

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 1

The plant is operating at 90% power with both Recirc Pumps in operation, when the following occur:

- A malfunction in the master recirculation controller causes recirculation flow and reactor power to lower
- The Reactor Operator places all individual recirculation M/A stations in MANUAL and the flow/power reduction ceases
- The following conditions result:
- Reactor power is 60% and steady
- Reactor recirculation flow is 47% of rated core flow and steady

Which one of the following actions is required?

- A. Manually Scram the Reactor.
- B. Raise recirculation pump speed or insert rods.
- C. Perform a normal plant shutdown per AOP - 8
- D. Lower recirculation pump speed.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295001 AK3.02
Importance Rating RO - 3.7; SRO – 3.8

QUESTION 1

K&A Statement: Knowledge of the operational implications of Power/Flow distribution as it applies to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: REACTOR POWER RESPONSE

Justification:

- A. **Incorrect but plausible** if the operator uses the power flow map, then plant is in manual scram zone.
- B. **Correct:** plant is in the buffer zone. Per AOP-8 exit restricted zone by raising recirc flow or lower power by inserting scram rods.
- C. **Incorrect:** because AOP-8 requires the restricted zone to be exited and directs actions to either raise recirc flow or lower power by inserting the scram rods to 00. This answer is plausible because it would have the operator exit the restricted zone however it is not correct because it is not required to shutdown the reactor.
- D. **Incorrect:** because AOP-8 requires the restricted zone to be exited and directs actions to either raise recirc flow or lower power by inserting the scram rods to 00.

References: AOP – 8; Loss or Reduction of Reactor Coolant Flow Student Ref: RAP – 7.3.16; Power/Flow Map with labeling removed

Learning Objective: SDLP-02HR14.pdf Reactor Recirc lesson plan 1.09
Given a set of plant conditions, describe the effect that a malfunction/loss of the Reactor Recirculation System may have on the following:
i. Reactor Power Versus Core Flow Operating Map Single Pump Trip

Question source: Modified NMP 1; 10/08 exam; question 53

Question History: None

Cognitive level: Comprehensive/Analysis:

10CFR 41.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 2.

The plant is operating at 100% power with 'D' EDG loaded for surveillance testing in a normal electrical lineup when the following annunciators alarm:

- 09-8-3-31 Bus 10400 Reserve Supp Bkr 10412 Trip
- 09-8-3-32 Bus 10400 Norm Supp Bkr 10402 Trip
- 09-8-4-31 EDG D GEN LOCKOUT

Assume **NO** operator actions have been taken and all equipment functions as designed.

What will be the status of the 4 kV emergency bus breakers after this event?

- A. ACB 10602 (EDG B Load Bkr) Closed,
ACB 10612 (EDG D Load Bkr) Open,
ACB 10404 (Bus 10400 – 10600 Tie Bkr) Closed,
ACB 10614 (Bus 10400 – 10600 Tie Bkr) Open,
ACB 10604 (EDG B & D Tie Bkr) Open.
- B. ACB 10602 (EDG B Load Bkr) Closed,
ACB 10612 (EDG D Load Bkr) Closed,
ACB 10404 (Bus 10400 – 10600 Tie Bkr) Open,
ACB 10614 (Bus 10400 – 10600 Tie Bkr) Closed,
ACB 10604 (EDG B & D Tie Bkr) Open.
- C. ACB 10602 (EDG B Load Bkr) Closed,
ACB 10612 (EDG D Load Bkr) Open,
ACB 10404 (Bus 10400 – 10600 Tie Bkr) Open,
ACB 10614 (Bus 10400 – 10600 Tie Bkr) Open,
ACB 10604 (EDG B & D Tie Bkr) Closed.
- D. ACB 10602 (EDG B Load Bkr) Closed,
ACB 10612 (EDG D Load Bkr) Closed,
ACB 10404 (Bus 10400 – 10600 Tie Bkr) Open,
ACB 10614 (Bus 10400 – 10600 Tie Bkr) Closed,
ACB 10604 (EDG B & D Tie Bkr) Open.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295003; AK3.01
Importance Rating RO – 3.3; SRO – 3.5

QUESTION 2.

K&A Statement: Knowledge of the reasons for the following as they apply to
PARTIAL OR COMPLETE LOSS OF AC POWER:
MANUAL AND AUTO BUS TRANSFER

Justification: Explanation Stem results in a loss of power to the 10400 Bus, the
EDGs B&D auto start and force parallel , (ACB 10604 closes initially
then subsequently opens when a EDG > 90% and closes onto the
10600 bus) The resultant bkr alignment per OP-22 Step G.2.2 will be
10612 open, 10602 closed, 10404 closed, 10604 open, 10614 open.

- A. **Correct** - Breakers are in correct position per OP-22 Step G.2.2. except for 'D' EDG Load Breaker tripped open and 10404 closed.
- B. **Incorrect** - ACB 10614 (Bus 10400 - 10600 Tie Bkr) should be Open vice Shut and 'D' EDG Load Breaker tripped open.
- C. **Incorrect** - ACB 10604 (EDG B & D Tie Bkr) should be Open vice Shut and 'D' EDG Load Breaker tripped open.
- D. **Incorrect** - ACB 10404 (Bus 10400 - 10600 Tie Bkr) should be Open vice Shut and 'D' EDG Load Breaker tripped open.

References: OP-22 Rev.53 Step G.2.2
AOP-17 Rev 14

Student Ref: None

Learning Objective: N/A

Question source: Modified to 'B' & 'D' EDGs

Question History: From JAF exam 3/08; question 2

Cognitive level: Comprehensive/Analysis:

10CFR 41.5/45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 3.

Plant is in mode 1 with reactor power at 100%.

All systems are in a normal lineup per procedures with the following exception:

- Bus 10300 loads remain supplied from off-site power due to mechanical binding in breaker NSS TO BUS 10300 BKR 10302.

Subsequently, a loss of DC Power System 'A' occurs with a resulting reactor scram.

What is the reason for the reactor scram?

- A. Main turbine trip from high RPV water level, due to loss of DC power to the selected Rx Wtr Lvl column.
- B. Inboard MSIV closure due to loss of DC power to the solenoids.
- C. Main turbine trip due to loss of DC power to EHC trip logic.
- D. Low RPV water level due to loss of DC power to Feedwater and Steam flow instruments.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295004; AK3.03
Importance Rating RO – 3.1; SRO – 3.5

QUESTION 3.

K&A Statement:

Knowledge of the reasons for the following responses as they apply to **PARTIAL OR COMPLETE LOSS OF D.C. POWER: REACTOR SCRAM**

Justification:

Per AOP-45 , Loss of DC Power System 'A- Section C- AUTOMATIC

- A. **Incorrect but plausible:** Loss of DC power system 1 A affects Rx Wtr Lvl 06LI-94A & C, not RX WTR LVL 06LI-94B, which is the normal selected column.
- B. **Incorrect but plausible:** Rx would have scrambled clue to response noted in the Correct not RX WTR LVL 06LI-94B, which is the normal selected column. answer prior to any MSIV closure caused by loss of both DC & AC control power. To lose power to the Inboard MSIV solenoids would require 29AOV-80A-D MSIV DC Inboard Solenoids powered from 71 DC-A2 & 29AOV-80A-D MSIV AC Inboard Solenoids powered from RPS "A" to be de-energized. Power has been lost to the DC solenoids however, RPS MG Set 1A is fed from MCC-251 fed via 10500 which would not lose power till the generator trips & the 10500 buss loses power as it will not transfer due to loss of DC control power to the 10500 breakers.
- C. **Correct:** Main turbine trip from loss of DC power to EHC trip logic, If Rx power >.29 %, a Rx scram will occur from main turbine stop valve closure.
- D. **Incorrect but plausible:** Loss of DC Power System 'A' results in a downscale failure of FDWTR flow 06FI-89A & Stm flow 06FI-88A & C. Control power is lost to RFP 'A' but RFP 'B' is not affected. The Rx would have scrambled due to response noted in the Correct answer prior to any scrams caused by water level from Steam /FW flow mismatch & loss of RFPT A speed control.

References: AOP-45 R 9

Student Ref:

NONE

AOP-21 R 21, AOP-'16 R 14

Learning Objective:
SDLP-71BR8; DC
1.09 -8 & 9

Given a set of plant conditions, describe the effect that a loss or malfunction of each of the following DC Electrical Systems may have on the listed systems: EHC and Main Turbine

Question source: Modified

Question History: From Fitz exam 3/08; question 3

Cognitive level: Comprehensive/Analysis:

10CFR

41.5 / 45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 4.

Fill in the blanks. Per OP-9, "Main Turbine", a reactor scram _____ required to be jumpered to conduct main turbine shell warming _____.

- A. is; to prevent a reactor scram on a sensed reactor power above 29%.
- B. is not; because the main turbine trip signal is reset before admitting steam for shell Warming.
- C. is; to prevent a reactor scram when the turbine trip is tested.
- D. is not; because the turbine-initiated reactor scrams are bypassed by low first stage Pressure.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295005; G2.1.32
Importance Rating RO - 3.2; SRO – 3.2

QUESTION 4.

K&A Statement: Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: Ability to apply safety limits and precautions

Justification:

- A. **Correct:** Shell warming could raise first stage pressure above the scram bypass setpoint. With first stage pressure greater than setpoint and turbine stop valves less than 90% open, a reactor scram will be initiated.
- B. **Incorrect:** Jumpering of first stage pressure reactor scram is required by the shell warming procedure. **Plausible because main turbine trip signal is reset prior to admitting steam and the scram is based on automatically shutting down the reactor upon a main turbine trip in anticipation of potential rapid pressure spike causing power spike associated when voids collapse.**
- C. **Incorrect:** The turbine trip is not tested during or following shell warming alignment. **Plausible because a scram is required to be jumpered and examinee may think the manual turbine trip capability is procedurally tested during or following shell warming alignment.**
- D. **Incorrect:** Jumpering of first stage pressure reactor scram is required by the shell warming procedure. While this level transient will occur, it is not part of the basis for the scram. **Plausible because turbine-initiated reactor scrams are bypassed automatically by low first stage pressure. Examinee may not understand that shell warming has the potential to raise first stage pressure above the scram setpoint, initiating a scram because stop valves are not fully open.**

References: RPS; SDLP-05R16.pdf

Student Ref: None

Learning Objective: State the expected plant response and appropriate operator actions for the following: Mn Turbine Trip
RPS; SDLP-05R16
1.07.a.10

Question source: Modified Question

Question History: From Limerick exam 10/06; question 1

Cognitive level: Memory or Fundamental Knowledge

10CFR (CFR:41.7 / 45.6)

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 5.

Given the following:

- The plant is operating at 15% power, startup in progress
- A SINGLE control rod SCRAM just occurred as a result of a troubleshooting error while investigating a SCRAM test switch problem.

Which of the following groups of alarms are consistent with this condition?

- A. CRD ACCUM TROUBLE (09-5-1-43)
ROD DRIFT (09-5-2-3)
SCRAM AIR HEADER LOW PRESSURE (09-5-1-54)
- B. ROD DRIFT (09-5-2-3)
ROD OUT MOTION BLOCK (09-5-2-01)
SCRAM AIR HEADER LOW PRESSURE (09-5-1-54)
- C. CRD ACCUM TROUBLE (09-5-1-43)
ROD DRIFT (09-5-2-3)
ROD OUT MOTION BLOCK (09-5-2-01)
- D. CRD ACCUM TROUBLE (09-5-1-43)
ROD OVERTRAVEL (09-5-2-04)
ROD OUT MOTION BLOCK (09-5-2-01)

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295006; AK2.03
Importance Rating RO-3.7; SRO- 3.8

QUESTION 5.

K&A Statement: Knowledge of the interrelations between SCRAM and the following: CRD HYDRAULIC

Justification:

- A. **Incorrect but plausible:** SCRAM Air HEADER LOW PRESSURE will not come in on a single rod scram. 2 out of 3 are correct. SCRAM AIR HEADER LOW PRESSURE comes in on a full scram.
- B. **Incorrect but plausible:** SCRAM Air HEADER LOW PRESSURE will not come in on a single rod scram. 2 out of 3 are correct. SCRAM AIR HEADER LOW PRESSURE comes in on a full scram.
- C. **Correct:** CRD ACCUM TROUBLE will come in due to low accumulator pressure following the rod scram. ROD DRIFT will come in since the rod is moving without an RMCS command. ROD OUT MOTION BLOCK comes from the RWM and/or SDV not drained.
- D. **Incorrect but plausible:** ROD OVERTRAVEL is indicative of an uncoupled control rod NOT a scrammed rod.

References: SDLP-03F R10; RMCS Student Ref: None
SdIp03C; CRD HYDRAULICS
OP-26; RMCS

Learning Objective: List the Reactor Manual Control System Administrative Limitation setpoints which effect the below listed components:
SDLP-03F R10; a. Rod Drift
RMCS; 1.08

Question source: From HC 9/07 exam question 75

Question History: None

Cognitive level: Comprehensive/Analysis

10CFR 41.8 to 41.10

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 6.

With the plant at 100% power a large smoky fire occurs in the Control Room and the CRS announces that he has entered AOP-43 and control room evacuation is required. You are the ATC operator.

Per AOP-43, which of the following actions are required to be performed within 2 hours?

- A. Verify closed breaker 71BCB-2A-B03; 125 VDC to "A" battery Charger
- B. Verify closed the Inboard MSIV
- C. Perform OP-18; Transfer RPS MG Set to ALT
- D. Perform OP-59A; Ventilation for 'B' Battery/Charger rooms

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295016; AA1.05

Importance Rating RO – 2.8 ; SRO – 2.9

QUESTION 6.

K&A Statement: Ability to operate and/or monitor the following as they apply to
CONTROL ROOM ABANDONMENT:
D.C. ELECTRICAL DISTRIBUTION

Justification:

- A. **Incorrect but plausible:** guidance is for breaker 71BCB-2A-B03 is to be opened in AOP-43.
- B. **Incorrect but plausible:** guidance is for closure of the MSIV, only the outboard valves need to be verified closed.
- C. **Incorrect but plausible:** guidance for RPS is to trip the running RPS MG sets.
- D. **Correct** - guidance contained in AOP-43; step F.5

References: AOP-43

Student Ref: None

Learning Objective: N/A

Question source: MODIFIED

Question History: From last Fitz exam 3/08; question 6

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7/ 45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 7.

The Plant is operating at 90% power with one Reactor Building Closed Loop Cooling (RBCLC) pump tagged out of service.

An electrical problem causes the two running RBCLC pumps to trip.

Operators have the ability to restore cooling via Emergency Service Water to **EACH** of the following **EXCEPT**:

- A. Drywell Ventilation Coolers
- B. RWCU Pump Coolers
- C. Control Rod Drive Hydraulic Pump Coolers
- D. Drywell Equipment Drain Sump Cooler

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295018 AA1.01
Importance Rating RO -3.3; SRO 3.4

QUESTION 7.

K&A Statement: 295018 Partial or Complete Loss of Component Cooling Water Ability to operate and /or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: BACKUP SYSTEMS

Justification:

- A. **Incorrect** – Can be manually aligned for cooling with ESW
- B. **CORRECT** - RWCU Pump Coolers are NOT supplied by ESW
- C. **Incorrect** - Can be manually aligned for cooling with ESW
- D. **Incorrect** - Can be manually aligned for cooling with ESW

References: AOP-11 R15 Student Ref: None

Learning Objective: Given a set of plant conditions, describe the effect that a loss of the following may have on Reactor Water Cleanup System:
SDLP-12 R-16
RWCU 1.10 a. RBCLC

Question source: From last Fitzpatrick exam 3/08;question 7

Question History: From last Fitzpatrick exam 3/08;question 7

Cognitive level: Memory or Fundamental knowledge:

10CFR 55.41 & 55.43

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 8:

A loose fitting has resulted in a loss of instrument air to the in-service Control Rod Drive (CRD) Flow Control Valve.

Determine which of the following conditions could result from this instrument air loss.

- A. Control Rod Drive accumulator alarms due to low pressure.
- B. High rod speeds during control rod withdraw.
- C. Control Rod Drive alarms due to high temperatures.
- D. Control Rods begin to drift due to excessive flow.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295019; AA2.02
Importance Rating RO – 3.6; SRO – 3.7

QUESTION 8.

K&A Statement: Ability to determine and/or interpret the following as they apply to
**PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR:
STATUS OF SAFETY RELATED INSTRUMENT AIR SYSTEM
LOADS.**

Justification:

- A. **Incorrect but plausible:** The charging header maintains pressure on the accumulators, and the charging header taps off upstream of the FCV, so accumulator pressure will not go down.
- B. **Incorrect but plausible:** The drive header is downstream of the FCV, so rod withdraw speeds will be slower rather than faster.
- C. **Correct:** The FCV fails to the minimum position on a loss of air. The cooling water header is downstream of the FCV. So, the failure mode results in decreased flow to the cooling water header and temperatures will **rise** resulting in CRD high temperature alarms.
- D. **Incorrect but plausible:** The failure results in low flow. The failure mode does not cause an increased DP across the drive piston, so there is no motive force to cause the rods to drift.

References: SDLP-03C\SDLP-03C R15 page 20 and 21 Student Ref: None

Learning Objective: Describe the purpose/function and operation of the CRD Hydraulic
1.05.a.3 System components listed for the following conditions:
3. Flow Control Valves

Question source: INPO BANK

Question History: From HC exam 9/07 question 8

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.10/ 43.5/ 45.13

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 9.

The Unit is in mode 5. The following conditions are present:

- A loss of shutdown cooling has occurred.
- The cavity is flooded.
- The cavity and spent fuel pool gates are installed.
- Radwaste is available
- Condensate transfer keep-full is available

IAW AOP-30, which alternate decay heat removal mode should be used?

- A. RWCU in blowdown mode.
- B. Fuel Pool Cooling system.
- C. Decay heat removal system.
- D. Fuel Pool Cooling assist.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295021; AA1.04
Importance Rating RO – 3.7 ; SRO – 3.7

QUESTION 9.

K&A Statement: Ability to operate and/or monitor the following as they apply to
LOSS OF SHUTDOWN COOLING: ALTERNATE HEAT
REMOVAL METHODS

Justification:

- A. **Correct:** Only available method of decay heat removal available. Gates installed, make up source available and radwaste available.
- B. **Incorrect but plausible:** Fuel Pool Cooling gates are installed between cavity and spent fuel pool,
- C. **Incorrect but plausible:** Decay heat removal needs gates removed between cavity and spent fuel pool.
- D. **Incorrect but plausible:** Fuel pool Cooling Assist mode, RHR and RHRSW must be available and gates are installed between cavity and spent fuel pool.

References: AOP-30; attachment 3 and 5 Student Ref: None
OP-13D; RHR SHUTDOWN COOLING

Learning Objective: N/A

Question source: New

Question History: New

Cognitive level: Comprehensive/Analysis:

10CFR 41.7 / 45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

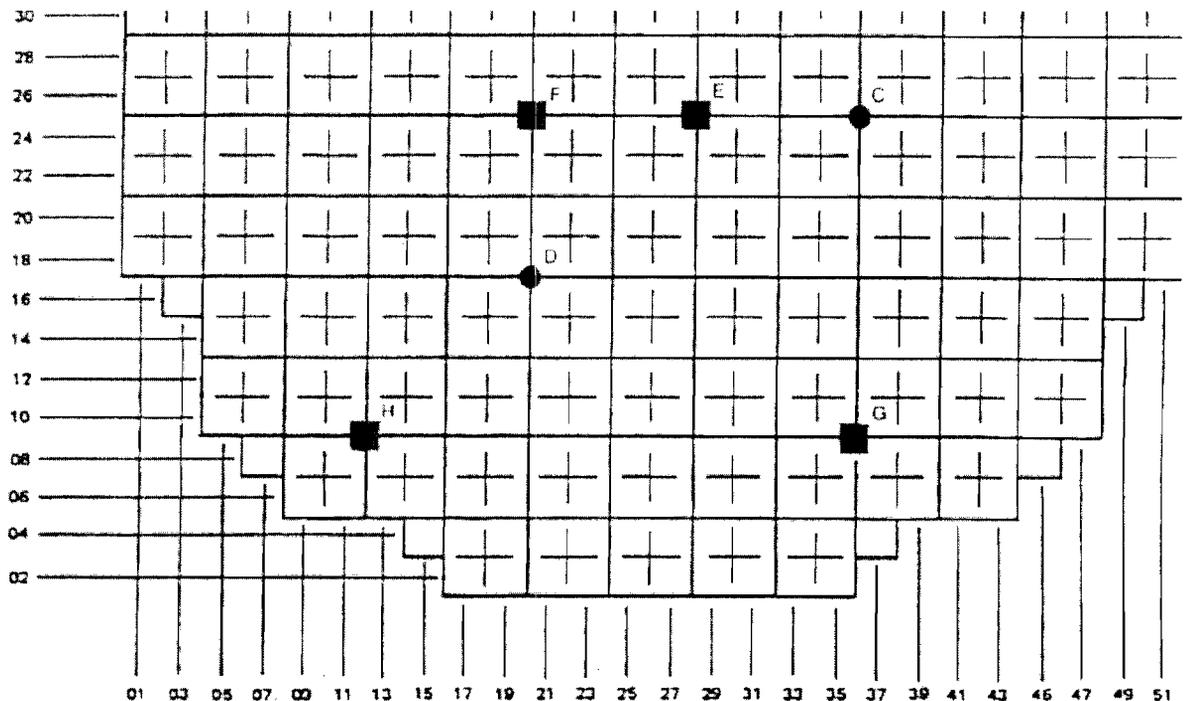
QUESTION 10.

Plant conditions are as follows:

- Mode 5
- Fuel moves in progress
- Fuel bundle 28-37 is being lowered into the core
- SRM 'C' count rate increases from 70 cps to 300 cps
- Remaining SRMs continue to indicate 70 to 80 cps
- Refueling Bridge SRO has just reported that fuel bundle 28-37 is half-way inserted to the seated position in the correct location

WHICH ONE of the following describes required action(s) of RAP 7.1.04C, "Neutron Instrumentation Monitoring During In-core Fuel Handling" and the basis for this action?

- A. Monitor count rate while completing the bundle insertion to ensure rate remains below 560 cps. A count rate beyond 560 cps may reflect an inadvertent criticality.
- B. Seat the fuel bundle and request Reactor Engineering to confirm that count rate is within expected range.
- C. Notify Refuel Bridge SRO to stop lowering the bundle. This action addresses an unexpected count rate increase.
- D. Evacuate personnel from line of sight of the reactor vessel. This action ensures personnel are safe from the effects of an inadvertent criticality.



● SRM LOCATIONS

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295023; AK1.02
Importance Rating RO – 3.2; SRO – 3.6

QUESTION 10.

K&A Statement: Knowledge of the operational implications of the following concepts as they apply to REFUELING ACCIDENTS:
SHUTDOWN MARGIN

Justification:

- A. **Correct:** RAP-7.1.04C states immediately stop the refueling evolution if the third doubling is seen.
- B. **Incorrect but plausible:** Doubling of count rate should be expected for loading of fuel assemblies adjacent to SRM detectors.
- C. **Incorrect but plausible:** RAP-7.1.04C states immediately stop the refueling evolution if the third doubling is seen. If count rate doubles Shutdown margin is reduced by $\frac{1}{2}$.
- D. **Incorrect but plausible:** since this would be the appropriate action if an increasing trend were observed. However, stable counts indicate a subcritical condition and evacuation would not be required.

References: Fitzpatrick RAP-7.1.04C

Student Ref: Detector assembly
in-core locations

Learning Objective: SDLP-8a R10; Refueling; L.O. 1.06.b and 1.10.a

Question source: Modified

Question History: Limerick exam 10/08; question 10

Cognitive level: Comprehensive/Analysis:

10CFR 41.7 / 45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 11.

Which one of the following describes the consequences of spraying the drywell if conditions are in the unacceptable region of the Drywell Spray Initiation Limit Curve in EP-1, EOP Entry and Use?

- A. Evaporative cooling results in an immediate, rapid and large reduction in drywell pressure which could cause a loss of primary containment integrity due to drywell to atmosphere pressure being negative
- B. The cold spray water will put excessive thermal stress on the drywell, which may lead to structural failure of the primary containment
- C. Convective cooling results in an immediate, rapid and large reduction in drywell pressure which could cause a loss of primary containment integrity due to drywell to atmosphere pressure being negative
- D. The steam produced by spraying cold water into a superheated atmosphere could over pressurize the primary containment

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295024; EK3.01
Importance Rating RO – 3.6; SRO – 4.0

QUESTION 11.
K&A Statement:

EK3.01 Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE : Drywell spray operation

Justification:

- A. Correct – IAW with the reference, the initiation of drywell sprays will result in a large drop in primary containment pressure due to evaporative cooling. This drop in pressure can occur faster than can be compensated for by the vacuum relief system, and could result in challenging primary containment integrity.
- B. Incorrect because the concern is not thermal stresses. Plausible if the candidate does not know the mechanism for drywell failure.
- C. Incorrect because convective cooling does not cause a rapid lowering of drywell pressure, plausible if candidate does not realize the concern is if the drywell is superheated drywell spray droplets will evaporate instantaneously causing the large drop in drywell pressure.
- D. Incorrect because drywell pressure will rapidly lower and not overpressurize the drywell. Plausible if the candidate does not know the failure mechanism.

References: MIT-301.11E Student Ref: None

Learning Objective: EA 4.05

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge: X
Comprehensive/Analysis:

10CFR 41.5

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 12.

The plant was operating at 100% power when a transient was initiated by a turbine trip without bypass valves. Indicated reactor pressure peaked at 1350 psig.

The following plant conditions exist:

- The reactor failed to scram
- Reactor Level is currently being maintained between +20 and +110 inches per EOP-3 Failure To Scram

Which **ONE** of the following is correct concerning Technical Specification safety limits?

- A. No safety limits have been exceeded.
- B. Only the safety limit for reactor water level has been exceeded.
- C. Only the safety limit for reactor coolant system pressure has been exceeded.
- D. The safety limits for reactor water level and reactor coolant system pressure have both been exceeded.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295025; G.2.2.22
Importance Rating RO – 4.0; SRO – 4.7

QUESTION 12.
K&A Statement:

G.2.2.22 Knowledge of limiting conditions for operations and safety limits: as it applies to High Reactor Pressure

Justification:

- A. Incorrect because the safety limit for pressure has been exceeded. Plausible if the candidate does not know the safety limit for reactor pressure.
- B. Incorrect but because the safety limit for pressure has been exceeded. Plausible if the candidate does not know the safety limit for reactor level is TAF and EOP-3 and EOP does not direct to lower below the safety limit.
- C. Correct : The safety limit is 1325 and has been exceeded.
- D. Incorrect because the safety limit for level has not been exceeded. Plausible if the candidate does not know the safety limit for reactor level.

