

QUESTION 1

Both Units are operating at full power.

The electrical distribution system is in a normal full power line up, EXCEPT that breaker 2A20109, Alternate Supply to ESS bus 2A, is INOPERABLE and is RACKED OUT for maintenance.

Breaker 0A10306, Startup Bus 10 feeder to XFMR-101, then TRIPS UNEXPECTEDLY due to a breaker mechanism failure.

Which one of the following describes the response (if any) to this breaker failure?

- A.
 - ESS Bus 1A will REMAIN ENERGIZED from its NORMAL supply;
 - ESS Bus 2A will be RE-ENERGIZED from Diesel Generator A when the DG exceeds 540 RPM and 90% rated voltage.

- B.
 - ESS Bus 1A will be RE-ENERGIZED from its ALTERNATE supply;
 - ESS Bus 2A will REMAIN ENERGIZED from its NORMAL supply.

- C.
 - ESS Bus 1A will REMAIN ENERGIZED from its NORMAL supply;
 - ESS Bus 2A will REMAIN ENERGIZED from its NORMAL supply.

- D.
 - ESS Bus 1A will be RE-ENERGIZED from its ALTERNATE supply;
 - ESS Bus 2A will be RE-ENERGIZED from Diesel Generator A when the DG exceeds 540 RPM and 90% rated voltage.

K&A # 264000 K1.01
Importance Rating 3.8

QUESTION 1

RO Tier 2 Group 1

K&A Statement:

Knowledge of the physical connections and/or cause- effect relationships between EMERGENCY GENERATORS (DIESEL/JET) and the following: A.C. electrical distribution

Justification:

- A. Incorrect, Bus 1A will auto transfer to its alternate supply, S/U bus 20 when its normal supply, bus 10 is de-energized by the breaker failure. Candidates may select this if they understand that bus 2A will be energized by DG A after it reaches rated speed and voltage, but fail to correctly recall the normal and alternate supplies to bus 1A.
- B. Incorrect, the normal supply to both busses 1A and 2A is lost when S/U bus 10 de-energizes. Candidates may select this if they do not recognize that the normal power supply to bus 2A is lost.
- C. Incorrect, the normal supply to both busses 1A and 2A is lost when S/U bus 10 de-energizes. Candidates may select this if they do not not recognize that the normal power supply to busses 1A and 2A is lost.
- D. **Correct, per TM-OP-004, the following conditions are required to be met in order for DG A to ESS 2A breaker 2A20104 to auto close:**
- **ESS bus voltage <20% for 0.5 sec**
 - **Preferred source breaker 2A20101 open**
 - **Alternate source breaker 2A20109 open**
 - **30 cycle time delay**
 - **Bus 2A lockout reset**
 - **DG > 540 rpm, >90% voltage**

Since the alternate supply is inop, and the normal supply will open when the ESS 2A bus load shed and DG A autostart begins due to the <20% for 0.5 sec signal, the closure of 2A20104 will occur after the DG is >540 RPM and >90% voltage.

Bus 1A alternate supply from S/U bus 20 is still available, and will close in and re-energize bus 1A after bus voltage is lost.

K/A Match Justification:

This question matches the stated K/A since candidates must determine that normal and alternate supplies to bus 2A are lost and recall diesel generator start and load sequences following loss of voltage to bus 2A.

References: TM-OP-004 rev 2 Reference Required none

Learning Objective: 10541.a

Question source: New

Question History: New

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

10CFR55 41(b)8

Comments: Created by: T. North, 9/6/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 2

Unit 1 was at 50 % power when a Loss of Offsite Power occurred. After plant conditions have stabilized, the following conditions exist:

- HPCI is in service for RPV pressure control.
- RCIC is in service for RPV level control.

A steam leak then occurs on the HPCI steam supply line raising temperature in the HPCI pipe routing area to 196 °F in approximately 1 (one) minute, then eventually stabilizing at this temperature.

Which one of the following correctly identifies the status of HPCI AND RCIC 20 minutes later, with NO operator action?

- A. HPCI isolated after a 1 second time delay. RCIC will continue to operate indefinitely.
- B. HPCI AND RCIC will BOTH continue to operate indefinitely.
- C. HPCI AND RCIC BOTH isolated after a 15 minute time delay.
- D. HPCI isolated after a 15 minute time delay. RCIC will continue to operate indefinitely.

