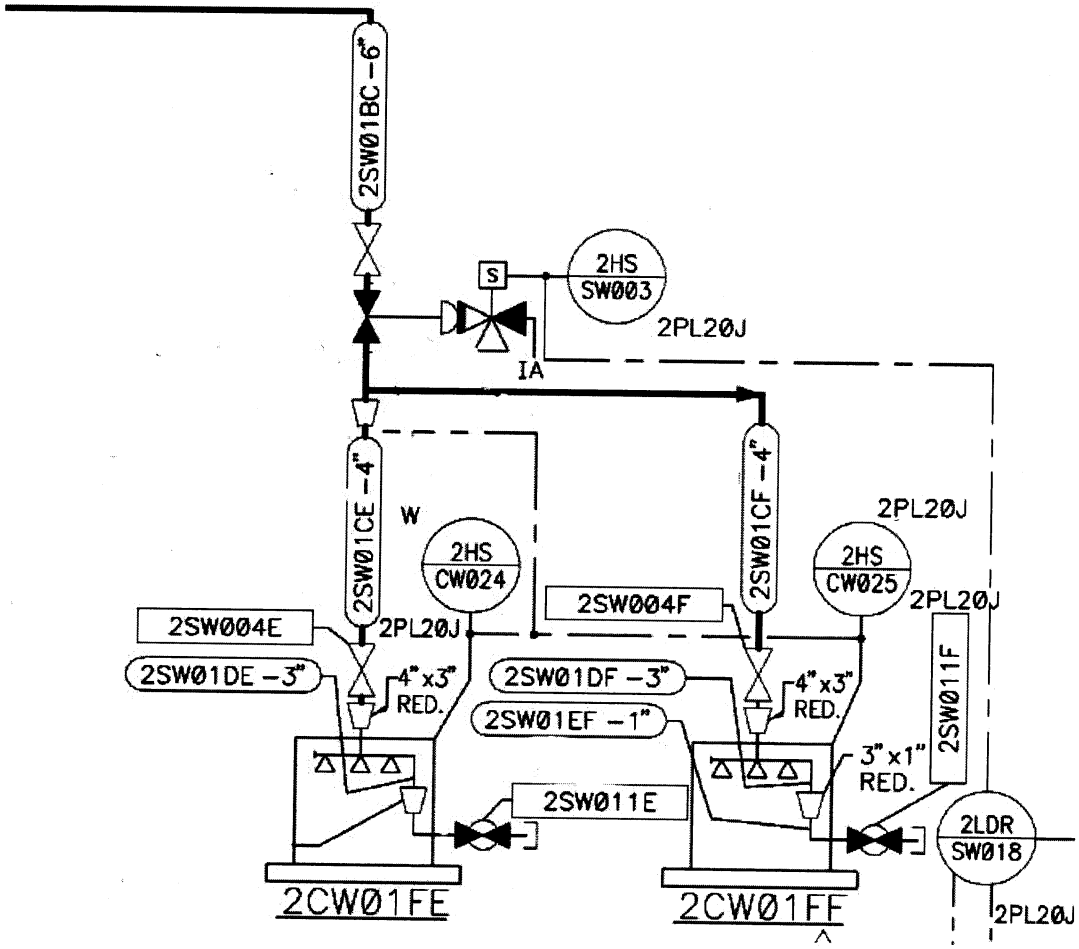
**Associated objective(s):**

Recall the reasons for the Emergency Diesel Generator System precautions and limitations while operating the system or on an exam in accordance with station procedures.

**52** **ID: 111.00.16.03** **Points: 1.00**

Both Units are at 100% power.

- All Traveling Screens are in Automatic
- All Traveling Screen differential levels are at 2 in wg.
- Lake Level as read on the PPC in the MCR is 699.3 ft




What effect, if any, would a COMPLETE LOSS OF INSTRUMENT AIR have on:
1) The Screen Wash capability of the Traveling Screens?
2) Lake Level Indication in the MCR?

A. (1) Screen Wash capability would be LOST
(2) Will be unreliable

B. (1) Screen Wash capability would be LOST
(2) NO EFFECT

C. (1) Screen Wash capability would be AUTOMATICALLY MAXIMIZED
(2) Will be unreliable

D. (1) Screen Wash capability would be AUTOMATICALLY MAXIMIZED
(2) NO EFFECT

Answer: A

**Answer Explanation:**

**Correct Answer:** LOP-CW-05 Limitation D.1 states that "A loss of Instrument Control Air will cause indicated differential pressure readings on the Traveling Screens (as measured on the recorders) to decrease causing a loss of protection to backwash Traveling Screens." The control feature that auto starts the traveling screens based on rising differential level is effectively disabled. Additionally, the Screen Wash Valve from Service Water is a fail-closed air-operated valve, which would also prevents Screen Wash. A picture of the P & ID is provided to student. The Failed Closed abreviation is removed from diagram. The student will have to interpret drawing to determine condition of spray wash valve thus not a direct look up.
Lesson Plan 111 states that Lake Level Indication comes from the 1B/2B CW Pump Traveling Screen bubbler. "A loss of Air will cause loss of Lake Level indication for the Unit and audible alarms in the MCR from the process computer." Level indication is based on the pressure in the bubbler tube. The higher the water level outside of the tube, the higher pressure must be inside the bubble tube before it starts to bubble. Low pressure in the tube equates to low level or a loss of regulated air supply.

**Distractors b and d:** Selected if the effect of a loss of air to the Lake Level bubbler is not understood.

**Distractor c and d:** Selected if the effect of a loss of air to the Traveling Screen bubbler is thought to be high differential level, which would maximize Screen wash. Also selected if the loss of air is thought to disable the Traveling Screen rotation but not the bubbler, which would then raise differential level as the screens became fouled. High differential level maximizes Screen Wash.

**Reference:** LOP-CW-05, STARTUP OF CIRCULATING WATER (CW) TRAVELING SCREENS
LP#111, Circulating Water System, M-70 screen wash drawing
**Reference provided during examination:** None

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

**KA Number:** 300000 K3.02 / RO 3.3 SRO 3.4
**Statement:** Knowledge of the effect that a loss or malfunction of the Instrument Air will have on following: Systems having pneumatic valves and controls

**Learning Objective:** 111.00.16d Given various plant conditions, predict the Circulating Water System response to a loss of the major power supplies or the following support systems while operating the system, or on an exam in accordance with station procedures: d. Instrument Air

**Question Source:** New

**Associated objective(s):**

Given various plant conditions, predict the Circulating Water System response to a loss of the major power supplies or the following support systems while operating the system, or on an exam in accordance with student text:
a. Service Water (WS)
b. Gland Water (WG)
c. Dewatering (DM)
d. Instrument Air (IA)

**53** **ID: 065.00.22.02** **Points: 1.00**

Unit 2 is 100% reactor power, when the following occurred:

- LOS-RH-Q1 RHR (LPCI) AND RHR SERVICE WATER PUMP AND VALVE INSERVICE TEST FOR MODES 1,2,3,4 AND 5 is in progress.
- The 2A RH WS strainer backwash motor tripped on thermal overload during a backwash.

Which of the following statements describes the effect on 2A RHR WS system or the action to take?

A. Immediately secure the system due to strainer unavailability.

B. Backwash feature is unavailable, system can continue to operate.

C. Backwash feature is still available, system can continue to operate.

D. System can continue to operate until high strainer Dp Alarm, then secure system.

Answer: C

**Answer Explanation:**

Explanation: Automatic RHR Service Water Strainer backwash is NOT required for RHR Service Water operability. The instrumentation and valve operator for automatic backwash are powered by non-safety-related supplies, therefore, automatic backwash function cannot be relied upon under accident conditions. In the event of a loss of power, or a failure of the backwash valve operator, the backwash function can be achieved by manually opening backwash valve and manually rotating backwash arms.

Distractor A: There is no requirement to immediately secure the system. This answer is plausible because under normal circumstances in a surveillance if an item breaks the Operator could secure the system and place it in a safe configuration, but IAW LOP-RH-14 Limitation D.4 Automatic RHR Service Water Strainer backwash is NOT required for RHR Service Water operability. The strainer is still capable of performing its design function but manual rotation of strainer by hand will be required

Distractor B: This answer is plausible because the automatic mode of backwash is unavailable, but is incorrect because the capability exist to perform a manual backwash IAW LOP-RH-14 "BACKWASH OF THE RESIDUAL HEAT REMOVAL SERVICE WATER STRAINERS".

Distractor D: This answer is plausible because the system can continue to operate, but is incorrect. If the high strainer Dp alarms in the main control room, the Control Room Operators can dispatch an Operator to the strainer and have it manually backwashed IAW LOP-RH-14.

Reference: LOS-RH-Q1RHR (LPCI) AND RHR SERVICE WATER PUMP AND VALVE INSERVICE TEST FOR MODES 1,2,3,4 AND 5 rev 81, LOP-RH-14 BACKWASH OF THE RESIDUAL HEAT REMOVAL SERVICE WATER STRAINERS REV 14

Reference provided during examination: None

K/A Number/IR: 400000 K6.05
K/A Statement:Knowledge of the effect that a loss or malfunction of the following will have on the Component Cooling Water: Motors
Safety Function:8
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given a copy of Technical Specifications, key system parameters, and various plant conditions, apply Technical Specifications to determine if LCO's have been met or exceeded, the basis for the LCO, and identify the required actions, while operating the system or on an exam, in accordance with Technical Specifications.

**54** **ID: 048.00.21.01** **Points: 1.00**

Unit 2 is in Mode 2 at 8% Power.

- Control Rod withdrawal is in progress
- "BLOCKS TO FULL" is enabled on the Rod Worth Minimizer (RWM)

From this condition, the TOTAL STEAM FLOW output signal from Digital Reactor Water Level Control to the Rod Worth Minimizer FAILS HIGH.

How will subsequent rod motion be affected?

The RWM will ...

A. apply insert and withdrawal blocks to ALL rods.

B. allow rod motion by single notch increments ONLY.

C. apply rod blocks in accordance with the loaded rod sequence.

D. allow ALL rod motion independent of the loaded rod sequence.

Answer: C

**Answer Explanation:**

Explanation: RWM (Rod Worth Minimizer) is integrated with the RCMS Rod Control Management System at LaSalle Station, RWM uses two mechanism to activate Sequence enforcement. The first method uses the MSL flow input from the RWLCS (Reactor Water Level Control System), this flow input provides power indication to RWM. It uses this power indication and compares it to a predetermined low power setpoint, if power indication is less than the low power setpoint then sequence enforcement is active. The second method available using RCMS is called "Blocks to Full" and is activated by using soft keys available in RCMS to activate the rod sequence, this control rod sequence is active throughout the entire range of power regardless of reactor power status. If the MSL flow indications were to fail high but since Blocks to Full is enabled then this indication will not have an effect on RWM and control rod sequence will still continue to be enforced by the RWM

Distractor A: The sequence would still be enforced and the control rod that was next in the sequence would be available to move.

Distractor B: Control rod movement will be available in both directions as dictated by the control rod sequence. This distractor is plausible certain RCMS failures only allow a control rod to be single notch inserted.

Distractor D: Control rod sequence would continue to be enforced throughout the power range, because Blocks to Full is enabled.

Reference: LOP-RM-02 ROD CONTROL MANAGEMENT SYSTEM ON DEMAND FUNCTIONS rev 21, Lesson Plan #32 REACTORS WATER LEVEL CONTROL, Lesson Plan #48 Rod Worth Minimizer

Reference provided during examination: None

K/A Number/IR: 201006 K3.01 /RO 3.2 SRO 3.5
K/A Statement:RWM Knowledge of the affect that a loss or malfunction of the RWM will have on the following: Reactor Manual Control system: Plant specific(RCMS)
Safety Function: 7
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 2 Group:
Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, predict how the Rod Worth Minimizer System will respond to various system component failures while operating the system or on an exam in accordance with student text.

**55** **ID: 23.00.21.03** **Points: 1.00**

The Unit 1 Reactor Recirculation Flow Control system is operating in Loop Automatic mode with the RR-FCVs 68% open and RVDT selected on both loops.

Given the following from the 1DS001 panel. (see attached reference)

Which one of the following describes the 1A Flow Control Valve (FCV) response?

The Flow Control Valve has ...

A. failed OPEN to 100%.

B. immediately LOCKED UP.

C. started to open then switched to its LVDT.

D. started to CLOSE then switched to its LVDT.

Answer: C

**Answer Explanation:**

Explanation:
"starts to open then switches to its LVDT and returns to demanded position." is correct. If the RVDT fails, its output will be 0 volts. 0 volts equates to 50%. A 0.5 second time delay starts because of the greater than 3% mismatch between the RVDT and the LVDT and the RVDT and the position demand. In addition, the actual valve starts to open because the position demand is greater than the RVDT indicated position. The valve is limited to 8% per second velocity so the valve can move up to 4% during the 0.5 second time delay. At 0.5 seconds, the system will determine that the RVDT has failed and transfer to the LVDT. The system will see that the valve has opened and then start closing the valve to restore the valve to the position demand.

Distractor A: This is the response of a FCV when it is positioned between 45 to 55% open. In this band a failure will not be detected and locking up the FCV will place in safe condition

Distractor B: The valve will not go to 100% demand at the 3% mismatch the valve will start a .5 sec timer and then swap to the other operable indication and then return to its original position.

Distractor D: This is the reverse effect if the LVDT had failed in the other direction.

Reference: Recirculation Flow Control Lesson Plan #23, LOP-FW-16 OPERATOR STATION ALARM MESSAGE INTERPRETATION rev 027
Reference provided during examination: Screen shot of 1DS001 panel with the 1A RR pump LVDT, RVDT and position indications

K/A Number/IR: 202002 2.4.47
K/A Statement:Recirculation Flow Control System; Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

Safety Function:1
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 2 Group: 2

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

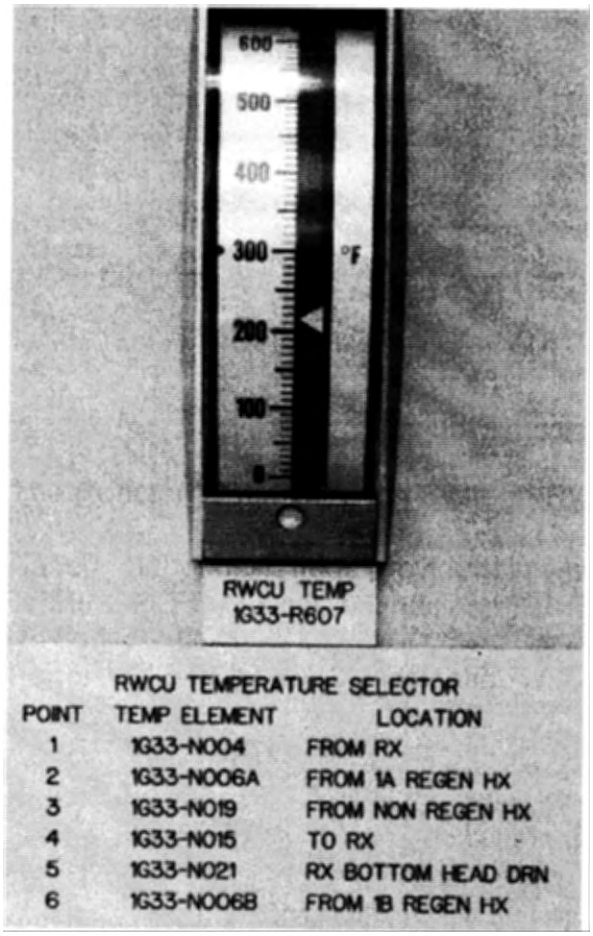
Given various plant conditions, predict how the RRFC System will respond to various system component failures while operating the system or on an exam in accordance with student text.

**56** **ID: 027.00.14.05** **Points: 1.00**

The Reactor Water Cleanup System (RWCU) is in normal operation at full power.

Based on the indications provided, in which position would the RWCU LOOP TEMP SELECT switch be in?

Panel 1H13-P602 RWCU indication




A. 5

B. 4

C. 2

D. 1

Answer: C

**Answer Explanation:**

Explanation:The provided picture is taken from the 1H13-P602 panel with the switch in position 2. Meter is reading approximately 200°F. The Regenerative HX cools the reactor water from 540-550°F to approximately 210-220 °F. The return flow from the filter demineralizers is approximately 90-110 °F and the Regen HX raises system temperature approximately to 440 to 455°F, a difference of 300°F. If you use this amount of temperature differential and include ambient heat losses this would place REGEN HX OUTLET, Point 2 approximately 210 - 220 °F Therefore, the correct answer is Point 2 REGEN HX OUTLET temperature

Distractor A: Per LOP-RT-10 temperature alarms at > 130 °F , and at 140 °F the system will isolate, normal Pt 5 value is 510-530 °F

Distractor B: Per LOS-CS-S001 HEAT BALANCE INPUT SHIFTLY SURVEILLANCE Attachment "1E", normal Pt 4 value is 450°F.

Distractor D: Per LOS-CS-S001 HEAT BALANCE INPUT SHIFTLY SURVEILLANCE Attachment "1E", normal Pt 1 value is 540-550 °F.