References: TS 2.1.2, SDLP-02D

Student Ref:

None

Learning Objective: SDLP-02D,

Question source: Brunswick 2008 RO Exam

Question History: Q60 Brunswick NRC Exam

Cognitive level: Memory/Fundamental knowledge: X
Comprehensive/Analysis:

10CFR 41.5

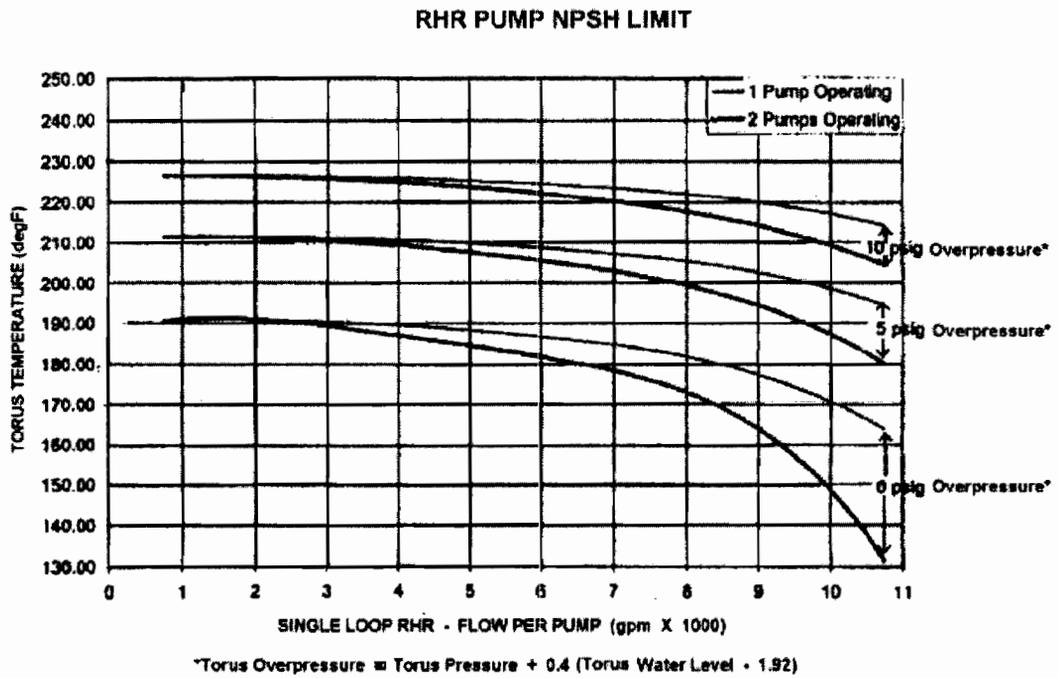
JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 13.

The following plant conditions exist with RHR aligned for low pressure injection:

- Torus Pressure 2.9 psig
- Torus Level 10.72 feet
- RHR PMP 10P-3A Flow 0 gpm
- RHR PMP 10P-3B Flow 9000 gpm
- RHR PMP 10P-3C Flow 0 gpm
- RHR PMP 10P-3D Flow 9000 gpm

Given these conditions, what is the maximum Torus water temperature that will maintain net positive suction head within limits?



- A. 194 F
- B. 202 F
- C. 213 F
- D. 220 F

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295026; EK1.01
Importance Rating RO – 3.0; SRO – 3.4

QUESTION 13.

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE : Pump NPSH

Justification:

- A. Correct – Overpressure is calculated from plant conditions and is 6.42 psig. Reading 2 pump running curve with 5 psig overpressure (can not interpolate) is 194 F.
- B. Incorrect but plausible if the candidate uses the 1 pump running curve and 5 psig overpressure.
- C. Incorrect but plausible if the candidate uses the 2 pump running curve and 10 psig overpressure.
- D. Incorrect but plausible if the candidate uses the 1 pump running curve and 10 psig overpressure.

References: OP-13A

Student Ref:

None

Learning Objective: SDLP-10, EO-1.13.A

Question source: Fitz 03 modified

Question History: Fitz 03 NRC exam

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis:

X

10CFR 41.8-41.10

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 14.

EOP-4, Primary Containment Control, has been entered due to a high drywell pressure condition. Simultaneously, EPIC power is lost and no Control Room computer screens are available.

The following indications exist:

- Drywell pressure is 5 psig and rising.
- TORUS TEMP A, 16-1TR-131A reading 93 F
- TORUS TEMP B, 16-1TR-131B reading 95 F
- DW TEMP A, 16-1TR-108 reading 126 F
- DW TEMP B, 16-1TR-107 reading 142 F
- DW COOLER A TEMP INLET, 68TI-100 reading 160 F
- DW COOLER A TEMP OUTLET, 68TI-100 reading 120 F
- DW COOLER B TEMP INLET, 68TI-101 reading 140 F
- DW COOLER B TEMP OUTLET, 68TI-101 reading 120 F

Which one of the following describes a criterion for EOP-4 re-entry under these conditions?

- A. DW Cooler B inlet temperature
- B. DW Cooler A average inlet and outlet temperature
- C. DW Temp B temperature
- D. Torus Temp A and Torus Temp B average temperature

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295028; EA2.01
Importance Rating RO – 4.0; SRO – 4.1

QUESTION 14.

K&A Statement:

Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE : Drywell Temperature.

Justification:

- A. Incorrect because DW cooler inlet temperature is not a valid entry condition. Plausible if the candidate thinks that the DW cooler inlet being above 135 F is an EOP-4 entry condition.
- B. Correct – DW temperature entry condition is above 135 F. Per EP-1 average inlet and outlet cooler temperature is a valid entry condition. A DW Cooler average is 140 F.
- C. Incorrect because a single drywell temperature is not a valid entry condition. Plausible if the candidate does not know that the average of the two DW temperatures is the correct indication per EP-1.
- D. Incorrect because do not use average torus temperature for EOP entry. Also no reading is above 95 which is the entry condition. Plausible if the candidate does not know the EP-1 requirements for Torus temperature.

References: EP-1 5.2

Student Ref:

None

Learning Objective: MIT-301.11E 4.02

Question source: Modified 03 Fitz

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis:

X

10CFR 41.10

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 15.

A plant event has occurred with the following plant conditions:

- Reactor has been manually scrammed
- Drywell pressure is 7.0 psig and rising
- Torus level is steady at 5.5 feet
- Torus Temperature is 160 F and rising
- Emergency Depressurization is in progress using group 2 pressure control systems

With these plant conditions, which one of the following is a RCIC operational concern?

- A. The RCIC suction must remain aligned to the CST to prevent pump suction cavitation
- B. The RCIC system can not be operated in the RPV pressure control mode because it will result in a further reduction of Torus Level
- C. The RCIC system must be tripped to prevent over pressurizing the containment
- D. The RCIC suction must remain aligned to the CST to prevent pump suction vortexing

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295030; EK2.02
Importance Rating RO – 3.7; SRO – 3.8

QUESTION 15.

K&A Statement: Knowledge of the interrelations between **LOW SUPPRESSION POOL WATER LEVEL** and the following: **RCIC**

Justification:

- A. Incorrect because the torus temperature limit for cavitation is 190 F. Plausible because the candidate may think low torus level would cause cavitation
- B. Incorrect because RCIC operation in the pressure control mode pumps water from the CST to the CST. Plausible if the candidate does not realize that operating RCIC in pressure control mode will not lower torus level.
- C. Incorrect but plausible if the candidate does not realize that containment can not be overpressurized by RCIC turbine exhaust.
- D. Correct – Per OP-19 Page 5, operating RCIC with suction from the Torus with torus level below 5.7 feet could cause vortexing.

References: OP-19 Student Ref: None

Learning Objective: N/A

Question source: Modified Fitz 02 Q16

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis: X

10CFR 41.7 / 45.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 16.

Given the following:

- A failure to scram has occurred
- Reactor power is 20%
- Torus bulk water temperature is 115 degrees F
- Pressure is being controlled between 1000 and 1050 psig with SRVs
- Injection has been terminated and prevented from Condensate and Feedwater, HPCI, RHR and Core Spray
- RPV water level has been lowered to +50 inches in accordance with EOP-3, Failure To Scram

Which ONE of the conditions listed below would allow the operator to resume injection from these systems?

- A. Reactor power drops to less than <2.5%
- B. Reactor water level reaches +19 inches
- C. Reactor power drops to within the heating range with a negative period
- D. Reactor pressure is reduced such that one SRV can maintain pressure

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295031; EA2.02
Importance Rating RO – 4.0, SRO-4.2

QUESTION 16.
K&A Statement:

**Ability to determine and/or interpret the following
as they apply to REACTOR LOW WATER LEVEL : Reactor
Power**

Justification:

- A. Correct – Reactor Power < 2.5% is a condition per EOP-3 that will allow reinjection.
- B. Incorrect because reactor level would need to reach 0 inches TAF to meet the conditions to reinject. Plausible because level is a parameter that if the condition is met then reinjection is allowed.
- C. Incorrect, because although EOP -3 could be exited if the reactor was shutdown and would remain shutdown under all conditions without boron, this condition has not been met. The control rods that did not insert due to the failure to scram are still withdrawn and therefore the reactor would not remain shutdown under all conditions. Plausible because the candidate may think that being shutdown is a condition to exit EOP-3 and control level with EOP-2.
- D. Incorrect because all SRV's need to be closed to meet the condition to reinject. Plausible because the amount of SRV's is a condition that will determine if reinjection can be met.

References: EOP-3, EP-1 Student Ref: None

Learning Objective: MIT-301 11D 1.07

Question source: Pilgrim Bank

Question History: Pilgrim 04 NRC

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis: X

10CFR 41.10

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 17.

The reactor failed to scram and the following conditions exist:

- RPV pressure is being controlled at 1000 psig
- Standby Liquid Control (SLC) has been initiated and is injecting from an initial tank level of 82%

What conditions must be met to lower RPV pressure per EOP-3, Failure To Scram?

- A. The hot shutdown boron weight has been injected, indicated by the SLC tank level <46%.
- B. The hot shutdown boron weight has been injected, indicated by the SLC tank level <36%.
- C. The cold shutdown boron weight has been injected, indicated by SLC tank level <46%.
- D. The cold shutdown boron weight has been injected, indicated by SLC tank level <36%.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295037; EK1.05
Importance Rating RO – 3.4; SRO – 3.6

QUESTION 17.

K&A Statement: Knowledge of the operational implications of the following concepts as they apply to **SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN:**
Cold Shutdown Boron Weight

Justification:

- A. Incorrect but plausible because the Hot Shutdown Boron Weight does not ensure the reactor is shutdown under all conditions. Plausible because the HSBW is used in EOP-3 for controlling level. Level may be raised after HSBW is injected.
- B. Incorrect but plausible because the Hot Shutdown Boron Weight does not ensure the reactor is shutdown under all conditions. Plausible because the HSBW is used in EOP-3 for controlling level. Level may be raised after HSBW is injected.
- C. Incorrect because the cold weight boron is indicated by a 46% drop in SLC level, but plausible if the candidate does not know the specific number for CSBW
- D. Correct – Prior to lowering pressure during an ATWS with SLC injecting, the reactor must remain shutdown under all conditions. This is ensured by injecting the cold boron weight as indicated by a 46% drop in SLC tank level

References: EOP-3, MIT 301.11d, MIT 301.11b Student Ref: None

Learning Objective: MIT 301.11d, 1.07 and MIT-301.11b EO 1.02

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis: X

10CFR 41.8 to 41.1

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 18

In preparation for the upcoming refueling outage, new fuel is being moved in the spent fuel pool per OP-66A, Refueling Bridge Operation

During the moves, the grapple fails and the control room is notified that a new fuel bundle fell on irradiated fuel bundles and caused damage to the irradiated bundles.

The following alarms and indications are received in the Control Room:

- 9-3-1-20 REFUEL AREA ARM RAD HI, alarms
- 9-3-2-29 RX BLDG VENT RAD MON HI, alarms
- Control Room Ventilation Supply Radiation Monitor is currently reading 200 cpm

The immediate actions of AOP-44, Dropped Fuel Assembly are performed.

Which one of the following describes the Reactor Building Ventilation and SGTS alignment and the reason for the system alignment?

	<u>System Response</u>	<u>Reason</u>
A.	Reactor Building Ventilation Isolates and SGTS starts	Reactor Building Vent Rad Monitor is in Alarm
B.	Reactor Building Ventilation Isolates and SGTS starts	Refuel Area ARM Rad Hi is in alarm
C.	Reactor Building Ventilation is isolated and SGTS is running	Operator Manually performed per AOP-44 Dropped Fuel Assembly
D.	Reactor Building Ventilation continues to run and SGTS is in standby	Automatic trip setpoint has not been exceeded and RB Ventilation not required to be manually isolated

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295038; EK3.02
Importance Rating RO – 3.9, SRO-4.2

QUESTION 18.

K&A Statement:

**Knowledge of the reasons for the following responses
as they apply to HIGH OFF-SITE RELEASE RATE: System
Isolations**

Justification:

- A. Incorrect because the reactor building vent rad monitor at the Hi setpoint does not isolate the reactor building and start SGTS. Plausible if applicant does not know the Hi-Hi starts system versus the Hi alarm.
- B. Incorrect because the refuel area ARM does not isolate the reactor building and start SGTS. Plausible if applicant does not know which ARMs start SGTS.
- C. Correct-AOP immediate actions for a dropped fuel bundle are to isolate RB Ventilation per OP-51A. OP-51A has operator manually start SGTS prior to isolation of RB.
- D. Incorrect because the AOP does direct realigning the system. Plausible if applicant does not know immediate actions of AOP.

References: AOP-44, OP-51A, OP-20

Student Ref:

None

Learning Objective: LP-AOP 1.03

Question source: Modified NMP1 Q9

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis:

X

10CFR 41.5, 41.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 19.

The plant is at 100% power with the following:

- Fire Brigade leader confirms a reported fire in the relay room
- CO2 System High Temperature Alarm at panel FPP is in alarm

Which one of the following describes the (1) means of fixed CO2 suppression for the relay room area AND (2) the required position of the Control Room Ventilation ISOL & PURGE CONTROL switch to align Control Room ventilation?

- A. (1) Manual AND Auto Initiation
(2) PURGE
- B. (1) Manual Initiation ONLY
(2) PURGE
- C. (1) Manual AND Auto Initiation
(2) ISOL
- D. (1) Manual Initiation ONLY
(2) ISOL

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 20.

The plant is operating at 100% power with the Main Generator supplying 820 MWe and 200 MVAR to the grid. It is 11:30 am on Wednesday, May 15th.

- The main generator voltage regulator is in AUTO
- Generator hydrogen pressure is 57 psig
- Fitz 345 Line voltage is 360 kV

Subsequently there is a grid disturbance resulting in the following plant conditions:

- R935 breaker is out of service
- Fitz 345 Line voltage is 365 kV

Which **ONE** of the following describes the required action, if any, per OP-11A, “Main Generator, Transformers and Isolated Bus Phase Cooling”, considering the initial and final grid conditions?

- A. Place the voltage regulator control switch to RAISE to increase MVAR to at least 200 MVAR (OUT).
- B. Place the voltage regulator control switch to LOWER to decrease MVAR to less than 400 MVAR (OUT).
- C. Place the voltage regulator control switch to RAISE to increase MVAR to at least 325 MVAR (OUT).
- D. No action is required. The generator is operating within the Estimate Capability Curve and the Minimum Voltage/MVAR Operating Limits curves.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 700000: AA1.01
Importance Rating RO – 3.8; SRO – 3.7

QUESTION 20.
K&A Statement:

Ability to operate and/or monitor the following as they apply to
**GENERATOR VOLTAGE AND ELECTRICAL GRID
DISTURBANCES: Voltage regulator controls**

Justification:

- A. CORRECT. Per OP-11A Attachment 3, generator terminal voltage will be 24.4 kV under the given initial conditions of 360 kV on the Fitz 345 Line, with the main gen at 820 MWe and 200 MVAR out. Since the voltage regulator is in auto, it will maintain this generator terminal voltage thru the transient. Attachment 5, for on-peak hours with the R935 breaker out of service, should be used to determine the post-transient reactive load as 120 MVAR out when the Fitz 345 Line is at 365 kV and generator terminal voltage is at 24.4 kV. This same attachment specifies minimum generator terminal voltage and reactive load for real load less than 840 MWe at 24.7 kV and 200 MVAR. Therefore, the operator is required to raise voltage generator terminal voltage and MVAR out to > 24.7 kV and > 200 MVAR out, respectively.
- B. Incorrect. If applicant believes MVAR would have increased in this situation it is plausible using attachment 2 that the MVARs need to be lowered below 400 for this power and generator pressure.
- C. Incorrect. If applicant uses the 840-896 line in Attachment 5 it is plausible that raising MVARs to 325 would be required. However, the generator is at 820 MWe, so the <840 line is the correct line.
- D. Incorrect. If the applicant looks at Attachment 2 they may believe that no actions are required. However OP-11a step E.1.2 requires the generator parameters to be within both attachment 2 and attachment 5.

References: OP-11A, "Main Generator, Transformers and Isolated Bus Phase Cooling", Rev 37
OP-11C, "Main Generator Hydrogen Cooling and Seal Oil System", Rev 41

Student Ref: OP-11A, Section E.1 (pages 22 thru 25) and Attachments 2 through 12 (pages 55 thru 65)

Learning Objective: SDLP-94D, Obj 1.13

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis: X

10CFR 41.5 and 41.10

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 21.

Plant conditions are as follows:

- Reactor power is at 25%
- Feedwater level control failure has occurred.
- Operators have taken actions of AOP-41; High RPV Level.
- Reactor level is 228" and rising.
- Reactor pressure is 1000 psig.
- Annunciator 09-5-2-29 is in alarm for HIGH REACTOR WATER LEVEL

WHICH ONE of the following identifies the correct operator response?

- A. Enter AOP -1 "Reactor Scram"; Perform immediate actions. Automatic scram was due to turbine trip.
- B. Enter AOP – 42 "Lowering Feedwater Flow"; Attempt to reset feed pumps and maintain RPV Level in manual.
- C. Enter AOP-1 "Reactor Scram"; Perform immediate actions. Automatic scram was due to high Reactor pressure transient caused by turbine trip .
- D. Enter AOP-42 "Lowering Feedwater Flow"; Insert a manual scram

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295008; G.2.1.7
Importance Rating RO – 3.7; SRO – 3.7

QUESTION 21.
K&A Statement:

Ability to evaluate plant performance and make operational judgements as they apply to **HIGH REACTOR WATER LEVEL: REACTOR WATER LEVEL CONTROL**

Justification:

- A. **INCORRECT but plausible** – With reactor power at 25%, at 222.5 inches the main turbine, RFPTs, HPCI and RCIC have tripped on high RPV water level. However reactor power is within the capacity of the Main turbine bypass valves. There is no automatic scram.
- B. **INCORRECT but plausible:** At 222.5 inches the main turbine, RFPTs, HPCI and RCIC have tripped on high RPV water level. No guidance in AOP- 42 to reset the reactor feed pumps.
- C. **INCORRECT but plausible** – With reactor power at 25%, at 222.5 inches the main turbine, RFPTs, HPCI and RCIC have tripped on high RPV water level. However reactor pressure is within the capacity of the Main turbine bypass valves. There is no automatic scram.
- D. **CORRECT:** Once RFPTs have tripped RPV water level will begin to lower. Immediate actions of AOP-42, states with no RFPs in service which have all tripped due to level reaching 222.5 inches, then insert a manual scram.

References: AOP-41; AOP-42; AOP-1 Student Ref: None

Learning Objective: SDLP-06 R12; FWLC; L.O. 1.08.a

Question source: New

Question History: None

Cognitive level: Comprehensive/Analysis:

10CFR 41.7 / 45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 22.

The Unit is operating at 85 percent power with both Recirc Pumps at 86 percent speed. The "A" Recirc Pump controller is placed in manual for troubleshooting when a fuse blows in the speed control circuit.

SELECT the expected response of the Recirculation Pumps if Condensate Pump B trips, level decreases to 196.0 inches, and then is restored to +200 inches by feedwater.

	<u>RRP 'A' Speed</u>	<u>RRP 'B' Speed</u>
A.	44%	44%
B.	86%	44%
C.	30%	30%
D.	86%	30%

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295009; AK2.03
Importance Rating RO – 3.1; SRO – 3.2

QUESTION 22.

K&A Statement: Knowledge of the reasons for the following responses as they apply to **LOW REACTOR WATER LEVEL: RECIRCULATION SYSTEM**

Justification:

- A. **INCORRECT but plausible:** RRP 'A' will remain at 86% speed. It's control circuit will receive a runback signal but the speed will not change because its scoop tube, which controls pump speed, is locked in position by the control circuit fuse fault. RRP 'B' will act on low level runback signal, reducing its speed to 44%.
- B. **CORRECT:** Recirc pump runback to 44% is automatically initiated by RPV level less than 196.5 inches. RRP 'A' will remain at 86% speed. It's control circuit will receive a runback signal but the speed will not change because its scoop tube, which controls pump speed, is locked in position by the control circuit fuse fault. RRP 'B' will act on low level runback signal, reducing its speed to 44%.
- C. **INCORRECT:** RRP 'A' will remain at 86% speed. It's control circuit will receive a runback signal but the speed will not change because its scoop tube, which controls pump speed, is locked in position by the control circuit fuse fault. **Plausible because RRP runs back to 30% on total feed flow below 20%. Applicant may think the 30% runback is caused by condensate pump trip rather than total feed flow.**
- D. **INCORRECT:** RRP 'A' will remain at 86% speed. It's control circuit will receive a runback signal but the speed will not change because its scoop tube, which controls pump speed, is locked in position by the control circuit fuse fault. **Plausible because RRP runs back to 30% on total feed flow below 20%. Applicant may think the 30% runback is caused by condensate pump trip rather than total feed flow.**

References: AOP-42

Student Ref: None

Learning Objective: SDLP-21 R12; Recirc Flow Control; L.O. 1.10.b

Question source: Modified from SQ Exam 12/07

Question History: Modified

Cognitive level: Comprehensive/Analysis:

10CFR 41.8 / 45.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 23.

A reactor startup is in progress.

Reactor Power is 2%, when a Reactor Scram occurs

- Ten control rods remain at position “48”

WHICH ONE of the following describes the required operator action?

- A. Enter AOP-1 and insert control rods with RMCS
- B. Enter EOP-2 and insert control rods with RMCS
- C. Enter EOP-3 and insert control rods per EP-3
- D. Enter AOP-1 and insert control rods per EP-3

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295015; AA1.03
Importance Rating RO – 3.6; SRO – 3.8

QUESTION 23:

K&A Statement: Ability to operate and/ or monitor the following as they apply to
INCOMPLETE SCRAM: RMCS

Justification:

- A. **CORRECT:** AOP-1 step F.1 directs if any control rod is not full in and EOP-3 entry is not present then insert control rods with RMCS.
- B. **INCORRECT but plausible if candidates does not remember that** Stem conditions do not warrant entry into EOP-2.
- C. **INCORRECT but plausible if candidates does not remember that** Stem conditions do not warrant entry into EOP-3.
- D. **INCORRECT but plausible if candidates does not remember that** AOP-1 does not direct entry into EP-3

References: EOP-2 &3 and EP-3

Student Ref: None

Learning Objective: N/A

Question source: Modified from Limerick Exam 10/06 question 27

Question History: None

Cognitive level: Comprehensive/Analysis:

10CFR 41.7 / 45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 24.

The plant is operating at 100% power when the following occurs:

- 09-5-1-49, CRD PMP 3P-16A TRIP Alarms.
- 09-5-1-09, CRD CHARGING WTR PRES LO alarms.
- 09-5-1-43, CRD ACCUM PRESS LO OR LVL HI alarms.
- Yellow ACCUM Light is LIT for Control Rod 02-31, which is at position 48.

With these conditions, the procedurally required action is to:

- A. Place the Reactor Mode Switch in SHUTDOWN IMMEDIATELY.
- B. Place the Reactor Mode Switch in SHUTDOWN WITHIN 20 MINUTES.
- C. Close 03CRD-56 CRD Charging Water Supply Header Isol Valve, and then start CRD Pump B.
- D. Place the CRD Flow Controller in MANUAL, close the CRD Flow Control Valve and then start CRD Pump B.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295022; AK2.03
Importance Rating RO – 3.4; SRO – 3.4

QUESTION 24.

K&A Statement: Knowledge of the interrelations between **LOSS OF CRD** and the following: **ACCUMULATOR PRESSURES**

Justification:

- A. **Incorrect but plausible:** if charging water header pressure is not restored to greater than or equal to 940 psig within 20 minutes of a second accumulator light, then insert a manual scram. Only 1 accumulator alarm is in and 20 minutes have not passed.
- B. **Incorrect but plausible:** if charging water header pressure is not restored to greater than or equal to 940 psig within 20 minutes of a second accumulator light, then insert a manual scram. Only 1 accumulator alarm is in.
- C. **Incorrect but plausible:** preferred method for placing the CRD pump in service is to place the CRD Flow Controller in MANUAL, close the CRD Flow Control Valve, and then start CRD pump B.
- D. **CORRECT:** IAW procedure guidance of AOP-69; step E-3

References: AOP-69; Control Rod Drive Pump trouble Student Ref: None

Learning Objective: 1.08a SDLP-03C-R15; CRD Hydraulics

Question source: From JAF exam bank

Question History: From JAF exam bank

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7/45.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 25.

The plant is operating at 100% power when a LOCA occurs, resulting in the following:

- The reactor has scrammed on High Drywell pressure of 7 psig and rising slowly
- The reactor is shutdown
- MSIV's have closed
- HPCI and RCIC suction are aligned to the CST and are injecting into the RPV.
- Reactor pressure is being controlled between 800 and 1000 psig with SRVs.
- Torus temperature is 120 degs and rising slowly
- Torus level is 17 feet and rising slowly
- Reactor level is being maintained 177 in. to 222.5 in.