K&A # 223002 K1.07

Importance Rating 3.4

QUESTION 2

RO Tier 2 Group 1

K&A Statement:

Knowledge of the physical connections and/or cause- effect relationships between PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF and the Reactor core isolation cooling; Plant-Specific

Justification:

- A. Incorrect, HPCI isolated after 15 minute TD for a high temp in the pipe routing area, and RCIC will also isolate following a HPCI leak in the shared pipe routing area. The 15 minute time delay is applicable only for the pipe routing area isolation signal. Candidates may select this if they incorrectly recall the isolation setpoint for the shared pipe routing area, and that RCIC will also isolate with a steam leak in the shared area.
- B. Incorrect, HPCI and RCIC will both isolate. Candidates may select this if they incorrectly recall the isolation setpoint for the shared pipe routing area, and that RCIC will also isolate with a steam leak in the shared area.
- C. **Correct, HPCI and RCIC share a common pipe routing area, and the isolation setpoint for both HPCI and RCIC is 167°F after a 15 minute time delay. Engineering evaluation determined that for a HPCI leak in this area, RCIC would also isolate.**
- D. Incorrect, RCIC will also isolate following a HPCI leak in the shared pipe routing area. Candidates may select this if they incorrectly recall that RCIC will also isolate with a steam leak in the shared area.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the relationship between Steam leak detection isolation setpoints and the RCIC system.

References: TM-OP-059B rev 5 Reference Required none

Learning Objective: 2120.b, 2123.o

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP059B/2120 004

Question History: Bank

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

10CFR55 55. 41(b)7

Comments: Created by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 3

A fault occurs in 250 VDC Switchgear 1D662, causing the battery charger output breaker to trip and the fuse to the battery to blow.

Which of the following loads would be affected by this event?

- A. Main Generator Emergency Seal Oil Pump
- B. HPCI Auxiliary Oil Pump
- C. Reactor Feed Pump 1B Emergency Lube Oil Pump
- D. RCIC Barometric Condenser Vacuum Pump

K&A # 263000 K2.01
Importance Rating 3.1

QUESTION 3

RO Tier 2 Group 1

K&A Statement:

Knowledge of electrical power supplies to the following: Major D.C. loads

Justification:

- A. Incorrect, Emergency Seal oil pump is powered from 250vdc control center 1D155 via 1D652. The candidate may select this if they confuse the ESOP with the main turbine emergency oil pump which is powered by 1D274/1D662
- B. Correct, the HPCI aux oil pump is powered from 1D662 via HPCI control center 1D274 breaker 31**
- C. Incorrect, RFP 1B emergency oil pump is powered from 250vdc control center 1D155 via 1D652. The candidate may select this because RFP 1A emergency oil pump is powered from 1D274/1D662
- D. Incorrect, powered by 250 VDC Control Center 1D254 via 1D652. The candidate may select this if they confuse HPCI and RCIC 250 vdc power supplies.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of power supplies to major 250 VDC oil pumps.

References: TM-OP-088-FS rev 00, ON-188-001att Reference Required none
B rev 11

Learning Objective: 1383

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP088/1393 001

Question History: Bank

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

10CFR55 41(b)7

Comments: Created by:
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 4

Unit 1 is operating in MODE 2 with ALL Intermediate Range Monitor (IRM) detectors fully inserted into the core.

Which one of the following power supplies, IF LOST, will result in IRM channels A, C, E, and G UNABLE to accurately indicate neutron flux?

- A. 120 VAC Panel 1Y216.
- B. 120 VAC Panel 1Y218.
- C. 24 VDC Bus 1D682.
- D. 24 VDC Bus 1D672.

K&A # 215003 K2.01
Importance Rating 2.5

QUESTION 4

RO Tier 2 Group 1

K&A Statement:

Knowledge of electrical power supplies to the following: IRM channels/detectors

Justification:

- A. Incorrect, 1Y216 does not power any IRM system components. Candidates may select this if they cannot correctly recall power supplies to IRMs.
- B. Incorrect, 1Y218 powers the IRM detector drive motors. Since the detectors are fully inserted, loss of this power will not affect the channel's ability to indicate flux.
- C. Incorrect, this power supply feeds the div II IRMs, B,D,F,H.
- D. **Correct, this power supply feeds the div I IRMs, A,C,E,G and its loss will result in these channels being completely de-energized and unable to indicate neutron flux.**

K/A Match Justification:

This question matches the stated K/A since candidates must recall power supplies to various IRM detector and channel components and determine the effect on IRM indication.