Reference: LOP-RT-10 REACTOR WATER CLEANUP SYSTEM (RWCU) HEAT EXCHANGER ROTATION rev 9, LOS-CX-S001 HEAT BALANCE INPUT SHIFTLY SURVEILLANCE rev 14
Reference provided during examination: None

K/A Number/IR: 204000 A1.06/ RO 2.8 SRO 2.8
K/A Statement: REACTOR WATER CLEANUP SYSTEM: Ability to predict and/or monitor changes in parameters associated with operating REACTOR WATER CLEANUP SYSTEM controls including: System Temperatures
Safety Function:2
CFR 41.
PRA: No

Cognitive level: High 2-DR

Level: RO
Tier: 2 Group: 2

Question Source: Bank
Question History: Quad Cities 2009 NRC

SRO Justification: N/A

Comments:

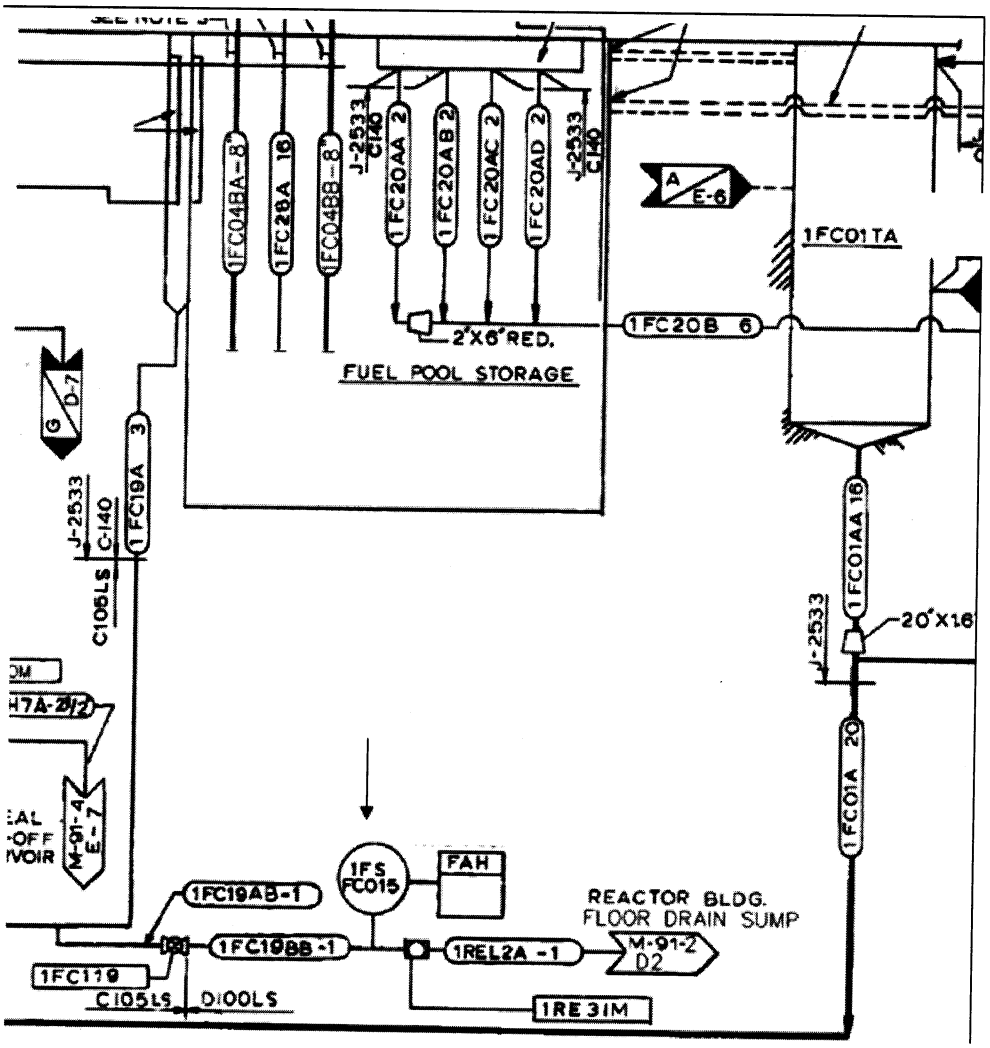
**Associated objective(s):**

Given a Reactor Water Cleanup System lineup and various plant conditions, evaluate system indications/responses and determine if the indications/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.

**57** **ID: 029.00.14.02** **Points: 1.00**

Unit 1 is at 100% power.

- Assume leakage flow has become just high enough to activate the Flow Switch 1FS-FC015 shown below.




1) Does this Flow switch initiate an alarm in the MCR or at the Fuel Pool Cooling Panel
in the Turbine Building?

2) Will continued leakage require filling the Skimmer Surge Tank with Cycled Condensate(CY) or filling the Fuel Pool with Clean Condensate(MC)?

A. 1) Alarms in the MCR
2) Fill the Fuel Pool with Demineralized Water

B. 1) Alarms in the MCR
2) Fill the Skimmer Surge Tank with Cycled Condensate

C. 1) Alarms in the Turbine Building at the Fuel Pool Cooling Panel
2) Fill the Fuel Pool with Demineralized Water

D. 1) Alarms in the Turbine Building at the Fuel Pool Cooling Panel
2) Fill the Skimmer Surge Tank with Cycled Condensate

Answer: B

**Answer Explanation:**

Explanation: Picture shows flow switch 1FS-FC015 which monitors Fuel Pool Gate Leakage. This switch provides an alarm as SER R-Point 0540 and on panel 1H13-P601-C207. Continued leakage will require makeup from CY to the Skimmer Surge Tank per LOR 1H13-P601-C207.

Distractor A: Correct location but Clean Condensate is the wrong source of make up water to fuel pool cooling system but plausible because it is an available source of water on the refuel floor.

Distractor C: Incorrect location but plausible because its primary control panel is located 663 TB basement including the controls for the system and associated alarms. Clean Condensate is the wrong source of make-up water to fuel pool cooling system but plausible because it is an available source of water on the refuel floor.

Distractor D: Incorrect location but plausible because its primary control panel is located 663 TB basement including the controls for the system and associated alarms, but it does list its correct source of make-up supply.

Reference: Drawing M-98 Sheet 1, LOR-1H13-P601-C207
Reference provided during examination: None

K/A Number/IR: 233000 A2.11 / RO 2.9 SRO 3.3
K/A Statement:Fuel Pool Cooling and Clean-up: Ability to (a) predict the impacts of the following on the FUEL POOL COOLING AND CLEAN-UP; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Fuel pool gate seal high flow
Safety Function:9
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 2 Group: 2

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given a Fuel Pool Cooling System lineup and various plant conditions, evaluate the following system indications/responses. Determine if the indications/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.

**58** **ID: 030.00.05.02** **Points: 1.00**

Fuel movements are in progress.

- The reactor mode switch is locked in the REFUEL position
- All Rods are fully inserted
- One rod is selected
- A fuel assembly has been grappled in the Fuel Pool and is being transferred to the reactor core for installation

Which statement, if any, describes the refueling interlock(s) that will be in effect, when the refueling bridge closes the over-the-core limit switches?

A. No refueling interlock is in effect.

B. ONLY a rod block interlock is in effect.

C. ONLY bridge motion towards the core is stopped.

D. A Rod block interlock AND bridge motion towards the core is stopped.

Answer: B

**Answer Explanation:**

Explanation: Refueling interlocks prevent more than one reactivity addition event from occurring at the same time. If all rods are inserted, when the over-the-core limit switches are activated, a rod block will be generated, preventing withdrawal of a control rod. Conversely, if a control rod is withdrawn (not at 00), bridge motion will stop as the core is approached (over-the-core limit switches picked up).

Distractor A: Could be plausible to candidate who does not remember the basis behind the purpose of the refueling blocks to prevent more than one reactivity addition event from occurring at the same time.

Distractor C: Could be plausible to candidate who does not understand how the refueling interlocks work, the control rod is inserted so bridge motion will not stop

Distractor D: Could be plausible to candidate who does not understand how the refueling interlocks work, the control rod is inserted so bridge motion will not stop but a rod block will be effect.

Reference: LFS-100-1, Revision 25, Section E.12.6
Reference provided during examination: None

K/A Number/IR: 234000 A3.02
K/A Statement: Fuel Handling Equipment: Ability to monitor automatic operations of the FUEL HANDLING EQUIPMENT including: interlock operation
Safety Function: 8
CFR 41.
PRA: No

Cognitive level: Memory
Level: RO
Tier: 2 Group: 2

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, and characteristics of the following Fuel Handling System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. Refueling Platform
b. Overhead Crane
c. Fuel Grapple Hoist
d. Fuel Grapple Head
e. Fuel Storage Racks
f. Blade Guides
g. Frame Mounted Hoist (LSRO/FH)
h. Trolley Mounted Hoist (LSRO/FH)
i. Instrument Handling Tool (LSRO/FH)
j. Control Rod Grapple (LSRO/FH)
k. Control Rod Guide Tube Grapple (LSRO/FH)
l. Control Rod Latch Tool (LSRO/FH)
m. Fuel Preparation Machine (LSRO/FH)
n. Fuel Vault (LSRO/FH)
o. New Fuel Transfer Basket (LSRO/FH)
p. New Fuel Inspection Stand (LSRO/FH)
q. Defective Fuel Storage Racks (LSRO/FH)
r. Control Rod Storage Racks (LSRO/FH)
s. Control Rod Guide Tube Storage Racks (LSRO/FH)
t. Sipping Equipment (LSRO/FH)
u. Submersible Pump (LSRO/FH)
v. Underwater Vacuum/Filter Unit (LSRO/FH)
w. Fuel Loading Chambers (LSRO/FH)
x. Dunking Chamber (LSRO/FH)

**59** **ID: 300.00.01.05** **Points: 1.00**

Unit 2 is in Mode 2, Reactor start-up in progress with the following conditions.

- Reactor pressure is at 145# with 1/2 turbine bypass valve open
- Pressurization is on hold in preparation of RCIC testing
- LOP-OG-09 pre-warming OG recombiner is in progress

(1) IAW LGP-1-1 UNIT START-UP what is the preferred method to control condensate flow?
(2) What is the minimum flow requirement for each operating condensate pump?

A. (1) Control Flow with the TDRFP min flow
(2) Minimum flow requirement is at least 5000 GPM.

B. (1) Control Flow with hotwell reject to CY tank
(2) Minimum flow requirement is at least 5000 GPM.

C. (1) Control Flow with the CB pump Min flow valves
(2) Minimum flow requirement is at least 1500 GPM.

D. (1) Control flow with Condensate recirc. to condenser via heater drain system
(2) Minimum flow requirement is at least 1500 GPM.

Answer: A

**Answer Explanation:**

Explanation:This question requires the candidate to recognize that the condensate system will heatup when a bypass valve is open, and then interpret the operational implications with these conditions. IAW LGP-1-1 UNIT START-UP Notes page 3 step E.1.3.3 Due to the physical location in the condenser, using the TDRFP minimum flow valves is an important means to control/lower condensate temperature when putting OG on-line and admitting steam to the condenser via bypass valves. This flow path allows return flow to the condenser to spray of the circulating water tube sheets. CD/CB pump flow should be maintained above 5000 to prevent vibration

Distractor B: This distractor is plausible because CD/CB min flows are a means to allow additional condensate flow and could be a flow path for condensate system. This flow path IAW LGP-1-1 does not provide a cooling medium for the condensate system. These valves are currently gaged to allow for only 1500 gpm but if gag is removed then these valves have capability to allow 2500 GPM flow per pump. Operators can open multiple min flow valves to gain more flow making 5000 gpm plausible.

Distractor C: This distractor is plausible because hotwell reject is a means to allow additional condensate flow per LGP-1-1 but per this procedure these valves are not preferred and 1500 gpm does not provide enough flow through the system to alleviate vibration concerns on the CD/CB pumps.

Distractor D: This distractor is plausible because Condensate recirc. to condenser via heater drain system is an available system per LGP-1-1 and the capacity to provide enough flow but does not provide a mechanism to provide cooling to the condensate system. 1500 gpm does not provide enough flow through the system to alleviate vibration concerns on the CD/CB pumps.

Reference: LGP-1-1 UNIT START UP rev 108
Reference provided during examination: None

K/A Number/IR: 256000 A4.05 / RO 3.1 SRO 3.1
K/A Statement:REACTOR CONDENSATE SYSTEM: Ability to manually operate and/or monitor in the control room: System Flow
Safety Function:2
CFR 41.
PRA: No

Cognitive level: High 3SPK Solve a Problem with Knowledge( Per Conversation with M. Bielby if a question has two parts, and one part is High cog and it takes the hi cog part to answer then it is High Cog

Tier: 2 Group: 2

Question Source: New
Question History:

SRO Justification: N/A

Comments

**Associated objective(s):**

While operating the plant, operating the simulator, or on a written examination, determine how the following parameters respond during a normal unit startup in accordance with the student text.

a. Core thermal power
b. Neutron flux
c. MW(e)
d. Heatup rate
e. Reactor pressure
f. Reactor Water level
g. Feed, steam, and core flows
h. TCVs and BPVs
i. Condensate Polisher differential pressure

**60** **ID: 075.00.20.01** **Points: 1.00**

IAW LOP-CD-03 STARTUP AND OPERATION OF THE CONDENSATE AND CONDENSATE BOOSTER SYSTEM, a precaution step states that on a loss of CD system at normal pressures do not restart the CD system until FW (Feed Water) has had sufficient time to cool, or FW is isolated by the FW pump suction valves and the FW seal injection system.

This prevents...

A. high water level trips in the HP heaters.

B. water hammer within the condensate system.

C. pump run out conditions in the Condensate Pump.

D. windmilling a TDRFP during Condensate pump restart.

Answer: B

**Answer Explanation:**

Explanation:The actions given in the stem represent the operational implications and the Candidate has to demonstrate an understanding of the KA by connecting the right answer to these implications. IAW LOP-CD-03 "STARTUP AND OPERATION OF THE CONDENSATE AND CONDENSATE BOOSTER SYSTEM" states on a loss of the condensate system, at normal operating pressures and temperatures, do not restart the condensate system until the feedwater system has had sufficient time to cool down, or the feedwater system is isolated by the feedwater pump suction valves, and the feedwater seal injection system. This is to prevent water hammer within the condensate system

Distractor A: High water level trips can be a concern with cooler water running through the heater with increase condensation but extraction steam at this point would be isolated to the heaters due to lack of system flow, so this is not the reason for the precaution.

Distractor C: Pump runout can be a concern with this system but the system is started with Feedwater valves closed and the pumps running on their min flow valves. This is NOT an issue when first starting the system.

Distractor D: Windmilling a TDRFP is incorrect, but plausible based on it is a precaution step from LOP-CD-03 "STARTUP AND OPERATION OF THE CONDENSATE AND CONDENSATE BOOSTER SYSTEM" windmilling a TDRFP is possible when opening the min flow valve on the associated pump.

Reference: LOP-CD-03 STARTUP AND OPERATION OF THE CONDENSATE AND CONDENSATE BOOSTER SYSTEM
Reference provided during examination: None

K/A Number/IR: 259001 K5.02 / SRO 2.5 RO 2.5
K/A Statement:Reactor Feedwater: Knowledge of the operational implications of the following concepts as they apply to REACTOR FEEDWATER SYSTEM : Water hammer
Safety Function:2
CFR 41.

PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 2

Question Source: New
Question History:

SRO Justification: N/A

Comments

**Associated objective(s):**

Recall the reasons for the Condensate/Condensate Booster System or the Suppression Pool Cleanup System precautions and limitations while operating the system or on an exam in accordance with station procedures.

**61** **ID: 049.00.16.05** **Points: 1.00**

Unit 1 is operating at power when a loss of RPS A occurs.

Which of the following Process Radiation Monitoring systems would be affected by the loss?

A. Off Gas Post Treatment Monitor

B. Main Steam Line Radiation Monitors

C. Off Gas Pretreatment Linear Monitor

D. Control Room Air Intake Radiation Monitors

Answer: B

**Answer Explanation:**

Explanation: Main Steam Line Radiation Monitors is correct. RPS A supplies power to 2 of the MSL Radiation Monitors. B is the only response that identifies a system affected by this loss.

Distractor A: OFF Gas Pre-Treatment Rad monitors are powered from the 24/48 VDC Bus and is unaffected by this power loss.
Distractor C: OFF Gas Pre-Treatment Rad monitors are powered from the 24/48 VDC Bus and is unaffected by this power loss.
Distractor D: Control Room Air Intake Rad Monitors are powered from 136Y-2 and 136Y-2 120 V AC and is unaffected by this power loss.

Reference: Process Rad monitor lesson Plan #052 Page 31 and 32 Section E. Power Supplies
Reference provided during examination: None

K/A Number/IR: 272000 K2.01 RO 2.5 SRO 2.8
K/A Statement:Radiation Monitoring System Knowledge of electrical power supplies to the following: Main Steam Radiation Monitors
Safety Function:9
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 2

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, predict the Reactor Protection System response to a loss of the major power supplies or the following support systems while operating the system, or on an exam in accordance with student text.

a. Reactor Vessel Instrumentation
b. Nuclear Instrumentation
c. Control Rod Hydraulic System
d. Plant Air System
e. Turbine EHC Hydraulic System
f. Main Steam
e. Containment Monitoring

**62** **ID: 128.00.05.06** **Points: 1.00**

What are the Operational implications of the 0 DG room temperature reaching 109□ F and the 0 DG is in operation.

When the 0 DG is secured...

A. the ventilation fan will immediately automatically stop.

B. the ventilation fan will continue to run and manual shutdown is required.

C. the ventilation fan will continue to run until room temperature lowers to approximately 104□ F.

D. the ventilation fan will automatically stop when the DG is secured, but restart if room temperature reaches 110□ F.

Answer: C

**Answer Explanation:**

Explanation: The room ventilation automatically starts when the DG is started and continue to run until the DG is secured, but if room temperature goes above 108□ F. then the fan will continue to run until room temperature is less than 104□ F.

Distractor A: This distractor is plausible because this is the normal response of the ventilation system but because temperature reached 108 □ F the interlock keeps the fan in operation until less than 104□ F.

Distractor B: This distractor is plausible because the fan will continue to run but as room temperature drops the fan will automatically shutdown at less than 104□ F. there is no need for manual shutdown.

Distractor D: This distractor is plausible because this is the normal response of the ventilation system if room temperature remains below 108 □ F but because temperature reached 108 □ F the interlock keeps the fan in operation until less than 104□ F.This distractor test the candidate's knowledge of the interlock

Reference: LOP-DG-03 DIESEL GENERATOR SHUTDOWN rev 33, Lesson Plan #128 Safety Related Ventilation
Reference provided during examination: None

K/A Number/IR: 288000 K5.03 / RO 2.5 SRO 3.5
K/A Statement:Knowledge of the operational implications of the following concepts as they apply to Plant Ventilation : Temperature control

Safety Function:
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 2

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips, and characteristics of the following Plant Ventilation System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. VD fans
b. VY fans
c. VX fans

**63** **ID: 090.00.05.05** **Points: 1.00**

Unit 2 is at 100% power, when the following occurs:

- A contractor calls the Main Control Room and reports that they are in the 710 elevation air lock from Reactor building to the Off-gas building and CANNOT open the Off-gas building airlock door.
- Assume this interlock is original design and has NOT been modified.

What is the cause for them NOT being able to exit into the Off-gas building?

A. Power to door interlock is de-energized.

B. The door from the Reactor Building is open.

C. Reactor Building track way Door 19 or 20 is open.

D. The Reactor Building to atmosphere Dp is at 0.4 inches/WG.

Answer: B

**Answer Explanation:**

Explanation: The door from the Reactor Building is still open is correct, If a door is open then no other associated interlock door will open, this prevents both doors being opened at the same time creating a loss of safety function.

Distractor A: This distractor is wrong if the interlocks are de-energized then the interlock is defeated and both doors will be able to open at the same time.