Assuming all parameters remain on their current trend, which one of the following describes the operator response to the current conditions and the reason for the response?

- A. An Emergency Depressurization is required if Torus level cannot be restored and maintained below the SRV Tail Pipe Level Limit (STPLL), because operation of SRV's above the STPLL could lead to SRV discharge line damage and/or containment failure.
- B. Depressurize the RPV to less than 200 psig, exceeding cooldown rates is authorized per EP-1, because Torus Temperature is at 120 F.
- C. Terminate injection into the RPV from sources external to Primary Containment, even if adequate core cooling is not assured, because when performing EOP-2 and EOP-4 concurrently, maintaining containment parameters takes precedent over adequate core cooling.
- D. Initiate Drywell Sprays when Torus pressure exceeds 15 psig to ensure that the Primary Containment Pressure Limit is not exceeded.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295029; EK3.01
Importance Rating RO – 3.5; SRO – 3.9

QUESTION 25.

K&A Statement: Knowledge of the reasons for the following responses as they apply to **HIGH SUPPRESSION POOL WATER LEVEL: EMERGENCY DEPRESSURIZATION**

Justification:

- A. **CORRECT:** An emergency depressurization is required if Torus level can not be restored and maintained below the SRV Tail Pipe Level Limit.
- B. **Incorrect but plausible:** EP-1 does state to depressurize below 200 psig if Torus temperature is at 120 F, however normal cooldown rates are in effect.
- C. **Incorrect but plausible:** Terminate injection into the RPV from sources external to Primary Containment is to be performed but only if adequate core cooling is assured. EP-1 states adequate core cooling takes precedent over containment parameters.
- D. **Incorrect but plausible:** Drywell sprays are required when Torus pressure exceeds 15 psig, but this is to preclude chugging which could lead to fatigue failure of the junction at the junction of the downcomers and the vent header.

References: EOP-4 and EP-1

Student Ref: None

Learning Objective: 1.07.a SDLP-16A; R-12 and T/s Bases 3.6.2.2

Question source: New

Question History: None

Cognitive level: Comprehensive/Analysis:

10CFR 41.5 / 45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 26.

With the unit at 100 percent power. The following conditions exist:

- RWCU Heat Exchanger Room area radiation is reading 900 mrem/hour.
- RWCU Pump Area Radiation Monitor is reading 900 mrem/hour.
- RWCU has failed to isolate.

Which one of the following actions is required?

- A. A Primary system is NOT discharging into the Reactor Building. Shutdown the Reactor IAW OP-65; Subsection F.
- B. A Primary system is NOT discharging into the Reactor Building. Continue Power Operations and attempt to isolate RWCU.
- C. A Primary system is discharging into the Reactor Building. Shutdown the Reactor IAW EOP-5 and EOP-2.
- D. A Primary system is discharging into the Reactor Building. Emergency depressurize the Reactor IAW EOP-5 and EOP-2.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 295033; EA2.01
Importance Rating RO – 3.8; SRO – 3.9

QUESTION 26.

K&A Statement: Ability to determine and/or interpret the following as they apply to
**HIGH SECONDARY CONTAINMENT AREA RADIATION
LEVELS: AREA RADIATION LEVELS**

Justification:

- A. **Incorrect but plausible:** A primary system is discharging into the Reactor Building.
- B. **Incorrect but plausible:** A primary system is discharging into the Reactor Building.
- C. **CORRECT:** A primary system is discharging into the Reactor Building. Emergency depressurization must occur after 2 rooms exceed the maximum safer Area radiation Levels which is 1000 mrem/hr. Since radiation levels are only 900 mrem/hr, a unit Shutdown should be started. If radiation levels exceed 1000 mrem/hr an emergency depressurization is required.
- D. **Incorrect but plausible:** A primary system is discharging into the Reactor Building. Emergency depressurization must occur after 2 rooms exceed the maximum safer Area radiation Levels, which is 1000 mrem/hr.

References: EOP-5 and EOP-2

Student Ref: None

Learning Objective: 1.14.5 SDLP.17 R-10 Reactor Building Area radiation Monitors

Question source: NEW

Question History: NEW

Cognitive level: Comprehensive/Analysis:

10CFR 41.7/45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 27.

A large break LOCA has occurred and the following conditions exist:

- Reactor Level is -60 inches and slowly rising
- Drywell Pressure is 12 psig and slowly rising

Which one of the following describes the availability of the Hydrogen and Oxygen Sampling Systems and what actions are required?

The Hydrogen and Oxygen Sampling Systems are...

- A. Isolated, direct Chemistry to manually sample with the Post Accident Monitoring System.
- B. Available and lined up, verify proper operation at the H₂/O₂ Analyzer Cabinets.
- C. Isolated, bypass the isolation using EP-2 to obtain a sample.
- D. **NOT** available, direct Chemistry to manually sample the Containment using CA-01.02 or PSP-17.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 500000; EA2.01
Importance Rating RO – 3.1; SRO – 3.5

QUESTION 27.

K&A Statement:

Ability to determine and/or interpret the following as they apply to
**HIGH PRIMARY CONTAINMENT HYDROGEN
CONCENTRATIONS:
HYDROGEN MONITORING SYSTEM AVAILABILITY**

Justification:

- A. **Incorrect but plausible:** if the candidate forgets the Post Accident Sampling System is used under severe LOCA conditions to sample the primary coolant.
- B. **Incorrect but plausible:** if the candidate forgets that the RPV level and Drywell pressure signals have caused an isolation of the H2/O2 Analyzer Cabinet.
- C. **CORRECT:** In accordance with EOP-2, defeat isolation with EP-2 place H2/O2 Analyzer Cabinets in service.
- D. **Incorrect but plausible:** if the candidate forgets that this sampling method is only done when H2/O2 Analyzer Cabinet is not available. The cabinet can be restored with EP-2.

References: SDLP-16B R20

Student Ref: None

Learning Objective: 1.05.3.a and b

Question source: Modified to JAF format

Question History: NMP 1; NRC 10/08; Q-65

Cognitive level: Memory or Fundamental Knowledge

10CFR 41.10/ 43.5 / 45.13

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 28.

The following describes the initial plant conditions:

- Reactor is at 100% power.
- RHR Loop 'A' is in Suppression Pooling Cooling.

Subsequently, a reactor coolant leak occurs and the following conditions exist:

- Reactor pressure is 500 psig and dropping
- Reactor level is 60" and dropping
- Drywell pressure is 10.0 psig and rising

WHICH ONE of the following describes the current position of the following RHR Loop 'A' valves for LPCI injection:

10MOV-66A, A RHR Htx Shell Side Bypass Valve
10MOV-39A, RHR Full Flow Test Return Valve
10MOV-16A, A RHR Pp Min Flow Valve
10MOV-25A, A RHR LPCI Injection PCIV

- A. 10MOV-66A - Open
10MOV-39A - Closed
10MOV-16A - Open
10MOV-25A - Closed
- B. 10MOV-66A - Closed
10MOV-39A - Closed
10MOV-16A - Open
10MOV-25A - Closed
- C. 10MOV-66A - Open
10MOV-39A - Closed
10MOV-16A - Closed
10MOV-25A - Open
- D. 10MOV-66A - Closed
10MOV-39A - Open
10MOV-16A - Closed
10MOV-25A - Closed

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 203000; K4.01
Importance Rating RO – 4.2; SRO – 4.2

QUESTION 28.
K&A Statement:

Knowledge of **RHR/LPCI: INJECTION MODE design feature(s) and/or interlocks which provide for the following: AUTOMATIC SYSTEM INITIATION/INJECTION**

Justification:

- A. **CORRECT:** LOCA signal closes Torus return valve and Heat exchanger bypass valve remains open. RPV pressure is not below 450 psig. Min flow valve is open and LPCI injection is closed, but will open at 450 psig.
- B. **Incorrect but plausible:** LOCA signal closes Torus return valve and Heat exchanger bypass valve remains open. RPV pressure is not below 450 psig. Min flow valve is open and LPCI injection is closed, but will open at 450 psig.
- C. **Incorrect but plausible:** LOCA signal closes Torus return valve and Heat exchanger bypass valve remains open. RPV pressure is not below 450 psig. Min flow valve is open and LPCI injection is closed, but will open at 450 psig.
- D. **Incorrect but plausible:** LOCA signal closes Torus return valve and Heat exchanger bypass valve remains open. RPV pressure is not below 450 psig. Min flow valve is open and LPCI injection is closed, but will open at 450 psig.

References: SDLP-10 R19; RHR Student Ref: None

Learning Objective: SDLP-10R19;1.05.a.1.a

Question source: Modified to JAF format

Question History: Limerick 10/08 Exam; Q-28

Cognitive level: Comprehensive/Analysis:

10CFR 41.5 / 45.5

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 29.

The 'B' RHR pump is in shutdown cooling mode with 'A' RPS Bus on alternate power source and 'B' RPS Bus powered from a motor generator set.

Which one of the following conditions would result in a loss of shutdown cooling?

- A. Loss of the 10600 bus
- B. Loss of 71MCC-251-0C1
- C. RPV water level lowering to 187 inches
- D. RPV water temperature rising to 325°F

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A #
Importance Rating

205000; A3.01
RO – 3.2; SRO – 3.1

QUESTION 29.

K&A Statement: Ability to monitor automatic operations of the **SHUTDOWN COOLING SYSTEM: VALVE OPERATION.**

Justification:

- A. **Incorrect but plausible:** if candidate believes the loss of 10600 bus powers 'A' and 'B' RHR pumps. 10600 powers 'C' and 'D' RHR pumps. 10500 bus powers 'A' and 'B' RHR pumps.
- B. **Incorrect;** Since 'A' RPS is on it's alternate power supply **but plausible** if the candidate thinks 71MCC-251-0C1 is 'A' RPS normal power supply. The alternate power supply for 'A' RPS is 71MCC-252-0C1.
- C. **Incorrect but plausible:** Isolation occurs at an RPV level setpoint of 177".
- D. **CORRECT:** 325°F corresponds to an RPV saturation pressure of approximately 80 psig will close 10MOV-17 and 10MOV-18.

References: AOP-30; Loss of Shutdown Cooling
AOP-59; Loss of RPS Bus A Power
SDLP-10, RHR System, Rev 19, Page 48 of 137

Student Ref: Steam tables

Learning Objective: SDLP-10 R19; RHR 1.05.4 N/A

Question source: New

Question History: None

Cognitive level: Comprehensive/Analysis:

10CFR 41.7 / 45.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 30.

Given the following

- The unit is operating at 90% power.
- The Quarterly HPCI surveillance test is in progress and is taking longer than expected.
- Annunciator 9-3-3-5 HPCI TORUS LVL Hi has just been received.

What is the expected response of HPCI to the Suppression Pool High Level alarm?

- A. No effect since HPCI suction valves do not transfer on High Suppression Pool Level.
- B. HPCI Suppression Pool Suction Valves 23MOV-57 and 58 receive an open signal, when the valves are full open, the CST Suction Valve 23MOV-17 will go closed.
- C. HPCI Suppression Pool Suction Valves 23MOV-57 and 58 receive an open signal and simultaneously CST Suction Valve 23MOV-17 receives a closed signal.
- D. HPCI Suppression Pool Suction Valves 23MOV-57 and 58 receive an open signal, CST suction valve 23MOV-17 does not receive any signal.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 206000; A4.09
Importance Rating RO – 3.8; SRO – 3.7

QUESTION 30.

K&A Statement:

Ability to manually operate and /or monitor in the control room:
SUPPRESSION POOL LEVEL

Justification:

K/A match for suppression pool level based on during the performance of the HPCI ST, suppression pool water level will need to be monitored.

- A. **Incorrect but plausible:** if the candidate forgets Torus water level ≤ 14 feet, the Torus suction valves 23MOV-57 and 58 will get an open signal. When the 23MOV-57 and 58 are open, CST suction 23MOV-17 will automatically close.
- B. **CORRECT:** Torus water level ≤ 14 feet, the Torus suction valves 23MOV-57 and 58 will get an open signal. When the 23MOV-57 and 58 are open, CST suction 23MOV-17 will automatically close.
- C. **Incorrect but plausible:** if the candidate forgets Torus water level ≤ 14 feet, the Torus suction valves 23MOV-57 and 58 will get an open signal. When the 23MOV-57 and 58 are open, CST suction 23MOV-17 will automatically close.
- D. **Incorrect but plausible:** if the candidate forgets Torus water level ≤ 14 feet, the Torus suction valves 23MOV-57 and 58 will get an open signal. When the 23MOV-57 and 58 are open, CST suction 23MOV-17 will automatically close.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

References: SDLP-23 R15; HPCI

Student Ref: None

Learning Objective: 1.05.b.1

Question source: Modified to JAF

Question History: HC NRC Exam 11/05; question 39

Cognitive level: Memory

10CFR 41.7 / 45.5 to 45.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 31.

Given the following conditions at T= 0 seconds:

- An un-isolable small LOCA and LOP have occurred
- Drywell pressure is 10 psig and rising
- RPV water level is 65 inches and slowly lowering
- At T=19 seconds, RPV pressure is 350 psig and slowly lowering

Which one of the following identifies the Core Spray response at T=19 seconds to the conditions specified above?

- A. Core Spray pumps must be manually started.
- B. Core Spray pumps are not running.
- C. Core Spray pumps are running and injecting.
- D. Core Spray Pumps are running but cannot inject.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 209001; G.2.1.28
Importance Rating RO – 4.1; SRO – 4.1

QUESTION 31.

K&A Statement: Knowledge of the purpose and function of major system components and controls: **AUTOMATIC SYSTEM INITIATION**

Justification:

- A. **INCORRECT but plausible if candidates do not remember that** Core Spray pumps receive an auto start signal. Injection valve gets power when the EDG output breaker closes and will be stroking open.
- B. **CORRECT:** EDG output breakers close at T=10 second however the Core Spray pumps do not start until T=21 seconds.
- C. **INCORRECT but plausible if candidates do not remember that** EDG output breakers close at T=10second however the Core Spray pumps due not start until T=21 seconds. Injection valves are opening.
- D. **INCORRECT but plausible if candidates do not remember that** EDG output breakers close at T=10 second however the Core Spray pumps due not start until T=21 seconds.

References: SDLP-14; R12

Student Ref: None

Learning Objective: 1.05.c.1

Question source: Modified

Question History: NMP 1 10/08 exam; Q - 1

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7/ 43.5/ 45.4

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 32.

The plant was operating at 100% power when a Containment isolation resulted in the following:

- Reactor Power is 15%
- SRVs are cycling to control reactor pressure
- SLC pumps have been manually started from the Control Room

Which one of the following describes indications that the squib valves have fired and the explosive valves are open?

- A. Current meter inside back of Panel 09-3 indicates 4 mA.
- B. Discharge pressure of the SLC pumps is 1150 psig.
- C. Current meter inside back of Panel 09-3 indicates 5 mA.
- D. Discharge pressure of the SLC pumps is 1500 psig.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 211000; K5.04
Importance Rating RO – 3.1; SRO – 3.2

QUESTION 32.

K&A Statement:

Knowledge of **STANDBY LIQUID CONTROL SYSTEM** design feature(s) and / or interlocks which provide for the following:
EXPLOSIVE VAVLE OPERATION

Justification:

- A. **Incorrect but plausible:** meter indicates there is continuity and the squibb valves have not fired.
- B. **CORRECT:** SLC is injecting because the discharge pressure of the pump is slightly above the SRV pressure setpoint
- C. **Incorrect but plausible:** 4.3 mA is normal firing current, but after firing, the indication goes to 0 mA due to the loss of continuity.
- D. **Incorrect but plausible:** squibb valves are not open, pump is at dead head pressure of the SLC pumps.

References: SDLP11 R12

Student Ref: None

Learning Objective: 1.05.9

Question source: New

Question History: Modified from NMP 1 exam 8/09; Q-34

Cognitive level: Comprehensive/Analysis:

10CFR 41.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 33.

The following describes the initial plant conditions:

- Reactor is at 100% power.
- A loss of 125 DC power, 71DCB5 to 'B' ARI/RPT logic has occurred
- Subsequently, a Main turbine trip occurs with a failure to scram

Describe the capability of the ATWS RPT 'A' ARI/RPT logic?

- A. Automatic initiation of ARI is available.
- B. Manual initiation of RPT is available.
- C. Automatic initiation of ARI and RPT is available.
- D. Manual initiation of ARI is available.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 212000; K6.04
Importance Rating RO – 2.8; SRO – 3.1

QUESTION 33.

K&A Statement: Knowledge of the effect that a loss or malfunction of the following will have on the **REACTOR PROTECTION SYSTEM** including:
DC ELECTRICAL DISTRIBUTION

Justification:

- A. **Incorrect but plausible:** Both logic circuits must be energized in order for a complete ARI and RPT to occur. Loss of either 71DCA5 or 71DCB5 renders the automatic initiation of ARI and RPT completely inoperable. A loss of 'B' Logic power supply will still leave the manual ARI initiation operable because it is entirely powered by 'A' Logic.
- B. **Incorrect but plausible:** Both logic circuits must be energized in order for a complete ARI and RPT to occur. Loss of either 71DCA5 or 71DCB5 renders the automatic initiation of ARI and RPT completely inoperable. A loss of 'B' Logic power supply will still leave the manual ARI initiation operable because it is entirely powered by 'A' Logic.
- C. **Incorrect but plausible:** Both logic circuits must be energized in order for a complete ARI and RPT to occur. Loss of either 71DCA5 or 71DCB5 renders the automatic initiation of ARI and RPT completely inoperable. A loss of 'B' Logic power supply will still leave the manual ARI initiation operable because it is entirely powered by 'A' Logic.
- D. **CORRECT:** A loss of 'B' Logic power supply will still leave the manual ARI initiation operable because it is entirely powered by 'A' Logic.

References: SDLP-05 R16;RPS

Student Ref: None

Learning Objective: 1.05.c.3

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7 / 45.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 34.

A unit startup is in progress with Reactor power on IRM range 5 then the following occurs:

- The 'A' 24 VDC battery charger trips due to an electrical failure within the charger.

How long will the battery be able to supply normal loads and what will be the response of the 'A' side IRMs as the battery is depleted?

- A. 2 hours; failing upscale causing a rod block from 'A' RPS
- B. 4 hours; failing downscale causing a rod block and a half trip of 'A' RPS.
- C. 8 hours; failing downscale causing a rod block from 'A' RPS
- D. 12 hours; failing upscale causing a rod block and a half trip of 'A' RPS.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 215003; K6.02
Importance Rating RO – 3.6; SRO – 3.8

QUESTION 34.

K&A Statement: Knowledge of the effect that a loss or malfunction of the following will have on the **INTERMEDIATE RANGE MONITORS (IRM) SYSTEM: 24/48 VOLT D.C. POWER**

Justification:

- A. **Incorrect but plausible:** if the candidate forgets the 24 VDC battery is designed to provide power for 4 hours and IRM indications will fail downscale, causing a rod block and a half trip on the 'A' RPS side.
- B. **Correct:** The 24 VDC battery is designed to provide power for 4 hours. IRM indications will fail downscale, causing a rod block and a half trip on the 'A' RPS side.
- C. **Incorrect but plausible:** if the candidate forgets the 24 VDC battery is designed to provide power for 4 hours and IRM indications will fail downscale, causing a rod block and a half trip on the 'A' RPS side.
- D. **Incorrect but plausible:** if the candidate forgets the 24 VDC battery is designed to provide power for 4 hours and IRM indications will fail downscale, causing a rod block and a half trip on the 'A' RPS side.

References: SDLP-07B R11

Student Ref: None

Learning Objective: 1.10.c

Question source: Modified

Question History: HC exam 11/05: Q-36

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7 / 45.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 35.

The following plant conditions exist:

- Reactor Mode Switch is in START/ HOT STANDBY
- All IRMs are on Range 2
- SRM A is reading 50 cps
- SRMs B,C and D are reading 8.3×10^4 cps
- A rod block signal has been generated.

Which one of the following has caused the SRM rod block?

- A. SRM Detector Not Full in
- B. SRM Hi Flux
- C. SRM Downscale
- D. SRM Inop

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 215004; A1.02
Importance Rating RO – 3.6; SRO – 3.7

QUESTION 35.

K&A Statement:

Ability to predict and/or monitor changes in parameters associated with operating the **SOURCE RANGE MONITOR (SRM) SYSTEM** controls including:
REACTOR POWER INDICATION

Justification:

- A. **CORRECT:** 'A' SRM is not fully inserted, indicating < 100 cps.
- B. **Incorrect but plausible if the:** candidate forgets that the SRM Hi Flux setpoint is 10E+5 cps and not 10E +4.
- C. **Incorrect but plausible if the:** candidate forgets that the SRM downscale is not bypassed when the IRMs are on range 2.
- D. **Incorrect but plausible if the:** candidate forgets none of the setpoints have been reached for Low voltage; Module unplugged, and switch out of operate

References: SDLP-07B R11; Startup range Neutron Monitoring Student Ref: None

Learning Objective: 1.14.a,b,c

Question source: Modified

Question History: HC exam 11/05 Q-37

Cognitive level: Analysis

10CFR 41.5/ 45.5

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 36.

The unit is on line at 100% power when "C" Flow unit fails downscale.

What will be the response from RPS and/or Control Rod Block?

- A. Comparator trip from the flow unit, rod block only.
- B. 'C' APRM rod block and half scram on 'A' RPS only.
- C. Rod blocks from 'C' flow unit and 'A', 'C' and 'E' APRM and half scram on 'A' RPS only.
- D. Rod blocks from 'C' flow unit and 'A' 'C' and 'E' APRM only.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 215005; A1.02
Importance Rating RO – 3.9; SRO – 4.0

QUESTION 36.

K&A Statement: Ability to predict and/or monitor changes in parameters associated with operating the APRM controls including:
RPS STATUS

Justification:

- A. **Incorrect but plausible:** if candidate forgets flow signal passes thru a low value gate. With 'A' Flow unit indicating normal, the flow signal from 'C' flow unit will be passed, causing a 10% comparator trip (rod block) from the flow unit and rod blocks and half scram trip from 'A', 'C' and 'E' APRMs.
- B. **Incorrect but plausible:** if candidate forgets flow signal passes thru a low value gate. With 'A' Flow unit indicating normal, the flow signal from 'C' flow unit will be passed, causing a 10% comparator trip (rod block) from the flow unit and rod blocks and half scram trip from 'A', 'C' and 'E' APRMs.
- C. **CORRECT:** flow signal passes thru a low value gate. With 'A' Flow unit indicating normal, the flow signal from 'C' flow unit will be passed, causing a 10% comparator trip (rod block) from the flow unit and rod blocks and half scram trip from 'A', 'C' and 'E' APRMs flow biased trips.
- D. **Incorrect but plausible:** if candidate forgets flow signal passes thru a low value gate. With 'A' Flow unit indicating normal, the flow signal from 'C' flow unit will be passed, causing a 10% comparator trip (rod block) from the flow unit and rod blocks and half scram trip from 'A', 'C' and 'E' APRMs.

References: SDLP-07C R10

Student Ref: None

Learning Objective: 1.05.a.2.a and 1.05.a.3.d

Question source: New

Question History: None

Cognitive level: Analysis

10CFR 41.7/ 45.5 to 45.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 37.

The unit is on line at 100% power with the following conditions:

- RX WTR LVL COLUMN SEL 06-S1 switch is in B-LEVEL.
- RCIC is in service for its quarterly surveillance test.
- A loss of DC Power System 'B' occurs.

With the loss of DC Power System 'B' select the correct status for RCIC?

- A. RCIC is not available, a loss of power to all RCIC MOVs except 13MOV-15 has occurred.
- B. RCIC is available, if RPV level approaches the high level trip, then close 13MOV-131.
- C. RCIC is not available, a loss of power to RCIC logic 'B' has occurred.
- D. RCIC is available, if RPV level approaches the high level trip, then RCIC would trip.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 217000;K6.01
Importance Rating RO – 3.4; SRO – 3.5

QUESTION 37.

K&A Statement: Knowledge of the effect that a loss or malfunction of the following will have on the **REACTOR CORE ISOLATION COOLING SYSTEM (RCIC): ELECTRICAL POWER**

Justification:

- A. **Incorrect but plausible if the candidate** forgets that RCIC is not available. This action is for a loss of DC Power System 'A'. AOP-45.
- B. **CORRECT:** IAW AOP-46, this is an override for if RPV level approaches the high RPV water level trip, then close TURB STM SUPP VLV 13MOV-131.
- C. **Incorrect but plausible if the candidate** forgets that RCIC is available. This action is for a loss of DC Power System 'A'. AOP-45.
- D. **Incorrect but plausible if the candidate** RCIC is available for control of RPV water level and pressure; however, there is no high level trip for RCIC IAW AOP-46, a loss of DC Power System 'B'.

References: SDLP -13 R14; RCIC
AOP-46 and AOP-41

Student Ref: None

Learning Objective: 1.10.b

Question source: New

Question History: None

Cognitive level: Comprehensive/Analysis:

10CFR 41.7 / 45.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 38.

The plant was operating at 100% power. Subsequently a LOCA occurs.

The plant configuration at T=0 is as follows:

- Reactor vessel water level is + 55 inches.
- HPCI and RCIC are injecting with discharge pressure at 1000 psig.
- ADS Normal/Override switches on Panel 09-4 are in the Normal position.
- At T=30 seconds Annunciator 09-4-1-28 [ADS Timers Actuated] lit.
- Core Spray pumps are running on minimum flow at 120 psig.
- Drywell pressure is 2.5 psig.

At T= 145 seconds, RPV water level is at + 70 inches.

What is the status of all ADS valves at T= 180 seconds?

- A. Open. ADS valves opened at T=150 seconds.
- B. Closed. Low pressure ECCS pump running logic is not satisfied.
- C. Open. ADS valves opened at T= 120 seconds.
- D. Closed. ADS TIMER is reset.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 218000; K5.01
Importance Rating RO – 3.8; SRO – 3.8

QUESTION 38.
K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to **AUTOMATIC DEPRESSURIZATION SYSTEM: ADS LOGIC OPERATION**

Justification:

- A. **Incorrect but plausible if the candidate** does not recognize that the ADS time delay relay has been reset since RPV water level is above 59.5 inches. The ADS valves will remain closed.
- B. **Incorrect but plausible if the candidate** the low pressure ECCS pump running logic is satisfied with Core Spray discharge pressure at 120 psig. The candidate may not recognize that the ADS time delay relay has been reset since RPV water level is above 59.5 inches. The ADS permissives have not been satisfied. The ADS valves will remain closed.
- C. **Incorrect but plausible if the candidate** does not recognize that the ADS time delay relay has been reset since RPV water level is above 59.5 inches. The ADS permissives have not been satisfied. The ADS valves will remain closed.
- D. **CORRECT:** The ADS time delay relay has been reset since RPV water level is above 59.5 inches. The ADS valves will remain closed.