References: ON-117-001 rev 30, TM-OP-078B rev 6 Reference Required none

Learning Objective: 10230

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 11/14/10
Reviewed by:

QUESTION 5

Unit 1 was operating at full power when a loss of all high pressure feed occurred. The High Pressure Coolant Injection (HPCI) system automatically started and injected due to low RPV water level.

- HPCI is injecting to the RPV at 4000 gpm
- RPV level is +20', steady
- RPV pressure is 934 psig, controlled with turbine bypass valves

A logic relay failure causes the HPCI Minimum Flow Isolation valve, HV-155-F012, to fully open.

Determine the impact of this failure on Suppression Pool water level if HPCI were to remain in its current line up:

(consider ONLY the effect of the HPCI line up)

Suppression Pool water level will...

- A. REMAIN UNCHANGED because Suppression Pool water will be short-cycled back to the Suppression Pool.
- B. REMAIN UNCHANGED because Condensate Storage Tank water will be short-cycled back to the Condensate Storage Tank.
- C. RISE because Condensate Storage Tank water will be diverted to the Suppression Pool.
- D. LOWER because Suppression Pool water will be diverted to the Condensate Storage Tank.

K&A # 206000 K3.03
Importance Rating 3.4

QUESTION 5

RO Tier 2 Group 1

K&A Statement:

Knowledge of the effect that a loss or malfunction of the HIGH PRESSURE COOLANT INJECTION SYSTEM will have on following: Suppression pool level control: BWR-2,3,4

Justification:

- A. Incorrect, level will rise. Normal suction path is from the CST. Candidates may select this if they incorrectly recall the normal HPCI suction path.
- B. Incorrect, level will rise. Min flow line directs water to the SP. Candidates may select this if they incorrectly recall the flow path of the HPCI min flow line.
- C. **Correct. HPCI normal suction path is from the CST. If the min flow valve were to open with HPCI injecting to the RPV at 4000 gpm, CST water will be diverted to the SP causing SP level to rise.**
- D. Incorrect, the normal suction path is NOT from the SP, and the min flow line directs water to the SP, NOT the CST. Candidates may select this if they incorrectly recall the normal HPCI suction path and min flow line path.

K/A Match Justification:

This question matches the stated K/A since candidates must determine the effect of a failure of the HPCI minimum flow line on suppression pool water level.

References: TM-OP-052 ST & PG, rev 4 Reference Required none

Learning Objective: 2035.d

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 7/30/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 6

Unit 1 is operating at full power when the "A" End of Cycle Recirc Pump Trip (EOC-RPT) logic circuit fails.

- The "A" EOC-RPT trip system is declared inoperable because it is not capable of generating the required trip signal to the recirc system.
- A spurious Main Generator Load Reject scram then occurs.

Which one of the following describes the result of these events?

- A. BOTH recirc pumps will trip because the "B" EOC-RPT trip system will trip one RPT breaker for each recirc pump.
- B. ONLY the "B" recirc pump will trip because the "B" EOC-RPT trip system trips both RPT breakers for that pump.
- C. NEITHER recirc pump will trip because each RPT breaker requires input from BOTH the "A" and "B" EOC-RPT trip systems to function.
- D. NEITHER recirc pump will trip because the EOC-RPT function is only activated when less than 26% power.

K&A # 212000 K3.11
Importance Rating 3.0

QUESTION 6

RO Tier 2 Group 1

K&A Statement:

Knowledge of the effect that a loss or malfunction of the REACTOR PROTECTION SYSTEM will have on following: Recirculation system

Justification:

- A. **Correct, each EOC-RPT trip system operates independently by opening an RPT breaker in each recirc pump.**
- B. Incorrect, both pumps will trip. Candidates may select this if they do not correctly recall the interrelationship between the EOC-RPT logic and recirc pump breakers.
- C. Incorrect, both pumps will trip. Candidates may select this if they do not correctly recall the interrelationship between the EOC-RPT logic and recirc pump breakers.
- D. Incorrect, the EOC-RPT is activated by the turbine stop valve or load reject scram signals which are active when above 26%. Candidates may select this if they do not correctly recall when EOC-RPT function is active.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the relationship between the EOC-RPT function of RPS, and determine the effect of a failure of that function on the reactor recirc pump breakers.

References: TM-OP-064C rev 10, TM-OP-058 rev 9 Reference Required none

Learning Objective: 2526.aa

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 5/19/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 7

Unit 1 is operating in single loop with the "A" recirc loop in operation.