Distractor C: This distractor is wrong but plausible because these doors are on the trackway which is connected to this interlock between buildings, there is an associated door that provides access between these two areas but there is no interlock between them

Distractor D: The Off-gas doors swings inward (toward the reactor building direction) and hi DP in the reactor building would not prevent the door from opening

Reference: LOS-CS-M1 SECONDARY CONTAINMENT INTEGRITY rev 27, Primary and Secondary containment LESSON PLAN #90
Reference provided during examination: None

K/A Number/IR: 290001 K4.01
K/A Statement:Knowledge of Secondary CONTAINMENT design feature(s) and/or interlocks which provide for the following: Personnel access without breaching secondary containment: Plant-System
Safety Function:5
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 2

Question Source: Modified
Question History: Clinton 2010 NRC EXAM

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips, and characteristics of the following Primary and Secondary Containment System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. Primary Containment
1) Drywell
2) Suppression Chamber Air Space
3) Suppression Pool
4) Downcomer Pipes
5) Vacuum Breakers
6) Drywell Head
7) Reactor Vessel Refueling Bellows Support
8) Reactor Shield
9) Reactor Pedestal
10) Equipment Handling Platform
11) Personnel Access Hatches
12) Equipment Access Hatches
13) Drywell Floor

b. Secondary Containment
1) Containment Boundary
2) Blowout Panels
3) Steam Tunnel Blast Door
4) Turbine Building Ventilation Surge Arrestors
5) Personnel Air Locks
6) Trackway Doors 19 and 20
7) Watertight Doors

**64** **ID: 052.00.05.09** **Points: 1.00**

Which one of the following combinations of U-1 Control Room HVAC (VC) Air Intake Monitoring System detectors with an upscale high trip will close the VC outside air damper and start the VC emergency makeup train?

A. 1D18-K751A and 1D18-K751C

B. 1D18-K751A and 1D18-K751B

C. 1D18-K751B and 1D18-K751C

D. 1D18-K751B and 1D18-K751D

Answer: B

**Answer Explanation:**

Explanation: An upscale high trip for the two detectors in the same trip system closes the outside air damper and starts the emergency makeup train. The logic for VC Emergency Make Up train is "1D18-K751A" and "1D18-K751B" or "1D18-K751C" and "1D18-K751D" to actuate the train, Answer "1D18-K751A and 1D18-K751B" is the only combination that completes the actuation logic.

Distractor A: This is not the correct logic but plausible, most actuation logic works 1 out of two twice typically "1D18-K751A" or "1D18-K751C" and "1D18-K751B" or "1D18-K751D"

Distractor C: This is not the correct logic but plausible, most actuation logic works 1 out of two twice typically "1D18-K751A" or "1D18-K751C" and "1D18-K751B" or "1D18-K751D"

Distractor D: This is not the correct logic but plausible, most actuation logic works 1 out of two twice typically "1D18-K751A" or "1D18-K751C" and "1D18-K751B" or "1D18-K751D"

Reference: LOA-PR-101 UNIT 1 PROCESS RADIATION MONITORING SYSTEM ABNORMAL rev 14, Lesson Plan Process Radiation Monitors #52
Reference provided during examination: None

K/A Number/IR: 290003 K1.01 / RO 3.4 SRO 3.5
K/A Statement:Knowledge of the physical connections and/or cause-effect relationships between Control Room HVAC and the following: Radiation Monitors
Safety Function:9
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 2

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips, and characteristics of the following Process Radiation Monitoring System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:

a. Off Gas Radiation Monitors
1) Pre-Treatment
2) Linear (Flux Tilt)
3) Post-Treatment
4) Carbon Bed Fault
b. Ventilation Radiation Monitors
1) Reactor Building Exhaust
2) Fuel Pool Exhaust
3) Control Room Intake
c. Liquid Process Radiation Monitors
1) Radwaste Effluent
2) Residual Heat Removal Service Water
3) Service Water
4) Reactor Building Closed Cooling Water
d. Wide Range Radiation Monitors
1) Station Vent Stack
2) Standby Gas
e. Main Steam Line Monitors

**65** **ID: 070.00.05.29** **Points: 1.00**

At 100% power what would be the effect of the MSIVs closing faster than 3 seconds?

A. Prevent over torquing of the MSIV actuators.

B. Loss of RPV water inventory below the wide range level indication.

C. Excessive hydraulic shock to the downstream components in the main steam system.

D. RPS may NOT protect the fuel assemblies and reactor coolant pressure boundary.

Answer: D

**Answer Explanation:**

Explanation:The time required to close the main steam valves shall not be so short that inadvertent isolation of steam lines causes a transient more severe than that resulting from closure of the turbine stop valves coincident with failure of the turbine bypass system. This ensures that the main steam isolation valve closure speed is compatible with the ability of the reactor protection system to protect the fuel assembly and reactor coolant pressure boundary.

Distractor A: This distractor is plausible because valves that move too fast have the potential to overtorque into their seat but because the MSIV's are air operated this is not a concern.

Distractor B: This distractor is plausible because reactor water will drop from the shrink but it is only expected to drop to level 2 and HPCS and RCIC would restore level.

Distractor C: This distractor is plausible because LaSalle has OPEX for shock waves in main steam piping from mis-operation of the MSIVs. Both the answer and distractor describe some type of mis-operation or malfunction of the MSIVs. In the OPEX the Reactor Operator opened the MSIV's with a high Dp across the valve. This sent shock waves down the main steam system which was felt by the Operators in the main control room. This distractor was selected most commonly by the exam validators.

Reference: LSCS UFSAR 15.2.4 Inadvertent MSIV closure,7.3 Engineered Safety Feature Systems page 7.3-30, Lesson Plan#70
Reference provided during examination: None

K/A Number/IR: 2900002 K6.20
K/A Statement:Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Vessel Internals: Main steam system

Safety Function:2
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 2 Group: 2

Question Source: New
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the function, theory of operation, interlocks, trips and characteristics of the following Main Steam System components and relate these items to overall system operation while operating the system or on an exam in accordance with the student text:
a. Reactor Pressure Vessel Head Vent
b. Safety Relief Valves
c. T-Quenchers
d. Safety Relief Valve Tailpipe Vacuum Breakers
e. Flow Restrictors
f. Main Steam Isolation Valves (MSIV)
g. Main Steam Isolation Valve Pilot Valves
h. Main Steam Line (MSL) Drain Valves
i. Equalizing Header
j. Turbine Bypass Valves

**66** **ID: 076.00.21.01** **Points: 1.00**

Unit 1 is operating at 100% power:

- There have been NO Condensate Polisher or RWCU Filter Demin changeouts for 2 days.
- Hotwell and Condensate Polisher inlet conductivity levels were both at approximately 0.1 µmho/cm when they started rising by 0.1 µmho/cm every 10 minutes.
- While Operators and Chem Techs are investigating IAW LOA-COND-101, UNIT 1 REACTOR WATER/CONDENSATE HIGH CONDUCTIVITY, the conductivity at both points continues to rise.

A Manual Scram is required when Condensate Polisher Inlet Conductivity first rises to...

A. ≥1.0 µmho/cm

B. ≥2.0 µmho/cm

C. ≥5.0 µmho/cm

D. ≥10.0 µmho/cm

Answer: A

**Answer Explanation:**

**Correct Answer:** In Section B.3, "Main Condenser Tube Leak in Mode 1" of LOA-Cond-101, on Pages 8-11, there is a box at the top of each page with the criteria (Chemistry Limit) for a MANUAL SCRAM as CP inlet conductivity rises along with Hotwell conductivity.
This procedure is based on OPEX from the 2003 event at Duane Arnold.

**Distractor B:** .Homogeneous distractor, twice the limit.

**Distractor C:** The LOA-COND-101 conductivity at which operators must attempt to divorce the reactor from the condensate system.

**Distractor D:** Homogeneous distractor, 10 times the limit

**Reference:** LOA-COND-101, "Unit 1 Reactor Water/Condensate High Conductivity", Rev. 7
**Reference provided during examination:** None

**KA Number:** 2.1.34 RO 2.7 SRO 3.5
**Statement:** Knowledge of primary and secondary plant chemistry limits

**Cognitive level:** Memory (1-P)

**Level (RO/SRO):** RO
**Tier** 3 **Group:**

**Question Source:** New

**Associated objective(s):**

Given a System lineup and various plant conditions, predict the Condensate Polishing System response to various system component failures while operating the system or on an exam in accordance with student text.

**67** **ID: LAS-LO-639-TO-01** **Points: 1.00**

A locked manual valve in a safety-related system is to be verified locked in the OPEN position. Per OP-AA-108-101-1001, COMPONENT POSITION DETERMINATION, which of the following is required?

(Note: Assume locking device will allow some valve movement.)

INITIALLY attempt to move the valve in the ...

A. CLOSED direction with the locking device INSTALLED.

B. CLOSED direction with the locking device REMOVED.

C. OPEN direction with the locking device INSTALLED.

D. OPEN direction with the locking device REMOVED.

Answer: A

**Answer Explanation:**

Explanation:IAW OP-AA-108-101-1001 "COMPONENT POSITION DETERMINATION" states as follows step 4.3 "ENSURE that the locking device is mounted securely to prevent valve movement and that the padlock is in a locked position. For a locked open valve, ATTEMPT to move the valve in the closed direction to ensure the locking device maintains the valve open."

Distractor B: Plausible if candidate assumes that the locking device must be removed to check vale position.

Distractor C: Plausible if candidate assumes that the methodology for checking valves open is the same a s checking closed

Distractor D: Combination of distractor B and C.

Reference: OP-AA-108-101-1001 COMPONENT POSITION DETERMINATION rev 4
Reference provided during examination: None

K/A Number/IR: 2.1.29 / SRO 4.0 RO 4.1
K/A Statement:Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.
Safety Function:
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 3 Group:

Question Source: Bank
Question History:

SRO Justification:

Comments:

**Associated objective(s):**

Demonstrate a thorough understanding of Demonstrate Verification Techniques

**68** **ID: 638.00.01.02** **Points: 1.00**

A motor operated valve (MOV) has been torqued into its seat.

Which ONE of the following describes:

(1) Preferred source to find the valve's physical location?

(2) The method to be used the next time the valve must be unseated?

A. (1) The system startup procedure
(2) Electrically with the handswitch

B. (1) Passport
(2) Electrically with the handswitch

C. (1) The system startup procedure
(2) Manually

D. (1) Passport
(2) Manually

Answer: D

**Answer Explanation:**

Explanation:Passport contains locations of plant equipment and the valve must be manually unseated after it has been manually seated

Distractor A: is incorrect, system procedure valve lineups do not include motor operated valve's physical locations and it must be manually unseated.

Distractor B: is incorrect, the valve must be manually unseated

Distractor C: is incorrect, system procedure valve lineups do not include motor operated valve's physical locations.

Reference: OP-AA-103-105 LIMITORQUE MOTOR-OPERATED AND CHAINWHEEL OPERATED VALVE OPERATIONS rev 4, OP-LA-101-111-1002 LASalle OPERATIONS PHILOSOPHY HANDBOOK
rev 53

Reference provided during examination: None

K/A Number/IR: 2.1.30 / RO 4.4 SRO 4.0
K/A Statement:Ability to locate and operate components, including local controls

Safety Function:
CFR 41.7/45.7
PRA: No

Cognitive level:Memory

Level: RO
Tier: 3 Group:

Question Source: Bank
Question History: LaSalle 2008 ILT NRC Exam

SRO Justification: N/A

Comments:

**Associated objective(s):**

Demonstrate a thorough understanding of On-shift Licensed Operator Responsibilities

69 ID: LAS-08EXAM-2753 Points: 1.00

A sample valve needs to be electrically isolated to allow maintenance to work on the valve. It is determined that:

- Opening the associated breaker or pulling the individual fuses will affect a large portion of the containment isolation system.
- Taking the control switch in the control room to OFF will electrically isolate the sample valve.

Using the above information, select the statement that describes how to continue with the Clearance Order (CO) utilizing the control switch as the boundary.

The CO will need to be ...

A. a routine CO with an INFO card on the control switch.

B. a routine CO with a Danger card on the control switch.

C. an exceptional CO with a Danger card on the control switch.

D. an exceptional CO with an INFO card on the control switch.

Answer: C

**Answer Explanation:**

Explanation:To answer this question requires knowledge of the type of clearance order required and deciding what type of card to use on the control switch. This is the application level of cognitive level ranking. Using a control switch as a zone of protection is a non-standard method of isolation and therefore the CO is flagged as "Exceptional." Since the control switch is providing a zone of protection a danger card must be used.

Distractor A: Describes another method of tagging out a control switch but does not meet criteria for personnel protection, the C/O would not be a routine as described in OP-AA-109-101,

Distractor B: Describes another method of tagging out a control switch but does not meet criteria for personnel protection, the C/O would not be a routine as described in OP-AA-109-101

Distractor D: Using a control switch as a zone of protection is a non-standard method of isolation and therefore the CO is flagged as "Exceptional", but use of an INFO card is incorrect, because the procedure will allow an info card to be manipulated

Reference: OP-AA-109-101 CLEARANCE AND TAGGING, revision 9 Attachment 2

Reference provided during examination: None

K/A Number/IR: 2.2.13 / RO 4.1 SRO 4.3
K/A Statement:Knowledge of tagging and clearance procedures.
Safety Function:

CFR 41.
PRA: No

Cognitive level: High 3 SPK Solve a problem with knowledge

Level: RO
Tier: 3 Group:

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

OP-AA-101-111

**70** **ID: 201.001.01** **Points: 1.00**

From the following, which statement describes "Operable-Operability", in accordance with LaSalle Technical Specifications?

The condition of a system, subsystem, division, component, or device...

A. capable of performing its specified safety function with some of its support systems inoperable.

B. that will allow testing, calibration or inspection to assure operation is within Safety Limits and LCOs.

C. necessary to protect the integrity of certain physical barriers to guard against the uncontrolled release of radioactivity.

D. capable of performing its specified safety function with its support systems capable of performing their required support functions.

Answer: D

**Answer Explanation:**

Explanation: capable of performing its specified safety function with its support systems capable of performing their required support functions.

Distractor A: It is required to have all of its support systems capable of performing their required support functions.

Distractor B: This is the definition of a surveillance.

Distractor C: This is the definition of a Safety Limit

Reference: LaSalle Technical Specifications definitions
Reference provided during examination: None

K/A Number/IR: 2.2.38 / RO 3.6 SRO 4.5
K/A Statement:Knowledge of conditions and limitations in the facility license.

Safety Function:
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 3 Group:

Question Source: Bank
Question History: Clinton 2008 NRC

SRO Justification: N/A

Comments:

**Associated objective(s):**

Identify the following sections of TS and the TRM: a. Limiting Condition for Operation b. Applicability c. Condition d. Required Actions e. Completion Time f. Surveillance Requirement

**71** **ID: 300.00.02.18** **Points: 1.00**

Given the following:

- A reactor startup is in progress
- NO control rods have been withdrawn
- Initial SRM count rates are:
- SRM A 30
- SRM B 35
- SRM C 50
- SRM D 45

Which of the following is the requirement IAW LGP-1-1 "Unit Startup" to START single notch withdrawal of control rods?

A. RWM is Inoperable

B. SRM C count rate of 200

C. Group 1 control rods all at position 48

D. The reactor is NOT critical after reaching the ECP estimated critical prediction

Answer: C

**Answer Explanation:**

Explanation:When Group 1 has been pulled to position 48 is the correct answer IAW LGP-1-1 "Unit Startup" When Group 1 has been pulled to position 48, DISCONTINUE Notch Out Override between positions 00 and 36, until either:
. At least one bypass valve is open.
. The generator is on line.
. Specified otherwise by a QNE.

Distractor A: This distractor is plausible because it is from LGP-1-1 Unit Startup" procedure and are required knowledge for the RO. If RWM becomes inoperable then control rod withdrawal would stop until administrative action by the operating crew and SOS approval. IAW LGP-1-1 "If RWM becomes inoperable after withdrawal of control rods for the purpose of making Reactor critical, a QNE shall be notified, and approval of Shift Operations Supervisor (SOS) shall be received prior to commencing non-emergency rod maneuvers."

Distractor B: This distractor is plausible because it is from LGP-1-1 Unit Startup" procedure and are required knowledge for the RO.C SRM count rate of 200 is only the second doubling of the SRM's. IAW LGP-1-1 "When SRM count rate on any operable SRM reaches 8 times highest initial SRM count rate, DISCONTINUE Notch Out Override between positions 00 and 36".

Distractor D: This distractor is plausible because it is from LGP-1-1 Unit Startup" procedure and are required knowledge for the RO. This distractor is a requirement to stop control rod withdrawal completely. IAW LGP-1-1 "STOP all control rod withdrawals. If the reactor has NOT been declared critical on or before a current ECP (including a +1% band) and until a revised ECP has been provided to Operations and it is understood and logged why the ECP deviation existed". This is a general knowledge that the RO is required to know when performing a plant startup.

Reference: LGP-1-1 UNIT STARTUP rev 108
Reference provided during examination: None

K/A Number/IR: 2.2.01 /RO 3.7 SRO 3.6
K/A Statement:Ability to perform pre-startup procedures for the facility / including operating those controls associated with plant equipment that could affect reactivity.
Safety Function:
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 3 Group:

Question Source: Modified
Question History: Oyster Creek 2004 NRC exam

SRO Justification: N/A

Comments:

**Associated objective(s):**

While operating the plant, operating the simulator, or on a written examination, recall the major-action categories and associated steps for a normal unit startup in accordance with the student text.

**72** **ID: 029.00.20.01** **Points: 1.00**

Unit 2 is in a Refueling Outage. All vessel work has been completed and the reactor cavity water level is being lowered to the flange.

(1) Which of the following is a concern IAW LOP-FC-16 REACTOR VESSEL/CAVITY
DRAINDOWN VIA RHR SDC?
(2) What is to be done to mitigate the problem?

A. (1) Elevated Refuel Floor general area dose-rates
(2) Can Only be mitigated by setting the reactor vessel head

B. (1) High Airborne radiation
(2) Verify reactor cavity walls are being sprayed as level is being lowered

C. (1) Foreign material introduction into the reactor
(2) Re-establish the reactor cavity as an FME Zone 2

D. (1) Elevated dose rates in the Drywell
(2) Restrict access to the upper levels of the Drywell

Answer: B

**Answer Explanation:**

Explanation:Cavity wall washing is a scheduled outage activity during drain down. Past experience has shown that the refuel floor has become airborne if the cavity walls are allowed to "dry out". Per LOP-FC-16 Precautions C.1 "As level drops, radiation levels and airborne activity may increase on the refueling floor. Cavity spray will minimize the airborne activity, but the first few feet at the top of the cavity cannot be sprayed using installed CY cavity sprays".