References: SDLP-02 R12; ADS

Student Ref: None

Learning Objective: 1.05.c.1 and 1.10.c

Question source: Modified

Question History: From JAF NRC 03/08: Q-38

Cognitive level: Comprehensive/Analysis:

10CFR 41.7/ 45.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 39.

During full power operation, I&C is conducting PCIS Group 1 Testing per Instrument Surveillance Procedures on transmitters, 02-3LT-57A through 57D. The technician commences testing RPV Level 1 response on level transmitter 02-3LT-57B. by inserting a level signal of < 59.5" on 02-3LT-57B, and at the same time level transmitter 02-3LT-57D fails downscale.

Which of the following describes the plant response and the operator response?

<u>Plant response</u>	<u>Operator Response</u>
A. Outboard MSIV's closed causing Reactor SCRAM.	Enter AOP-1, Rx scram and AOP-15 Isolation Verification and recovery and EOPs
B. All MSIV's closed causing Reactor SCRAM.	Enter AOP-1, Rx scram and AOP-15 Isolation Verification and recovery and EOPs
C. Half Isolation signal on PCIS 'B'.	Operators direct I&C Technician to restore 02-3LT-57B per AP-02.06, procedure use and adherence and reset the isolation signal per AOP-15, isolation verification and recovery.
D. Half Isolation signal on PCIS 'B'.	Operators direct I&C Technician to restore restore 02-3LT-57B per AP-02.06, procedure use and adherence and stop further testing.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 223002;A2.05
Importance Rating RO – 3.3; SRO – 3.6

QUESTION 39.
K&A Statement:

Ability to predict (a) predict the impacts of the following on the **PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF**; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
NUCLEAR BOILER INSTRUMENTATION FAILURES

Justification:

Group 1 MSIV Logic includes RPV Low Level. To permit testing and guard against spurious instrument failure, the de-energized- to-function, fail-safe logic, initiates a 1 out of 2 taken twice arrangement, which is also divided between two divisions. The failure of any one transmitter (either LT-57A or IC, 'B' or ID') will not cause MSIV Closure, just indication of partial logic actuation; the consequences will depend upon which ones are involved. Any combination of one on 'A' logic (LT-57A or 57C) and one on 'B' logic (LT-57B or 57D) will fulfill complete logic and MSIV's (all) will automatically close. If both transmitters on the same logic train fail, it will result in no more than the half isolation logic actuation.

- A. **Incorrect but plausible if the candidate** forgets that only a partial isolation has occurred on LT-57B and LT-57D.
- B. **Incorrect but plausible if the candidate** forgets that only a partial isolation has occurred on LT-57B and LT-57D.
- C. **Incorrect but plausible if the candidate** forgets that only a partial isolation has occurred on LT-57B and LT-57D. However with LT-57D failed downscale the isolation will not be able to be reset.
- D. **CORRECT-** (1) Half isolation signal on PCIS 'B' (2) operators direct I&C technician to restore 02-3LT-57B per AP-02.06, PROCEDURE USE AND ADHERANCE and stop further testing.

References: SDLP-16c R08

Student Ref: None

Learning Objective: 1.06.a

Question source: Bank

Question History: JAF NRC exam 7/03; Q-43

Cognitive level: Comprehensive/Analysis:

10CFR 41.5 / 45.5

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 40.

The unit is on line at 100% power when a spurious trip of the Main Turbine occurs.

Which of the following describes the design bases on how the SRVs will respond to this transient?

- A. 'D' and 'E' SRVs will open first by the SRV Electric Lift System.
- B. 'K' and 'L' SRVs will open first by their mechanical setpoint.
- C. 'D' and 'E' SRVs will open first by their mechanical setpoint.
- D. 'K' and 'L' SRVs will open first by the SRV Electric Lift System.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 239002; A3.02
Importance Rating RO – 4.3; SRO - 4.3

QUESTION 40.
K&A Statement:

Ability to monitor automatic operations of the **RELIEF/SAFEETY VALVES** including:

SRV OPERATION ON HIGH REACTOR PRESSURE

Justification:

All the safety/relief valves (SRVs) can also be operated by the SRV Electric Lift System (SRVELS). The SRVELS opens the SRV's electrically by energizing the solenoid valves on the pilot stage assembly located on each SRV. The electric lift initiation is designed to break any corrosion bonding on the valve seat to assist the existing mechanical relief in performing its intended function. The SRVELS functions only as an electrical back up to the mechanical setpoint and does not prevent the mechanical portion of the ARV from operating as designed.

- A. **Incorrect but plausible if the candidate forgets** 'D' and 'E' SRVs lift setpoint is 1140 psig which is above the 'K' and 'L' SRV lift setpoint of 1135 psig. Also the SRV Electric Lift System is a backup to the mechanical lift.
- B. **CORRECT** - 'K' and 'L' SRVs lift setpoint is 1135 psig which is below the 'D' and 'E' SRV lift setpoint of 1140 psig.
- C. **Incorrect but plausible if the candidate forgets** 'D' and 'E' SRVs lift setpoint is 1140 psig which is above the 'K' and 'L' SRV lift setpoint of 1135 psig.
- D. **Incorrect but plausible if the candidate forgets** 'K' and 'L' SRVs lift setpoint is 1135 psig which is below the 'D' and 'E' SRV lift setpoint of 1140 psig. Also the SRV Electric Lift System is a backup to the mechanical lift.

References: SDLP-02 R12; ADS

Student Ref: None

Learning Objective: 1.05.a.1

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7 / 45.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 41.

The plant is operating at 100% power. The Feedwater Level control system is maintaining RPV water level at the desired reactor water level in three element control.

The "A" main feed line flow D/P instrument fails downscale to zero and remains at zero.

Which one of the following describes the direction and magnitude of the RPV water level change?

- A. Lowers, and the Reactor scrams when RPV level reaches the low level setpoint.
- B. Rises, and the turbine trips when RPV level reaches the high turbine trip setpoint.
- C. Lowers, and power operation continues with RPV level controlling below the master feedwater controller level setpoint.
- D. Rises, and power operation continues with RPV level controlling above the master feedwater controller level setpoint.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 259002; K3.01
Importance Rating RO - 3.8; SRO – 3.8

QUESTION 41.

K&A Statement:

Knowledge of the effect that a loss or malfunction of the **REACTOR WATER LEVEL CONTROL SYSTEM** will have on the following: **REACTOR WATER LEVEL**

Justification:

- A. **Incorrect but plausible:** if candidate thinks the mismatch will lower feed system flow which would cause a lowering level.
- B. **Incorrect but plausible:** Total feed flow signal decreases, feed flow/steam flow mismatch will cause the feed system flow to rise, however the level error will balance the feed/steam mismatch error and level will rise about 11" to 212". The turbine trip is at 222.5" and therefore the turbine will not trip. Plausible if the candidate does not know the level error can compensate for the feed flow error signal.
- C. **Incorrect but plausible:** if candidate thinks the mismatch will lower feed system flow which would cause a lowering level..
- D. **CORRECT:** Total feed flow signal decreases, feed flow/steam flow mismatch will cause the feed system flow to rise, however the level error will balance the feed/steam mismatch error and level will rise about 11" to 212". The turbine trip is at 222.5" and therefore the turbine will not trip.

References: SDLP-06 R12; FWLC System

Student Ref: None

Learning Objective: 1.08.b

Question source: Modified

Question History: From JAF exam bank; Q-33

Cognitive level: Comprehensive/Analysis:

10CFR 41.7/45.5; 41.7/45.5 to 45.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 42.

It is required to vent the Primary Containment following a LOCA:

Which **ONE** of the following paths is the preferred Primary Containment Vent and Purge Strategy for these conditions?

- A. Vent the Torus through **ONE** Standby Gas Treatment Train and purge the Drywell.
- B. Vent the Drywell through **ONE** Standby Gas Treatment Train and purge the Torus.
- C. Vent the Torus through **BOTH** Standby Gas Treatment Trains and purge the Drywell.
- D. Vent the Drywell **BOTH** Standby Gas Treatment Trains and purge the Torus.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 261000; K1.03
Importance Rating RO – 2.9; SRO – 3.1

QUESTION 42.

K&A Statement: Knowledge of physical connection and/or cause-effect relationship between **STANDBY GAS TREATMENT SYSTEM and the following: SUPPRESSION POOL**

Justification:

- A. **CORRECT:** The preferred vent/purge flow path is to vent from the torus and purge through the drywell. This flow path has the following advantages:
- Maintains pressure suppression function
 - Scrubs gases before release
 - Ensures effective vent and purge of both drywell and torus
- If Primary Containment will be vented to maintain torus pressure below PCPL or PSP, then perform Subsection 5.2 alone or concurrently with any one applicable gas control strategy. Ensure only one SGT train is in service.
- B. **Incorrect but plausible:** if candidate forgets the Torus is the preferred path because by requiring the Drywell atmosphere to be pulled through the Torus to be vented, release rates can be minimized. Torus water level is low enough at 13.9 feet to allow this, but this is not the preferred path.
- C. **Incorrect but plausible:** if candidate forgets that the venting is to be done with only one SGT Train. While venting the primary containment, the in service SGT train could rupture and cause a ground level release. Ensure only one SGT train is in service.
- D. **Incorrect but plausible:** if candidate forgets the Torus is the preferred path because by requiring the Drywell atmosphere to be pulled through the Torus to be vented, release rates can be minimized. Torus water level is low enough at 13.9 feet to allow this; While venting the primary containment, radiation dose rates will rise in the following areas:
- Along primary containment vent piping in the Reactor Building
 - Above underground vent piping between the Reactor Building and Stack
 - In the vicinity of the Stack
 - In the Standby Gas Treatment System Room
- While venting the primary containment, the in service SGT train could rupture and cause a ground level release. Ensure only one SGT train is in service

References: SDLP-01B; Standby Gas treatment Student Ref: None

Learning Objective: 1.06.b

Question source: NMP #1; NRC 10/08; question 5

Question History: NMP #1; NRC 10/08; question 5

Cognitive level: Memory/Fundamental knowledge:
10CFR 41.7/45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 43.

The following conditions exist at the plant.

- The unit is at 100% power.
- The electrical alignment is normal.
- 09-8-3-17 annunciates for Bus 10300-10500 4 KV Tie Bkr 10304 Trip.

Which one of the following conditions on Bus 10500 would cause the breaker to trip?

- A. 'C' EDG in service with rated voltage 76% and bus voltage at 72% for 2.5 seconds.
- B. Rated voltage at 92% for 7 seconds with LOCA signal present.
- C. Rated voltage at 92% for 90 seconds with No LOCA signal present.
- D. 'A' EDG in service with rated voltage at 74% and Bus voltage at 72%.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 262001; K4.02
Importance Rating RO - 2.9; SRO – 3.3

QUESTION 43.

K&A Statement: Knowledge of **A.C. ELECTRICAL DISTRIBUTION** design feature (s) and /or interlocks which provide for the following:
CIRCUIT BREAKER AUTOMATIC TRIPS

Justification:

- A. **Incorrect but plausible:** if candidate believes required bus voltage 76% for 2.5 seconds will trip ACB 10304 and 'C' EDG voltage >75%.
- B. **Incorrect but plausible:** if candidate believes < 92% for only 7 seconds.
- C. **CORRECT:** Bus voltage < 93% for 45 seconds with No LOCA signal present.
- D. **Incorrect but plausible:** if candidate believes 'A' EDG is < 75% and bus voltage < 71.5%.

References: SDLP-71E 4160 AC Distribution Student Ref: None

Learning Objective: 1.12.a

Question source: New

Question History: None

Cognitive level: Comprehensive/analysis

10CFR 41.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 44.

The plant is at 100% power.

- The electrical alignment is normal.

Which one of the following conditions will result in a UPS MG Set automatic transfer from AC motor drive to DC motor drive?

- A. A UPS MG Set overspeed
- B. A UPS MG Set AC motor overload
- C. A UPS MG Set generator undervoltage
- D. A UPS MG Set generator underfrequency

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 262002; K6.01
Importance Rating RO – 2.7; SRO – 2.9

QUESTION 44.

K&A Statement: Knowledge of the effect that a loss or malfunction of the following will have on the **UNINTERRUPTABLE POWER SUPPLY (A.C. D.C.) - A.C. ELECTRICAL POWER**

Justification:

- A. **Incorrect but plausible:** if candidate does not remember that the MG set will shutdown and UPS transfer to alternate feed on an overspeed condition.
- B. **Incorrect but plausible:** if candidate does not remember that there is no AC Motor overload, however plausible because there is a DC motor overload.
- C. **Incorrect but plausible:** if candidate does not remember that the MG set will shutdown and UPS transfer to alternate feed on a generator undervoltage condition.
- D. **CORRECT:** When the AC motor loses power the MG will slow which will be an underfrequency condition and the MG will transfer to the DC motor.

References: SDLP-71F R3; 120 VAC Distribution Student Ref: None
AOP-21, R22

Learning Objective: 1.12.a

Question source: New

Question History:

Cognitive level: Memory

10CFR 41.7/45.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 45.

The following plant conditions exist at the plant.

- The plant is at 25% power with 'A' RFPT and the Main Turbine in service
- Rx WTR COLUMN SEL 06-S1 is in A-Level
- The electrical alignment is normal.
- 09-8-1-19 annunciates '125VDC BATT CHGR 'A' AC SUPP TROUBLE'
- 09-8-1-20 annunciates '125VDC BATT'A' Volt Lo'

Assuming all automatic actions function as designed, which one of the following actions will occur IAW AOP-45?

- A. 'A' RFPT will trip on High RPV Water Level.
- B. UPS Bus transfers from AC to DC drive.
- C. Outboard MSIV close on loss of DC power.
- D. ADS Logic A transfers to DC Power System 'B'.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 263000; K1.02
Importance Rating RO – 3.1; SRO – 3.2

QUESTION 45.

K&A Statement:

Knowledge of the physical connections and/or cause-effect relationships between **D.C. ELECTRICAL DISTRIBUTION** and the following: **BATTERY CHARGER AND BATTERY**

Justification:

- A. **Incorrect but plausible:** if the candidate forgets there is a loss of power to 'A' RFPT trip and control power.
- B. **Incorrect but plausible:** if the candidate forgets there is a loss of power to the DC drive motor.
- C. **Incorrect but plausible:** Only the inboard MSIVs will close due to a loss of AC and DC solenoid power. The outboard MSIVs will remain open.
- D. **CORRECT:** AOP-45, Attachment #6; ADS Logic 'A' transfers to DC Power system 'B'..

References: SDLP-71B R8; DC Distribution
AOP-45

Student Ref: None

Learning Objective: 1.05.C.1

Question source: New

Question History: None

Cognitive level: Comprehensive/Analysis:

10CFR 41.2 to 41.9/45.7 to 45.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 46.

Which of the following describes how the EDGs are cooled?

- A. 2 engine driven water pumps and a bypass TCV which directs ESW flow through the heat exchanger to maintain temperature 105 to 115 degs.
- B. 2 engine driven pumps and a bypass TCV which directs coolant flow thru the heat exchanger to maintain temperature 120 to 160 degs.
- C. 2 motor driven pumps and a bypass TCV which directs ESW flow thru the heat exchanger to maintain temperature 120 to 160 degs.
- D. 2 motor driven pumps and a bypass TCV which directs coolant flow thru the heat exchanger to maintain temperature 105 to 115 degs.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 264000; K1.04
Importance Rating RO – 3.2; SRO- 3.3

QUESTION 46.
K&A Statement:

**K1.04 Knowledge of the physical connections and/or cause-effect relationship between EMERGENCY GENERATORS (DIESEL/JET) and the following:
EDG COOLING WATER SYSTEM**

Justification:

- A. **Incorrect but plausible if the candidate:** does not remember TCV directs coolant flow through the heat exchanger to maintain temperature 120 to 160 degs..
- B. **CORRECT:** 2 engine driven pumps and a bypass TCV which directs coolant flow thru the heat exchanger to maintain temperature 120 to 160 degs.
- C. **Incorrect but plausible if the candidate:** does not remember the water pumps are engine driven and the TCV directs coolant flow through the heat exchanger to maintain temperature 120 to 160 degs.
- D. **Incorrect but plausible if the candidate:** does not remember the water pumps are engine driven and maintain temperature 120 to 160 degs.

References: SDLP-93 R16

Student Ref: None

Learning Objective: 1.05.a.11 and 1.05.a.13

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7/45.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 47.

The unit is at 100% power when instrument air pressure begins to slowly degrade. Current instrument air pressure is 94 psig and instrument air pressure is degrading at 1 psig every 3 minutes.

- Annunciator 9-6-2-37 is received for AIR COMPR DRYER TROUBLE
- Annunciator 09-6-1-31 is received for SERV AIR HDR PRESS LO
- Purge flow is 18 scfm
- Prefilter Filter d/p is 10 psid
- Moisture indicator light is not illuminated

Which one of the following conditions has caused instrument air pressure to degrade and which procedure must be used to correct the condition?

- A. Dryer high moisture, the moisture trap is clogged, Enter OP-39.
- B. High filter d/p, filters are clogged and need to be changed, Enter AOP-12.
- C. A failure to switch dryers has occurred, Enter OP-39.
- D. A loss of dryer purge has occurred, Enter AOP-12.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 300000; A2.01
Importance Rating RO – 2.9; SRO – 2.8

QUESTION 47.

K&A Statement:

Ability to (a) predict the impacts of the following on the **INSTRUMENT AIR SYSTEM** and (B) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:

AIR DRYER AND FILTER MALFUNCTIONS

Justification:

- A. **Incorrect but plausible:** Moisture indicator light is not illuminated, the moisture trap is not clogged. If high moisture was present the red HIGH DEW POINT light would be on. The high moisture condition cannot be cleared then remove the affected dryer tower from service per section G of OP-39.
- B. **Correct:** High d/p in the filters indicate that the filters are clogged and need to be isolated to change. Enter AOP-12.
- C. **Incorrect but plausible:** The switching failure alarm is an alarm only, no operating impact on the dryer. Initiate a CCR for Maintenance to repair.
- D. **Incorrect but plausible:** Purge flow is normal. If a loss of purge flow was to occur, the dryer tower heater should be immediately de-energized and Maintenance immediately notified.

References: SDLP-39 R14
AOP-12

Student Ref: None

Learning Objective: 1.15.a

Question source: New

Question History: None

Cognitive level: Analysis

10CFR 41.5/45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 48.

An unidentified leak from the RBCLC system has resulted in a loss of level in the Closed Loop Cooling (CLC) Makeup Tank in excess of makeup capability. The following conditions exist:

- 46P-2A ESW pump is tagged for a scheduled system outage.
- Makeup Tank level is two (2) feet and slowly lowering.
- ALL RBCLC Pumps are operating.
- RBCLC pressure is 38 psig and slowly lowering.
- RBCLC supply temperature is 93 degs and slowly rising.
- Operators have been dispatched to search for the location of the leak.

In accordance with AOP-11, Loss of RBCLC, which one of the immediate actions is required at this time?

- A. SCRAM the Reactor per AOP-1 and trip the Reactor Recirculation Pumps.
- B. Trip All RBCLC Pumps and attempt to isolate the leak IAW AOP-11
- C. Trip RWCU pumps and SCRAM the Reactor IAW AOP-1.
- D. Cross-tie ESW loops to RBCLC IAW AOP-11.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 400000: A2.02
Importance Rating RO –2.8; SRO – 3.0

QUESTION 48.
K&A Statement:

Ability to (a) predict the impacts of the following on CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:

HIGH/LOW SURGE TANK LEVEL

Justification:

- A. **CORRECT:** IAW AOP-11 immediate actions are to insert a manual scram and trip the Recirculation pumps
- B. **Incorrect but plausible if candidate:** Placing all RBCLC pumps in Pull-to-lock is step 6 of the immediate actions however attempting leak isolation is a subsequent action of AOP-11.
- C. **Incorrect but plausible if candidates:** Tripping RWCU pumps is a subsequent operator action. Scramming the reactor is IAW AOP-11.
- D. **Incorrect but plausible if candidates:** Cross-tie ESW loops to RBCLC IAW AOP-11 is a subsequent action of AOP-11 and The 46P-2B ESW pump will be in service since RBCLC header pressure is < 45 psig is an auto start signal for the ESW pumps..

References: SDLP-15, R-13; RBCLC system Student Ref: None
AOP-11; Loss of RBCLC

Learning Objective: 1.05.c.1

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.2 to 41.9/ 45.7 to 45.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 49.

The following describes the initial plant conditions:

- Reactor is at 100% power.
- A loss of DC power system 'A' occurs.

Subsequently, a reactor coolant leak occurs and the following conditions now exist:

- Reactor pressure is 500 psig and dropping.
- Reactor level is 58 inches and dropping.
- Drywell pressure is 10.0 psig and rising.

How will the LPCI Injection Valves 10MOV-25A and B respond when RPV pressure reaches 450 psig?

	<u>10MOV-25A</u>	<u>10MOV-25B</u>
A.	Remain Closed	Remain Closed
B.	Remain Closed	Will Open
C.	Will Open	Remain Closed
D.	Will Open	Will open

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 203000; K1.07
Importance Rating RO – 3.1; SRO – 3.3

QUESTION 49.

K&A Statement: Knowledge of the physical connections and/or cause-effect relationships between RHR/LPCI: INJECTION MODE and the following: D.C. ELECTRICAL POWER

Justification:

- A. **Incorrect but plausible if the candidate does not remember that both 10MOV25A & B receive an open signal from the LOCA initiation circuits from both RHR 'A' and 'B' Logics.** If the 'A' 125 VDC power is lost to the 'A' RHR initiation logic, the 10MOV-25A will still receive an open signal from the RHR 'B' initiation logic.
- B. **Incorrect but plausible if the candidate does not remember that both 10MOV25A & B receive an open signal from the LOCA initiation circuits from both RHR 'A' and 'B' Logics.** If the 'A' 125 VDC power is lost to the 'A' RHR initiation logic, the 10MOV-25A will still receive an open signal from the RHR 'B' initiation logic.
- C. **Incorrect but plausible if the candidate does not remember that both 10MOV25A & B receive an open signal from the LOCA initiation circuits from both RHR 'A' and 'B' Logics.** If the 'A' 125 VDC power is lost to the 'A' RHR initiation logic, the 10MOV-25A will still receive an open signal from the RHR 'B' initiation logic.
- D. **CORRECT:** both 10MOV25A & B receive an open signal from the LOCA initiation circuits from both RHR 'A' and 'B' Logics. If the 'A' 125 VDC power is lost to the 'A' RHR initiation logic, the 10MOV-25A will still receive an open signal from the RHR 'B' initiation logic.

References: SDLP-10 R19

Student Ref: None

Learning Objective: 1.04.a

Question source: New

Question History: None

Cognitive level: Analysis

10CFR 41.2 to 41.9 / 45.7 to 45.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 50.

HPCI turbine speed control system is designed to prevent the turbine from over speeding during turbine starts. With the flow controller in automatic, which choice below describes the process that controls turbine speed during startup?

- A. The turbine stop valve to the turbine 23HOV-1 will slowly throttle open to control turbine speed.
- B. The hydraulically controlled governor valve (23HOV-2) will slowly throttle open to admit steam to the HPCI turbine as soon as the turbine stop valve 23HOV-1 valve starts to go open.
- C. The hydraulically controlled governor valve (23HOV-2) will be closed until the turbine stop 23HOV-1 valve goes full open.
- D. The hydraulically controlled governor valve (23HOV-2) and the turbine 23HOV-1 will throttle open together to control HPCI turbine speed.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 206000; K5.05
Importance Rating RO – 3.3; SRO – 3.3

QUESTION 50.

K&A Statement: Knowledge of the operational implications of the following concepts as they apply to **HIGH PRESSURE COOLANT INJECTION SYSTEM: TURBINE SPEED CONTROL**

Justification:

- A. **Incorrect but plausible:** if candidate forgets to prevent turbine over speeding on startup, the electronics of the flow controller are such that, the hydraulic control valve will be fully closed until the turbine stop valve 23HOV-1 starts to open and sufficient hydraulic pressure is available to open 23HOV-2. The turbine stop valve does not control the HPCI pump speed on the startup.
- B. **CORRECT:** To prevent turbine over speeding on startup, the electronics of the flow controller are such that, the hydraulic control valve will be fully closed until the turbine stop valve 23HOV-1 starts to open and sufficient hydraulic pressure is available to open 23HOV-2
- C. **Incorrect but plausible:** if candidate forgets to prevent turbine over speeding on startup, the electronics of the flow controller are such that, the hydraulic control valve will be fully closed until the turbine stop valve 23HOV-1 starts to open and sufficient hydraulic pressure is available to open 23HOV-2
- D. **Incorrect but plausible:** if candidate forgets to prevent turbine over speeding on startup, the electronics of the flow controller are such that, the hydraulic control valve will be fully closed until the turbine stop valve 23HOV-1 starts to open and sufficient hydraulic pressure is available to open 23HOV-2

References: SDLP-23 R15; HPCI

Student Ref: None

Learning Objective: 1.05.a.22

Question source: Modified

Question History: JAF LOI-08 exam bank Q-31

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.5 / 45.3

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 51.

Plant is at 100% power with the following:

- Electrical plant is in a normal lineup with no equipment out of service
- T=0 seconds. Bus 10500 voltage degrades to 3800 volts
- T=13 seconds. Bus 10500 voltage is restored to 4160 volts

At T=18 seconds, and with **NO** operator action, what is the status of Bus 10500 and RPS Bus A?

- A. Bus 10500 is energized by the 10300 Bus. RPS Bus A is energized.
- B. Bus 10500 is energized by the 10300 Bus. RPS Bus A is de-energized.
- C. Bus 10500 is energized by the EDGs. RPS Bus A is energized.
- D. Bus 10500 is energized by the EDGs. RPS Bus A is de-energized.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 212000; K2.01
Importance Rating RO – 3.2; SRO – 3.3

QUESTION 51.