ALL required actions have been taken for single loop operation

Based on these conditions, what is the APRM Simulated Thermal Power (STP) UPSCALE TRIP setpoint?

- A. $.55W - 8.7 + 54.2$, clamped at 118%
- B. $.55W - 8.7 + 58.7$, clamped at 113.5%
- C. $.55W + 54.2$, clamped at 118%
- D. $.55W + 58.7$, clamped at 113.5%

K&A # 215005 K4.07
Importance Rating 3.7

QUESTION 7

RO Tier 2 Group 1

K&A Statement:

Knowledge of AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM design feature(s) and/or interlocks which provide for the following: Flow biased trip setpoints

Justification:

- A. Incorrect, the setpoint is "+58.7" and is clamped at 113.5. candidates may select this if they confuse the upscale alarm setpoint with the trip setpoint and do not recall the clamped value.
- B. Correct, when in SLO, the normal STP trip setpoint of .55w+58.7 is modified by subtracting ΔW (8.7)**
- C. Incorrect, the setpoint is "+58.7", is clamped at 113.5 and is modified for SLO by "-8.7". Candidates may select this if they confuse the upscale alarm setpoint with the trip setpoint, do not recall the clamped value or the SLO value.
- D. Incorrect, the normal scram setpoint is modified by $-\Delta W$ (8.7) for SLO. Candidates may select this if they do not correctly recall the SLO modifier value.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of the APRM flow biased trip setpoint for the given flow conditions.

References: TM-OP-078D rev 6 Reference Required none

Learning Objective: 15710.c

Question source: New

Question History: New

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

10CFR55 41(b)5

Comments: Created by: T. North, 5/20/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 8

Unit 1 is shutdown following an automatic scram with the following conditions present:

- RPV pressure is 900 psig, steady
- RPV level is +25 inches, up slow
- RCIC is injecting to the RPV at 600 gpm with the RCIC flow controller in AUTOMATIC

The PCOP then adjusts the RCIC flow controller setpoint thumbwheel to 60 gpm.

Which one of the following describes the RCIC system response:

The RCIC Flow Controller will reduce and stabilize ...

- A. RCIC RPV INJECTION FLOW at 60 gpm;
RCIC minimum flow isolation valve FV-149-F019 will remain CLOSED resulting in ZERO flow to the suppression pool.
- B. TOTAL RCIC PUMP FLOW at 60 gpm;
RCIC minimum flow isolation valve FV-149-F019 will automatically OPEN resulting in approximately 50% of the total pump flow to the suppression pool.
- C. TOTAL RCIC PUMP FLOW at 60 gpm;
RCIC minimum flow isolation valve FV-149-F019 will automatically OPEN resulting in ALL of the pump flow to the suppression pool.
- D. RCIC RPV INJECTION FLOW at 60 gpm;
RCIC minimum flow isolation valve FV-149-F019 will automatically OPEN resulting in approximately 75 gpm to the suppression pool.

K&A # 217000 K4.03
Importance Rating 2.9

QUESTION 8

RO Tier 2 Group 1

K&A Statement:

Knowledge of REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) design feature(s) and/or interlocks which provide for the following: Prevents pump over heating

Justification:

- A. Incorrect, the min flow valve will open when flow drops below 70 gpm. The candidate may select this if they do not recall the correct min flow valve setpoint.
- B. Incorrect, the flow controller does not sense min flow line flow, and with the controller in auto it will adjust RCIC pump speed to maintain RPV injection flow ONLY at 60 gpm. The min flow line is designed to pass approximately 75 gpm, therefore TOTAL RCIC pump flow will be significantly greater than 60 gpm. The candidate may select this if they do not recall that the flow element does not sense min flow line flow, and that the min flow line will pass 75 gpm by design.
- C. Incorrect, the flow controller does not sense min flow line flow, and with the controller in auto it will adjust RCIC pump speed to maintain RPV injection flow ONLY at 60 gpm. The candidate may select this if they do not recall that the flow element does not sense min flow line flow, and they disregard the effect of the min flow line flow restrictors and assume that the min flow line will pass ALL of the 60 gpm.
- D. **Correct, the min flow valve will automatically open when pump flow is reduced below 70 gpm. The flow controller will continue to maintain RCIC pump speed such that RPV injection flow is stabilized 60 gpm regardless of bypass flow through the min flow line, because the flow element does not sense flow in the min flow line. The min flow line orifices will maintain flow to the supp pool at approximately 75 gpm by design.**

K/A Match Justification:

This question matches the stated K/A since the candidates are required to recall facts regarding automatic operation of the min flow isolation valve, the design flowrate of the min flow line, and that the min flow line flow is not sensed by the RCIC flow element. The purpose of establishing flow in this min flow line is to prevent RCIC pump overheating when pump flow is reduced below a certain value.