Distractor A: Plausible because refuel floor dose rates may go up as level is lowered but incorrect because setting the vessel head is not the only mitigating strategy to control dose. Even though the head is set, drying of the cavaity walls still is a source of airborne radioactivity and dose.

Distractor C: The area around the vessel is always an FME Zone 1 during outages.

Distractor D: General area dose rates in the drywell are not affected by lowering level to the reactor flange

Reference: LOP-FC-16 REACTOR VESSEL/CAVITY DRAINDOWN VIA RHR SDC rev 23
Reference provided during examination: None

K/A Number/IR: 2.3.14
K/A Statement:Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.

Safety Function:
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 3 Group:

Question Source: Bank
Question History:

SRO Justification: N/A

Comments:

**Associated objective(s):**

Recall the reasons for the Fuel Pool Cooling System precautions and limitations while operating the system or on an exam in accordance with station procedures.

**73** **ID: 400.00.01.04** **Points: 1.00**

Which of the following ARM indications if alarming High, would require entry into an EOP?


**1** **2** **3** **4**

A. 1

B. 2

C. 3

D. 4

Answer: B

**Answer Explanation:**

Explanation: The only alarm that is listed and in alarm that is from LGA-002 Secondary Containment Control is RB 820 SBGT1D21-K602A thus making this the correct answer

Distractor A: This distractor is not listed in LGA-002 but is plausible because the detector it is located in the Reactor building and alarm unit is in the main control room

Distractor C: This distractor is not listed in LGA-002 but is plausible because the detector it is located in the Reactor building and alarm unit is in the main control room

Distractor D: This distractor is not listed in LGA-002 but is plausible because the detector it is located in the Auxiliary building and alarm unit is in the main control room

Reference: LGA-002 rev 6
Reference provided during examination: None

K/A Number/IR: 2.3.5 / RO 2.0 SRO 2.9
K/A Statement:Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.

Safety Function:
CFR 41.
PRA: No

Cognitive level: High

Level: RO
Tier: 3 Group:

Question Source: Bank
Question History: ILT class 09-1 Oyster Creek

SRO Justification: N/A

Comments:

**Associated objective(s):**

Provided initial plant conditions, recognize LGA entry condition(s) and enter the appropriate LGA flow chart, while operating the system or on an exam, IAW LGA procedures.

**74** **ID: 049.00.14.22** **Points: 1.00**

Unit 2 is at 100% power when the following occurred:

- A U-2 Main Generator lockout

IAW OP-LA-103-102-1003 "STRATEGIES FOR SUCCESSFUL TRANSIENT MITIGATION" which of the following annunciators received should the crew address first?

A. 2H13-P603-B406 "CHANNEL A1 AND B1 CRD DISCHARGE VOLUME HIGH LEVEL"

B. 2H13-P603-B106 "Channel A1/B1 TURBINE CONTROL VALVE FAST CLOSURE"

C. 2H13-P603-B505 "Channel A1/B1 Rx Vessel Level 3 Low"

D. 1PM02J B308 " Main Turbine Trip"

Answer: C

**Answer Explanation:**

Explanation: All alarms are reactor scram signals and expected for the transient described. However the reactor low level alarm is also a LGA-001 entry condition, IAW OP-LA-103-102-1002 "STRATEGIES FOR SUCCESSFUL TRANSIENT MITIGATION" "During a transient it is normal to receive multiple alarms for a single failure. It is permissible for the Reactor Operator to address the issue by referring to a single annunciator response to place the plant in a stable condition. The other annunciator response procedures should be reviewed when time permits."

Distractor A:Plausible because it would be an expected alarm under these conditions but would not represent the highest priority, RPV level and pressure control take first priority

Distractor B: Plausible because it would be an expected alarm under these conditions but would not represent the highest priority, RPV level and pressure control take first priority

Distractor D: Plausible because it would be an expected alarm under these conditions but would not represent the highest priority, RPV level and pressure control take first priority

Reference: OP-LA-103-102-1002 "STRATEGIES FOR SUCCESSFUL TRANSIENT MITIGATION" rev 5, OP-AA-103-102 "WATCH-STANDING PRACTICES" rev 12, LOR-2H13-P603-B106 "CHAN A1/B1 TCV fast closure" rev 7, LOR-2H13-P603-B505 "Channel A1/B1 Rx Vessel Level 3 Low" rev 2, LOR-2H13-P603-B406 Channel A1/B1 CRD Discharge Volume High Level" rev 1, LOR-2PM02J-B308 "U2 Main Turbine Trip" rev 1
Reference provided during examination: None

K/A Number/IR: 2.4.45
K/A Statement:Ability to prioritize and interpret the significance of each annunciator or alarm.

Safety Function:
CFR 41.
PRA: No

Cognitive level: High Comprehension

Level: RO
Tier: 3 Group:

Question Source: Bank
Question History: Oyster Creek NRC 2009

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given a Reactor Operating Mode and various plant conditions, evaluate Reactor Protection System indications/responses and determine if the indications/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.

**75** **ID: 125.02.20.03** **Points: 1.00**

LOA-FX-201, UNIT 2 SAFE SHUTDOWN WITH A LOSS OF OFFSITE POWER AND A FIRE IN THE CONTROL ROOM OR AEER, has been entered due to a fire and evacuation (abandonment) of the Control Room. Actions are directed to disable specific plant equipment.

These directions are intended to ...

A. mitigate the consequence of Hot Shorts.

B. ensures that the fire CANNOT spread to the opposite unit.

C. prevent unnecessary primary containment isolations.

D. ensures that operator action will NOT cause cooldown limits to be exceeded.

Answer: A

**Answer Explanation:**

Explanation:The correct answer is to mitigate the consequence of Hot Shorts. These actions will prevent spurious system initiation and limit inventory loss.

Distractor B: This distractor is wrong because these actions taken are to ensure safe shutdown of the plant, and not for fire containment. This answer is plausible if candidate does not understand the execution and methodology of LOA FX-201 "UNIT 1 SAFE SHUTDOWN WITH A FIRE IN THE CONTROL ROOM OR AEER" and the applicable steps that isolate equipment from a fire in the control room.

Distractor C: This distractor is wrong because these action are embedded in the procedure to de-energize RPS breakers 2A and 2B. This assures isolations will occur as designed. This answer is plausible if candidate does not understand execution and methodology of LOA FX-201 "UNIT 1 SAFE SHUTDOWN WITH A FIRE IN THE CONTROL ROOM OR AEER".

Distractor D: This distractor is wrong because the actions to disable equipment is to prevent spurious operation of equipment not direct operation from the Operator, this answer is plausible if candidate does not understand methodology of LOA FX-201 "UNIT 1 SAFE SHUTDOWN WITH A FIRE IN THE CONTROL ROOM OR AEER".

Reference: LOA-FX-201, "UNIT 1 SAFE SHUTDOWN WITH A FIRE IN THE CONTROL ROOM OR AEER" Rev 027, Remote Shutdown LP#54
Reference provided during examination: None

K/A Number/IR: 2.4.27 / RO 3.4 SRO 3.0
K/A Statement: Knowledge of "fire in the plant" procedures
Safety Function:
CFR 41.
PRA: No

Cognitive level: Memory

Level: RO
Tier: 3 Group:

Question Source: Bank
Question History: LaSalle ILT Class 2001-01 NRC License Exam

SRO Justification: N/A

Comments:

**Associated objective(s):**

Given various plant conditions, recall major action categories and selected step basis while operating the system or on an exam, in accordance with the student text.

**76** **ID: LAS-08EXAM-3102** **Points: 1.00**

Unit 1 was operating at 100% power when a Generator Load Reject event resulted in a turbine trip and reactor scram. The following were noted:

- RPV water level dropped to a low of -60", and is now being raised using HPCS and Feedwater for injection.
- ONE control rod failed to fully insert, ALL other control rods are full in.
- Bypass valves failed to operate as designed.
- One Turbine control valve remained Open.

Reactor pressure peaked at 1155 psig, and pressure is 1000 psig and lowering slowly, with one SRV currently open as a result of the event.

- Drywell pressure is 1.5 psig and stable.

Which of the following identifies the issue that will be addressed first and the procedure that must be directed?

The crew will address the...

A. failure of the TCVs to Close, enter LOA-EH-101 EHC ABNORMAL.

B. operation of the Open SRV, enter LOA-SRV-101 STUCK OPEN SAFETY RELIEF VALVE.

C. control rod that did NOT fully insert, enter LOA-RD-101 CONTROL ROD DRIVE ABNORMAL.

D. loss of core circulation, enter LOA-RR-101 REACTOR RECIRCULATION ABNORMAL.

Answer: D

**Answer Explanation:**

Explanation: The SRO must keep the big picture and prioritize what actions are required first. There are four potential LOA entry conditions. This answer is correct with reactor pressure reaching 1155 PSIG the Reactor recirc pumps will trip on ATWS scram setpoint of 1143 psig, LOA-RR-101 is the correct procedure to address loss of core circulation and should be the first procedure addressed by the crew. If the SRO does not direct actions in accordance with LOA-RR-101 then as a result actions in LGA-001 will change in the pressure control leg, i.e. perform cooldown versus stabilize pressure.

Distractor A: This is plausible because Entry conditions into LOA-EH-101 "EHC SYSTEM ABNORMAL", would exist. This procedure would not be a high priority LOA, since only one control valve remained open. Following a turbine trip the turbine will isolated by the remaining turbine stop valves.

Distractor B:This is plausible because entry conditions exist for LOA-SRV-101. This distractor is wrong because if reactor pressure rose to 1155 psig LLS would have actuated and one would expect an SRV to be open controlling reactor pressure, so actions for LOA-SRV-101.

Distractor C:This is plausible because entry conditions exist for LOA-RD-101 for stuck control rod. This is wrong because per LGP-3-2 "UNIT Scram" would direct inserting control rod per LGA-NB-01.

Reference: LGP-3-2, LOA-EH-101, LOA-RD-101
Reference provided during examination: None

K/A Number/IR: 295001 04.08
K/A Statement: Partial or Complete Loss of Forced Core Flow Circulation; Knowledge of how abnormal operating procedures are used in conjunction with EOP's
Safety Function:1 and 4
CFR 43.
PRA: No

Cognitive level: High

Level: SRO
Tier: 1 Group: 1

Question Source: Bank
Question History: 09-01 CERT

SRO Justification: Assessment of facility conditions and selection of appropriate procedures during normal, abnormal and emergency situations 10 CFR 55.43(b)(5) There is nothing that tells the SRO in the stem that they are in LGA-001 RPV control and LOA-RR-101 Reactor Recirculation Abnormal. The SRO must keep the big picture and prioritize what actions are required first. If the SRO does not direct actions in accordance with LOA-RR-101 then as a result actions in LGA-001 will change in the pressure control leg, i.e. perform cooldown versus stabilize pressure.

Comments:

**Associated objective(s):**

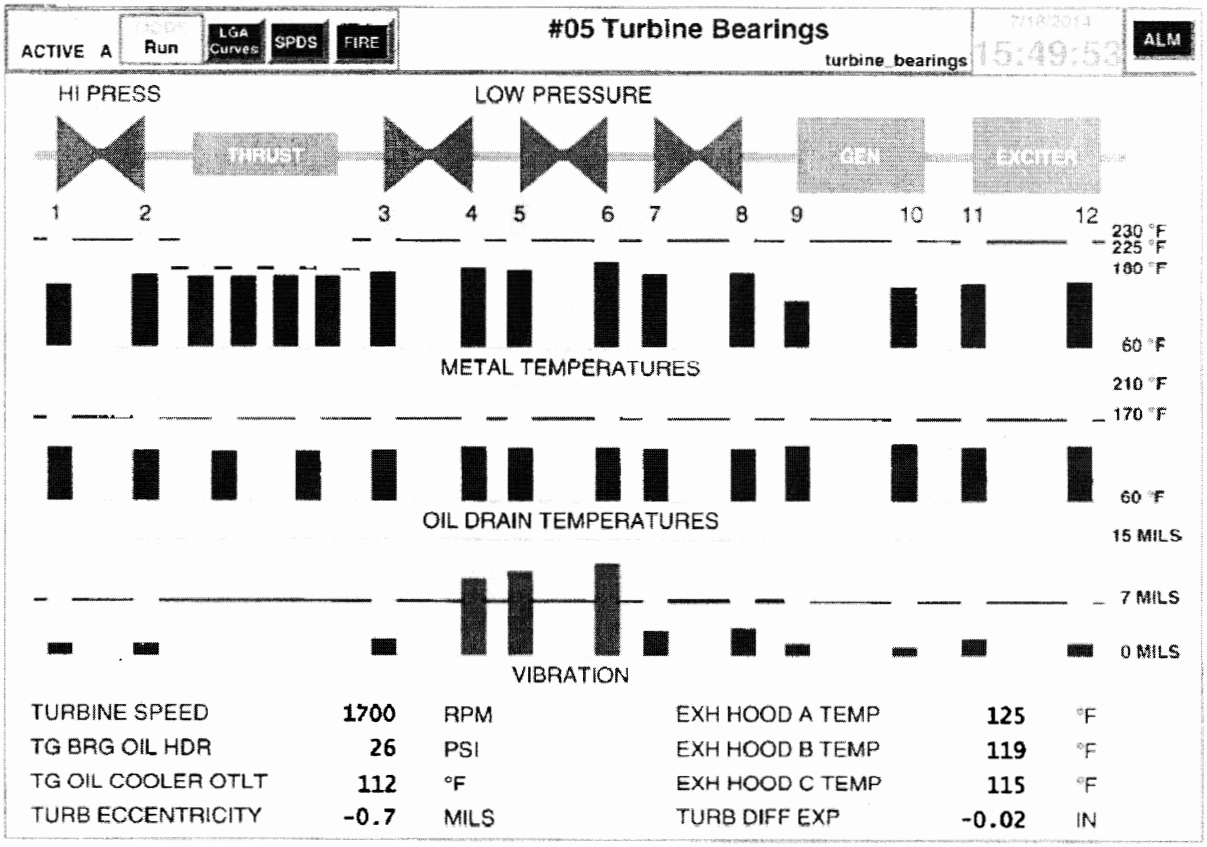
Given a Reactor Water Cleanup System lineup and various plant conditions, evaluate system indications/responses and determine if the indications/responses are expected and normal while operating the system, or on an exam in accordance with the student text and station procedures.

**77** **ID: 071.05.20-08** **Points: 1.00**

**Refer To Plant Process Computer PPC Turbine Display**

U-1 was at 100% power when the Unit scrammed with the following conditions.

- Condenser vacuum is at 3 inches backpressure Hg and stable.




What are the required actions to be directed by the Unit Supervisor?

A. Enter LOA-TO-101 Turbine Oil Abnormal, RAISE TLO temp to reduce vibrations.

B. Enter LOA-TO-101 Turbine Oil Abnormal, LOWER TLO temp to reduce vibrations.

C. Enter LOA-TG-101 Turbine Generator Abnormal, FULLY Open the 1TE111, Condenser Vacuum Breaker, to Stop the Main Turbine.

D. Enter LOA-TG-101 Turbine Generator Abnormal, THROTTLE Open the 1TE111, Condenser Vacuum Breaker, to Slow down the Main Turbine.

Answer: D

**Answer Explanation:**

Explanation: The stem of the question has a picture of the PPC with turbine vibrations in alarm status. The alarm setpoint for LOR-1PM01J is currently set at 7 mils. Entry conditions exist for LOA-TG-101 TURBINE GENERATOR ABNORMAL. IAW LOA-TG-101 step B.1 directs to throttle open 1TE111 Condenser Vacuum Breaker until back pressure reaches 5 inches of HG backpressure, or when turbine is past critical speed range of 900 to 1300 RPM, taking these actions will cause the turbine to slow at a faster rate to exit the critical speed range.

Distractor A: Turbine Oil is at the correct temperature range for turbine coast down but if temperature was too low, that would cause a vibration issue on the main turbine.

Distractor B: Turbine Oil is at the correct temperature range for turbine coast down but if temperature was too high, that would cause a vibration issue on the main turbine due to potential bearing damage.

Distractor C: This action is incorrect, by opening the vacuum breaker fully will result in overshooting the limitation of condenser back pressure of 5" Hg. The purpose of this step in LOA-TG-101 is to reduce turbine speed below the critical speed range where vibrations are at the highest peaks and not to stop the main turbine. Opening the vacuum breaker fully is prescribed in later section of LGP-2-1 Unit Shutdown

Reference: LOA-TG-101 TURBINE GENERATOR ABNORMAL Revision13,
LOA-TO-101 TURBINE LUBE OIL ABNORMAL revision 5, LGP-2-1 NORMAL UNIT SHUTDOWN rev 103
Reference provided during examination: Plant Process Computer PPC Turbine Display

K/A Number/IR: 295005 2.4.50
K/A Statement:Main Turbine Generator Trip: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.
Safety Function:3
CFR 41.
PRA: No

Cognitive level: High

Level: SRO
Tier:1 Group: 1

Question Source: New
Question History:

SRO Justification: 10 CFR 55.43(b)(5)Assessing plant conditions and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed. The SRO has to know these specific actions from the steps of LOA-TG-101 and that the specific action are to throttle and maintain backpressure.

Comments:

**Associated objective(s):**

Recall the reasons for the Main Turbine and Auxiliary System precautions and limitations while operating the system or on an exam in accordance with station procedures.

**78** **ID: 114.00.18.03** **Points: 1.00**

Unit 1 is operating at 100% power when the Unit NSO performing his hourly control room walk down identified the following abnormal system parameters:

- System Pressure is degrading for the Reactor Building Closed Cooling Water System (RBCCW).
- The Reactor Water Cleanup (RWCU) System Non-Regenerative Heat Exchanger discharge outlet temperature is 105°F and slowly trending upward 1°F PER MINUTE.

(1) If this trend is NOT reversed when will the high temperature isolation signal be received resulting in an automatic isolation of the RWCU Inlet Outboard Isolation Valve, 1G33-F004?

(2) What procedure will the Unit Supervisor direct first?

A. (1) In 35 minutes

(2) LOA-RT-101 LOSS OF REACTOR WATER CLEANUP SYSTEM

B. (1) In 25 minutes

(2) LOA-RT-101 LOSS OF REACTOR WATER CLEANUP SYSTEM

C. (1) In 35 minutes

(2) LOA-WR-101 LOSS OF RBCCW REACTOR BUILDING CLOSED COOLING WATER SYSTEM

D. (1) In 25 minutes

(2) LOA-WR-101 LOSS OF RBCCW REACTOR BUILDING CLOSED COOLING WATER SYSTEM

Answer: C

**Answer Explanation:**

Explanation: The SRO must prioritize what procedure to address first. Given the choice between LOA-WR-101 "LOSS OF REACTOR BUILDING CLOSED COOLING WATER" and LOA-RT-101 "LOSS OF REACTOR WATER CLEANUP SYSTEM" the correct procedure would be LOA-WR-101, the repercussions of not taking actions with this procedure is loss of cooling to reactor recirculation and subsequent Unit scram. With a degradation of system pressure in the RBCCW system, the Reactor Water Clean Up will lose cooling to the non-regenerative heat exchanger. At 140 °F the system isolates to protect the resin in the RWCU filters. At 1°F per minute, the isolation setpoint will be reached in 35 minutes.