K&A Statement: Knowledge of electrical power supplies to the following:
RPS motor-generator sets

Justification:

- A. CORRECT. Protective action is initiated on 10500 Bus degraded voltage after a 41 to 46 second time delay with NO LOCA signal present. Degraded voltage will increase the current drawn by the RPS MG Set drive motor. However, it will continue to rotate at rated speed, providing normal MG Set output voltage to the RPS Bus. Since the undervoltage clears prior to automatic protective action, 10500 and the RPS Bus both remain energized from normal power sources.
- B. Incorrect. RPS MG Set EPA monitors trip on undervoltage after 4 seconds. However, since they monitor output voltage, which is unchanged, they will not trip and the RPS Bus will remain energized from the MG Set.
- C. Incorrect. The EDG time delay for degraded voltage without a LOCA is 41-46 seconds. Plausible if the candidate does think the EDG time delay has actuated.
- D. Incorrect. The RPS MG Set EPA will not trip. Plausible if the candidate thinks degraded voltage on the 10500 will lower RPS Bus voltage.

References: SDLP 71-E, 71-F, Alarm 09-8-2-24 Student Ref: None

Learning Objective: 71E-1.09.e

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis: X

10CFR 41.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 52.

The plant is operating normally at 100% power when the drywell instrument header is lost.

Which **ONE** of the following describes ADS valve operation capabilities in this condition?

- A. ADS valves can self actuate on high reactor pressure **ONLY**.
- B. ADS valves can self actuate on high reactor pressure and auto initiate on ADS logic **ONLY**.
- C. ADS valves can self actuate on high reactor pressure, auto initiate on ADS logic or can be manually cycled five times.
- D. ADS valves can self actuate on high reactor pressure, auto initiate on ADS logic or can be manually cycled three times.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 218000; K4.04
Importance Rating RO – 3.5; RO -3.6

QUESTION 52.

K&A Statement:

Knowledge of **AUTOMATIC DEPRESSURIZATION SYSTEM** design feature(s) and /or interlocks which provide for the following: Insures adequate air supply to ADS valves: Plant specific

Justification:

- A. Incorrect because there is a nitrogen accumulator that will supply the pneumatic force for pilot actuation of the ADS valves, but plausible if the candidate thinks that only the self actuation on high pressure is available on a loss of nitrogen event.
- B. Incorrect because there is a nitrogen accumulator that will supply the pneumatic force for pilot actuation of the ADS valves, but plausible if the candidate thinks that only the self actuation on high pressure or ADS logic is available on a loss of nitrogen event.
- C. Correct – The ADS valve can actuate on reactor high pressure without nitrogen. Each ADS valve has an accumulator and double check valves that ensure that there is enough nitrogen to supply up to 5 cycles with 120 psig initial pressure. The valves can be both operated manually by operators or by the ADS system.
- D. Incorrect because there is enough supply for 5 cycles. Plausible if the operator does not remember how many cycles can be accomplished with the accumulators.

References: SDLP02J, OP-68, Op-37

Student Ref:

None

Learning Objective: N/A

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge: X
Comprehensive/Analysis:

10CFR 41.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 53.

Given the following conditions for 'A' Emergency Diesel Generator:

- A leak in the header downstream of the in service air compressor occurs
- Air Receiver Tank pressures are at 70 psig
- THEN an automatic start signal is received
- 10 seconds after start signal the engine speed reaches 190 rpm
- Annunciator 09-8-2-9 is received for 'A' EDG TROUBLE OR SHUTDOWN

Which one of the following describes the automatic response of the 'A' EDG and the operator actions required to attempt a restart of the 'A' EDG?

Auto response of 'A' EDG

Operator action required to restart 'A' EDG

- | | |
|---|---|
| A. Shuts down immediately and locks out | Depress the FAULT RESET pushbutton. |
| B. Shuts down immediately | Depress the local STOP pushbuttons.
And then manually starts 'A' EDG. |
| C. Shuts down immediately and locks out | Place the engine control switch to STOP.
And then manually starts 'A' EDG. |
| D. Shuts down immediately | Depress the FAULT RESET pushbutton. |

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 264000; K6.01
Importance Rating RO – 3.8; SRO – 3.9

QUESTION 53.

K&A Statement: Knowledge of the effect that a loss or malfunction of the following will have on the **EMERGENCY DIESEL GENERATORS: STARTING AIR**

Justification:

- A. **CORRECT:** The 'A' EDG will lockout Breakers 71-10502 and 71-10504 open and 'A' EDG coast down to a stop. Once the cause has been determined the 'A' EDG Fault Reset pushbutton must be depressed. With auto start signal present, 'A' EDG will auto start.
- B. **Incorrect but plausible if the** candidate forgets that there is a lockout of the 'A' EDG. The 'A' EDG will lockout Breakers 71-10502 and 71-10504 open and 'A' EDG coast down to a stop. Manually depress the local STOP pushbuttons. Once the cause has been determined, then manually start 'A' EDG. With auto start signal present, 'A' EDG will auto start.
- C. **Incorrect but plausible if the** candidate forgets the 'A' EDG will lockout Breakers 71-10502 and 71-10504 open and 'A' EDG coast down to a stop. Place the engine control switch in STOP. Once the cause has been determined, then manually start 'A' EDG. With auto start signal present, 'A' EDG will auto start.
- D. **Incorrect but plausible if the** candidate forgets that there is a lockout of the 'A' EDG. The 'A' EDG will lockout Breakers 71-10502 and 71-10504 open and 'A' EDG coast down to a stop. Once the cause has been determined the 'A' EDG Fault Reset pushbutton must be depressed.

References: SDLP-93 R16; Emergency Power Student Ref: None
ARP- 93ECP-A-1

Learning Objective: 1.10.e

Question source: Modified

Question History: NRC NMP 1 6/07 Q-34

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7 /45.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 54.

Which of the following describes the electrical power supply and function of the backup scram valve and ARI solenoid upon RPS and ARI initiation to actuate and depressurize the scram pilot air header?

Backup Scram Valve

ARI Solenoid

- | | |
|-------------------------|----------------------|
| A. 125 VDC energized | 120 VAC de-energized |
| B. 120 VAC de-energized | 125 VDC energized |
| C. 125 VDC energized | 125 VDC energized |
| D. 120VAC de-energized | 120 VAC de-energized |

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 201001; K2.02
Importance Rating RO – 3.6; SRO – 3.7

QUESTION 54.

K&A Statement: Knowledge of electrical power supplies to the following:
SCRAM VALVE SOLENOIDS

Justification:

- A. **Incorrect but plausible if the** candidates forgets Backup Scram valves are powered from 125 VDC and need to be energized to open. ARI valves are also powered from 125 VDC and need to energized to open.
- B. **Incorrect but plausible if the** candidates forgets Backup Scram valves are powered from 125 VDC and need to be energized to open. ARI valves are also powered from 125 VDC and need to energized to open.
- C. **CORRECT:** Backup Scram valves are powered from 125 VDC and need to be energized to open. ARI valves are also powered from 125 VDC and need to energized to open.
- D. **Incorrect but plausible if the** candidates forgets Backup Scram valves are powered from 125 VDC and need to be energized to open. ARI valves are also powered from 125 VDC and need to energized to open.

References: SDLP-05 R16; CRD Hydraulic Student Ref: None

Learning Objective: 1.04.c and d

Question source: Modified

Question History: JAF exam bank

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 55.

When attempting to WITHDRAW control rod 22-07, the following indications are observed:

- Drive water flow initially indicates 4.0 gpm, and the control rod moves into the core one notch
- THEN, drive water flow becomes 0.0 gpm, and the control rod settles at the initial position

Which of the following solenoid operated directional control valve failures has caused the above indications?

Directional Control Valve:

- A. 120, WITHDRAW EXHAUST AND SETTLE VALVE, is stuck open.
- B. 121, INSERT EXHAUST VALVE, is stuck open.
- C. 122, WITHDRAW SUPPLY VALVE, is stuck closed.
- D. 123, INSERT SUPPLY VALVE, is stuck closed.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 201002; K3.01
Importance Rating RO – 3.4; SRO – 3.4

QUESTION 55.

K&A Statement: Knowledge of the effect that a loss or malfunction of the **REACTOR MANUAL CONTROL SYSTEM** will have on the following:
ABILITY TO MOVE CONTROL RODS

Justification:

- A. **Incorrect but plausible if** 120 was stuck open the control rods would not insert as drive water flow through the 123 valve would flow directly to the exhaust header through the open 120. Additionally withdraw flow would equal stall flow for the CRD.
- B. **Incorrect but plausible if** the 121 valve was stuck open the control rod would insert and not withdraw but the withdraw flow would be high as drive water flow through the 122 valve would flow directly to the exhaust header through the open 121.
- C. **CORRECT:** When the rod movement control switch is moved to the ROD OUT position, the RMCS timer opens the inlet drive water valve (123) and the exhaust valve (121) and the control rod moves into the core and off the collet fingers. RMCS then should open the withdraw valve (122) and exhaust valve (120). If the withdraw valve (122) does NOT open no pressure is applied to the collet fingers or the area above the drive piston the control rod will settle back onto the collet finger at it's original position. This is further indicated by the 0.0 gpm drive water flow.
- D. **Incorrect but plausible if** 123 was failed closed the control rod would not insert and there would be no insert flow. Additionally withdraw flow would equal stall flow for the CRD.

References: SDLP-03F; RMCS

Student Ref: None

Learning Objective: 1.10.e

Question source: NMP 1 NRC 10/08 Q-31

Question History: NMP 1 NRC 10/08 Q-31

Cognitive level: Comprehensive/Analysis:

10CFR 41.7/ 45.5 to 45.8

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 56.

Given the following conditions:

- The IRMs are on range 8.
- Control rod 22-51 was just moved from position 04 to position 08.
- Control rod 22-51 now drifts in to position 00.

Which one of the following describes how the Reactor Manual Control System will respond?

- A. Rods can be inserted or withdrawn. RWM generates an insert error.
- B. Rods **CANNOT** be inserted but can be withdrawn. RWM generates an insert block.
- C. Rods can be inserted but can not be withdrawn. RWM generates a withdraw block.
- D. Rods **CANNOT** be inserted or withdrawn. RWM generates insert and withdraw blocks.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 201006;K4.01
Importance Rating RO – 3.4; SRO – 3.5

QUESTION 56.

K&A Statement: Knowledge of **ROD WORTH MINIMIZER SYSTEM** design features(s) and/or interlocks which provide for the following:
INSERT BLOCKS/ERRORS

Justification:

- A. **Incorrect but plausible:** if the candidate forgets that the RWM program aborts will generate withdraw and insert blocks. Takes 3 insert errors to generate an insert block
- B. **Incorrect but plausible:** if the candidate forgets that the RWM program aborts will generate withdraw and insert blocks. Takes 3 insert errors to generate an insert block
- C. **Incorrect but plausible:** if the candidate forgets that the RWM program aborts will generate withdraw and insert blocks. 1 withdraw error will generate a withdraw block.
- D. **CORRECT:** The control rod drift will cause a program abort of the RWM. Withdraw and insert blocks will be applied.

References: SDLP-03D; RWM

Student Ref: None

Learning Objective: 1.05.b.7

Question source: NMP #1; NRC 3/07; Q-37

Question History: NMP #1; NRC 3/07; Q-37

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 57.

The plant is in MODE 4, preparing for startup. RWR Pump 'A' is being started in accordance with OP-27, "Recirculation System", Section D.

All prerequisites have been completed and the procedure has been performed up to the step to start the pump.

The RO starts RWR Pump 'A'.

Select the choice which correctly completes the following description of expected MG set response and required operator action for a normal start sequence.

The MG set ramps up to (1) % speed, the field breaker closes, the MG set speed runs back to 30%. The operator must open the discharge valve within (2) seconds?

- | | (1) | (2) |
|----|-----|-----|
| A. | 80 | 30 |
| B. | 80 | 55 |
| C. | 44 | 30 |
| D. | 44 | 55 |

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 202002; A4.01
Importance Rating RO – 3.3; SRO – 3.1

QUESTION 57.

K&A Statement: **202002 Recirculation Flow Control System A4.01:**Ability to manually operate and/or monitor in the control room: MG sets

Justification:

- A. Incorrect. The operator must open the discharge valve within 55 seconds to prevent pump trip on valve position interlock. Plausible if applicant thinks the interlock is 30 seconds, which is the magnitude of the #1 limiter speed signal.
- B. Correct. When the pump is started, a signal generator generates a 44% speed signal which bypasses the flow controller. The pump will ramp to 80% until the field breaker closes and then the #1 limiter runs back speed to 30%. The discharge valve must be opened within 55 seconds or the MG set will trip.
- C. Incorrect. When the pump is started, a signal generator generates a 44% speed signal which bypasses the flow controller. The MG set will ramp to 80%. Plausible because a 44% speed signal is initially applied and plausible if applicant thinks the interlock is 30 seconds, which is the magnitude of the #1 limiter speed signal.
- D. Incorrect. Plausible if the candidate does not know when the pump is started, a signal generator generates a 44% speed signal which bypasses the flow controller. The MG set will ramp to 80%. The discharge valve must be opened within 55 seconds or the MG set will trip.

References:	OP-27	Student Ref:	None
Learning Objective:	SDLP-02H, 1.05a2		
Question source:	New		
Question History:	None		
Cognitive level:	Memory/Fundamental Knowledge Comprehensive/Analysis:	X	
10CFR	41.7		

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 58.

A failure to SCRAM has occurred with the following conditions:

- MSIVs have closed.
- RPV water level is being controlled 80 to 110 inches using HPCI.
- RPV pressure is being controlled 800 to 1000 psig using SRVs.
- Reactor Power is 10%.
- Torus water temperature is 120 degs.
- MCC-162 is de-energized.
- SLC injection is required.

Based on these indications, what is the affect on RWCU system when SLC is manually initiated?

<u>RWCU Pumps</u>	<u>RWCU System</u>
A. Will trip	Will only partially isolate.
B. Will not trip	Will not isolate
C. Will trip	Will fully isolate.
D. Will not trip	Will only partially isolate.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 204000;K6.05
Importance Rating RO -2.6; SRO – 2.6

QUESTION 58.

K&A Statement: Knowledge of the effect that a loss or malfunction of the following will have on the **REACTOR WATER CLEANUP SYSTEM: AC POWER**

Justification:

- A. **CORRECT:** MCC-162 powers 12MOV-69 and 'B' SLC pump. RWCU pumps will trip on closure of 12MOV-18. Only the RWCU Supply outboard isolation valve, 12MOV-18 will close.
- B. **Incorrect but plausible if the** candidates forget that MCC-162 powers 12MOV-69 and 'B' SLC pump. RWCU pumps will trip on closure of 12MOV-18. Only the RWCU Supply outboard isolation valve, 12MOV-18 will close.
- C. **Incorrect but plausible if the** candidates forget that MCC-162 powers 12MOV-69 and 'B' SLC pump. RWCU pumps will trip on closure of 12MOV-18. Only the RWCU Supply outboard isolation valve, 12MOV-18 will close.
- D. **Incorrect but plausible if the** candidates forget that MCC-162 powers 12MOV-69 and 'B' SLC pump. RWCU pumps will trip on closure of 12MOV-18. Only the RWCU Supply outboard isolation valve, 12MOV-18 will close.

References: SDLP-11; R12 - RWCU

Student Ref: None

Learning Objective: 1.09.a

Question source: New

Question History: None

Cognitive level: Comprehensive/Analysis:

10CFR 41.5/ 45.5

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 59.

The plant is operating at 98% power, with the following:

- Control Rod 34-19 (a non-peripheral rod) is selected for movement
- APRM D fails DOWNSCALE.
- NO operator actions are taken.

Which one of the following identifies the ability of Rod Block Monitor (RBM) Channels A and B to generate a rod block on high local power?

RBM Channel A

RBM Channel B

- | | |
|---------------------------|------------------------|
| A. Can generate blocks | Can generate blocks |
| B. Can generate blocks | Cannot generate blocks |
| C. Cannot generate blocks | Can generate blocks |
| D. Cannot generate blocks | Cannot generate blocks |

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 215002: A3.04
Importance Rating RO – 3.6; SRO – 3.5

QUESTION 59.

K&A Statement: Ability to monitor automatic operations of the **ROD BLOCK MONITOR SYSTEM** including:
VERIFICATION OR PROPER FUNCTIONING/OPERABILITY OF ROD BLOCK MONITOR

Justification:

- A. **Incorrect but plausible if candidate forgets** 'D' APRM is the reference APRM for RBM Channel 'B'. If 'D' APRM fails downscale, it would provide a signal to the 'B' RBM that is below 30% power. This would result in 'B' RBM being automatically bypassed, so no rod blocks will be generated. 'A' RBM is not affected.
- B. **CORRECT:** 'D' APRM is the reference APRM for RBM Channel 'B'. If 'D' APRM fails downscale, it would provide a signal to the 'B' RBM that is below 30% power. This would result in 'B' RBM being automatically bypassed, so no rod blocks will be generated. 'A' RBM is not affected.
- C. **Incorrect but plausible if candidate forgets** 'D' APRM is the reference APRM for RBM Channel 'B'. If 'D' APRM fails downscale, it would provide a signal to the 'B' RBM that is below 30% power. This would result in 'B' RBM being automatically bypassed, so no rod blocks will be generated. 'A' RBM is not affected.
- D. **Incorrect but plausible if candidate forgets** 'D' APRM is the reference APRM for RBM Channel 'B'. If 'D' APRM fails downscale, it would provide a signal to the 'B' RBM that is below 30% power. This would result in 'B' RBM being automatically bypassed, so no rod blocks will be generated. 'A' RBM is not affected. This would be true if a peripheral rod were selected.

References: SDLP-07C R10; PRNM

Student Ref: None

Learning Objective: 1.05.a.4

Question source: NMP #2 NRC 3/08; Q-28

Question History: NMP #2 NRC 3/08; Q-28

Cognitive level: Memory/Fundamental knowledge:

10CFR 41.7 / 45.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 60.

The plant is operating at 100% power when a fault on the grid causes a 50% load rejection condition to occur.

Assume **NO** operator actions.

What is the main generator, turbine and reactor response to this condition?

- A. Main turbine trips on overspeed, stop valves closing cause a reactor scram, generator trips on reverse power relay
- B. Main generator trips on lockout due to high volts per hertz, generator trip causes a turbine trip, stop valves closing cause a reactor scram
- C. Turbine control valves close at normal rate, high RPV pressure causes a reactor scram, generator tripping on reverse power causes a turbine trip
- D. Turbine control valves close rapidly, low RETS pressure causes a reactor scram, turbine trips on high RPV level, generator trips on anti-motoring relay

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 245000; G2.1.28
Importance Rating RO – 4.1; SRO 4.1

QUESTION 60.

K&A Statement:

G2.1.28 Knowledge of the purpose and function of major system components and controls as it applies to Main Turbine Gen/Aux

Justification:

- A. Incorrect because the load imbalance will trip before the overspeed. Plausible if the candidate does not know how the generator-power load imbalance fast closure works. The turbine would begin to overspeed with a large load imbalance.
- B. Incorrect because there will not be a high volts per hertz trip in this situation. Plausible if the candidate thinks that the electrical load rejection would cause the high volts per hertz trip.
- C. Incorrect because although EHC would sense a higher inlet pressure and start to close the control valves, they will trip on the load imbalance greater than 40%. But plausible if the candidate does not know how the generator-power load imbalance fast closure works. This is how the EHC system would respond without the fast closure.
- D. Correct – Turbine control valves trip closed by fast acting solenoid due to load imbalance > 40%, Low Relayed Emergency Trip System (RETS) pressure causes a reactor scram, with no operator actions the main turbine will trip on L8 when `RPV level is restored by FW, HPCI & RCIC. Turbine trip causes stop valves to close which meet the conditions for the anti motoring relay which will trip generator.

References: SDLP-94A

Student Ref:

None

Learning Objective: N/A

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis:

X

10CFR

41.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 61.

A main steam line break has occurred.

Secondary containment has isolated on high radiation in the reactor building vent exhaust.

What operator actions are required per AOP-40, "Main Steam Line Break"?

Ensure control room and relay room ventilation are _____

- A. Purged within 30 minutes
- B. Isolated within 30 minutes
- C. Purged within 60 minutes
- D. Isolated within 60 minutes

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 290003; A4.04
Importance Rating RO – 2.8; SRO – 3.0

QUESTION 61.
K&A Statement:

Control Room HVAC A4.04 Ability to manually operate and/or monitor in the control room: Environmental conditions

Justification:

- A. Incorrect- When there is contamination the correct mode for CR HVAC is isolate. Purge is used for smoky environments. Plausible because the purge is a mode of CR HVAC
- B. Correct-CR and relay room must be isolated within 30 minutes per AOP-40
- C. Incorrect- When there is contamination the correct mode for CR HVAC is isolate. Purge is used for smoky environments. Plausible because the purge is a mode of CR HVAC
- D. Incorrect- the immediate actions require isolation within 30 minutes, plausible because AOP-40 requires TSC to be isolated within 60 minutes.

References: AOP-40 Student Ref: None

Learning Objective: N/A

Question source: New

Question History: N/A

Cognitive level: Memory: X
Comprehensive/Analysis:

10CFR 41.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 62.

Given the following conditions:

- The plant is in mode 1, two weeks after a refueling outage.
- The FPCC system is operating with one pump and heat exchanger in service.
- No makeup water sources are available.
- Assume No evaporative losses.

Which of the following is the effect on Spent Fuel pool water temperature and level if a leak develops on the common FPCC pump suction?

<u>Spent Fuel Pool temperature</u>	<u>Spent Fuel Pool Water Level</u>
A. Remain stable	Water level will lower slightly then stabilize
B. Will rise	Water level will continuously lower
C. Remain stable	Water level will continuously lower
D. Will rise	Water level will lower slightly and stabilize

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 233000; K3.01
Importance Rating RO – 3.2; SRO – 3.4

QUESTION 62.

K&A Statement: Knowledge of the effect that a loss or malfunction of the **FUEL POOL COOLING AND CLEANUP** will have on the following:
FUEL POOL TEMPERATURE

Justification:

- A. **Incorrect but plausible** The skimmer surge tank will drain and the FPCC pumps will trip low-low skimmer surge tank level. Fuel pool level will drain to the bottom of the weir overflow pipe then stop. Water temperature will rise because the FPCC pumps are tripped. Temperature rise causes fuel pool water to expand, level is maintained at the weir.
- B. **Incorrect but plausible** The skimmer surge tank will drain and the FPCC pumps will trip low-low skimmer surge tank level. Fuel pool level will drain to the bottom of the weir overflow pipe then stop. Water temperature will rise because the FPCC pumps are tripped. Temperature rise causes fuel pool water to expand, level is maintained at the weir.
- C. **Incorrect but plausible** temperature will rise since there is no cooling and water level will not continuously lower. Fuel pool is designed for zero leakage. Temperature will rise level is maintained at the weir.
- D. **CORRECT:** The skimmer surge tank will drain and the FPCC pumps will trip low-low skimmer surge tank level. Fuel pool level will drain to the bottom of the weir overflow pipe then stop. Water temperature will rise because the FPCC pumps are tripped. Temperature rise causes fuel pool water to expand, level is maintained at the weir.

References: SDLP-19 R12; Fuel Pool Cooling Student Ref: None

Learning Objective: 1.09.a

Question source: HC NRC exam 11/05; Q-65

Question History: HC NRC exam 11/05; Q-65

Cognitive level: Comprehensive/Analysis:

10CFR 41.7 / 45.6

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 63.

Fuel handling operations are in progress. The following conditions exist:

- Mode switch in REFUEL
- Refueling Bridge is over the Spent Fuel Pool
- One control rod is selected and fully withdrawn
- Fuel Grapple is not full up
- Fuel Grapple is unloaded

From these conditions, which one of the following actions occurs?

- A. Main hoist power will not be blocked with bridge motion near or over the core.
- B. Bridge motion near or over the core will cause a control rod block.
- C. A second control rod selected will prevent bridge motion near or over the core.
- D. Bridge motion near or over the core will not be permitted.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 234000; K5.02
Importance Rating RO – 3.1; SRO – 3.7

QUESTION 63.

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to **FUEL HANDLING EQUIPMENT: FUEL HANDLING EQUIPMENT INTERLOCKS**

Justification:

- A. **Incorrect but plausible if the candidate** forgets that with not all control rods full in and the refueling bridge near or over the core will block main hoist power.
- B. **CORRECT:** With the grapple not full up and the refueling bridge near or over the core will generate a control rod block.
- C. **Incorrect but plausible if the candidate** forgets a second control rod selected will generate a control rod block.
- D. **Incorrect but plausible if the candidate** forgets with the grapple not full up and the refueling bridge near or over the core will generate a control rod block.

References: SDLP-08 R07

Student Ref: None

Learning Objective: 1.05.b

Question source: Modified

Question History: JAF exam, 7/03; Q -10

Cognitive level: Comprehensive/Analysis:

10CFR 41.5 /45.3

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 64.

During a plant startup, with reactor power at 15%, Control Rod 06-23 was selected and the following indications occur:

- Annunciator 09-5-2-2, ROD WITHDRAWAL BLOCK
- Annunciator 09-5-2-1, RWM ROD BLOCK RPIS INOP
- A loss of ALL rod position indications on the Four Rod Display
- A loss of ALL red Full-Out and green Full-In indications of Full Core Display

Which ONE of the following malfunctions would explain all of these indications?

- A. Loss of Panel 71AC10 Relay Room Distribution Panel
- B. Loss of Panel 71RBACB5 Rx Building Distribution Panel
- C. Loss of Panel 71ACUPS Relay Room Uninterruptible Bus Distribution Panel
- D. Loss of Panel 71ESSA1 Relay Room Safeguard Power Distribution Panel

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 214000: A3.02
Importance Rating RO – 3.2; SRO – 3.1

QUESTION 64.

K&A Statement:

A3.02 Ability to monitor automatic operations of the **ROD POSITION INFORMATION SYSTEM** including: Alarm and indicating lights

Justification:

- A. **Incorrect but plausible because** power supply 71AC10 powers Reactor Manual Control Rod Block Relays which if lost could give a rod block.
- B. **Incorrect but plausible because** power supply 71RBACB5 powers CRD accumulator panel which if lost could give a rod block.
- C. **CORRECT** – The loss of the UPS panel 71ACUPS will cause a loss of rod position indication which inputs into the RWM, which will give the rod block.
- D. **Incorrect but plausible because power supply** 71ESSA1 powers various safety related logic circuits which are 120 VAC.