References: TM-OP-050 rev 4 Reference Required none

Learning Objective: 2008.i, 2018.c, 2012.c

Question source: New

Question History: New

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

10CFR55 41(b)5

Comments: Created by: T. North, 8/29/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 9

During a Unit 1 reactor startup, the ROD OUT BLOCK Annunciator alarms. The following neutron monitoring conditions exist:

- SRMs A and B.....Fully Inserted, reading 8×10^4 cps.
- SRMs C and D....Partially withdrawn, reading 60 cps.
- Reactor Period....+200 seconds.
- IRMs.....Fully inserted, reading 4 on Range 1.

What one of the following actions will clear the ROD OUT BLOCK condition and permit continued rod withdrawal?

The ROD OUT BLOCK will clear if...

- A. SRM Detectors C and D are driven in until they indicate greater than 100 cps.
- B. a control rod is inserted until count rate is less than 1×10^4 cps.
- C. power is allowed to continue to rise until the IRMs indicate above 5 on Range 1.
- D. SRM Detectors A and B are driven out until count rate is less than 1×10^3 cps.

K&A # 215004 K5.01
Importance Rating 2.6

QUESTION 9

RO Tier 2 Group 1

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to SOURCE RANGE MONITOR (SRM) SYSTEM : Detector operation

Justification:

- A. **Correct. The retract permit rod block is causing the condition.**
- B. Incorrect. High count rate is 2E5. Candidates may select this if they do not correctly recall SRM rod block setpoints.
- C. Incorrect. The IRM downscale is bypassed on Range 1, SRM Retract permit is bypassed @ Range 3. Candidates may select this if they do not correctly recall SRM retract permit logic.
- D. Incorrect. High count rate is 2E5. Candidates may select this if they do not correctly recall SRM rod block setpoints.

K/A Match Justification:

This question matches the stated K/A since candidates must recall how SRM detector operation impacts plant operation.

References: TM-OP-078A rev 3 Reference Required none

Learning Objective: 10026

Question source: SSES OPS_INITIAL_LICENSE
Bank # TMOP078A/10026 001

Question History: Bank

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

10CFR55 41(b)5

Comments: Created by:
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 10

Unit 1 is operating at full power when the in-service Containment Instrument Gas (CIG) compressor suction filter becomes completely plugged.

This results in a CIG header pressure dropping below 142 psig.

Which one of the following describes the impact of this condition?

- A. The standby suction filter will automatically shift into service, but the CIG compressor will trip and control of SRVs, MSIVs, and ADS valves will be lost until the compressor can be restarted.
- B. The standby suction filter will automatically shift into service and the CIG compressor will remain in service with NO interruption to CIG loads.
- C. The running CIG compressor will trip due to loss of suction, and control of SRVs, MSIVs, and ADS valves will be lost until the standby compressor can be restarted.
- D. The running CIG compressor will trip due to loss of suction, but will NOT IMMEDIATELY interrupt control of CIG loads due to the backup gas bottles and accumulators.

K&A # 300000 K5.13
Importance Rating 2.9

QUESTION 10

RO Tier 2 Group 1

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Filters

Justification:

- A. Incorrect, the standby filter must be manually placed in service. Candidates may select this if they do not correctly recall operational details regarding CIG filter operation.
- B. Incorrect, the standby filter must be manually placed in service. Candidates may select this if they do not correctly recall operational details regarding CIG filter operation.
- C. Incorrect, control of MSIVs and SRVs will not be immediately impacted. Candidates may select this if they do not correctly evaluate the impact of low CIG pressure resulting from compressor trip.
- D. **Correct: the compressors will trip on low suction pressure, and the backup gas bottles and accumulator will automatically charge the 150# and 90# headers respectively, resulting in no immediate loss of component control.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine the effect of CIG filter failure on plant operation.

References: ON-125-001 rev 12 Reference Required none

Learning Objective: 1595.c, 1592.m

Question source: New

Question History: New

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

10CFR55 41(b)5

Comments: Created by: T. North, 5/20/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 11

Unit 1 is in Mode 3; Unit 2 is in Mode 1.