Distractor 1: With a degradation of system pressure in the RBCCW system, the Reactor Water Clean Up will lose cooling to the non-regenerative heat exchanger. AT 140 °F the system isolates to protect the resin in the RWCU filters. 1 degree per minute, the isolation setpoint will be reached in 35 minutes. What makes this distractor wrong is that the correct procedure should be LOA-WR-101 LOSS OF REACTOR BUILDING CLOSED COOLING WATER and to investigate the degraded system pressure prior to getting a reactor water cleanup isolation, loss of cooling to reactor recirculation and Unit scram. If corrected would stop the adverse trend.

Distractor 2: This distractor is wrong because with a degradation of system pressure in the RBCCW system, the Reactor Water Clean Up will lose cooling to the non-regenerative heat exchanger. At 140 °F the system isolates to protect the resin in the RWCU filters. 1 degree per minute, the alarm setpoint will be reached in 25 minutes at 130 °F. What also makes this distractor wrong is that the correct procedure should be LOA-WR-101 LOSS OF REACTOR BUILDING CLOSED COOLING WATER and to investigate the degraded system pressure prior to getting a reactor water cleanup isolation, loss of cooling to reactor recirculation and Unit scram. If corrected would stop the adverse trend.

Distractor 3: This distractor is wrong because with a degradation of system pressure in the RBCCW system, the Reactor Water Clean Up will lose cooling to the non-regenerative heat exchanger. At 140 °F the system isolates to protect the resin in the RWCU filters. 1 °F per minute, the alarm setpoint will be reached in 25 minutes at 130 °F.

Reference: LOA-WR-101 LOSS OF REACTOR BUILDING CLOSED COOLING WATER Rev 11, LOP-CX-06 PRIMARY CONTAINMENT ISOLATION STATUS DISPLAY rev 8

Reference provided during examination: None

K/A Number/IR: 295018 A.2.01
K/A Statement:Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Component Temperature
Safety Function:8
CFR 43(b)(5)
PRA: No

Cognitive level: High

Level: SRO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: 10 CFR 55.43(b)(5) ASSESSMENT of Facility conditions and selection of appropriate procedures during normal, abnormal, and emergency procedures. The SRO must know this about "specific procedure content" and prioritize which procedure LOA-WR-101 or LOA-RT-101 has the most useful content.

Comments:

**Associated objective(s):**

Given various plant conditions, predict the response of the following supported systems to a loss of the WR System while operating the system, or on an exam in accordance with student text:
a. Instrument Nitrogen
b. Reactor Building Equipment Drains
c. Off Gas
d. Control Rod Drive
e. Reactor Recirculation
f. Drywell Equipment Drains
g. Reactor Water Clean Up
h. Primary Containment Cooling System

**79** **ID: 120.00.18.08** **Points: 1.00**

Unit 1 is operating at 100% power when an Instrument Air line in the Turbine Building ruptures.

- The air compressors are unable to keep up with the loss of air and Instrument Air pressure is lowering.
- The operators insert a manual scram.
- The STA (Shift Technical Advisor) has determined that there is NO RPV leakage.

IAW OP-LA-103-102-1002 STRATEGIES FOR SUCCESSFUL TRANSIENT MITIGATION. What (1) reactor pressure and (2) reactor level should the SRO direct?

A. (1) Maintain Rx Pressure 450-650 psig with SRVs and RCIC for pressure control.
(2) Maintain Rx level 20" to 50" with MDRFP.

B. (1) Maintain Rx Pressure 800-1000 psig with SRVs and RCIC for pressure control.
(2) Maintain Rx level -30" to 50" with CD/CB control.

C. (1) Maintain Rx Pressure 450-650 psig with SRVs and RCIC for pressure control.
(2) Maintain Rx level -30" to 50" with CD/CB control.

D. (1) Maintain Rx Pressure 800-1000 psig with SRVs and RCIC for pressure control.
(2) Maintain Rx level 20" to 50" with MDRFP.

Answer: C

**Answer Explanation:**

Explanation: The loss of Instrument air affects the outboard MSIVs and with this loss of air the MSIVs will close completing their safety function. The Operating crew will lose the ability to use the main condenser as the primary heat sink. IAW with OP-LA-103-102 Strategies For Successful Transient Mitigation, the direction is given when no RPV leakage exist, to lower reactor pressure to 450 to 650 psig then use SRV's to control pressure and to secure MDRFP and use CD/CB pumps to control reactor level.

Distractor A: correct pressure strategy but incorrect level strategy

Distractor B: Incorrect pressure strategy, but level strategy is correct

Distractor D: Incorrect pressure strategy and incorrect level strategy

Reference: IAW OP-LA-103-102-1002 Strategies For Successful Transient Mitigation

Reference provided during examination: None

K/A Number/IR: 295019 AA2.02/ 3.7
K/A Statement:Partial or total loss of INSTRUMENT. Air; Ability to determine and/or interpret the following as they apply to partial or total loss of INSTRUMENT. Air Status of safety-related instrument air system loads
Safety Function: 8
CFR 43(b)(5).
PRA: No

Cognitive level: High

Level: SRO
Tier:1 Group: 1

Question Source: New
Question History:

SRO Justification: 10CFR 55.43(b)(5) Assessing plant conditions and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed. IAW OP-AA-101-111 THE CONDUCT OF OPERATIONS clearly defines the task of directing EOPs is an SRO only task. (communications log on 5/5/14 with NRC lead examiner documents this concurrence with this interpretation).

Comments:

**Associated objective(s):**

Given various plant conditions, predict the response of the following supported systems to a loss of the Plant Air System while operating the system, or on an exam in accordance with student text:
a. Service Air Loads
b. Instrument Air Loads

**80** **ID: 432.000.01** **Points: 1.00**

Unit 2 was at 93% reactor power when the following event took place:

- A HIGH STEAMLINE FLOW signal has resulted in a Group 1 isolation.
- There was a report from the field that steam was coming from the Div 3 switch gear room.
- Control rods DID NOT fully insert.
- SBLC has been initiated.
- RPV water level is currently -145 " and being intentionally lowered.
- Low-Low Set SRVs are controlling RPV pressure.

Would it be required for the US to direct installation of LGA-MS-01, "MSIV AND MSL DRAIN RX LO-LO-LO LEVEL ISOLATION DEFEAT" and why or why not?

A. NOT REQUIRED; There are indications of a Steam Line break.

B. NOT REQUIRED; LGA-MS-01 CANNOT be performed after the MSIVs have closed.

C. REQUIRED; The main condenser is available and reopening of the MSIVs/MSL Drains will help stabilize RPV pressure.

D. REQUIRED; The main condenser is available and reopening of the MSIVs/MSL Drains will reduce the challenge to Primary Containment.

Answer: A

**Answer Explanation:**

Explanation: The high steam flow signal will cause a group 1 isolation, all MSIV's will close causing reactor pressure to spike, and this will actuate lo lo set function of the SRVs US must prioritize safety functions. LGA-MS-01 USING MAIN CONDENSER AS HEAT SINK IN ATWS Step E.1.a states the following "If a MSL break is detected in the steam tunnel.Then GO TO E.3 to close the MSIV's and exit this procedure", this is specific procedure content.

Distractor B: Selected if candidate is confused about ATWS level leg Step which says, if all MSIVs are open perform LGA-MS-01. LGA-MS-01 does "allow opening" MSIVs with a Group 1 lo level isolation in effect.

Distractor C: Not required per LGA-MS-01 step E.1 Immediate procedure termination if MSL leak close MSIV's and exit procedure. The condenser would be available and reopening MSIVs/MSL Drains would help stabilize RPV pressure.

Distractor D: Not required per LGA-MS-01 step E.1 Immediate procedure termination if MSL leak close MSIV's and exit procedure.

Reference: LGA-MS-01 USING MAIN CONDENSER AS HEAT SINK IN ATWS rev 14, LGA-010 rev 13,
Reference provided during examination: None

K/A Number/IR: 295025 04.11/ 4.2
K/A Statement:High Reactor Pressure; Knowledge of abnormal condition procedures
Safety Function:3
CFR 43.5(b)(5)
PRA: No

Cognitive level: High

Level: SRO
Tier:1 Group: 1

Question Source: New
Question History:

SRO Justification: IAW OP-AA-101-111 THE CONDUCT OF OPERATIONS clearly defines the task of directing EOPs is an SRO only task. (communications log on 5/5/14 with NRC lead examiner documents this concurrence with this interpretation). Also related to 43.5(b)(5) in that SRO must access plant conditions.

Comments:

**Associated objective(s):**

evaluate plant conditions and maintain a Heat Sink,

**81** **ID: 433.00.06.01** **Points: 1.00**

Unit 1 was scrammed and the following conditions exist:

- Multiple control rods failed to insert.
- A Blowdown has been initiated.
- Only Six SRVs would open.
- RPV Pressure is 210 psig and dropping as expected.
- The appropriate procedures are in progress.

Based on the above information:
(1) What is the next action the U-1 Control Room should perform to control reactor water level?
(2) What is the Basis for re-injecting at the procedure required Reactor Pressure?

**G RPV Pressures**

| Number of Open SRVs | RPV Pressure (psig) |
|---|---|
| 7 or more | 185 |
| 6 | 218 |
| 5 | 265 |
| 4 | 335 |
| 3 | 451 |
| 2 | 683 |

A. (1) Immediately inject using ONLY preferred ATWS systems to slowly raise level above -150″ on WR or -183″ on FZ.
(2) To ensure adequate core cooling.

B. (1) Immediately inject using ONLY preferred ATWS systems to slowly raise level above -150″ on WR or -183″ on FZ.
(2) To prevent inadvertent criticality.

C. (1) Wait until pressure is below 185 psig, then inject using ONLY preferred ATWS systems to slowly raise level above -150″ on WR or -183″ on FZ.
(2) To ensure adequate core cooling.

D. (1) Wait until pressure is below 185 psig, then inject using ONLY preferred ATWS systems to slowly raise level above -150″ on WR or -183″ on FZ.
(2) To prevent inadvertent criticality.

Answer: A

**Answer Explanation:**

Explanation:Per LGA-010 per table "G" with 6 SRV's open the required injection pressure is 218#, adequate core cooling is provide by steam flow above this pressure with 6 SRV's open. Per LGA-010 level leg after returning from blowdown procedure the first step after the wait on reactor pressure reads as follows "1. Using **only** Preferred ATWS Systems (Detail) A, **slowly** start re-injecting and raise RPV water level above -150" on WR or -183" on FZ"

Distractor B: This answer is wrong because the basis behind vessel re-injection is due to the steam cooling effect on the core from the blowdown is lost and not due to an inadverdaent criticality. With control rods still out it is expected that the reactor will once again go critical when reactor water level is restored.

Distractor C: This step is wrong based on reactor pressure is at 210# and per table "G" the crew should be injecting after reaching 218# of reactor pressure, this pressure is the point where there is not enough steam cooling provided to the core. If the crew waits until 185 # reactor pressure adequate core cooling would be lost.

Distractor D: This answer is wrong due to both parts are wrong, because the basis behind vessel re-injection is due to the steam cooling effect on the core from the blowdown is lost and not due to an inadverdaent criticality. With control rods still out it is expected that the reactor will once again go critical when reactor water level is restored. This step is also wrong based on reactor pressure is at 210# and per table "G" the crew should be injecting after reaching 218# of reactor pressure, this pressure is at the point there is not enough steam cooling provided to the core, if the crew waits until 185 # reactor pressure adequate core cooling would be lost.

Reference: LGA-010 FAILURE TO SCRAM rev 13 LP LGA-10 Failure to Scram
Reference provided during examination: None
K/A Number/IR: 295037 A2.06/4.1
K/A Statement:Scram condition present and reactor power above APRM Downscale or unknown: Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Reactor Pressure
Safety Function:
CFR 43
PRA: No

Cognitive level: High

Level: SRO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: Per OP-AA-101-111 Conduct of operations procedure, it describes the role of directing EOP activities as SRO only task. Also related to 10CFR43(b)(5) Assessing plant conditions.

**Associated objective(s):**

Given LGA-010, Failure to Scram, in progress, with LGA-006 blowdown complete, raise RPV level above –150" (WR) or –185" (FZ) and return level to control band selected prior to blowdown, using ATWS preferred injection systems, while operating the plant or on an exam, IAW LGA-010.

**82** **ID: 711.00.01** **Points: 1.00**

Unit 1 is in a General Emergency with a loss of coolant accident and a Loss of Division 1 AC power.

Prior to venting the primary containment to stay within the PCPL, the following occurred:

- Light Indication was lost for a VQ inboard and its associated outboard primary containment damper
- Drywell pressure started to drop quickly
- Multiple fire sirens are Alarming on the 815′ and 786′ Aux Building elevations
- Multiple Area Rad Monitors (ARMs) are Alarming on the 815′ and 786′ Aux Building elevations
- Station Vent Stack WRGM radiation readings are not available
- Standby Gas WRGM radiation readings are steady
- There are NO hostile activities in progress
- There are NO impediments to evacuation
- NO PARS have been determined for this event
- RPT had determined Dose Projection as < 1 REM TEDE and < 5 REM CDE for containment venting

(1) Is a release is in progress?
(2) If a release is in progress what are PAR actions?

A. (1) No release is in progress,
(2) No Par Required.

B. (1) Yes a release is in progress,
(2) No PAR required.

C. (1) Yes a release is in progress,
(2) **Shelter** 2-mile radius and 5-mile downwind.

D. (1) Yes a release is in progress,
(2) **Evacuate** 2 mile radius and 5 mile downwind.

Answer: D

**Answer Explanation:**

For the purpose of the question, the "SOURCE" of the off-site release must be determined between an elevated and filtered release or an un-monitored and unfiltered ground level release in the Auxiliary Building. Using the BWR release in progress determination checklist, a determination of a release in progress is made as follows, Is there a leak of coolant from the RCS (supplied in stem) Answer is Yes, Is the leak outside secondary containment? Answer is Yes, as determined per precautions of LGA-VQ-02 when venting the primary containment at elevated pressures a release path can develop through a rupture in the low pressure VQ duct work or blow out panels in the upper elevations of the MSL tunnel thus venting into the auxiliary Building. Additional information comes from the stem that fire detection is alarming in the upper auxiliary building per LOA-FP-101 high humidity will set off fire detectors. The next question is the release a direct result of the emergency event? The Answer is Yes. Then a release in progress determination is made. Then using LaSalle Plant Based Par Flow Chart EP-AA-111-F-05 PAR determination is made by following flow chart. The first question is a yes based on general emergency has been declared, Initial Par? Answer-Yes supplied in stem. Release via controlled direct containment vent with a duration < 1 hour? Answer-No, because due to rupture of VQ duct work the venting would not be a **controlled direct vent,** hostile action none (supplied in stem), impediments to travel none (supplied in stem) then determination is made that the actions are to evacuate 2 miles radius and 5 miles downwind

Distractor A: This distractor is incorrect but plausible if the candidate does not recognize that an unmonitored pathway or leak outside the secondary containment exist and then using this information, answers the question as no from the BWR release in progress determination guidance flow chart which directs that NO release is progress.

Distractor C: This distractor is plausible if candidate correctly chooses that a release is in progress and a release in progress can exist with out a PAR if the classification is one of the other three emergency classification levels.

Distractor D: This distractor is plausible if candidate correctly chooses that a release is in progress and if the candidate does not execute the LaSalle Based Par flowchart chooses the other choice of shelter versus evacuate.

Reference: EP-AA-111-F-05 Rev E, EP-AA-114-F-02 Rev A, LGA-VQ-02, LOA-FP-101
Reference provided during examination: EP-AA-111-F-05 page 1 Rev E, EP-AA-114-F-02 Page 1 Rev A

K/A Number/IR: 295038 A2.04 / 4.5
K/A Statement:High Off-site Release; Ability to determine and/or interpret the following as they apply to high off-site release rate: Source of off-site release
Safety Function:9
CFR 43
PRA: No

Cognitive level: High

Level:SRO
Tier: 1 Group: 1

Question Source: New
Question History:

SRO Justification: Part 1 SRO task 701.001 Perform actions as a SED Shift Emergency Director and SRO task 711.001 recommended PARS

Part 2 10 CFR 55.43(b)(4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions

Comments:

**Associated objective(s):**

Demonstrate a thorough understanding of Identify PARS / Reporting Emergencies

**83** **ID: 400.00.14.65** **Points: 1.00**

U-1 is at 100% power, with the B VP Chill Water Pump removed from service, when the following occurred:

- Trip of the running Primary Containment Ventilation Fan
- The crew was unable to restart the VP fan
- LGA-003 "PRIMARY CONTAINMENT CONTROL" was entered
- 1H13-P603 B501 Primary Containment Pressure High alarm was received
- The crew commenced venting per LGA-VQ-01 "CONTAINMENT VENT"
- 20 minutes after the start of LGA-VQ-01, the Primary Containment Pressure High alarm cleared
- 10 minutes later the following alarms were received
- 1PM13J B501 PRIMARY CONTAINMENT CONTINUOUS AIR MONITOR PANEL1PL75J RAD HI
- 1PM13J A501 ATMOSPHERE MONITORING PANEL 1PL15J RAD HI are received
- 1 minute later the following alarms were recieved
- 1N62-P600 B304 STA VENT STACK WIDE RANGE RAD HI alarm
- 1H13-P603 B501 Primary Containment Pressure High alarm was received again

What action will the Unit Supervisor direct next?

A. Secure the LGA-VQ-01 containment venting line up and perform LGP-3-2.

B. Continue venting per LGA-VQ-01 Containment Vent, the cycling of the alarm is an expected response.

C. Continue venting per LGA-VQ-01 Containment Vent, and have chemistry sample the Primary Containment.

D. Secure the LGA-VQ-01 containment venting line up and have Chemistry sample the Primary Containment.

Answer: A

**Answer Explanation:**

Explanation: The ability to verify that alarms are consistent with plant conditions is demonstrated by when the primary containment high pressure alarm comes in a second time. This trend is not consistent with the heat up of the containment without a primary containment chiller. The candidate has to understand this change of alarm status to choose the correct answer. When the Hi rad alarms and containment pressure alarm comes in, a change in drywell parameters has occurred. The correct action is to secure the venting, because LGA-VQ-01 does not allow this operation if containment hi rad alarms are present. Without a running loop of primary containment ventilation and evidence of a leak the next correct action is to scram the unit is the appropriate action. The unit is scram due to the pressure rise in the containment with no remedial actions.