References: AOP-21, OP-46B

Student Ref:

None

Learning Objective: SDLP-03F R10; RMCS 1.04a

Question source: Fitzpatrick NRC Exam

Question History: 2003 Q58

Cognitive level: Memory/Fundamental knowledge: X
Comprehensive/Analysis:

10CFR 41.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 65.

A plant startup is in progress. Control Rod 10-19 has just been withdrawn to notch position 48. The next rod in the sequence has been selected when the in-service CRD pump trips.

Given these conditions, and assuming no additional operator actions, select the response which correctly completes the following statement:

The scram time for Control Rod 10-19 will be within technical specification limits _____.

- A. ONLY if 10-19 HCU is fully charged
- B. ONLY if reactor pressure is >800 psig
- C. if reactor pressure is >800 psig AND 10-19 HCU is fully charged
- D. if reactor pressure is >800 psig OR if 10-19 HCU is fully charged

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 201003; K1.01
Importance Rating RO – 3.2; SRO – 3.3

QUESTION 65.
K&A Statement:

Knowledge of the physical connections and/or cause-effect relationships between CONTROL ROD AND DRIVE MECHANISM and the following: Control drive hydraulic system

Justification:

- A. **Incorrect** because the ts can be met without accumulators if pressure is > 800 psig. Plausible if candidate does not know the interrelationship between hcu and CRD mechanism.
- B. **Incorrect** because the ts can be met with accumulators charged at any reactor pressure. Plausible if candidate does not know the interrelationship between hcu and CRD mechanism.
- C. **Incorrect** because the ts can be met without both accumulators charged and pressure above 800 psig. Plausible if candidate does not know the interrelationship between hcu and CRD mechanism.
- D. **Correct** – with hcu's charged the scram times will meet ts at any reactor pressure, or if pressure is >800 ts limits will be met even if HCU's are not charged.

References: TS 3.1.4 bases, SDLP 3A fig 8 Student Ref: None

Learning Objective: SDLP-03A; CRDM 1.10.a

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis: X

10CFR 41.2 to 41.9

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 66.

The plant is shutdown and the following conditions exist:

- Mode Switch is in SHUTDOWN
- Average Reactor Coolant Temperature is 190 degrees F

Which **ONE** of the following lists the **MINIMUM**, on site shift staffing requirements per Technical Specifications and 10CFR50.54?

- A. 1 Shift Manager (SRO Licensed)
1 Licensed Reactor Operator
1 Non-licensed operator
- B. 1 Shift Manager (SRO Licensed)
1 Control Room Supervisor (SRO Licensed)
1 Licensed Reactor Operator
- C. 1 Shift Manager (SRO Licensed)
1 Licensed Reactor Operator
2 Non-licensed operator
- D. 1 Shift Manager (SRO Licensed)
2 Licensed Reactor Operators
2 Non-licensed operators

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 67.

The unit is at 100% power. EDG A and EDG C are running for post-maintenance activities. Equipment status is as follows:

- Bus 10300 to Bus 10500 Tie Breaker 10304 is closed
- Bus 10300 to Bus 10500 Tie Breaker 10514 is closed
- EDG A Load Breaker 10512 is closed
- EDG C Load Breaker 10512 is closed
- EDG A and C Tie Breaker 10504 is open
- EDG A and EDG C are each carrying 2600 kW load
- Bus 10500 frequency is at 60.1 HZ

The 'L' fuel oil filter has just been replaced on EDG C with the engine running and the equipment operator is preparing to perform Step G.15.2.d of OP-22, "Diesel Generator Emergency Power" (shown below), to align the 'L' filter for service.

CAUTION

Placing fuel filter selector lever in BOTH will cause a reduction in EDG load, or frequency if the EDG is not in parallel with another power source. The faster the selector lever is placed in BOTH, the greater the EDG load or frequency reduction.

- d. Slowly place filter selector lever in BOTH.
- e. Wait approximately 1 minute, then place filter selector lever in L or R.

Given the operational conditions above, which of the following is correct, regarding implementation of this step?

- A. The rate of filter selector lever operation will NOT have a noticeable impact. EDG C load and frequency will remain constant.
- B. Placing the filter selector lever in BOTH will NOT affect EDG C frequency. EDG C load will lower.
- C. EDG C frequency will lower when the filter selector is placed in BOTH. EDG C load will remain constant.
- D. Fast operation of the filter selector lever will have a noticeable impact. EDG C load and frequency will lower.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # G.2.1.20
Importance Rating 4.6

QUESTION 67.

K&A Statement: Ability to interpret and execute procedure steps.

Justification:

- A. **Incorrect.** Plausible if the applicant interprets the caution to mean "load and frequency only affected when not paralleled.
- B. **CORRECT.** EDG fuel oil pressure will drop as standby fuel oil filter is aligned. The lower pressure will result in EDG load reduction. Frequency will not be affected because the EDG is running in parallel with the infinite bus (grid).
- C. **Incorrect.** Plausible if the applicant interprets the caution to mean frequency is affected during parallel operation. Also plausible if applicant is confused as to whether or not the EDG is running in parallel with offsite sources.
- D. **Incorrect.** Plausible if applicant focuses on speed of switch operation rather than which parameter will be affected.

References: OP-22, EDG Power, Rev Step G.15.2.d Student Ref: None

Learning Objective: N/A

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis: X

10CFR 41.10

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 68.

Plant conditions are as follows:

- Reactor power is 80%
- Control Rod 22-47 is at position 08

Control Rod 22-47 is required to be withdrawn to position 24 for a rod pattern adjustment.

Continuous control rod withdrawal is recommended by the Reactor Engineer and the control rod **is not** identified as fast on the list of CRD deficiencies.

Given the recommendation by the Reactor Engineer, WHICH ONE of the following describes the procedural restrictions for continuous control rod withdrawal of Control Rod 22-47 in accordance with OP-26, "Control Rod Drive Manual Control System"?

- A. Continuously withdraw the rod and release the rod control switches at least 2 notches before the intended position, then single notch withdraw to position 24.
- B. Continuously withdraw the rod and release the rod control switches at least 2 notches before the intended position, then continuously withdraw to position 24.
- C. Continuously withdraw the rod and release the rod control switches at least 3 notches before the intended position, then single notch withdraw to position 24.
- D. Continuously withdraw the rod and release the rod control switches at least 3 notches before the intended position, then continuously withdraw to position 24.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 69.

Plant conditions were as follows 24 hours ago:

- Reactor power stable at 80%
- Total RCS LEAKAGE at 6.7 gpm
- Identified RCS LEAKAGE at 3.5 gpm
- Unidentified RCS LEAKAGE at 3.2 gpm

Current conditions are as follows:

- Reactor power stable at 75%
- Total RCS LEAKAGE at 11.1 gpm
- Identified RCS LEAKAGE at 5.7 gpm
- Unidentified RCS LEAKAGE at 5.4 gpm

Which **ONE** of the following describes the impact of these changed conditions on limits of Tech Spec 3.4.4, “RCS Operational Leakage?”

- A. Unidentified RCS LEAKAGE is within limits; however, the increase in unidentified RCS LEAKAGE exceeds TS limits.
- B. Total RCS LEAKAGE exceeds TS limits and the unidentified RCS LEAKAGE exceeds TS limits.
- C. Identified RCS LEAKAGE is within limits; however, the increase in the identified RCS LEAKAGE exceeds TS limits.
- D. Unidentified RCS LEAKAGE and the increase in unidentified RCS LEAKAGE both exceed TS limits.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # G.2.2.38
Importance Rating 3.6

QUESTION 69.

K&A Statement: Knowledge of conditions and limitations in the facility license

Justification:

- A. Incorrect-because the unidentified leakage is not within the TS limit. Plausible if the candidate does not know the TS limit for UILR.
- B. Incorrect because the Total leakage is within the TS limit. Plausible if the candidate does not know the TS limit for Total Leakage.
- C. Incorrect– There is no Tech Spec limit on increase in identified leakage. Plausible if the candidate does not know the difference between identified and unidentified limits.
- D. Correct- because the UILR is >5 gpm and the increase in UILR is >2 gpm.

References: TS 3.4.4 Student Ref: None

Learning Objective: N/A

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis: X

10CFR 41.7

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 70.

A plant startup is in progress with the Mode Selector switch in startup. Control rods are being withdrawn.

- The Rod Worth Minimizer (RWM) has just failed with 11 control rods withdrawn.

Per OP-64, Rod Worth Minimizer, what actions are required to continue the startup with the 11 control rods withdrawn?

- A. Verify >10 control rods have been withdrawn, bypass the RWM, verify all further control rod movements are in compliance using a second individual, licensed operator only
- B. Verify by administrative methods that startup with RWM inoperable has not been performed in the past 365 days, bypass the RWM, verify all further control rod movements are in compliance using a second individual, licensed operator only
- C. Verify >10 control rods have been withdrawn, bypass the RWM, verify all further control rod movements are in compliance using a second individual, licensed operator or Shift Technical Advisor
- D. Verify by administrative methods that startup with RWM inoperable has not been performed in the current calendar year, bypass the RWM, verify all further control rod movements are in compliance using a second individual, licensed operator or Shift Technical Advisor

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 71.

Personnel are preparing to enter the Drywell at power to investigate a problem.

Which **ONE** of the following states the requirements of AP-12.02, "Drywell Entries During Primary Containment"?

Personnel may enter when reactor power is less than or equal to (1) and Oxygen concentration is greater than (2).

- A. (1) 15%
(2) 19.5%
- B. (1) 20%
(2) 19.5%
- C. (1) 15%
(2) 17.5%
- D. (1) 20%
(2) 17.5%

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 72.

The plant is operating at 100% power with the following:

- Annunciator 09-3-2-38 OFF GAS RAD MON HI-HI, alarms
- The reactor operator reports that both Offgas Radiation Monitors are at the Hi-Hi alarm setpoint.

Which one of the following states the immediate actions per AOP-3, High Activity in the Rx Coolant or Off-Gas?

- A. Ensure 01-107AOV-100, Off Gas Discharge to Stack is closed
- B. Insert a manual scram per AOP-1, Reactor Scram
- C. Secure hydrogen addition flow to reduce radiation levels
- D. Lower reactor power as necessary to control radiation levels

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # 2.3.11
Importance Rating RO 3.8, SRO

QUESTION 72.

K&A Statement: Ability to Control Radiation Releases

Justification:

- A. Incorrect because the isolation has not occurred when the high offgas alarm comes in, (timer needs to time out) but plausible if the candidate thinks the system has isolated. This is an override if the timer has timed out.
- B. Incorrect because AOP-3 does not direct a scram until the timer has timed out. However, plausible if the candidate thinks this action is required as an immediate action. This is an override if the timer has timed out.
- C. Incorrect because this is a subsequent action of AOP-3 (step F.2.3) and is not an immediate action. Plausible because a reduction in hydrogen injection will reduce the radiation levels.
- D. Correct – With an off gas hi-hi rad alarm in, AOP-3 directs to reduce power to control radiation levels below the alarm setpoint.

References: AOP-3 Student Ref: None

Learning Objective: N/A

Question source: NMP1 09 q71

Question History: None

Cognitive level: Memory/Fundamental knowledge: X
Comprehensive/Analysis:

10CFR 41.11

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 73.

The plant is operating at 100% power when the following conditions develop:

- An unisolable steam line break occurs in the RCIC room
- RCIC Equipment Room Area is 132°F and rising at 1 degree per minute
- West Crescent Area temperature is 108°F and rising at 3 degrees per minute

Per BWROG Emergency Procedure Guidelines/Severe Accident Guidelines, under these conditions what is the basis for initiating a reactor scram?

- A. To terminate the fissioning process since Emergency Depressurization is anticipated.
- B. To lower reactor power to decay heat to reduce the energy that may be discharged to the room.
- C. To ensure the Reactor is shutdown prior to the leak getting larger.
- D. To allow the steam leak to depressurize the reactor thereby reducing the release rate.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # G.2.4.6
Importance Rating 3.7

QUESTION 73.

K&A Statement: Knowledge of EOP mitigation strategies

Justification:

- A. **Incorrect but plausible if candidate forgets** that only a single area is approaching it's maximum safe area temperature. Emergency de-pressurization requires 2 or more Reactor Building area temperatures above their maximum safe values. Should reactor building temperatures exceed their maximum safe operating values in more than one area and a primary system is discharging outside primary containment, the RPV must be depressurized to preclude further temperature increases. RPV depressurization places the primary system in its lowest possible energy state, rejects heat to the torus in preference to outside the containment, and reduces the driving head and flow of primary systems that are unisolated and discharging into the reactor building and preserving secondary containment.
- B. **CORRECT:** If any reactor building area temperature listed in EOP-5 approach their maximum safe operating value, adequate core cooling, containment integrity, safety of personnel, or continued operability of equipment required to perform EOP actions can no longer be assured. EOP-2 RPV Control must be entered to make certain the reactor is scrammed. Scramming the reactor reduces to decay heat levels the energy that the RPV may be discharging to the secondary containment. An explicit direction to scram the reactor is not provided in this step. The max safe area temperature for RCIC is 137°F.
- C. **Incorrect Plausible if candidate forgets** that only a single area is approaching it's maximum safe area temperature. Shutting down the reactor prior to the leak getting larger is not a concern per the bases. The reactor shutdown is based on room temperatures approaching their max safe area temperature.
- D. **Incorrect Plausible if candidate forgets** that the RCIC room is not an enclosed by water tight doors. If a steam leak were to occur it would spread to other rooms e.g. the west cressent area, RCIC drywell entrance, and RHR Heat exchanger room. Only a single area is approaching it's maximum safe area temperature. Should reactor building temperatures exceed their maximum safe operating values in more than one area and a primary system is discharging outside primary containment, the RPV must be depressurized to preclude further temperature increases. RPV depressurization places the primary system in its lowest possible energy state, rejects heat to the torus in preference to outside the containment, and reduces the driving head and flow of primary systems that are unisolated and discharging into the reactor building and preserving secondary containment.

References: MIT-301.11F; EOP-5

Student Ref: None

Learning Objective: 1.07

Question source: HC 2/09; Q-61

Question History: HC 2/09; Q-61

Cognitive level: Memory/Fundamental knowledge: X
Comprehensive/Analysis:

10CFR 41.10

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 74.

A plant transient has resulted in the following plant conditions:

- Reactor is shutdown
- Emergency Depressurization has been performed
- Reactor Pressure is 50 psig and steady
- RPV water level is -25 inches and steady
- A Core Spray subsystem is injecting at 4825 gpm

Is core cooling adequate and why?

- A. Yes. Steam cooling with injection **AND** reactor level above -31.5 inches ensures adequate core cooling.
- B. No. Steam cooling with injection requires reactor level above -19 inches. Since level is at -25 inches adequate core cooling cannot be ensured.
- C. Yes. Core Spray injecting at or above 4725 gpm **AND** reactor level above -44.5 inches ensures adequate core cooling.
- D. No. Spray cooling requires Core Spray injecting at or above 4925 gpm. Since Core Spray is injecting at 4825 gpm adequate core cooling cannot be ensured.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # G.2.4.17
Importance Rating 3.9

QUESTION 74.

K&A Statement: Knowledge of EOP terms and definitions

Justification:

- A. Incorrect because steam cooling with injection requires RPV level to be above -19 inches. Plausible if the candidate does not know the minimum level for steam cooling with injection.
- B. Incorrect because adequate core cooling is ensured with spray cooling. Plausible if the candidate does not know the spray cooling requirements.
- C. Correct - Spray cooling is defined to exist when a Core Spray loop is injecting at or above 4725 gpm. With level above -44.5 inches and core spray injecting above the minimum flow adequate core cooling is ensured.
- D. Incorrect because the correct flow is 4725 gpm. This answer is a plausible distractor if the candidate does not know the minimum core spray flow for spray cooling.

References: EOP-2, MIT 301.11C

Student Ref:

None

Learning Objective: MIT 301.11C LO 3.0

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis:

X

10CFR 41.10

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 75.

A plant startup is in progress after a refueling outage, with the following conditions:

- RPV pressure is 970 psig
- Main Turbine Bypass Valve BPV-1 is half open
- Reactor power is being raised per OP-65, Reactor Power Ascension, to achieve BPV-1 near full open
- Preparations are being made to calibrate APRM's per ST-5D
- All plant parameters are within normal range
- All equipment is operable

Then the following conditions occur:

- The Red PREFERRED POWER light on panel 09-43 is off
- EPIC-D-912 INTERPOSING RLY SYS LOSS OF AC is in alarm
- Annunciator 09-5-1-58 INTERPOSING RELAY SYS ON DC PWR is **NOT** in alarm.

Based on these indications, what is the annunciator status, and what is required in accordance with AOP-65, Loss of Control Room Annunciators?

- A. The control room annunciators are available on backup power. The power ascension and APRM calibration may continue as directed by the Shift Manager.
- B. The control room annunciators are available on backup power. The power ascension and APRM calibration may **NOT** continue.
- C. The control room annunciators are **NOT** available. The power ascension and APRM calibration must be suspended until control room annunciators are returned to service.
- D. The control room annunciators are **NOT** available. The power ascension must be suspended until control room annunciators are returned to service, however the APRM calibration may continue.

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # G.2.4.32
Importance Rating 3.6

QUESTION 75.

K&A Statement: Knowledge of operator response to loss of all annunciators

Justification:

- A. Incorrect because a loss of AC power only would cause Annunciator 09-5-1-58 INTERPOSING RELAY SYS ON DC PWR to alarm, but plausible because the candidate may conclude that power is still available.
- B. Incorrect a loss of AC power only would cause Annunciator 09-5-1-58 INTERPOSING RELAY SYS ON DC PWR to alarm, but plausible because the candidate may conclude that power is still available
- C. Correct – AOP-65 immediate actions require to avoid any transients and secure all surveillance/testing activities
- D. Incorrect but plausible if the candidate thinks that the APRM calibration must be done in this situation because of the power level.

References: AOP-65, OP-65

Student Ref:

None

Learning Objective: N/A

Question source: New

Question History: None

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis:

X

10CFR 41.10

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 76.

Plant conditions are as follows:

- Unit startup is in progress per OP-65
- Reactor Power is 24%
- Turbine first stage pressure is 186 psig

The Main Turbine, Main Shaft Oil Pump Discharge pressure drops to 99 psig.

WHICH ONE of the following describes the expected plant response to the above and the procedure to respond to the event?

- A. (1) Main Turbine Trips.
(2) Reactor Power rises.
(3) Enter AOP-32; Unexplained/Unanticipated reactivity change.
- B. (1) Main Turbine remains on line.
(2) Shutdown the Main Turbine per OP-9; Main turbine.
- C. (1) Main Turbine Trips.
(2) Reactor Scrams.
(3) Enter AOP-1; Reactor Scram.
- D. (1) Main Turbine Trips and Reactor Recirculation Pumps Trip.
(2) Reactor Scrams.
(3) Enter EOP-2; RPV Control.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 295005 A2.05
Importance Rating 3.9

QUESTION 76.

K&A Statement: **AA2.05** Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP : **REACTOR POWER**

Justification:

- A. **CORRECT:** Under the current conditions with first stage pressure ≤ 217 psig the turbine will trip. But instead of a Reactor Scram, reactor power will rise due to increased feedwater subcooling since feedwater heating is lost when extraction steam is isolated by the turbine trip.
- B. **Incorrect but plausible if the candidate forgets** Main Turbine, Main Shaft Oil Pump Discharge Pressure dropping to 99 psig will cause a turbine trip.
- C. **Incorrect but plausible if the candidate forgets** a Reactor Scram is not expected since Reactor Power is below 29% as sensed by turbine first stage pressure ≤ 217 psig.
- D. **Incorrect but plausible if the candidate forgets** a Reactor Scram and Recirculation pump trip are not expected since Reactor Power is below 29% as sensed by turbine first stage pressure ≤ 217 psig.

References: OP-9, AOP-32; AOP-68
SDLP-35R12; Feedwater Heating

Student Ref: None

Learning Objective: 1.09.a

Question source: Modified Limerick 2008

Question History: NRC Exam Q 77

Cognitive level: Memory/Fundamental knowledge:

10CFR55.43(b)(6)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 77.

The plant is operating at 100% power, with the following:

1100 on 5/01/10: Line 3 offsite AC circuit is declared INOPERABLE

1300 on 5/03/10: 'A' Emergency Diesel Generator is declared INOPERABLE

1400 on 5/03/10: Line 3 offsite AC circuit is declared OPERABLE

1600 on 5/03/10: Line 4 offsite AC circuit is declared INOPERABLE

1700 on 5/03/10: 'B' Emergency Diesel Generator is declared INOPERABLE

What is the LATEST time that the plant is required to enter mode 3 IAW Technical Specifications?

- A. 0500 on 5/04/10
- B. 0600 on 5/04/10
- C. 0700 on 5/04/10
- D. 1600 on 5/04/10

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 295003; G.2.2.22
Importance Rating SRO – 4.7

QUESTION 77.

K&A Statement: Knowledge of limiting conditions for operations and safety limits in regards to: **PARTIAL OR COMPLETE LOSS OF AC**

Justification:

- A. **INCORRECT:** because this time represents only 12 hours for mode 3 entry. With 3 AC sources inoperable, required per TS 3.8.1 Action G to enter T/S 3.0.3 immediately. Action shall be initiated to place the plant in Mode 3 within 13 hours **Plausible if the candidate bases** shutdown only on T/S 3.8.1.
- B. **CORRECT:** With 3 AC sources inoperable, required per TS 3.8.1 Action G to enter T/S 3.0.3 immediately. Action shall be initiated within 1 hour to place the plant in mode 3 within 13 hours.
- C. **Incorrect:** because this time represents the action time to mode 3 based on 2 EDG being inoperable. **Plausible if the candidate bases** the shutdown actions on 2 EDGs being inoperable in TS3.8.1 Action E and not a loss of 3 AC sources. A total time of 14 hours for mode 3 entry.
- D. **Incorrect:** because this time represents 1 AC offsite and 1 EDG being inoperable. **Plausible if the candidate bases** the shutdown on TS 3.8.1 Action D. A total time of 24 hours for mode 3 entry.

References: SDLP-93 R16; Emergency AC power Student Ref: None
JAF technical Specifications 3.8.1

Learning Objective: 1.16 and 1.18

Question source: New

Question History: None

Cognitive level: Comprehensive/Analysis:

10CFR55.43(b) (2)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 78.

The reactor is operating normally at 100% power when the following sequence of events occurs:

- 0323 - EPIC-D-124 SEISMIC EVENT ALARM actuates
 - NMP-2 reports 0.10g horizontal ground acceleration
 - Operators notice ground motion and smoke in JAF control room
 - Offsite power is lost
 - EDGs A and C automatically connect to Bus 10500
 - EDGs B and D do NOT connect to Bus 10600
- 0324 Smoke and fire observed behind the panels. Shift Manager orders control room evacuation
- 0325 Operators take required INSIDE control room actions and then exit the control room
- 0342 Fire brigade extinguishes the fire in the control room
- 0345 Bus 10600 energized from EDGs
- 0359 LPCI injection to RPV commenced, vessel level rising
- 0405 Plant walkdown complete, only minor equipment damage

Which of the following (1) describes field action(s) required per AOP-43, Plant Shutdown From Outside the Control Room, and (2) identifies the highest ECG classification?

- A. (1) Trip RWR MG Set A Motor Breaker 71-10110
(2) Alert
- B. (1) Open ESW Sys B Injection Valve 46MOV-101B
(2) Alert
- C. (1) Start RHRSW Pump A and RHR Pump C
(2) Site Area
- D. (1) Align LPCI MOV Bus B to Alternate Feed
(2) Site Area

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 295016; G.2.4.12
Importance Rating SRO – 4.3

QUESTION 78.

K&A Statement:

Knowledge of general operating crew responsibilities during emergency operations in regards to:

CONTROL ROOM ABANDONMENT

Justification:

- A. **Incorrect.** Site Area is the correct classification **but plausible** because the ATC trips RWR MG Set A Motor Feed Breaker 71-10110 per AOP-43 and AOP-43 directs minimum EAL classification of Alert.
- B. **Incorrect.** Site Area is the correct classification **but plausible** because the ESW Sys B Injection Valve is opened by the SNO or CRS at Panel 25ASP-3 and AOP-43 directs minimum EAL classification of Alert.
- C. **Incorrect.** RHR Pumps A and C motor breakers are tripped by the SNO or CRS at the breakers **but plausible** because RHRSW Pp B and RHR Pump D breakers are closed by the SM at Panel 25RSP. Site Area is the proper classification when vessel injection is not restored within 30 minutes after evacuating the control room.
- D. **Correct:** LPCI MOV Bus B is placed on its alternate feed per subsequent steps. The fire safe shutdown strategy uses Bus 10600 equipment to establish vessel level control. Site Area is the proper classification when vessel injection is not restored within 30 minutes after evacuating the control room.

References: AOP-43; Plant shutdown from outside the control room Student Ref: EAL Matrix

Learning Objective: LP-AOP; 1.03.a & b

Question source: New

Question History: None

Cognitive level: Analysis

10CFR55.43(b) (5)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 79.

The plant is shutting down for a refueling outage. Shutdown Cooling has been in service for 1 hour.

T= 12:00 – RPV temperature is 162 degrees F.

Then a complete loss of Shutdown cooling occurs. After 20 minutes, the operators determine that RPV temperature is rising at 18 degrees every 10 minutes.

T= 12:20 – RPV temperature is 196 degrees F.

Which one of the following describes how the heatup, if it continues at the rate stated above will affect the plant Operational Condition and the Technical Specification (TS) heatup limits?

- A. After T=12:30, a mode change will occur. At T=13:00, the TS heatup rate limit will be exceeded.
- B. After T=12:30, a mode change will occur. At T=13:00, the TS heatup rate limit will **NOT** be exceeded.
- C. Before T=12:30, a mode change would occur. At T=13:00, the TS heatup rate limit will be exceeded.
- D. Before T= 12:30, a mode change would occur. At T=13:00, the TS heatup rate limit will **NOT** be exceeded.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 295021; AA2.01
Importance Rating SRO – 3.6

QUESTION 79.