A ground fault occurs on 0B516, "DIESEL GENERATOR 'A' ESS 480V MOTOR CONTROL CENTER".

Which one of the following statements describes the effect of the above condition?

- A. Unit 1 is NOT affected;
Unit 2 Battery Charger 2D613 transfers to its alternate AC source.
- B. Unit 2 is NOT affected;
Unit 1 Battery Charger 1D613 de-energizes, and battery 1D610 will carry the DC loads.
- C. Unit 1 AND Unit 2 Battery Chargers 1D613 AND 2D613 are BOTH lost and batteries 1D610 and 2D610 will carry the DC loads.
- D. Unit 1 AND Unit 2 Battery Chargers 1D613 AND 2D613 BOTH transfer to their alternate AC source.

K&A # 263000 K6.01
Importance Rating 3.2

QUESTION 11

RO Tier 2 Group 1

K&A Statement:

Knowledge of the effect that a loss or malfunction of the following will have on the D.C. ELECTRICAL DISTRIBUTION : A.C. electrical distribution

Justification:

- A. Incorrect, Both unit 1 and 2 battery chargers are affected. There is no alternate source of AC power for these battery chargers. Candidates may select this if they do not correctly recall the physical arrangement of chargers 1D613 and 2D613.
- B. Incorrect, Both unit 1 and 2 battery chargers are affected. Candidates may select this if they do not recall that 0B516 supplies both chargers.
- C. **Correct, 0B516 is the AC supply to BOTH unit 1 and 2 battery chargers. With 0B516 de-energized, both unit's DC loads supplied by 2D610 and 1D610 will be supplied by their respective batteries. The batteries are rated for 4 hours.**
- D. Incorrect, there is no alternate source of AC power for these battery chargers. Candidates may select this if they do not correctly recall the physical arrangement of chargers 1D613 and 2D613.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the physical connections and relationship between DC battery chargers and their AC power source, and determine the effect of the loss of the AC supply on those battery chargers and the associated DC loads.

References: TM-OP-002 rev 5; ON-104-201 rev 13 Reference Required none

Learning Objective: 1431.a

Question source: SSES OPS_INITIAL_LICENSE
Bank # TMOP002/1431 001

Question History: Bank

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

10CFR55 41(b)7

Comments: Created by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 12

The Unit 1 Core Spray (CS) Initiation Logic Channel A has experienced a loss of power from 125 VDC Class 1E Bus A (1D614).

If a valid High Drywell pressure condition were to occur, which one of the following describes how CS pumps respond?

- A. ONLY B and D pumps start because logic channel B can independently initiate the B CS loop.
- B. ONLY A and B pumps start because logic channel B can independently start one pump in each CS loop.
- C. ALL 4 pumps start because logic channel B can independently initiate both CS loops.
- D. ALL 4 pumps remain OFF because BOTH logic channels are required to initiate each CS loop.

K&A # 209001 K6.04
Importance Rating 2.8

QUESTION 12

RO Tier 2 Group 1

K&A Statement:

Knowledge of the effect that a loss or malfunction of the following will have on the LOW PRESSURE CORE SPRAY SYSTEM :
D.C. power

Justification:

- A. **Correct, Only the div 2 pumps start because the B logic has power and can only provide start signals to B loop pumps. Loop A pumps will not start without power to the A initiation logic.**
- B. Incorrect, Only the loop B pumps receive start signals. Candidates may select this if they do not correctly recall the core spray logic arrangement.
- C. Incorrect, see above
- D. Incorrect, see above

K/A Match Justification:

This question matches the stated K/A since candidates must evaluate the failure of DC power to core spray logic and determine the resultant effect following a LOCA signal.

References: TM-OP-051 ST & PG rev 2; Reference Required none
E156-sh 1 rev 21, -sh 2 rev 21, -sh 3
rev 26, -sh 4 rev 25

Learning Objective: 2093.d

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 7/30/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 13

Unit 1 is in the process of a plant startup after a refueling outage.

- Containment inerting is in progress using "A" Train of Standby Gas Treatment (SGTS)
- "A" SGTS is running and is aligned to take suction from Unit 1 Primary Containment only.
- Oxygen concentration at 20% and going down slowly.

A malfunction in the Unit 1 PCIS logic causes a false RB Zone 3 Isolation Signal on a -38" reactor water level signal to be initiated. The "A" SGTS system responds as designed.