Distractor B: Plausible distractor if candidate believes LGA-VQ-01 has similar allowances for venting as LGA-VQ-02 EMERGENCY CONTAINMENT VENT. This LGA-VQ-02 is performed further down the pressure leg of LGA-003 Primary Containment Control after 1.93 psig is exceeded in the drywell.

Distractor C: Plausible distractor by securing the LGA-VQ-01 lineup but is incorrect because Chemistry sampling is NOT the the first action the crew is to perform

Distractor D: Plausible distractor if candidate believes LGA-VQ-01 has similar allowances for venting as LGA-VQ-02. This LGA is performed further down the pressure leg of LGA-003 Primary Containment Control and does not limit operation based on 1PL75J/1PL15J hi rad alarms. Chemistry sampling the drywell is directed by the LOR actions but this NOT the first actions the crew is to perform.

Reference: LGA-003 PRIMARY CONTAINMENT CONTROL rev 14 , LGA-VQ-01 CONTAINMENT VENT, LOR-1H13-P603-B501 PRIMARY CONTAINMENT PRESSURE HI AND LO, 1N62-P600-B304 STATION VENT STACK RADIATION HIGH, 1PM13J-A501/B501 ATMOSPHERE MONITORING PANEL 1PL15J TROUBLE/1PL75J TROUBLE
Reference provided during examination: None

K/A Number/IR:295010 2.4.46 / SRO 4.2
K/A Statement: High Drywell Pressure: Ability to verify that the alarms are consistent with the plant conditions
Safety Function:
CFR 41.
PRA: No

Cognitive level: High

Level: SRO
Tier: 1 Group: 2

Question Source: New
Question History:

SRO Justification: 10 CFR 55.43.(b)(5) Assessing plant conditions and then selecting a procedure or section to mitigate, recover or with to proceed

Comments:

**Associated objective(s):**

Given plant conditions and LGA entry, recall major action categories and step basis, while operating the plant or on an exam, IAW the LGA procedures.

**84** **ID: 419.00.01.01** **Points: 1.00**

Given the following conditions:

- Reactor pressure is 800 psig and stable
- A LOCA with an ATWS is in progress
- Reactor water level is 12″ and stable
- Drywell temperature is 345°F and rising
- Drywell pressure is 4 psig and rising
- Suppression Pool temperature is 190°F and stable
- Suppression Pool level is +1 foot
- RR pumps are tripped
- 1A and 1B RHR pumps are running in Suppression Pool cooling

Which of the following actions will be directed next to control containment temperature?

A. Start Drywell Sprays

B. Blowdown per LGA-006, ATWS BLOWDOWN

C. Open Turbine Bypass Valves, OK to exceed 100°F per hour

D. Perform LGA-VP-01, PRIMARY CONTAINMENT TEMPERATURE REDUCTION

Answer: B

**Answer Explanation:**

Explanation: Using LGA-003 temperature leg, Cannot use LGA-VP-01 since above the allowable Drywell temperature.
The DSL (Drywell Spray Initiation Limit ) curve is violated, therefore DW Sprays should NOT be used. Therefore, per LGA-003, in the Drywell Temperature leg, the next step is to blowdown per LGA-006. "Blowdown per LGA-006, ATWS Blowdown" is correct.

Distractor A: Cannot spray the drywell because the DSL curve is violated, therefore DW Sprays should NOT be used.
Distractor C: Cannot anticipate a blowdown and use bypass valves during an ATWS.
Distractor D: Cannot use LGA-VP-01 since above the allowable Drywell temperature and LOCA is in progress.

Reference: LGA-003 DW Temperature leg rev 14, LGA-003 Drywell Spray Initiation Limit rev 14, LGA-003 Heat capacity Temperature Limit rev 14.
Reference provided during examination: LGA-003 Temperature leg rev 14, LGA-003 Drywell Spray Initiation Limit rev 14

K/A Number/IR: 295012 A.2.01 3.9
K/A Statement: Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell temperature

Safety Function: 5
CFR 43.
PRA: No

Cognitive level: High
Level: SRO
Tier: 1 Group: 2

Question Source: Bank LaSalle
Question History:

SRO Justification: Per OP-AA-101-111 Conduct of operations procedure, it describes the role of directing EOP activities as SRO only task.
Also related to 10 CFR 55.43(b)95) Assessing plant conditions.

Comments:

**Associated objective(s):**

Given plant conditions and LGA entry, recall the basis for each portion of the Drywell Spray Initiation Limit curve and identify actions when limit is exceeded, while operating the plant or on an exam, IAW the LGA procedures.

**85** **ID: 718.001.01** **Points: 1.00**

Unit 1 is at 100% power:

Which of the following events requires notification to a State Agency?

A. HPCS corner room with water level at the 30" level

B. Suppression Chamber oxygen concentration discovered at 6%

C. Unidentified or pressure boundary leakage into Drywell of 5 GPM

D. Completing a plant Shutdown to mode 3 in12 hours per TS LCO 3.0.3

Answer: A

**Answer Explanation:**

Explanation: Water level above the max safe operating levels is an EAL classification HA4 which is an Alert. This would require a notification to the State Agency.

Distractor B: This distractor is incorrect, an unusual event would be declared if Hydrogen concentration of 6% or greater with oxygen concentration 5% or greater.

Distractor C: This value is the TS 3.4.5 LCO limit requiring entry into the timeclock making this a plausible distractor, but greater then 10 gpm would require a classification at the unusual event level which would then require a notification to the state.

Distractor D: This distractor is plausible because if a shutdown is not completed within the required time per Tech Specs then an unusual event has to be declared. This distractor is incorrect because a plant shutdown per TS 3.0.3 is required to be completed in 13 hours, if unable to complete this time an Unusual event would be required to be declared and thus a notification to the state.

Reference: EP-AA-1005, LGA-002 rev 6
Reference provided during examination: EP-AA-1005 (Hot EAL's)

K/A Number/IR: 295036/ 4.1
K/A Statement:Secondary Containment/high Sump/water level: 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.
Safety Function:5
CFR 43.
PRA: No

Cognitive level: High

Level: SRO
Tier: 1 Group: 2

Question Source: New
Question History:

SRO Justification: Performing E-plan duties is an SRO task 10CFR 55.43.(b)(5) Knowledge of when to implement attachments and appendices,

Comments:

**Associated objective(s):**

Demonstrate a thorough understanding of ENS Notifications

**86** **ID: 64.00.22.02** **Points: 1.00**

Unit 1 is at 100% Power.

- LOS-RH-M1 RHR SYSTEM OPERABILITY TEST FOR MODE 1,2, and 3 for 1A RHR is in progress with Engineering performing ultrasonic testing for fill and vent verification.
- Engineering has reported that the ultrasonic testing for the 1A RHR discharge piping did NOT meet maximum acceptance criteria for the size of the void in the system piping, and normal venting methods did NOT remove the voids.

What actions are required for Tech Specs/TRM?

A. Enter 72 hour timeclock per TRM 3.7.i for system snubbers.

B. Enter 7 day timeclock per TS 3.5.1 for ECCS pump operability.

C. Enter 8 day timeclock per TS 3.3.5.1 for ECCS Instrumentation.

D. Enter 24 hour timeclock for TRM 3.3.e for ECCS Discharge Line keep filled alarm instrumentation.

Answer: B

**Answer Explanation:**

Explanation:**Per precaution statement C.2**, in response to generic letter 2008-1 has established a guideline for periodic venting verification via ultrasonic exam. With voiding in system piping as identified by ultrasonic testing, acceptance criteria has been established to call a system filled and vented, per operability requirements for a system to be fully operable it is required to be filled and vented and be capable of injecting into the RPV, voiding in the system leaves it vulnerable to water hammer events with the potential to damage system struts

Distractor A: Plausible distractor because it is related to the precaution C.2. The precaution states "voiding in the system leaves it vulnerable to water hammer events with the potential to damage system struts", but the distractor is incorrect because the voiding was just discovered and damage would occur after system operation. The stem does not state the system has been operated.

Distractor C: Plausible distractor because it is ECCS related TS 3.3.5.1 RA F.2 for ADS trip system "A" discharge pressure permissive(function 4f). When voiding has been discovered in system piping it is in localized areas of system piping.
The current practice is not to call system pressure permissive instrumentation inoperable.

Distractor D: Plausible distractor because it is a ECCS related TS. When voiding has been discovered in system piping discharge pressure has indicated normally with no associated control room alarms. Voiding has been shown not to reduce system pressure and instrumentation is still fully operable.

Reference: LOP-RH-01rev 54, LOS-RH-M1 rev 30 LOP-RH-11 rev 29, TS 3.5.1, TS 3.3.5.1, TRM 3.3.e, TRM 3.7.i
Reference provided during examination: TS 3.5.1, TS 3.3.5.1, TRM 3.3.e TRM 3.7.i

K/A Number/IR: 203000 2.1.32/ SRO 4.0
K/A Statement:RHR/LPCI: Ability to explain and apply system limits and precautions. (See Nureg ES-401 page 6)
Safety Function:3
CFR 43.
PRA: No

Cognitive level: High

Level: SRO
Tier: 2 Group: 1

Question Source: New
Question History:

SRO Justification: 10 CFR 55.43.(b)(2) Application of required actions and surveillance requirements in accordance with the rules of application requirements

Comments:

**Associated objective(s):**

Given a copy of Technical Specifications key system parameters, and various plant conditions, determine if Technical Specifications LCOs are met, recall the basis for the LCO, and identify the required actions in accordance with Technical Specifications, while operating the system or on an exam.

**87** **ID: 063.00.23** **Points: 1.00**

Unit 2 is at 100% Power with NO active time clocks, when the following occurred:

- 2H13-P601-C404 RHR 2A and LPCS LINE INTEGRITY MONITOR Alarm was received.
- Local reading was confirmed to be reading 1psid to the left of zero, indicating a problem with LPCS injection line.
- IMD was dispatched and the calibration was confirmed in tolerance for the DP switch per LOR actions.

(1) Based on the above condition a LPCS Core Spray piping leak/break may have occurred_____.

(2) What is the status of the LPCS system?

A. (1) inside the shroud
(2) Requires an operability determination.

B. (1) inside the shroud
(2) Declare the system inoperable and immediately start a plant shutdown.

C. (1) between the Reactor Pressure Vessel and the Core Shroud
(2) Requires an operability determination.

D. (1) between the Reactor Pressure Vessel and the Core Shroud
(2) Declare the system inoperable and immediately start a plant shutdown.

Answer: C

**Answer Explanation:**

Explanation: Per TRM B 3.3.f Bases, The function of the ECCS header Differential Pressure Instrumentation is to provide an alarm to alert the Operator of a potential compromise of ECCS piping integrity internal to the RPV. The presence of this alarm may indicate that the system is not operable since cooling water would flow out of the break and bypass the core region, potentially invalidating the flow delivery assumptions in the safety analysis. If the alarm is determined to be valid, the operability of the affected ECCS system should be evaluated for Operability to determine if the system is still capable of performing its specified function assumed in the safety analysis.

Distractor A: The first part of the question is correct, since cooling water would flow out of the break and bypass the core region, but part 2 is wrong per basis an Operability determination is made to determine system operability.

Distractor B: The first part of the question is incorrect, since cooling water would flow out of the break between the RPV wall and shroud and bypass the core region, part 2 of the question is correct the operability of the affected ECCS system should be evaluated for Operability to determine if the system is still capable of performing its specified function assumed in the safety analysis.

Distractor D: Both Parts of this question is wrong, the first part of the question is incorrect, since cooling water would flow out of the break between the RPV wall and shroud and bypass the core region, part 2 is wrong per basis an Operability determination is made to determine system operability.

Reference: TRM 3.3.f
Reference provided during examination: TRM 3.3.f

K/A Number/IR: 209001 A2..05
K/A Statement:Ability to (a) predict the impacts of the following on the LPCS system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequence of those abnormal conditions or operations: Core Spray Line Break

Safety Function:3
CFR 41.
PRA: No

Cognitive level: High

Level: SRO
Tier: 2 Group: 1

Question Source: Bank
Question History:

SRO Justification:10 CFR 55.43(b)(2) (Tech Specs) Knowledge of TS bases that is required to analyze TS required actions and terminology

Comments:

**Associated objective(s):**

Recall the systems that support the low pressure core spray system and the nature of the support provided and how the low pressure core spray system will respond to a failure of the support systems while operating the system or on an exam in accordance with the student text:

a. ECCS equipment cooling water system
b. Corner room ventilation
c. Residual hat removal
d. Leakage detection system
e. suppression pool

**88** **ID: 64.00.22.03** **Points: 1.00**

What is the basis in TS 3.9.8 "RESIDUAL HEAT REMOVAL (RHR) HIGH WATER LEVEL" for the requirement for only one loop of RHR Shutdown Cooling is required to be Operable when the reactor cavity is flooded up and the gates are out?

A. Because the volume of water above the RPV flange provides backup decay heat removal capability.

B. Because decay heat is low enough to credit cooling capability being available from CRD cooling water flow as a backup decay heat removal system.

C. Because the volume of water above the spent fuel in the fuel pool provides backup decay heat removal capability.

D. Because decay heat is low enough to credit cooling capability being available from RWCU per LOP-RT-13 RWCU LINEUP FOR HEAT REMOVAL.

Answer: A

**Answer Explanation:**

Explanation: Per basis of 3.9.8 Page 3.9.8-1, the LCO section reads as follows only one RHR shutdown cooling subsystem is required to be operable in mode 5 with irradiated fuel in the RPV and the water level ≥ 22 feet above the RPV flange. Only one subsystem is required to be OPERABLE because the volume of water above the RPV flange provides backup decay heat removal capability.

Distractor B: This is a valid distractor because it is listed in the basis for Required Action A.1as a viable alternate cooling system if the Action statements of this LCO is entered. The required cooling capacity of the alternative method should be ensured by verifying(by calculation or demonstration) its capability to maintain or reduce temperature in the RPV. The additional statement concerning temperature adds plausibility for this system as a valid distractor.

Distractor C: This is a valid distractor because if the candidate does not understand that water above the spent fuel pool (even though is substantial) does not provide the basis for this Tech Spec.

Distracter D:: This is a valid distractor because it is listed in the basis for Required Action A.1as a viable alternate cooling system if the Action statements of this LCO is entered. The required cooling capacity of the alternative method should be ensured by verifying(by calculation or demonstration) its capability to maintain or reduce temperature in the RPV. The additional statement concerning temperature adds plausibility for this system as a valid distractor.

Reference: Basis B.3.9.8 Residual Heat Removal RHR-High Water Level; LCO section page B.3.9.8-1
Reference provided during examination: None

K/A Number/IR: 205000 2.2.25/ 4.2
K/A Statement:SHUTDOWN COOLING SYSTEM; 2.2.25 Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits

Safety Function:4
CFR 41.
PRA: No

Cognitive level: Memory

Level:SRO
Tier:2 Group: 1

Question Source: New
Question History:

SRO Justification: 10 CFR 55.43(b)(2) Facility operating limitations in the TS and their basis.

Comments:

**Associated objective(s):**

Given a copy of Technical Specifications key system parameters, and various plant conditions, determine if Technical Specifications LCOs are met, recall the basis for the LCO, and identify the required actions in accordance with Technical Specifications, while operating the system or on an exam.

**89** **ID: 032.00.21.01** **Points: 1.00**

Unit 1 has scrammed due to a Loss of Off-Site Power.

- Both Div 1 and 2 DGs failed to start.
- HPCS DG tripped 15 minutes into the event.
- RCIC is maintaining level at -75".

(1) What are the required actions to keep RCIC available for injection after 4 hours?

(2) What procedure will the Unit Supervisor direct after 4 hours?

A. (1) Transfer to local operation in the RCIC room.
(2) Operate RCIC IAW LGA-RI-101 U-1 ALTERNATE VESSEL INJECTION USING RCIC INCLUDING DEFEAT OF RCIC ISOLATIONS.

B. (1) Transfer control to Remote operation at the remote shutdown panel 1C91-P001.
(2) Operate RCIC IAW LOP-RX-04 STARTUP AND OPERATION OF RCIC FROM THE REMOTE SHUTDOWN PANEL.

C. (1) Transfer control to Remote operation at the remote shutdown panel 1C91-P001.
(2) Operate RCIC IAW LGA-RI-103 U-1 RPV INJECTION USING RCIC WHEN A LOSS OF DC IS IMMINENT OR HAS OCCURRED.

D. (1) Transfer to local operation in the RCIC room.
(2) Operate RCIC IAW LGA-RI-103 U-1 RPV INJECTION USING RCIC WHEN A LOSS OF DC IS IMMINENT OR HAS OCCURRED.

Answer: D

**Answer Explanation:**

Explanation: The impact on RCIC due to this situation will result in a loss of DC power to the turbine control system which results in a failure of proper operation of RCIC. With a loss of AC power the Division 1 battery charger will be lost. The design mission time for battery operation is four hours. If DC power becomes unavailable the control power for RCIC will be lost resulting in a failure of the turbine speed control, and the turbine would trip on overspeed. Part "A" of the K/A statement "Predict the impact of a controller failure on RCIC, is imbedded in Part 1 of this question. When the normal controller fails due to a loss of DC power, the Remote Shutdown Panel (RSP) controller also loses its DC power making RCIC inop from the RSP. Based on OPEX from Fukishima a new procedure was written LGA-RI-103 U-1 RPV INJECTION USING RCIC WHEN A LOSS OF DC IS IMMINENT OR HAS OCCURRED for the loss of DC control power to RCIC speed controller, and manual actions developed to operate RCIC locally in the RCIC room.

Distractor A: This represents the correct actions but if selected the candidate has confusion of what is the correct procedure to use.

Distractor B: Transferring to remote operation at the remote shutdown panel changes the circuit of RCIC, but the source will remain the Div 1 125 VDC system. Transferring control at remote shutdown panel will isolate RCIC from the control room. LOP-RX-04 START-UP AND OPERATION OF RCIC FROM THE REMOTE SHUTDOWN PANEL has no actions to operate RCIC without control power available. Selected if candidate has confusion of remote shutdown panel operation and what is the correct procedure to use.