K&A Statement: Ability to determine and/or interpret the following as they apply to
**LOSS OF SHUTDOWN COOLING:
REACTOR WATER HEATUP/COOLDOWN RATE**

Justification: Mode change occurs at >212 degrees F per TS definitions. The TS heatup limit is 100 degrees in a one hour period. Although the rate is > 100 degrees per hour the limit is not exceeded until the one hour time period has been met (1200-1300)

- A. **Incorrect but plausible** Mode change occurs at >212 degrees F per TS definitions. Based on the heatup rate the mode change occurred before 12:30 and not after 12:30. The TS heatup rate will be exceeded at T=1300.
- B. **Incorrect but plausible** Mode change occurs at >212 degrees F per TS definitions. Based on the heatup rate the mode change occurred before 12:30 and not after 12:30. The TS heatup rate will be exceeded at T=1300.
- C. **CORRECT:** Mode change occurs at >212 degrees F per TS definitions. Based on the heatup rate the mode change occurred before 12:30 and not after 12:30. The TS heatup rate will be exceeded at T=1300.
- D. **Incorrect but plausible** Mode change occurs at >212 degrees F per TS definitions. Based on the heatup rate the mode change occurred before 12:30 and not after 12:30. The TS heatup rate will be exceeded at T=1300.

References: T/S 3.4.9 and 1.1 TS definitions Student Ref: None

Learning Objective: SDLP-02AR11; 1.07.a

Question source: Modified TS for JAF

Question History: HC NRC 02/09; SRO-76

Cognitive level: Memory or Fundamental Knowledge

10CFR55.43(b) (1)
10CFR

41.10 / 43.5 / 45.13

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 80.

The unit was shutdown six days ago to begin a refueling outage. The refueling cavity is flooded and irradiated fuel moves are in progress. Both doors in the drywell personnel air lock have been open to support drywell inspections. Both Standby Gas Treatment (SGT) trains have just been declared inoperable because they failed to start during a routine surveillance.

Per Technical Specifications what operator actions must be taken in reference to the irradiated fuel moves?

- A. No actions are required, irradiated fuel movements may continue
- B. Suspend movement of recently irradiated fuel assemblies in secondary containment until **ONE** train of SGT is operable
- C. Suspend movement of recently irradiated fuel assemblies in secondary containment until **BOTH** trains of SGT are operable
- D. Manually initiate and run one Standby Gas Treatment subsystem until the SGT automatic initiation logic is returned to an operable status

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 295003 G.2.2.22
Importance Rating SRO 4.7

QUESTION 80.

K&A Statement: **295003 Refuel ACC G.2.2.22 Knowledge of limiting conditions for operations and safety limits**

Justification:

- A. Correct –per TS bases B3.6.4.1 recently irradiated fuel is defined as fuel that has occupied part of a critical reactor core within the previous 96 hours. Since this is day 6 after shutdown, TS 3.6.4.3 is not applicable
- B. Incorrect but plausible because this would be the correct action statement if the TS was applicable.
- C. Incorrect but plausible if the candidate thinks both systems need to be operable to exit 3.6.4.3.D
- D. Incorrect but plausible if the candidate thinks that by manually starting a system, this would make it operable, and fuel movements could continue.

References: TS 3.6.4.3 Student Ref: None

Learning Objective: N/A

Question source: Modified Fitz 02 NRC Exam

Question History: SRO Q24

Cognitive level: Memory/Fundamental knowledge: x
Comprehensive/Analysis:

10CFR 43.2

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 81.

After a long period of full power operation, an instantaneous loss of all AC power occurs and is not corrected. The HPCI System failed to start.

With No initial operator action, over the next hour you would expect (1) and the correct subsequent Operator action to be (2) ?

- A. (1) SRV's to open and close periodically on mechanical overpressure.
(2) Commence a cooldown at less than 100 °F/ hr.
- B. (1) SRV's to open and close periodically on mechanical overpressure.
(2) Commence a cooldown at less than 20 °F/ hr.
- C. (1) SRV's initial operation with RCIC operation precluding the need for further SRV operation.
(2) Commence a cooldown at less than 100 °F/ hr.
- D. (1) SRV's initial operation with RCIC operation precluding the need for further SRV operation.
(2) Commence a cooldown at less than 20 °F/ hr.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 295025 EA2.05
Importance Rating SRO 3.6

QUESTION 81.

K&A Statement:

EA2.05 Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE: Decay heat generation

Justification:

- A. Incorrect because although EOP-2 would allow a cooldown at 100 degrees F, AOP-49 is the correct procedure and it has a more limiting cooldown rate. Plausible because the limit in EOP-2 is 100 degrees F.
- B. Correct – Candidate must recognize that RCIC steam demand is far less than decay heat generation. Per AOP-49 cooldown is to be <20 degrees F per hour.
- C. Incorrect because candidate must recognize that RCIC steam demand is far less than decay heat generation which will cause the SRV's to continue to cycle without operator action. Plausible if the candidate does not know that the decay heat is beyond the capacity of the RCIC system.
- D. Incorrect because candidate must recognize that RCIC steam demand is far less than decay heat generation which will cause the SRV's to continue to cycle without operator action. Plausible if the candidate does not know that the decay heat is beyond the capacity of the RCIC system.

References: AOP-49, EOP-2

Student Ref:

None

Learning Objective: LP-AOP, EO-1.10

Question source: Fitz 03 NRC

Question History: Q S30 Fitz NRC Exam

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis:

X

10CFR

43.5

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 82.

The plant was operating normally at power. A loss of coolant accident occurs with complications, resulting in an automatic reactor scram. Conditions shortly after the scram are as follows:

- Reactor is shutdown
- Drywell pressure is 9.5 psig and rising slowly
- Drywell temperature is 190°F and rising slowly
- RPV Water Level is 45 inches and slowly lowering
- Torus water level is 9.6 feet and dropping
- RPV pressure is being controlled between 700 to 800 psig
- Torus water temperature is 110°F and rising slowly

Per the EOPs, which of the following is required and why?

- A. Place RHR in Drywell Spray to mitigate the effects of a deflagration.
- B. Cycle SRV's to maintain RPV pressure below the heat capacity temperature limit.
- C. Secure Core Spray pumps to prevent cavitation damage of the pumps.
- D. Emergency depressurize due to compromise of pressure suppression capability.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 295030; G.2.1.27
Importance Rating 4.0

QUESTION 82.

K&A Statement: Knowledge of system purpose and/or function in regards to: **LOW SUPPRESSION POOL WATER LEVEL**

Justification:

- A. **Incorrect but plausible if the candidate forgets** that Drywell conditions do not support placing RHR in the Drywell Spray mode. Drywell sprays are used to effect a reduction in drywell temperature and pressure, to control hydrogen and oxygen concentrations in the drywell, and to mitigate the effects of a deflagration.
- B. **Incorrect but plausible if the candidate forgets** HCTL is not about to be exceeded. With RPV pressure between 700 and 800 psig, HCTL limit is 120°F.
- C. **Incorrect but plausible if the candidate forgets** the Vortex Limit is defined to be the lowest torus water level above which air entrainment is not expected to occur in RCIC or an ECCS pump taking suction on the torus. ECCS pumps could handle 20% entrainment of air, but > 4% air by volume can noticeably reduce pump capacity. Also should a pump trip under these conditions air would collect at system high points. Subsequent restarts could damage system components due to water hammer. This limit is a function of pump flow, and is imposed to preclude system damage due to air entrainment. 8.92 ft for flows between 0 to 20,800 gpm.
- D. **CORRECT:** Per EOP bases the downcomer vents can begin to uncover. This can lead to pressurization of the Torus air space.

References: MIT-301.11E; EOP-4

Student Ref:

NONE

Learning Objective: EO-4.05

Question source: Modified

Question History: NMP #1; NRC3/07; Q-63

Cognitive level: Comprehensive/Analysis:

10CFR55.43(b) (1)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 83.

The plant is in a refueling outage and fuel movements are in-progress on the refuel floor for a spiral onload around 'B' SRM.

- 'A' SRM is inoperable
- The intended core location for the bundle is in the 'B' SRM quadrant
- There are currently 9 bundles around the 'B' SRM
- The Control Room Refuel Operator reports that the 'C' SRM indication is now reading < 2 cps.

IAW with RAP-7.1.04C; NEUTRON INSTRUMENTATION MONITORING DURING IN-CORE FUEL HANDLING, which of the following is correct?

- A. Core alterations may continue with **NO** further confirmations/verifications.
- B. Core alterations shall be halted in the 'C' SRM quadrant **ONLY**.
- C. Core alterations may continue **ONLY** if 'C' SRM indicates ≥ 2 cps.
- D. **ALL** core alterations shall be halted.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 205004; G.2.1.40
Importance Rating SRO – 4.2

QUESTION 83.

K&A Statement: Knowledge of refueling administrative requirements as they apply to **SRM**

Justification:

- A. **Incorrect:** because this does not met RAP-7.1.04C guidance by have the adjacent "A" and "C" SRM operable and performing core alterations in the "B" SRM quadrant **but plausible if the candidate forgets** 3 SRMs operability is based on indications > 3 cps and 2 SRMs have to be adjacent to each other.
- B. **Incorrect:** because this does not met RAP-7.1.04C guidance by have the adjacent "A" and "C" SRM operable and performing core alterations in the "B" SRM quadrant **but plausible if the candidate forgets** 3 SRMs operability is based on indications > 3 cps and 2 SRMs have to be adjacent to each other.
- C. **Incorrect:** because "C" SRM has to indicate > than 3 cps **but plausible if the candidate forgets** 3 SRMs operability is based on indications > 3 cps and 2 SRMs have to be adjacent to each other.
- D. **CORRECT:** IAW RAP-7.1.04C the 3 operable SRMs have to indicate > 3 cps and 2 SRMs have to be adjacent to each other. With "A" and "C" SRMs inoperable core alterations must be stopped. RAP-7.1.04C is more conservative than T/S 3.3.1.2.4 RAP-7.1.04C step 6.2 states **IF** Neutron Instrumentation reads **LOWER THAN 3 CPS, THEN** core alterations shall immediately stop until it can be determined if the following is met: Technical Specifications SR 3.3.1.2.4

References: RAP-7.1.04B and C Student Ref: None
SRM/IRM Core Map
T/S 3.3.1.2.E
SDLP-08A R10; Refueling Equipment

Learning Objective: 1.10.a

Question source: OC 08/01 Q-14

Question History: OC 08/01 Q-14

Cognitive level: Memory/Fundamental knowledge:

10CFR 55.43(b) (2)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 84.

A LOCA has occurred and the following conditions exist.

- Reactor is shutdown
- Reactor pressure is 900 psig and lowering slowly
- Torus temperature is 135 degs and rising slowly
- Torus water level is 10 feet and steady
- Torus pressure is 6 psig lowering slowly
- Drywell pressure is 7 psig and lowering slowly
- Drywell temperature is 300 degs and rising slowly
- Drywell hydrogen concentration is .5% and steady
- Drywell oxygen concentration is 4% and steady
- RPV Level 141 inches, lowering 2 inch / min

Based on the above conditions, which one of the following actions is required?

- A. Vent the drywell
- B. Emergency depressurize the RPV
- C. Spray the drywell
- D. Lower RPV pressure maintaining <100 degree/hour cooldown rate

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 295010; A2.06
Importance Rating SRO – 3.6

QUESTION 84.

K&A Statement: Ability to determine and /or interpret the following as they apply to
HIGH DRYWELL PRESSURE : DRYWELL TEMPERATURE

Justification:

- A. **Incorrect but plausible if the candidate** does not remember venting the drywell occurs when drywell hydrogen concentration is above .6%. Also drywell pressure will not exceed the Primary Containment Pressure Limit.
- B. **CORRECT:** IAW drywell temperature leg of EOP-4 before drywell temperature reaches 309 degs Spray the Drywell, however plant parameters are not within the drywell spray initiation limit and therefore the next step if you cannot spray is to ED.
- C. **Incorrect but plausible if the candidate** does not recognize that they are on the bad portion of the drywell spray initiation limit.
- D. **Incorrect but plausible** if the candidate does not recognize not on bad portion of HCTL and pressure is lowering, Lowering pressure to maintain parameters within the HCTL is not required at this time.

References: SDLP-10 R19; RHR

Student Ref: HCTL, DSIL EOP-4

Learning Objective: 1.05.a.3.b & d

Question source: New

Question History: New

Cognitive level: Comprehensive/Analysis:

10CFR55.43(b) (5)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 85.

Which ONE of the following describes how primary containment is protected against high hydrogen concentrations IAW EOP-4 "Primary Containment Control" and EOP-4a Primary Containment Gas Control?

- Drywell Hydrogen concentration is 5%
 - Drywell Oxygen concentration is 4%
 - Torus Hydrogen concentration is .5%
 - Torus Oxygen concentration is 4%
- A. Vent and Purge the Drywell WHEN H₂ concentration reaches .6% in the Drywell.
- B. Vent the Torus BEFORE H₂ concentration reaches .5% in the Torus.
- C. Vent the Drywell WHEN H₂ concentration reaches .6% in the Drywell.
- D. Vent and Purge the Torus BEFORE H₂ concentration reaches .5% in the Torus.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 500000; EA2.03
Importance Rating SRO – 3.8

QUESTION 85.

K&A Statement: Ability to determine and/or interpret the following as they apply to
HIGH PRIMARY CONTAINMENT HYDROGEN
CONCENTRATIONS: **COMBUSTIBLE LIMITS FOR DRYWELL**

Justification:

- A. **CORRECT:** Venting and Purging of the Drywell is required IAW DW/G-1.
- B. **Incorrect but plausible:** Venting and Purging of the Torus is not required until after .6% hydrogen is reached in the Torus.
- C. **Incorrect but plausible:** Venting and Purging of the Drywell is required since drywell is at .6% hydrogen.
- D. **Incorrect but plausible:** Venting and Purging of the Torus is not required until after .6% hydrogen is reached in the Torus.

References: EOP-4 and EOP-4a

Student Ref: None

Learning Objective: SDLP-16B R20;Primary Containment Auxiliary Systems
1.01a

Question source: Modified to JAF

Question History: From SQ exam 12/07; Q-65

Cognitive level: Comprehensive/Analysis:

10CFR 41.1/43.5/45.13

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 86.

The plant is operating at 100% power, when the following occurs:

- Annunciator 09-3-1-1 for 'A' Core Spray HDR Pipe Detector Break alarms.
- Report received that the D/P indicating switch reading is +4.0 psid.

Which one of the following describes the LOCATION of this piping break AND the Technical Specification implication of this failure?

A. LPCS piping BETWEEN the Reactor Pressure Vessel wall and the Core Shroud. AND Enter a 7 day LCO and place the LPCS Pump in PULL TO LOCK.

B. LPCS piping INSIDE the Core Shroud. AND Place the LPCS Pump in PULL TO LOCK and reduce Reactor Coolant Temperature to < 212" F within 24 hours.

C. LPCS piping INSIDE the Core Shroud. AND Enter a 7 day LCO, place the LPCS Pump in PULL TO LOCK, and deactivate the Injection Valve.

D. LPCS piping BETWEEN the Reactor Pressure Vessel wall and the Core Shroud. AND Enter a 14 day LCO, place the LPCS Pump in PULL TO LOCK, and deactivate the Injection Valve.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 209001; G.2.1.45
Importance Rating SRO – 4.3

QUESTION 86.
K&A Statement:

Ability to identify and interpret diverse indications to validate the response of another indication for
LOW PRESSURE CORE SPRAY SYSTEM LINE BREAK PROTECTION

Justification:

- A. **Correct:** A Line Break annunciator detects a line break BETWEEN the Reactor Pressure Vessel and the Core Shroud. With spray function not assured, a 7 day LCO is required by Technical Specification 3.5.1.
- B. **Incorrect but plausible:** Break INSIDE Core Shroud will NOT be annunciated. Not required to be < 212°F in 12 hours.
- C. **Incorrect but plausible:** Break INSIDE Core Shroud will NOT be annunciated.
- D. **Incorrect but plausible if** does not recognize 14 day LCO is applicable for HIGH Pressure Core Spray function.

References: SDLP-14 R12; Core Spray

Student Ref: None

Learning Objective: 1.05.a.13 and 1.18.a

Question source: Modified to JAF

Question History: NMP #2 NRC Exam 3/8; Q-87

Cognitive level: Comprehensive/Analysis

10CFR 41.7/ 43.5/ 45.4

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 87.

Plant conditions are as follows:

- Reactor Power is 100%
- I&C reports that Narrow Range Level Transmitters 02-3LT-101A and 02-3LT-101D have failed their Surveillance Test
- All other Narrow Range Level Transmitters are OPERABLE

WHICH ONE of the following identifies the required action with the shortest completion time per Technical Specifications that is applicable for the above conditions?

- A. Restore isolation capability within 1 hour.
- B. Restore RPS trip capability within 1 hour.
- C. Place ONE Channel in the tripped condition within 6 hours.
- D. Place ONE Channel in the tripped condition within 12 hours.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 212000; G.2.2.40
Importance Rating 4.7

QUESTION 87.

K&A Statement: Ability to apply Technical Specifications for a system: **RPS**

Justification:

- A. **Correct** because 3.3.6.1.B is applicable in this condition because the isolation capability is not functional with one transmitter in each trip system inoperable. Placing one channel in trip will restore isolation functionality.
- B. **Incorrect** because 3.3.1.1.C is not applicable in this condition because the RPS trip system can still function. Plausible if the candidate thinks that RPS trip capability is not maintained with 2 channels inoperable.
- C. **Incorrect** 02-3LT-101A and D inoperable means that TS 3.3.1.1. B is applicable. There is one function with one or more channels inoperable in both trips systems. One channel must be tripped within 6 hours, however 3.3.6.1 is more limiting.
- D. **Incorrect** because although 3.3.1.1.A would be an entry condition, the question asked which condition has the shortest completion time. This is plausible if the candidate does not realize that 3.3.1.1.B is applicable because A and D are in separate trip systems.

References: SDLP-02B R16; Rx Vessel Level instrumentation

Student Ref:

TS
3.3.6.1
and
3.3.1.1

T/S 3.3.1.1 and 3.3.6.1

Learning Objective: 1.16 and 1.17

Question source: Modified

Question History: Limerick 10/06; Q-86

Cognitive level: Comprehensive/Analysis:

10CFR55.43(b) (5)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 88.

While operating at 60% Reactor Power, a Reactor Scram on low reactor water level occurs but all control rods remain at their pre-trip conditions.

Plant conditions 30 minutes after the transient are:

- Power level is 5% and lowering
- RPV pressure is controlled between 600 to 800 psig
- RPV Level is 110 inches
- Torus Level is 13.95 feet
- Torus temperature is 152°F and rising
- Drywell pressure is 15 psig and steady
- Torus pressure is 13.5 psig and steady
- Main steam tunnel temp is 200°F and rising

Which one of the following is required for the conditions above?

- A. Maintain RPV pressure at 800 psig.
- B. Lower pressure using bypass valves, maintain < 100°F/hr cooldown rate.
- C. Reduce RPV pressure using SRVs, can exceed 100°F/hr cooldown rate.
- D. Emergency depressurize the reactor vessel.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 295015; G.2.1.7
Importance Rating 4.7

QUESTION 88.

K&A Statement:

Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior and instrument interpretations as they apply to: **INCOMPLETE SCRAM**

Justification:

- A. **Incorrect** because with Torus temperature rising, the HCTL will be exceeded. RPV pressure needs to be reduced **but plausible if the candidate forgets** RPV pressure needs to be reduced.
- B. **Incorrect** because there is indication of a steam line break in the steam tunnel **but plausible if the candidate forgets** the isolation setpoint of 193°F.
- C. **CORRECT:** With Torus temperature rising. The HCTL will be exceeded. RPV pressure needs to be reduced.
- D. **Incorrect** because Torus pressure does not meet the criteria for Emergency Depressurization **but plausible if the candidate forgets** the required torus pressure for Emergency depressurization.

References: EOP-3; Failure to Scram

Student Ref: HCTL &
PSP Curves

MIT-301.11.D;

Learning Objective: 1.07

Question source: HC 2/09: Q-80

Question History: HC 2/09: Q-80

Cognitive level: Comprehensive/Analysis:

10CFR55.43(b) (5)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 89.

The plant is at 100% power with all equipment operable when the following annunciators alarm:

- 09-8-3-9, 10100 OR 10200 OR 10300 OR 10400 PROLONG UV TRIP
- 09-8-3-32, BUS 10400 NORM SUPP BKR 10402 TRIP

The reactor operator reports that 115kV line voltage is normal and there are no alarms indicating a bus or transformer fault.

Assume the electric plant responds as designed **WITHOUT** any additional failures.

Which **ONE** of the following correctly describes (1) the procedures that must be entered on this transient and (2) an immediate action to be taken?

- A. (1) Enter AOP-17 "Loss of 10400 Bus", and OP-46A, "4160 V and 600 V Normal AC Power Distribution"
(2) Close L14 L24 L34 L44 4KV FDR BKR 10440
- B. (1) Enter AOP-57, "Recovery From Residual Bus Transfer", and OP-46A, "4160 V and 600 V Normal AC Power Distribution"
(2) Close L14 L24 L34 L44 4KV FDR BKR 10440
- C. (1) Enter AOP-17 "Loss of 10400 Bus", and AOP-8, "Loss or Reduction of Reactor Coolant Flow"
(2) Ensure Reactor Power is less than 65% power
- D. (1) Enter AOP-57, "Recovery From Residual Bus Transfer", and AOP-8, "Loss or Reduction of Reactor Coolant Flow"
(2) Ensure Reactor Power is less than 65% power

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 264000; A2.06
Importance Rating SRO – 2.9

QUESTION 89.
K&A Statement:

Ability to(a) predict the impacts of the following on the **A.C. ELECTRICAL DISTRIBUTION**; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
DE-ENERGIZING A PLANT BUS

Justification:

- A. **Incorrect because** closing L14 L24 L34 L44 4KV FDR BKR 10440 is not an immediate action of AOP-17. Plausible because the 10440 breaker will trip when the 10400 bus is de-energized for 3 seconds until the residual bus transfer re-energizes the 10400 bus. At that point the L14 L24 L34 L44 switchgear needs to be re-energized, but it is not an immediate action. Breaker 10440 closure is, however, an immediate action in AOP-57.
- B. **Incorrect because** AOP-57 is only entered when a successful residual bus transfer has occurred for **BOTH** the 10400 bus and 10300 bus. With only the loss of 10400, the plant will stay at power. Plausible if the candidate thinks that AOP-57 Recovery From Residual Bus Transfer is applicable when a single bus (10400 in this case has a residual bus transfer) has tripped and been re-energized by the residual bus transfer. The immediate action is correct for AOP-57, however since AOP-57 is not correct procedure, it would be incorrect to use this procedure for restoration of 10440.
- C. **CORRECT.** The correct procedure to enter is AOP-17 for a loss of the 10400 bus. The 10400 bus has been reenergized due to the residual transfer. The B RWR pump will have tripped during the time that the bus was de-energized. AOP-17 immediate actions are to ensure reactor power is below 65% and enter AOP-8 due to the loss of B RWR.
- D. **Incorrect because** AOP-57 is only entered when a successful residual bus transfer has occurred for **BOTH** the 10400 bus and 10300 bus. With only the loss of 10400, the plant will stay at power. Plausible if the candidate thinks that AOP-57 Recovery From Residual Bus Transfer is applicable when a single bus (10400 in this case has a residual bus transfer) has tripped and been re-energized by the residual bus transfer.

References: SDLP-71E; 4160 KV System Student Ref: None
AOP-17 "Loss of 10400 Bus
AOP-57; Recovery From Residual Bus
Transfer

Learning Objective: 1.05.c.1

Question source: New

Question History: New

Cognitive level: Comprehensive/Analysis:

10CFR55.43(b) (5)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 90.

The plant is operating at 100% power when the following annunciators are received:

- 09-4-0-4 CONT HI RANGE RAD MON B FAIL OR POWER LOSS
- 09-4-0-5 CONT HI RANGE RAD MON B ALERT
- 09-4-0-6 CONT HI RANGE RAD MON B HI-HI

At Panel 09-10:

- 27RM-104A, Containment Hi Range Rad Monitor 'Alpha', reads 9R/HR.
- 27RM-104B, Containment Hi Range Rad Monitor 'Bravo', indicates UPSCALE.

Which of the following describes the appropriate operator action?

- A. Swap the 'A' H₂/O₂ analyzer to drywell sampling per OP-37, Containment Atmosphere Dilution System. A daily swap to the Torus is required to obtain Torus values.
- B. Due to the inability to maintain Drywell to Torus D/P, 27RM-104B must be returned to service and the isolation reset per AOP-15, Isolation Verification and Recovery.
- C. If purge is needed the Containment Vent and Purge partial isolation requires swapping containment vent and purge control to the 'A' CAD train per OP-37, Containment Atmosphere Dilution System.
- D. Due to the inability to maintain Drywell to Torus D/P, 27RM-104B must be bypassed and the isolation reset per AOP-15, Isolation Verification and Recovery.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 223002; A2.04
Importance Rating SRO – 3.2

QUESTION 90.
K&A Statement:

Ability to (a) predict the impacts of the following on the **PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF** (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
PROCESS RADIATION MONITORING SYSTEM FAILURES

Justification:

- A. **Incorrect** because the PCIS arrangement of the analyzer will result in a single analyzer fully isolated on appropriate rad monitor isolation signals resulting in the need to swap the remaining analyzer between sample points. The Containment Hi Range Rad Monitors do not isolate the analyzer **but plausible if the candidate forgets** the PCIS logic arrangement for rad monitor isolation.
- B. **CORRECT:** This instrument only effects the containment vent and purge functions and will isolate one valve in each penetration pathway. Eventually, drywell to torus d/p will drift to <1.7 psid unless the instrument is restored and the isolation reset to allow d/p maintenance. Nitrogen make is required to be done due to leak by past the Drywell to Torus vacuum breakers.
- C. **Incorrect:** because with the B channel tripped the vent and purge penetrations have one valve shut in each penetration. Therefore the 'A' CAD train is also isolated. **Plausible if the candidate** thinks that the A trip system isolates the A CAD and the B channel isolates the B CAD.
- D. **Incorrect:** T/S 3.6.1.1 does not allow bypassing the channel. 3.6.1.1.A requires that the system be in the tripped condition. **Plausible if the candidate** thinks that the logic is 2 channels and one trip system. TS Table 3.3.6.1-1 requires 1 channel per trip system for the containment high rad trip. However the bases describes the system as 1 channel per trip system with 2 systems. Each system isolates a valve in each penetration.