Based on this malfunction, what is the resultant effect on the oxygen concentration in Primary Containment?

Primary Containment oxygen concentration will:

- A. RISE due to the increased flow due to the automatic start of the "B" SGTS Train.
- B. continue to LOWER but at a slower rate because the Nitrogen supply valves (SV-15767 & SV-15789) remain open.
- C. LOWER faster due to the resulting automatic rise in "A" SGTS system flow caused by the zone 3 isolation signal.
- D. remain CONSTANT because the primary containment suction dampers (HD17508A & B) closed.

K&A # 261000 A1.05
Importance Rating 2.7

QUESTION 13

RO Tier 2 Group 1

K&A Statement:

Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including: Primary containment oxygen level: Mark-I&II

Justification:

- A. Incorrect, O2 levels will remain constant. The "B" SGTS train will not start, and this would not cause increased flow from PC. Candidates may select this if they do not correctly recall SGTS response to a -38" signal.
- B. Incorrect, SGTS will no longer take suction from PC and the N2 supply valves isolate at -38". Candidates may select this if they do not correctly recall the response to a -38" signal.
- C. Incorrect, SGTS flow will not affect O2 levels since PC suction dampers are closed. Candidates may select this if they do not correctly recall SGTS response to a -38" signal.
- D. **Correct, the -38" isolation signal will cause the PC purge dampers and N2 supply valves to close, resulting in SGTS no longer reducing O2 levels inside PC and no additional N2 being added. O2 levels will remain constant.**

K/A Match Justification:

This question matches the stated K/A since candidates must predict changes in oxygen levels following a re-alignment of SGTS during de-inerting activities.

References: TM-OP-070 rev 5, OP-173-001 rev 37, Reference Required none
ON-159-002 att B rev 29

Learning Objective: 1985.j / 1991.a

Question source: INPO exam bank # 23535

Question History: Columbia station 2003 NRC exam

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

10CFR55 41(b)5

Comments: Modified by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 14

Unit 1 has experienced a LOCA concurrent with a loss of high pressure injection sources. The following conditions are present:

- RPV water level is -135", down slow
- RPV pressure is 475 psig, down slow
- Drywell pressure is 7.5 psig, up slow

Which one of the following is true regarding the LPCI system under these conditions?

- A.
 - All LPCI injection valves are currently open;
 - Injection will begin when the testable check valves, F050A and B, open at approximately 420 psig.
- B.
 - LPCI injection valves F015A and B are shut and will open when pressure drops to 420 psig;
 - Injection will begin when the testable check valves F050A and B open when RPV pressure reaches LPCI pump shutoff head.
- C.
 - LPCI injection valves F015A and B are shut;
 - Injection will begin when testable check valves, F050A and B, and F015A and B all open when pressure drops to 420 psig.
- D.
 - All LPCI injection valves are currently open;
 - Injection will begin when the testable check valves, F050A and B, open when RPV pressure reaches LPCI pump shutoff head.

K&A # 203000 A1.02
Importance Rating 3.9

QUESTION 14

RO Tier 2 Group 1

K&A Statement:

Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: Reactor pressure

Justification:

- A. Incorrect, F015A and B are shut until <420#. F050A and B open when RPV pressure reaches LPCI pump shutoff head (approximately 275-300 psig). Candidates may select this if they do not correctly recall the response of RHR valves during depressurization.
- B. Correct, the LPCI auto injection setpoints have been reached, but F015A and B remain closed until <420#. F050A and B remain closed until pressure below LPCI pump shutoff head (approximately 275-300 psig), at which time vessel injection will begin.**
- C. Incorrect, F050A and B will not open until RPV pressure reaches LPCI pump shutoff head. Candidates may select this if they do not correctly recall the response of RHR valves during depressurization.
- D. Incorrect, F015A and B are shut until <420#. Candidates may select this if they do not correctly recall the response of RHR valves during depressurization.

K/A Match Justification:

This question matches the stated K/A since candidates must be able to predict the response of LPCI injection valves during RPV depressurization while in the LPCI injection mode.

References: TM-OP-050 rev 4 Reference Required none

Learning Objective: 196.o

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 5/20/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 15

Unit 2 is operating in mode 1 when power is lost to 480 VAC Panel 2B236.

An ATWS occurs and the Unit Supervisor directs the PCOP to inject Standby Liquid Control (SBLC).