Distractor C: Transferring to remote operation at the remote shutdown panel changes the circuit of RCIC, but the source will remain the Div 1 125 VDC system. Transferring control at remote shutdown panel will isolates RCIC from the control room. LOP-RX-04 START-UP AND OPERATION OF RCIC FROM THE REMOTE SHUTDOWN PANEL has no actions to operate RCIC without control power available. Selected if candidate has confusion of remote shutdown panel operation.

Reference: LGA-RI-103 U-1 RPV INJECTION USING RCIC WHEN A LOSS OF DC IS IMMINENT OR HAS OCCURRED Rev 6,

Reference provided during examination: None

K/A Number/IR: 217000 A2.10 / 3.1 SRO
K/A Statement:RCIC: Ability to (a) predict the impacts of the following on the RCIC; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Turbine control system failures.
Safety Function:2
CFR 43
PRA: No

Cognitive level: High

Level:SRO
Tier:2 Group:1

Question Source: New
Question History:

SRO Justification: Per OP-AA-101-111 Conduct of operations, it describes the role of directing EOP activities as SRO only task , and 10 CFR 43(b)(5)
Assessing plant conditions and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed.
Comments:

**Associated objective(s):**

Given various plant conditions, predict how the Reactor Core Isolation Cooling System will respond to various system component failures while operating the system or on an exam in accordance with student text.

**90** **ID: 062.00.22.02** **Points: 1.00**

Unit 2 is at 100% power when the following occurred:

- 2PM13J-A404 Instrument Nitrogen System Trouble
- R-point 0601 Southside N2 Bank Press Lo
- EO reports Southside bottle bank pressure is at 550 psig
- The EO reports that after valving in the reserve bottle, due to a loose fitting the reserve pressure is at 750 psig and steady

(1) What is the status of ADS prior to bottle change out?
(2) What is the status of ADS during southside bottle change out with the above conditions?

A. (1) Inoperable
(2) Operable

B. (1) Operable
(2) Operable

C. (1) Inoperable
(2) Inoperable

D. (1) Operable
(2) Inoperable

Answer: D

**Answer Explanation:**

Explanation: IAW TS basis SR 3.5.1.4 Verification that ADS accumulator backup compressed gas system bottle pressure is ? 500 psig or that the ADS accumulator backup compressed gas system reserve bottle pressure is ? 1100 psig assures availability of an adequate backup pneumatic supply to the ADS accumulators following a loss of the drywell pneumatic supply (Ref 15). The alarm setpoint for low bottle pressure is set at 800# with some allowance for instrument drift. The reserve bottle is only utilized during bottle changeouts and once valved in, the reserve bottle will be verified to have a minimum bottle pressure of 1100 psig. The reserve bottle will allow bottle change out without affecting the operating unit or requiring entry into TS LCO 3.5.1.G. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Distractor A: This distractor is selected if candidate does not remember the requirement of the basis

Distractor B: This distractor is selected if candidate does not remember the requirement of the basis

Distractor C: This distractor is selected if candidate does not remember the requirement of the basis

Reference: TS Basis TS 3.5.1 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM, LOP-IN-05 REPLACING NITROGEN BOTTLES ON INSTRUMENT NITROGEN
SYSTEM rev 24
Reference provided during examination: None

K/A Number/IR: 218000 2.2.37 RO 3.6 SRO 4.6
K/A Statement:ADS: Ability to determine operability and/or availability of safety related equipment
Safety Function:3
CFR 43(b)(2)
PRA: No

Cognitive level: Memory

Level: SRO
Tier: 2 Group: 2

Question Source: New
Question History: N/A

SRO Justification: 10 CFR 55.43(b)(2) Knowledge of TS basis

Comments:

**Associated objective(s):**

Given a copy of Technical Specifications, key System parameters, and various plant conditions, determine if the Technical Specification LCOs are met, recall the basis for the LCO, and identify the required actions, in accordance with Technical Specifications while operating the system or on an exam, .

**91** **ID: 201.008.12** **Points: 1.00**

Unit 2 is at 100% Reactor Power when the following conditions take place.

- IMD is performing both LIS-NB-205A/B, UNIT 2 REACTOR HIGH PRESSURE SCRAM CHANNELS for all four channels.
- During the calibration of the second HIGH PRESSURE SCRAM CHANNEL, its trip setting is discovered at 1061 psig.

Which ONE of the following describes the Technical Specification required Actions?

A. The channel must be placed in trip within 12 hours following the completion of the 6-hour Surveillance Requirement delay period.

B. The channel must be placed in trip within the 6-hour Note 2 Surveillance Requirement even though all of the trip unit calibrations are NOT complete.

C. Immediately exit the 6-hour Note 2 Surveillance Requirement delay period. The channel must be placed in trip within the next 12 hours, even though all of the trip unit calibrations are NOT complete.

D. Immediately exit the 6-hour Note 2 Surveillance Requirement delay period. The channel must be placed in trip within 12 hours from the start of the surveillance, even though all of the trip unit calibrations are NOT complete.

Answer: C

**Answer Explanation:**

Explanation:Per Note 2 of the surveillance requirements a channel is allowed to be placed in inoperable status for the performance of the required surveillance, but if channel is discovered to be inoperable and not due to the surveillance the correct action is to exit the note 2 and the associated 6 hour allowance, then enter the Required actions of the LCO from the point of discovery of the inoperability. Function 3 which requires 2 channels per trip system to be operable, and there are only two channels per trip for function 3, Reactor Vessel Pressure High, with one of two channels inoperable entry into required action A.1 and commence a 12 hour time clock is the correct action

Distractor A: This distractor is wrong, Per Note 2 of the surveillance requirements a channel is allowed to be placed in inoperable status to perform of required surveillance, but if channel is discovered to be inoperable and not due to the surveillance the correct action is to exit the note 2 and the associated 6 hour allowance, then enter the Required actions of the LCO.

Distractor B: This distractor is wrong, Per Note 2 of the surveillance requirements a channel is allowed to be placed in inoperable status to perform of required surveillance, but if channel is discovered to be inoperable and not due to the surveillance the correct action is to exit the note 2 and the associated 6 hour allowance, then enter the Required actions of the LCO. The 6 hour timeclock is nor correct either, this is a valid distractor if the candidate selects Required action B.1 and enter a 6 hour time clock.

Distractor D: This distractor is incorrect because the correct action is to exit the note 2 and the associated 6 hour allowance, then enter the Required actions of the LCO from the point of discovery of the inoperability.

Reference: TS 3.3.1.1, LIS-NB-205A UNIT 2 REACTOR HIGH PRESSURE SCRAM CHANNELS rev 15
Reference provided during examination: TS 3.3.1.1

K/A Number/IR: 216000 2.2.40/ 4.7
K/A Statement:NUCLEAR BOILER INST; Ability to apply Technical Specifications for a system.
Safety Function:
CFR 43
PRA: No

Cognitive level: High

Level: SRO
Tier: 2 Group: 2

Question Source: LaSalle Bank
Question History:

SRO Justification: 10 CFR 55.43(b)(2) Application of required actions and surveillance requirements in accordance with rules of application requirements.

Comments:

**Associated objective(s):**

apply the rules of TS Section 3.0

**92** **ID: 080.00.21.07** **Points: 1.00**

Unit 1 is at 100% power:

If fuse 1D18-J013-F502 were to blow,

(1) What annunciator will come in first?

(2) What is/are the ODCM required action(s)?

A. (1)1N62-P600-B207 OFF-GAS POST TREATMENT RADIATION HIGH
(2) Enter ODCM 12.2.2.A RA D.1 and D.2 and D.3

B. (1) 1N62-P600-B208 "OFF GAS POST-TREATMENT RADIATION TROUBLE"
(2) Enter ODCM 12.2.2.A RA C.1

C. (1) 1N62-P600-B208 "OFF GAS POST-TREATMENT RADIATION TROUBLE"
(2) Enter ODCM 12.2.2.A RA D.1 and D.2 and D.3

D. (1) 1N62-P600-B207 OFF-GAS POST TREATMENT RADIATION HIGH
(2) Enter ODCM 12.2.2.A RA C.1

Answer: C

**Answer Explanation:**

Explanation:The Off-Gas Post Treatment sample skid had two sample pumps and 2 detectors "A" and "B". Normal system line up has one sample pump in operation, pulling a sample on the outlet of the OG charcoal adsorbers, sending the sample flow to both detectors and then back to the inlet of the charcoal train. The detector skid has one power source and the sample pumps have one common fuse to both pumps, when a fuse blows both sample pumps will lose 120 VAC power, but the detectors have a different source of power and will stay energized. With the loss of motive force in the system due to DP difference between inlet and outlet of charcoal trains, sample flow will reverse sending untreated gases to the detector. (refer to LaSalle OPEX see comments)..The untreated gases will cause indicated radiation readings on the POST TREATMENT RAD MONITORS to go up on both detectors. Both detectors will reach their high radiation alarm setpoints, but the first alarm to be received will be the OFF GAS POST-TREATMENT RADIATION TROUBLE. This alarm is received first because of low sample flow. Local action is required to replace the fuse and start a sample pump. Entry into ODCM 12.2.2.A for both detectors and action is taken per RA D.1 and D.2 and D.3.

Distractor A: This distractor is plausible because the alarm will come in because of the blown fuse, but the high radiation alarm will come after gases in the monitor reverse, the low sample flow alarm will come in first because both pumps fail with the fuse blowing.

Distractor B: This distractor is plausible if candidate does not understand that both detectors share common sample pumps and the loss of the sample flow makes both detectors inoperable.

Distractor D: combination of Distractor A and B

Reference: 1E-1-4218AG rev L, M-153 SH 3 rev Q, M-88 SH 4 rev V, ODCM 12.2.2.A, 1N62-P600-B208 "OFF GAS POST-TREATMENT RADIATION TROUBLE" rev 003 Off-Gas System lesson Plan #80

Reference provided during examination: 1E-1-4218AG rev L, M-153 SH 3 rev Q, M-88 SH 4 rev V, ODCM 12.2.2.A

K/A Number/IR: 271000 A.2.08
K/A Statement: OFF-GAS SYSTEM:Ability to (a) predict the impacts of the following on the OFF-GAS SYSTEM; and(b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A.C. distribution failures.
Safety Function:9
CFR 43
PRA: No

Cognitive level: High

Level: SRO
Tier: 2 Group: 2

Question Source: New
Question History:

SRO Justification: 10 CFR 55.43(b)(2) Facility operating limitations in the TS and their bases.

Comments:

1. Loss of Flow on LaSalle Unit 2 Off Gas Post Treatment.
On November 19, 1987, at approximately 0700 the B 1 pump on the Unit 2 Off Gas Post Treatment Monitor tripped causing a low flow alarm in the control room followed by both the high and high high radiation alarms. An operator was dispatched to start the B 2 pumps. Once the pump was started the alarms cleared.
The incident might appear normal except for the high and high high radiation alarms. On further investigation, the cause of these alarms was found not to be detector spiking. The cause was identified to be back flow through the sample system that caused the flow past the detector to be gas prior to the charcoal beds. This caused the alarms.
The significance of this event is that if the untreated gas is at a higher level of activity, a high-high-high trip on the Off Gas system would occur. This would lead to a loss of condenser vacuum, a turbine trip, and, of course, a possible reactor scram.

**Associated objective(s):**

Given various plant conditions, predict how the Off Gas System will respond to various system component failures while operating the system or on an exam in accordance with student text.

**93** **ID: 25.00.22.01** **Points: 1.00**

Both Units are at 100 % power. EMD has just completed and restored from LES-FP-06 PREACTION SPRINKLER/SPRAY SYSTEMS IONIZATION SMOKE DETECTOR TEST for the U-2 cable spreading room with the following results:

- 14 smoke detectors passed the surveillance requirements.
- Current hourly fire watch for the LES-FP-06 is still in place.
- Fire detection outside the cable spreading room is inoperable with compensatory actions in place.

When leaving the room, they discovered the Fire Door #279 to the Cable spreading room inoperable.

Identify the required compensatory actions, if any, for this situation.

A. Continue the HOURLY Fire Watch.

B. Establish a CONTINUOUS Fire Watch.

C. NONE, the HOURLY Fire Watch may be secured after the LES-FP-06 has been signed off.

D. Stage an extra fire hose in the area AND establish a CONTINUOUS Fire Watch after the LES-FP-06 has been signed off.

Answer: B

**Answer Explanation:**

Answer B
Explanation:Per LOS-FP-D1 TECHNICAL REQUIREMENTS MANUAL FIRE DOOR DAILY SURVEILLANCE ATTACHMENT "2A" the door this is reported broken is a required fire door, Per TRM 3.3.p with less than required number of fire detectors, the required actions would be to continue the hourly fire watch but with the door impaired, entry into TRM 3.7.o FIRE RATED ASSEMBLIES is required, The student is required to recognize that the fire door is part of the fire rated assembly ,Required Actions A.1.1 would be the correct action to start a continuous fire watch because fire detection on the other side of door is inoperable

Distractor A: This distractor is not correct because a continuous fire watch is required because fire detection on both sides of the door are inoperable per TRM 3.7.o

Distractor C: This distractor is incorrect because there is less than required number of detectors in the cable spreading room, the fire barrier is impaired and detection on the other side of door is inoperable, based on these conditions entry into TRM 3..o is required which directs use of a continuous fire watch RA A.1.1
Distractor D: A Fire hose is not required, there are no entry conditions into TRM 3.7.m FIRE HOSE STATION and a continuous fire watch is required. per TRM 3.7.o

Reference: TRM 3.7.o, TRM 3.3.p, LES-FP-06,
Reference provided during examination: TRM 3.7.o, TRM 3.3.p
K/A Number/IR: 286000 2.1.25/ 4.2
K/A Statement:FIRE PROTECTION: Ability to interpret reference materials, such as graphs, curves, tables, etc.
Safety Function: 8
CFR 43(b)(1)
PRA: No

Cognitive level: High

Level: SRO
Tier:2 Group: 2

Question Source: New
Question History:

SRO Justification: 10 CFR 55.43(b)(1) Conditions and limitations in the facility license.

Comments:

**Associated objective(s):**

Given a copy of Technical Specifications, key system parameters, and various plant conditions, determine if LCO's have been met or exceeded and the LCO basis while operating the Fire Protection system or on an exam in accordance with student text and student text.

**94** **ID: 030.00.22.01** **Points: 1.00**

IAW LFP-100-1 MASTER REFUEL PROCEDURE, in order to move fuel within the RPV, at a minimum, a Licensed Fuel Handling Supervisor (SROL) or Senior Reactor Operator (SRO) must be an active license holder ...

A. directly supervising core alterations from the refuel floor.

B. directly supervising core alterations from the refuel bridge.

C. within 10 minutes of the refuel floor AND knowledgeable of the status of refuel floor activities.

D. supervising core alterations in constant communication from the 1H13-P603 while observing SRMs.

Answer: B

**Answer Explanation:**

Explanation:IAW MASTER REFUEL PROCEDURE LFP-100-1, Prerequisites B.1 A Fuel Handling Supervisor(SROL) or a Senior Licensed Supervisor(SRO) holding active licenses in accordance with OP-AA-105-102, shall directly supervise the fuel handling operation when core alterations are being performed using the refuel bridge equipment.

Distractor 1: LFP-100-1 MASTER REFUEL PROCEDURE clearly states on ATTACHMENT "F" page 33, "Active License holders (per OP-AA-101-701) DIRECTLY SUPERVISING CORE ALTERATIONS from the Refuel Bridge
Distractor 2: LFP-100-1 MASTER REFUEL PROCEDURE clearly states on ATTACHMENT "F" page 33, "Active License holders (per OP-AA-101-701) DIRECTLY SUPERVISING CORE ALTERATIONS from the Refuel Bridge,
Distractor 3: LFP-100-1 MASTER REFUEL PROCEDURE clearly states on ATTACHMENT "F" page 33, "Active License holders (per OP-AA-101-701) DIRECTLY SUPERVISING CORE ALTERATIONS from the Refuel Bridge, and this describes the requirement for the RO duties.

Reference: LFP-100-1 Rev 54
Reference provided during examination: None

K/A Number/IR: 2.1.35
K/A Statement:Knowledge of the fuel-handling responsibilities of SROs.
Safety Function:
CFR 43
PRA: No

Cognitive level: Memory

Level: SRO
Tier:3 Group:

Question Source: Bank
Question History:

SRO Justification: Fuel handling facilities and procedures 10 CFR 55.43(b)(7)

Comments:

**Associated objective(s):**

Given a copy of Technical Specifications, key system parameters, and various plant conditions, determine if Technical Specification LCOs are met, recall the basis for the LCO and identify the required actions in accordance with Technical Specifications, while operating the system or on an exam.

**95** **ID: 030.00.20.02** **Points: 1.00**

The following conditions exist on Unit-1:

- Core alterations are in progress between the Spent Fuel Pool and the Reactor Cavity
- The Refuel Floor Fire Siren has begun annunciating without warning

Which one of the following describes the course of action to be followed on the Refuel Floor?

A. Immediately evacuate the Refuel Floor until the cause of the alarm is resolved and the alarm is reset.

B. Fuel movement may continue until the report of an actual fire inside the Protected Area is reported.

C. Suspend all fuel movement after placing the fuel assemblies in a safe condition until the fire alarm is reset.

D. Contact the Main Control Room for further information and wait for evacuation orders, fuel movement may continue unless otherwise directed.

Answer: C

**Answer Explanation:**

Explanation:
"Suspend all fuel movement after placing the fuel assemblies in a safe condition until the fire alarm is reset." is correct. The correct course of action IAW LFP-100-1 Master Refuel procedure Precaution step C.19 states the following "Degraded Communications exist whenever the Refuel Floor Fire siren or E-Plan siren is activated. All movement of fuel must be suspended after placing fuel assemblies in a safe condition until cause for the fire siren is resolved and reset".

Distractor A: Plausible because it is the normal response to a fire alarm, but the requirement is to place fuel in a safe location prior to leaving the refuel floor. This is an immediate action that ROs are not required to know and refueling activities are SRO tasks.

Distractor B: Fuel movement is not allowed under these conditions due to degraded communications. IAW LFP-100-1 Degraded Communications exist whenever the Refuel Floor Fire siren or E-Plan siren is activated. All movement of fuel must be suspended after placing fuel assemblies in a safe condition until cause for the fire siren is resolved and reset.

Distractor D: Plausible because the Main Control room would be contacted but fuel movement is not allowed under these conditions due to degraded communications. IAW LFP-100-1 Degraded Communications exist whenever the Refuel Floor Fire siren or E-Plan siren is activated. All movement of fuel must be suspended after placing fuel assemblies in a safe condition until cause for the fire siren is resolved and reset.