References: ARP-09-4-0-4/5/6; AOP-15; T/S 3.6.1.1 Student Ref: None
SDLP-17; area process rad monitors

Learning Objective:
SDLP-17; area
process rad monitors
LO: 1.05.c.2

Question source: Fitz 5/05 Q-83

Question History: Fitz 5/05 Q-83

Cognitive level: Comprehensive/Analysis:

10CFR 55.43 (b) (2) & (5)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 91.

Plant conditions are as follows:

- 37% power
- Reactor Pressure 997 psig
- Control rod scram time testing is in progress IAW RAP-7.4.01, " Control Rod Scram Time Evaluation (IST)"
- All control rods are OPERABLE
- Rods 30-35 and 30-39 are the only rods that are declared SLOW
- Rod 30-31 has been withdrawn from position "12" to position "48" to support scram time testing

The following sequence of events occur (times in *hour:min:sec:hundredths_of_sec* format):

13:02:16:10 Rod 30-31 toggle switch at Panel 9-16 in DOWN SCRAM
13:02:16:40 Rod 30-31 at notch position 46
13:02:17:16 Rod 30-31 at notch position 36
13:02:21:52 Rod 30-31 at notch position 26
13:02:22:50 Rod 30-31 toggle switch at Panel 9-16 in UP SCRAM
13:02:24:20 Rod 30-31 at notch position 06

For the conditions described above, which one of the following meets Tech Spec required actions?

- A. Fully insert either Rod 30-31 or Rod 30-39 or Rod 30-35 within 3 hours, AND isolate the associated inserted rod's HCU within 4 hours.
- B. Declare Rod 30-31 as INOPERABLE. Ensure the rod remains fully inserted, AND disarm Rod 30-31 HCU within 6 hours.
- C. Fully insert Rod 30-31 within 3 hours, AND remove power from the rod's HCU directional control valves within 4 hours.
- D. Declare Rod 30-31 as SLOW. Ensure < 11 rods are declared SLOW AND restore Rod 30-31 position to notch position 12.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 201003; A2.10
Importance Rating SRO – 3.4

QUESTION 91.
K&A Statement:

Ability to (a) predict the impacts of the following on the **CONTROL ROD AND DRIVE MECHANISM**; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

EXCESSIVE SCRAM TIME FOR A GIVEN DRIVE MECHANISM

Justification:

- A. **Incorrect.** Rods 30-35 and 30-39 are adjacent rods. TS 3.1.4 requires no more than 2 adjacent rods declared as SLOW. Rod 30-31 is also an adjacent rod but its scram time is greater than 7 seconds to notch position 04, which requires declaration as INOPERABLE. Must therefore take action to maintain the rod fully inserted per TS 3.1.3. Plausible to take actions for > 2 adjacent slow rods since rod times are slower than required by TS Table 3.1.4-1.
- B. **Incorrect.** Control Rod 30-31 scram time is greater than 7 seconds requires actions for INOPERABLE rod. **Plausible if applicant** thinks disarm required within 6 hours rather than 4 hours.
- C. **CORRECT.** Control Rod 30-31 is inoperable IAW T/S 3.1.3 and 3.1.4 since the scram time is greater than 7 seconds to position 04. Position 04 time is not provided in stem but can be inferred scram time exceeds 7 seconds since time to notch position 06 is greater than 8 seconds. T/S actions required are to fully insert the control rod within 3 hours and disarm the HCU directional control valves (or isolate the HCU) within 4 hours. References are not provided with this question. However, it is reasonable to expect an SRO applicant to know from memory 1) INOPERABLE if > 7 seconds to position 04, and 2) withdrawal capability defeated within 4 hours.
- D. **Incorrect.** Control Rod 30-31 scram time exceeds SLOW criteria. Therefore, **plausible if the candidate doesn't realize** INOPERABLE and doesn't apply limit of no more than 2 adjacent SLOW rods.

References: Technical specifications 3.1.3 and 3.1.4 Student Ref: None
RAP-7.4.01; Control Rod Scram Time
Evaluation

Learning Objective: SDLP03A R8; 1.17 and 1.18

Question source: Limerick NRC 10/06; Q-94

Question History: Limerick NRC 10/06; Q-94

Cognitive level: Comprehensive/Analysis:

10CFR55.43(b) (6)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 92.

The plant is in a refueling outage in MODE 5 with the following evolution in progress:

24 month Surveillance for "B" Control Room Emergency Ventilation Air Supply (CREVAS) System has just been completed at 0400 with the following test results:

- 1) HEPA filter in place test penetration and system bypass flow is 0.9% at a flow rate of 990 scfm
- 2) Charcoal adsorber HEPA filter in place test penetration and system bypass flow is 0.8% at a flow rate of 980 scfm

There are NO fuel movements in progress.

The "A" Control Room Emergency Ventilation Air Supply (CREVAS) System is OPERABLE.

The refuel schedule has an activity to perform a recirculation pump suction valve replacement using a freeze seal beginning at 0800.

You are the Control Room Supervisor. You are tasked with evaluating Technical Specifications to determine if this maintenance activity can be performed as scheduled.

Which **ONE** of the following describes (1) whether this work can be authorized to commence **WITH** the existing plant conditions and **WITHOUT** any additional evaluations, and (2) the basis for that decision?

	Additional Actions	Basis
A.	Maintenance activity can NOT be authorized.	LCO 3.7.3 is currently NOT met and entry into OPDRV specified condition can ONLY be done when two CREVAS subsystems are OPERABLE.
B.	Maintenance activity can be authorized.	Entry into OPDRV specified condition is allowed because TS 3.7.3.D.1 allows continued operation for an unlimited period with an OPERABLE CREVAS subsystem in isolate mode.
C.	Maintenance activity can NOT be authorized.	LCO 3.7.3 is currently NOT met and entry into OPDRV specified condition would require a LCO 3.0.4.b risk assessment be performed prior to performing the maintenance.
D.	Maintenance activity can be authorized.	Maintenance activity is NOT an OPDRV and Technical Specification 3.7.3 is not applicable in Mode 5.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 290003; G2.2.38
Importance Rating SRO – 4.5

QUESTION 92.

K&A Statement:

CONTROL ROOM HVAC G2.2.38 Knowledge of conditions and limitations in the license.

Justification:

- A. Incorrect because with one subsystem operable the work can commence without any additional evaluations. LCO 3.0.4.a allows entry into a specified condition if the actions have an unlimited completion time. With one subsystem inoperable 3.7.3.A would be the required action and if the 7 days ran out action 3.7.3.D would allow placing the operable subsystem for an unlimited time, therefore the maintenance can be performed and the specified condition can be entered. Plausible if the candidate does not consider LCO 3.0.4. and thinks the only way to meet LCO 3.7.3 is to restore the B subsystem to operability.
- B. CORRECT: because the "B" CREVAS is inoperable per TS 5.5.8.b. and LCO 3.0.4.a is applicable. LCO 3.7.3 requires 2 subsystems to be operable. LCO 3.7.3 is not met and entry into a specified condition (during OPDRVS) can only be made IAW LCO 3.0.4. LCO 3.0.4.a allows entry into a specified condition if the actions taken have an unlimited time which per 3.7.3.D with the operable system in isolate OPDRV's can continue for an unlimited time. Therefore the OPDRV specified condition can be entered without restoring the inoperable system or by performing a risk assessment.
- C. Incorrect because with one subsystem operable the work can commence without any additional evaluations. Although the "B" CREVAS is inoperable per TS 5.5.8.b. and therefore 3.7.3 is not met, the risk assessment is not required because LCO 3.0.4.a allows entry into the specified condition. Plausible if the candidate does not consider LCO 3.0.4.a to allow entry into the specified condition of an OPDRV.
- D. Incorrect because the maintenance activity is an OPDRV. Maintenance activities that open a reactor coolant pressure boundary below the RPV normal water level and actions are required to maintain the isolation is an OPDRV. The suction valve is below the normal RPV level and the freeze seal requires actions to maintain the isolation. Plausible if the candidate does not know the definition of an OPDRV per AP-10.09.

References: TS
AP-10.09

Student Ref: TS 3.7.3 and 5.5.8

Learning Objective:

Question source: NEW

Question History: None

Cognitive level: Comprehensive/Analysis:

10CFR55.43 (1)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 93.

The plant is operating at steady-state conditions at 85% power when #2 Turbine Control Valve closes spuriously.

Which one of the following identifies an appropriate procedural response to mitigate the transient?

- A. Reduce reactor power to approximately 75%, then evaluate thermal limits using 3D Monicore report per AOP-6, Malfunction of EHC Pressure Regulator.
- B. Reduce reactor power as necessary to maintain power at pre-transient level per RAP-7.3.16, Plant Power Changes.
- C. Reduce reactor power to $\leq 65\%$, then insert rods until power below 70% rod line per AOP-62, Loss of Feedwater Heating.
- D. Reduce reactor power as necessary to ensure the bypass valves close per AOP-32, Unexplained/Unanticipated Reactivity Change.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # 241000; A2.04
Importance Rating SRO – 3.8

QUESTION 93.
K&A Statement:

Ability to(a) predict the impacts of the following on the **REACTOR/TURBINE PRESSURE REGULATOR** and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
FAILED OPEN/CLOSED CONTROL/GOVERNOR VALVE

Plant response: Closure of #2 TCV was demonstrated in the Fitzpatrick simulator at 85% power, which is the power level at which the station performs normal TCV closure surveillance testing. The simulator showed TCVs 1 and 3 go full open, TCV 4 goes to 60% open and one BPV remains open to control pressure at new, higher equilibrium value. RPV pressure peaked at 1030 psig during the transient. Feedwater temperature lowered from 402°F to 391°F.

- A. **Incorrect.** AOP-6 directs a 5% power reduction, not a 10% power reduction. Also, AOP-6 is written to specifically address a pressure regulator malfunction. This type of malfunction would affect all TCVs, not just one. **Plausible** because AOP-6 entry condition is met (change in reactor pressure with no operator action), because AOP-6 does direct a power reduction and because AOP-6 directs thermal limit evaluation. Applicants may not remember that the AOP directs a specific percentage power reduction but may not remember it is 5% not 10%.
- B. **Incorrect.** The transient causes a BPV to open and remain open, resulting in a reduction in normal feedwater heating. Power level must be lowered to close the BPV to restore normal feedwater temperature. **Plausible** because it is generally desirable to stabilize power at pre-transient level pending further assessment of conditions and procedural requirements. RAP 7.3.16 does provide guidance for power changes.
- C. **Incorrect.** The transient causes a BPV to open and remain open, resulting in a reduction in normal feedwater heating. Power level must be lowered. However, the feedwater heating problem is resolved when BPVs are closed. Guidance in AOP-62 addresses a sustained loss of heating due to extraction steam isolation or heater level control problems. Also, action to reduce to below the 70% rod line is only required for loss of feedwater heating with initial core flow less than 55%. **Plausible** because there is a feedwater temperature issue when BPVs are open. Also, AOP-32 refers the operator to AOP-62 for a loss of feedwater heating.
- D. **CORRECT.** Entry conditions and symptoms are met for AOP-32, Unexplained / Unanticipated Reactivity Change. The procedure provides guidance for lowering reactor power to the desired level. In the given situation, the desired level would be that power level which would result in closure of the BPV(s).

References: SDLP-94C; EHC Logic, AOP-6, AOP-32, Student Ref: None
AOP-62, RAP 7.3.16

Learning Objective: 1.05.a.4 & 5

Question source: Modified to JAF
Question History: Limerick NRC 10//06; Q-90
Cognitive level: Comprehensive/Analysis:
10CFR55.43(b) (5)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 94.

The plant is performing a reactor startup.

T=0 hr the steaming rate is 50,000 lb/hr and reactor coolant chemistry sample shows the following:

- Reactor water Chloride Ion 0.094 ppm
- Reactor water Conductivity 1.6 micromho/cm

T=2 hr the steaming rate is 100,000 lb/hr and reactor coolant chemistry sample shows the following:

- Reactor water Chloride Ion 0.13 ppm
- Reactor water Conductivity 5.6 micromho/cm

T=4 hr the steaming rate is 150,000 lb/hr and reactor coolant chemistry sample shows the following:

- Reactor water Chloride Ion 0.096 ppm
- Reactor water Conductivity 5.5 micromho/cm

Which one of the following describes the operator actions required by the Technical Requirements Manual?

- A. Unless chloride ion concentration improves, the plant must be in Mode 4 by T=26 hr.
- B. Unless chloride ion concentration improves, the plant must be in Mode 4 by T=50 hr.
- C. Unless conductivity improves, the plant must be in Mode 4 by T=26 hr.
- D. Unless conductivity improves, the plant must be in Mode 4 by T=50 hr.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # G.2.1.34
Importance Rating SRO – 3.5

QUESTION 94.

K&A Statement:

Knowledge of primary and secondary plant chemistry limits

Justification:

- A. Incorrect because chloride ion limit at T=4 is in spec and the LCO entry for chloride would be clear, therefore no actions are required. Plausible if the candidate does not exit the high chloride LCO at T=4.
- B. Incorrect because chloride ion limit at T=4 is in spec and therefore no actions are required. Plausible if the candidate thinks at T=26 chloride (instead of conductivity) is out of spec, which would require being in mode 4 by T=50.
- C. Incorrect because conductivity at T=0 is in spec and therefore there are no actions required for conductivity. Plausible if the candidate does not treat the two limits as separate LCO's and starts the clock at T=2 when the chloride ion is out of spec and then when chloride is out they calculate the time from the first out of spec condition.
- D. Correct –Conductivity is in spec at T=2 but exceeds the long term at power limit of <5, which becomes applicable at T=26. This will require entry into an action statement to be in mode 4 within 24 hours from T=26 which is T=50. The chloride ion was out of spec high at T=2 requiring an LCO entry however that condition cleared at T=4 when the next sample went below the limit.

References: TRM 3.4.B

Student Ref:

TRM
3.4.B

Learning Objective: N/A

Question source: Modified Fitz 02 NRC Exam

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

Question History: Q S86

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis: X

10CFR 55.43(b)(2)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 95.

The plant is in Mode 1. It is January 25th 2010.

Prior to assuming the shift as the Control Room Supervisor (CRS), you are informed that you are **NOT** qualified.

Which **ONE** of the following conditions would have caused you to be disqualified as a CRS?

- A. SRO License was issued in December of 2005.
- B. Last quarter you stood three 12 hour watches as CRS and five 12 hour watches as Shift Manager.
- C. NRC Form 396 Certification of Medical Examination by Facility Licensee completed in December of 2007.
- D. Successfully completed a re-qualification operating exam in October 2008 in training cycle 11, and then a re-qualification written and operating exam in December 2009 in training cycle 11.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # G.2.1.35
Importance Rating SRO – 3.9

QUESTION 95.

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

Justification:

- A. Incorrect because license expires in 6 years, December of 2011 but plausible if candidate does not know how long licenses are issued.
- B. Incorrect because either position CRS or shift manager performs SRO duties and is therefore proficient. But plausible if the candidate thinks that standing only 3 watches previous quarter does not satisfy proficiency watches for quarter.
- C. Correct – Require a medical exam every two years. Expired December 2009
- D. Incorrect because exceeded annual operating test but completed within training cycle.

References: 10CFR55, ODSO-30

Student Ref:

None

Learning Objective: N/A

Question source: Perry 2009 NRC Exam

Question History: Q SRO 19

Cognitive level: Memory/Fundamental knowledge: X
Comprehensive/Analysis:

10CFR 55.43(b) (2)

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

QUESTION 96

WHICH ONE of the following describes the bases for the Technical Specification Limit for the Specific Activity of Primary Coolant?

The Technical Specification primary coolant activity limit ensures that whole body dose limits at the site boundary are not exceeded in the event of a main steam line rupture _____ (1) _____ primary containment and are based on 10 CFR _____ (2) _____ limits.

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|------------|
| A. | inside | 50 |
| B. | inside | 100 |
| C. | outside | 50 |
| D. | outside | 100 |

JAF LOI-05-10 NRC WRITTEN EXAM – RO AND SRO

K&A # G2.2.25
Importance Rating SRO – 4.2

QUESTION 96.

K&A Statement: **Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.**

Justification:

- A. Incorrect. Plausible if applicant assumes the TS is based on 10CFR50 limits.
- B. Incorrect. Plausible if applicant assumes an unisolable break inside containment is the higher risk for extended offsite dose due to the potential for core damage and/or breach of containment.
- C. Incorrect. Plausible if applicant assumes the TS is based on 10CFR50 limits.
- D. Correct. Tech Spec 3.4.6 limit is based on ensuring the 2 hour thyroid and whole body doses resulting from a main steam line break outside containment will not exceed the dose guidelines on 10 CFR Part 100.

References: TS 3.4.6 bases Student Ref: None

Learning Objective: CHT-101.11 GFE

Question source: Limerick 08 NRC Exam

Question History: None

Cognitive level: Memory/Fundamental knowledge: X
Comprehensive/Analysis:

10CFR 41.5 41.7

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 97.

A plant startup is in progress with the reactor critical and the Reactor Mode Switch in STARTUP.

Reactor Power is 6% with preparations being made to place the Reactor Mode Switch to RUN.

The following alarms are received in the Control Room

- 93ECP-A9 Low Air Start Press
- 93ECP-D9 Low Air Start Press

Plant Operator reports the following:

- EDG A air receiver pressures are at 125psig
- EDG D air receiver pressures are at 90 psig

What should the Control Room Supervisor direct and how is this direction justified?

- A. Place startup on hold because transitioning to Mode 1 can not be performed with these plant conditions.
- B. Continue the startup including actions to place the Reactor Mode Switch to Run and restore Starting Air Pressure to normal within 48 hours because both EDGs remain Operable.
- C. Place startup on hold, perform a risk assessment prior to changing to MODE 1 because EDG D is inoperable
- D. Continue the startup including actions to place the Reactor Mode Switch to Run and restore Starting Air Pressure to normal within 48 hours because EDG A is Operable and therefore sufficient AC sources are operable to continue with the startup.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # G.2.2.44
Importance Rating SRO – 4.4

QUESTION 97.

K&A Statement:

Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

Justification:

- A. Correct – LCO 3.0.4.b which allows a mode change if a risk assessment is performed for inoperable equipment is not applicable to EDG inoperability.
- B. Incorrect but plausible if the candidate thinks that only 3.8.3 is applicable and has 48 hours to restore air pressure.
- C. Incorrect but plausible if the candidate thinks that 3.0.4.b is applicable to the EDG's.
- D. Incorrect but plausible if candidate thinks 3 EDGs operable meets LCO 3.8.1 which requires 2 EDG subsystems to be operable.

References: TS 3.0.4, 3.8.1, 3.8.3

Student Ref:

None

Learning Objective: N/A

Question source: Perry 2009 NRC Exam

Question History: Q SRO 22 Perry exam

Cognitive level: Memory/Fundamental knowledge:
Comprehensive/Analysis:

X

10CFR55.43(b) (5)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 98.

A canal discharge is required to reduce level in Waste Sample Tank 'A'. The radwaste effluent radiation monitor is out of service for maintenance.

Select the choice which correctly fills in the blanks in the statement below to identify 1) who approves the permit and 2) what additional actions must be documented to initiate the discharge with the radiation monitor out of service per OP-49, Liquid Radioactive Waste System.

The (1) approves the permit, and the permit must document that (2) shall verify discharge line valving, and that two independent representative samples are obtained and analyzed.

- A. Shift Manager
one technically qualified facility staff member
- B. General Manager - Operations
one technically qualified facility staff member
- C. Shift Manager
two technically qualified facility staff members
- D. General Manager - Operations
two technically qualified facility staff members

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # G.2.3.6
Importance Rating SRO – 3.8

QUESTION 98.

K&A Statement: Ability to approve release permits.

Justification:

- A. Incorrect because OP-49 requires two individuals perform the discharge line valving, but plausible if the candidate does not know the special requirements for an unmonitored release.
- B. Incorrect because OP-49 requires two individuals perform the discharge line valving and the the shift manager must approve the permit. Plausible if the candidate does not know the special requirements for an unmonitored release and the Radwaste Supervisor obtaining General Manager – Operations concurrence to perform a canal discharge.
- C. Correct – OP-49 requires that the permit document that two qualified members of the staff shall verify the discharge valving. The Shift Manager approves the permit.
- D. Incorrect but plausible because although the GMO must concur for a discharge the shift manager approves the permit. Plausible if the candidate does not know the special requirements for an unmonitored release and the Radwaste Supervisor obtaining General Manager – Operations concurrence to perform a canal discharge.

References: OP-49, ODCM Table 2.1-1 Student Ref: None

Learning Objective: 2.3.6 Knowledge of the requirements for reviewing and approving release permits.

Question source: Modified Fitzpatrick NRC Exam

Question History: Q93 2002 NRC Exam

Cognitive level: Memory/Fundamental knowledge: X
Comprehensive/Analysis:

10CFR 55.43(b)(4)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 99.

A plant event has led to the following conditions:

<u>Time</u>	<u>Condition</u>
0800	Plant conditions support declaration of an ALERT
0801	Plant conditions have improved Plant conditions NO LONGER support declaration of an ALERT Plant conditions support declaration of an UNUSUAL EVENT
0805	The Shift Manager has assessed plant conditions and is ready to declare the Emergency event.

Which one of the following describes the IAP-2 emergency notification to be made in response to these conditions at time 0805?

- A. Declare and report an ALERT. Terminate the event when terminate criteria are met.
- B. Declare and report a NOTIFICATION OF UNUSUAL EVENT. Terminate the event when terminate criteria are met.
- C. Declare and report an ALERT. Submit a separate notification to indicate the change in classification to a NOTIFICATION OF UNUSUAL EVENT.
- D. Declare and report a NOTIFICATION OF UNUSUAL EVENT. No mention of the momentary ALERT condition is required.

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # G.2.4.29
Importance Rating SRO - 4.4

QUESTION 99.

K&A Statement:

Knowledge of the emergency plan.

Justification:

- A. **CORRECT:** IAW IAP-2 step 5.1.4. Classifying transient events. For some events, the condition may be corrected before a declaration has been made. The key consideration in this situation is to determine whether or not further plant damage occurred while the corrective actions were being taken. In some situations, this can be readily determined, in other situations, further analyses (e.g. coolant radiochemistry sampling) may be necessary. Classify the event as indicated and terminate the emergency once assessment shows that there were no consequences from the event and other termination criteria are met.
- B. **Incorrect but plausible if the candidates forgets that** IAW IAP-2 step 5.1.4. Classifying transient events. For some events, the condition may be corrected before a declaration has been made. The key consideration in this situation is to determine whether or not further plant damage occurred while the corrective actions were being taken. In some situations, this can be readily determined, in other situations, further analyses (e.g. coolant radiochemistry sampling) may be necessary. Classify the event as indicated and terminate the emergency once assessment shows that there were no consequences from the event and other termination criteria are met.
- C. **Incorrect but plausible if the candidates forgets that** IAW IAP-2 step 5.1.4. Classifying transient events. For some events, the condition may be corrected before a declaration has been made. The key consideration in this situation is to determine whether or not further plant damage occurred while the corrective actions were being taken. In some situations, this can be readily determined, in other situations, further analyses (e.g. coolant radiochemistry sampling) may be necessary. Classify the event as indicated and terminate the emergency once assessment shows that there were no consequences from the event and other termination criteria are met.
- D. **Incorrect but plausible if the candidates forgets that** IAW IAP-2 step 5.1.4. Classifying transient events. For some events, the condition may be corrected before a declaration has been made. The key consideration in this situation is to determine whether or not further plant damage occurred while the corrective actions were being taken. In some situations, this can be readily determined, in other situations, further analyses (e.g. coolant radiochemistry sampling) may be necessary. Classify the event as indicated and terminate the emergency once assessment shows that there were no consequences from the event and other termination criteria are met.

References: IAP-2; step 5.1.4

Student Ref: None

Learning Objective: N/A

Question source: Modified

Question History: NMP #1 10/08; Q-98

Cognitive level: Memory/Fundamental knowledge:

10CFR55.43(b) (5)

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

QUESTION 100.

Initial plant conditions are the plant is operating at 100% power.

Subsequently plant conditions are as follows:

- A manual scram was inserted resulting in no rod movement
- Reactor Pressure is being controlled 800-1000 psig with SRV's
- Drywell Pressure is 5 psig and rising
- RCS leakage is 15 GPM

15 minutes later, plant conditions are as follows:

- Reactor Pressure is being controlled 800-1000 psig with SRV's
- Reactor water level has been lowered to +100 inches
- Reactor Power is 2.0%
- Torus temperature is 150 °F and rising slowly
- RCS leakage is 25 GPM
- Drywell Pressure is 8 psig and rising
- Torus level is 10 feet and rising slowly

Which **ONE** of the following describes the **HIGHEST** EAL classification required for the conditions described above.

- A. Alert
- B. General Emergency
- C. Site Area Emergency
- D. Notification of Unusual Event

JAF LOI-05-10 NRC WRITTEN EXAM -SRO

K&A # G.2.4.41
Importance Rating SRO – 4.6

QUESTION 100.

K&A Statement: Knowledge of the emergency action level thresholds and classifications.

Justification:

- A. **Incorrect because the ATWS combined with the initial power being greater than 2.5% means that the correct classification is SAE. Plausible if the candidate thinks that power being reduced to 2.0% means that the alert is the correct classification. The highest EAL should be declared.**
- B. **Incorrect because the ATWS plus exceeding the HCTL is the current conditions, however the statement in the GE classification is Torus Temperature and RPV pressure cannot be maintained <HCTL. The pressure band can be lowered to meet the HCTL curve. Plausible if the candidate does not realize pressure can be reduced.**
- C. **Correct: Because the manual and automatic scrams did not lower power to below 2.5%. Lowering level did reduce power to <2.0% however the procedure states to declare the highest EAL classification.**
- D. **Incorrect because the ATWS is classified above a NUE. Plausible if the candidate thinks that the RCS leakage above 10 GPM is the highest classification due to the wording in the alert for the ATWS saying automatic scram, however the reactor should have scrambled on the 5 psig drywell pressure.**

References: EAL Matrix

Student Ref:

EAL
Matrix +
HCTL
and BIIT
curves

Learning Objective: N/A

Question source: New

Question History: None

Cognitive level: Analysis

10CFR55.43(b) (5)