Reference: LFP-100-1 MASTER REFUEL PROCEDURE, Rev 54, PRECAUTIONS step C.19
Reference provided during examination: None

K/A Number/IR: 2.1.42/ 3.4
K/A Statement:KNOWLEDGE OF NEW AND SPENT FUEL MOVEMENT PROCEDURES
Safety Function:
CFR 43(B)(7)
PRA: No

Cognitive level: Memory

Level: SRO
Tier: 3 Group:

Question Source: BANK
Question History:

SRO Justification: 10 cfr 55.43(B)(7)

Comments:

**Associated objective(s):**

Recall the reasons for the Fuel Handling System precautions and limitations while operating the system or on an exam in accordance with station procedures.

**96** **ID: 201.008.02** **Points: 1.00**

The U-1 is at 8% Reactor Power with the mode switch in START-UP.

An outboard containment isolation valve that is required to be operable in MODES 1, 2, and 3, FAILED its stroke time testing. To comply with the associated LCO TS 3.6.1.3 Primary Containment Isolation Valves, the inoperable valve has been closed and deactivated.

After 6 hours maintenance has been completed and Post Maintenance Testing (PMT) requires the valve to be opened and timed closed.

Which of the following actions is required to perform the PMT?

A. Enter LCO 3.0.3 complete the Post Maintenance Test, then exit LCO 3.0.3.

B. Prior to entering MODE 1, enter LCO 3.0.4, perform the Post Maintenance Test then exit LCO 3.0.4.

C. Perform the electrical stroke timing ONLY if the valve is reclosed within 4 hours to comply with Tech Specs 3.6.1.3 Primary Containment Isolation Valves.

D. Enter LCO 3.0.5, only for time required to prove Operability without further maintenance, then exit LCO 3.0.5.

Answer: D

**Answer Explanation:**

Explanation:LCO 3.0.5 is the applicable section of "LCO applicability" to use to for POST maintenance testing, LCO 3.0.5 Equipment removed from service or declared inoperable to comply with Actions may be returned to service under administrative control solely to perform testing required to demonstrate operability or the operability of other equipment. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.

Distractor 1: LCO 3.0.3 is not the correct section of LCO applicability to apply, this section is written for a LCO is not met and the associated actions are not met, an associated action is not provided.

Distractor 2: LCO 3.0.4 does not demonstrate the correct application of this LCO. this LCO apply for changing MODES when an LCO condition is not met.

Distractor 3: Once the required actions of an LCO are completed you can not go back into the action statement of the applicable LCO unless using LCO 3.0.5 and using administrative controls

Reference: TS LCO Applicability pages 3.0-1 and 3.0-2
Reference provided during examination: None

K/A Number/IR: 2.2.21/ 4.1
K/A Statement:Knowledge of pre and post-maintenance operability requirements

Safety Function:
CFR 41.
PRA: No

Cognitive level: High

Level: SRO
Tier: 3 Group:

Question Source: Bank
Question History:

SRO Justification: 10 CFR 55.43(b)(2) Facility operating limitations in the TS and their basis; Application of generic limiting condition for Operation (LCO) requirements(LCO3.0.1 thru 3.0.7; SR 4.0.1 thru 4.0.4)

Comments:

**Associated objective(s):**

apply the rules of TS Section 3.0

**97** **ID: 201.003.01** **Points: 1.00**

Given the following Conditions:

- Reactor Mode Switch is in Shutdown.
- Average Reactor Coolant Temperature is 205° F.
- Reactor Vessel Head Closure bolt tensioning will be complete in 2 hours.

The Unit is currently in____(1)_____ and the ____(2)____ must be completed prior to the completion of Reactor Vessel Head closure bolt tensioning.

A. (1) MODE 5
(2) MODE 4 Checklist

B. (1) MODE 5
(2) MODE 3 Checklist

C. (1) MODE 4
(2) MODE 3 Checklist

D. (1) MODE 4
(2) cooldown to less than or equal to 200 degrees F.

Answer: B

**Answer Explanation:**

Explanation:With any head closure bolt not fully tensioned the plant is in MODE 5 REFUEL, as soon as all head closure bolts are fully tensioned with temperature >200 the plant will be in MODE 3 HOT SHUTDOWN. This was a previous OPEX from LaSalle refuel outage, when head bolts were detensioned without entering mode 5

Distractor 1: The candidate may recognize that the Unit is in MODE 5 REFUEL, and believe that it will move to Mode 4 COLD SHUTDOWN when the bolts are tensioned.
Distractor 2: With the head closure bolts not fully tensioned, a candidate may expect that the condition would be considered MODE 4 COLD SHUTDOWN and that it would change to mode 3 when the bolts are tensioned to hold pressure
Distractor 3: Due to a temperature of > 200 degrees F. a candidate may believe that we are in MODE 3 HOT SHUTDOWN, and may believe this is not affected by tensioning the head closure bolts.

Reference: LOP-AA-03, Technical Specification
Reference provided during examination: None

K/A Number/IR: 2.2.35 /4.5
K/A Statement: Ability to determine Technical Specification Mode of Operation.
Safety Function:
CFR 43
PRA: No

Cognitive level: High

Level: SRO
Tier: 3 Group:

Question Source: Bank
Question History:

SRO Justification: This is a SRO only task at LaSalle to complete the administrative requirements (Mode Change Checklist) to change modes. The Mode change checklist consists of verifying operability with each applicable tech spec that would apply when changing modes. This is a tech spec determination which meets 10 CFR 55.43.(b)(2) Facility operating limitations in the TS and their basis.

Comments:

**Associated objective(s):**

determine the plant Mode

**98** **ID: 425.00.01.01** **Points: 1.00**

A major event has occurred on Unit-1.
The following conditions exist several hours later:

- Drywell Pressure is 10 psig and steady.
- Suppression Chamber pressure is 5 psig and steady.
- The hydrogen recombiner is in operation for mixing.
- Division 1 and 2 Post-LOCA monitors indicate 7% hydrogen in the Drywell and rising slowly.
- Division 1 and 2 Post-LOCA monitors indicate 2% oxygen in the Drywell and rising slowly.
- Containment venting per LGA-VQ-02 EMERGENCY CONTAINMENT VENT has just been started IAW LGA-011 HYDROGEN CONTROL.

The following sequence of events take place next:

- The NSO reports oxygen levels in the containment are now at **4%** and steady.
- Then 1N62-P600-B304 STATION VENT STACK RADIATION HIGH alarms.

What will the Unit Supervisor direct next?

A. Continue venting per LGA-VQ-02 EMERGENCY CONTAINMENT VENT, okay to exceed ODCM limits and Secure Recombiner IAW LGA-HG-101 OPERATION OF THE RECOMBINER AS A MIXING SYSTEM.

B. Secure venting per LGA-VQ-02 EMERGENCY CONTAINMENT VENT due to exceeding ODCM limits and Continue to run Recombiner IAW LGA-HG-101 OPERATION OF THE RECOMBINER AS A MIXING SYSTEM.

C. Continue venting per LGA-VQ-02 EMERGENCY CONTAINMENT VENT, okay to exceed ODCM limits and Continue to run Recombiner IAW LGA-HG-101 OPERATION OF THE RECOMBINER AS A MIXING SYSTEM.

D. Secure venting per LGA-VQ-02 EMERGENCY CONTAINMENT VENT due to exceeding ODCM limits and Secure Recombiner IAW LGA-HG-101 OPERATION OF THE RECOMBINER AS A MIXING SYSTEM.

Answer: B

**Answer Explanation:**

Explanation:IAW LGA-011 with oxygen <5% leg, the containment is not in jeopardy of a H2 detonation, actions are directed to start containment venting but not to exceed ODCM limits which is dictated by not having a high radiation alarm in alarm state. There are two overriding steps in this LGA 011 leg, the first is if oxygen >5% then go to decision tree for hydrogen concentration and continue to vent and purge, the second override is if the STATION VENT STACK RADIATION HIGH alarms to discontinue venting. In the stem of the question's sequence, the STATION VENT STACK RADIATION HIGH alarms is received the US will direct discontinue venting the containment and continue to monitor oxygen levels, the oxygen level of 4% given in the stem does not change actions in LGA-011, the crew will continue to run the recombiner in the mixing mode of operation.

Distractor A:This distractor is plausible if the candidate does not remember actions required as Oxygen levels change. If the candidate does not remember that it takes Oxygen levels greater then or equal to 5% as directed by the override step of the left leg of LGA-011. The override directs to continue to vent and then take actions based on decision tree of oxygen levels (23) and if assumptions are made based on Oxygen levels then the right leg of LGA-011 is executed with actions to secure the recombiner.

Distractor C: This distractor is plausible if the candidate does not remember actions required as Oxygen levels change. If the candidate does not remember that it takes Oxygen levels greater then or equal to 5% as directed by the override step of the left leg of LGA-011. The override directs to continue to vent and then take actions based on decision tree of oxygen levels (23) and if assumptions are made based on Oxygen levels when the center leg of LGA-011 is executed with no action to secure the recombiner.

Distractor D: This distractor is plausible if the candidate does not remember actions required as Oxygen levels change. The decision to discontinue venting is correct based on receiving the station vent stack high rad alarm but if candidate makes further decisions based on Oxygen level and enters the left leg of LGA-011 which directs securing the recombiner.

Reference: LGA-011 hydrogen control rev 9, LGA-VQ-02 EMERGENCY CONTAINMENT VENT rev 20,
Reference provided during examination: LGA-011 hydrogen control

K/A Number/IR: 2.3.11 /4.3
K/A Statement:Ability to control radiation releases.
Safety Function:
CFR 43.4
PRA: No

Cognitive level: High

Level: SRO
SRO Justification: Directing steps in LGA procedure is a SRO task.
Tier: 3 Group:

Question Source: New
Question History:
Comments:

**Associated objective(s):**

Given LGA-011, Hydrogen Control, in progress, analyze Suppression Chamber and Drywell Hydrogen and Oxygen concentrations and determine appropriate mitigation strategy, while operating the plant or on an exam, IAW LGA-011.

**99** **ID: 701.02.00.01** **Points: 1.00**

You are the SRO in the control room when the following conditions exist:

- 10:10 Event occurred.
- 10:20 an Alert is declared.

What is the Latest time by which the reports to the State and NRC must be made?

A. State 10:25 and NRC 11:10.

B. State 10:35 and NRC 11:10.

C. State 10:35 and NRC 11:20.

D. State 10:25 and NRC 11:20.

Answer: C

**Answer Explanation:**

Explanation:15 minutes is the required report time after declaration of the event to the State and 1 hour to the NRC after declaration of the event.

Distractor A:Explanation:15 minutes is the required report time after declaration of the event to the State and **1 hour to the NRC after declaration of the event**, the first state report time is wrong both report times are wrong.

Distractor B: Explanation:15 minutes is the required report time after declaration of the event to the State and **1 hour to the NRC after declaration of the event**, the report time to the NRC is wrong.

Distractor D: Explanation:15 minutes is the required report time after declaration of the event to the State and **1 hour to the NRC after declaration of the event**, the report time to the State is wrong.

Reference:EP-AA-114 NOTIFICATiONS
Reference provided during examination: None

K/A Number/IR: 2.4.29/ 4.4
K/A Statement:Knowledge of Emergency plans.
Safety Function:
CFR 43
PRA: No

Cognitive level: High
Level: SRO
Tier:3 Group:

Question Source: Bank LaSalle
Question History:

SRO Justification: EP reporting requirements is an SRO task and

10 CFR 55.43(b)(5) Assessment of conditions and selection of a procedure

Comments:

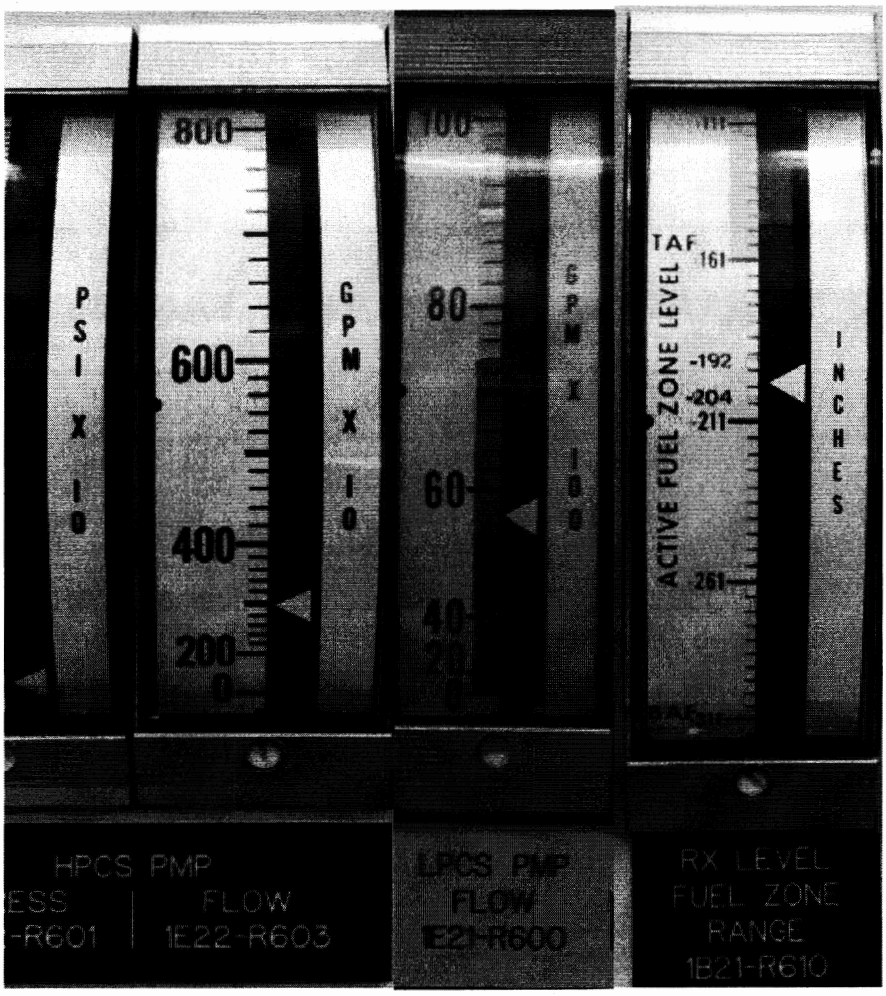
**Associated objective(s):**

During performance of tasks, apply the administrative requirements of EMERGENCY RESPONSE ORGANIZATION (ERO) / EMERGENCY RESPONSE FACILITY (ERF) ACTIVATION AND OPERATION, IAW EP-AA-112

**100** **ID: 413.00.03.02** **Points: 1.00**

Unit 1 has scrammed and experienced a LOCA:

- RPV pressure is 15 psig and going DOWN SLOWLY.
- The TSC is NOT Prepared to provide SAMG decisions.
- The NSO reports the following indications




Does adequate core cooling exists, and what are the required procedural actions?

A. Does Exist, Enter all LSAMGs.

B. Does NOT exist, Enter All LSAMGs

C. Does Exist, Continue with LGA-001.

D. Does NOT exist, Continue with LGA-001.

Answer: D

**Answer Explanation:**

Explanation:Adequate core cooling does not exist based on LGA-001 Detail AC (ADEQUATE CORE COOLING for LGA-001), there is inadequate ECCS core spray flow. Two of three conditions to meet adequate core cooling do exist but both LPCS and HPCS flow do not meet the flow requirement. The flow requirements for LPCS or HPCS is to be ≥ 6250 gpm per pump to adequately cover the core. This value can not be derived by adding the HPCS and LPCS flow amounts together because total core coverage by the spray header would not be achieved. With the TSC not activated, criteria for LSAMG entry has not been met, the correct action would be to continue with LGA-001

Distractor A: This distractor is incorrect based on the information provided does not satisfy criteria established per Detail "AC",.

Distractor B: Adequate Core Cooling does not exist, but with the TSC not activated, the Unit Supervisor will continue to direct LGA-001 RPV CONTROL actions.

Distractor C: This distractor is incorrect based on the information provided does not satisfy criteria established per Detail "AC", but with the TSC not activated, the Unit Supervisor will continue to direct LGA-001 RPV CONTROL actions.

Reference: LGA-001 RPV CONTROL rev14
Reference provided during examination: None

K/A Number/IR: 2.4.4/ 4.7
K/A Statement:Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.
Safety Function:
CFR 43(b)(5)
PRA: No

Cognitive level: High

Level: SRO
Tier: 3 Group:

Question Source: New
Question History: N/A

SRO Justification: 10 CFR 43(b)(5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

**Associated objective(s):**

Given plant conditions and LGA entry, compare and prioritize the use of RPV injection systems, while operating the plant or on an exam, IAW the LGAs.

# 2014 LaSalle Written Examination Answer Key

A Questions 1 through 75 are RO level questions.
A Questions 76 through 100 are SRO level questions.

| Q# | Answer | Q# | Answer | Q# | Answer | Q# | Answer |
|---|---|---|---|---|---|---|---|
| 1 | A | 26 | A | 51 | C | 76(1) | D |
| 2 | D | 27 | A | 52 | A | 77(2) | D |
| 3 | B | 28 | B | 53 | C | 78(3) | C |
| 4 | A | 29 | C | 54 | C | 79(4) | C |
| 5 | D | 30 | C | 55 | C | 80(5) | A |
| 6 | A | 31 | D | 56 | C | 81(6) | A |
| 7 | A | 32 | C | 57 | B | 82(7) | D |
| 8 | A | 33 | D | 58 | B | 83(8) | A |
| 9 | D | 34 | A | 59 | A | 84(9) | B |
| 10 | C | 35 | B | 60 | B | 85(10) | A |
| 11 | B | 36 | C | 61 | B | 86(11) | B |
| 12 | D | 37 | C | 62 | C | 87(12) | C |
| 13 | A | 38 | A | 63 | B | 88(13) | A |
| 14 | A | 39 | C | 64 | B | 89(14) | D |
| 15 | C | 40 | C | 65 | D | 90(15) | A |
| 16 | C | 41 | D | 66 | A | 91(16) | C |
| 17 | C | 42 | B | 67 | A | 92(17) | C |
| 18 | C | 43 | C | 68 | D | 93(18) | B |
| 19 | C | 44 | C | 69 | C | 94(19) | B |
| 20 | D | 45 | D | 70 | D | 95(20) | C |
| 21 | B | 46 | C | 71 | C | 96(21) | D |
| 22 | C | 47 | C | 72 | B | 97(22) | B |
| 23 | D | 48 | B | 73 | B | 98(23) | B |
| 24 | D | 49 | B | 74 | C | 99(24) | C |
| 25 | A | 50 | D | 75 | A | 100(25) | D |