Which one of the following is correct concerning boron injection?

- A. ONLY SBLC Pump A is available.
Initiate SBLC per OP-253-001, "Standby Liquid Control System".
- B. ONLY SBLC Pump B is available.
Initiate SBLC per OP-253-001, "Standby Liquid Control System".
- C. BOTH SBLC subsystems are available.
Initiate SBLC per OP-253-001, "Standby Liquid Control System".
- D. NEITHER SBLC subsystem is available.
Implement ES-250-002, "Boron Injection Via RCIC".

K&A # 211000 A2.03
Importance Rating 3.2

QUESTION 15

RO Tier 2 Group 1

K&A Statement:

Ability to (a) predict the impacts of the following on the STANDBY LIQUID CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A.C. power failures

Justification:

- A. Incorrect, SBLC pump A is powered from 2B236, therefore it will not start if its handswitch is placed in start. Candidates may select this if they do not recall the 480 vac power supply to Unit 2's SLC Pumps.
- B. **Correct, SBLC pump B (2B217) and squib valve A (2Y216) are available for boron injection. Note Unit 2 squib valve power supplies are the reverse of Unit 1 (A from Y236, B from Y216)**
- C. Incorrect, 2B236 is the power supply for A SBLC Pump and 2Y236, which is the power supply to B Squib valve. Therefore, only the B SBLC Pump can inject via the A Squib valve. Candidates may select this if they do not recall the 480/120 vac power supply to Unit 2's SLC Pumps and squib valves.
- D. Incorrect, as stated above, B SBLC Pump is able to inject. Although implementing ES-150-002 would allow the use of RCIC to inject boron, it is only implemented in the event that SBLC can not inject boron. Candidates may select this if they do not recall the 480/120 vac power supply to Unit 2's SLC Pumps and squib valves.

K/A Match Justification:

This question matches the stated K/A since candidates must determine the impact on SBLC due to the loss of 480 vac and 120vac panels powering some SBLC components, AND determine the correct method and procedure required to inject boron with this AC power unavailable.

References: TM-OP-053-ST rev 9, TM-OP-053-FS Reference Required none
rev 2, ON-217-001 Att. H, rev 24

Learning Objective: 1214.c

Question source: New

Question History: New

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

10CFR55 41(b)5

Comments: Created by: M. Jacopetti, 11/30/10
Reviewed by: M. Shaffer, G. Shellenberger, R. Klinefelter 11-30-10

QUESTION 16

Unit 1 is operating at full power with the following conditions present:

- 1 Feedwater Flow input is BYPASSED due to deviation >0.50%
- LIC-C32-1R600, FW Level Ctl/Demand Signal Controller, is in AUTOMATIC
- RPV level control is selected to 3 ELEMENT
- RPV level stable at +35"

A SECOND Feedwater Flow input then FAILS DOWNSCALE.

Which one of the following describes:

- (1) The RPV level response (if any), AND;
 - (2) The action(s) that should be taken in accordance with ON-145-001, "RPV Level Control System Malfunction"?
- A. (1) RPV level rises to approximately +42", then stabilizes at approximately +35".
(2) Shift ICS/DCS to SINGLE ELEMENT, then manually bypass the second failed RFP flow input.
- B. (1) RPV level remains stable at approximately +35".
(2) Maintain ICS/DCS in its current configuration and verify that ICS/DCS automatically bypassed the second failed RFP flow input.
- C. (1) RPV level remains stable at approximately +35".
(2) Verify that ICS/DCS automatically shifted to SINGLE ELEMENT control, then manually bypass the second failed RFP flow input.
- D. (1) RPV level rises to approximately +42", then stabilizes several inches ABOVE +35".
(2) Establish manual control of Reactor Feed Pump speeds to return RPV level to +35" until one feedwater flow input can be returned to service.

K&A # 259002 A2.02
Importance Rating 3.3

QUESTION 16

RO Tier 2 Group 1

K&A Statement:

Ability to (a) predict the impacts of the following on the REACTOR WATER LEVEL CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of any number of reactor feedwater flow inputs

Justification:

- A. **Correct: Per ON-145-001, the 2nd failed feed flow transmitter remains in service until manually bypassed. The downscale signal causes an RPV level rise to 42" in response to a potential reduction in level due to lowering total feed flow signal. Level control remains in 3 element, and restore level to 35". The 2nd failed flow instrument must be manually bypassed, and ICS/DCS should be shifted to single element.**
- B. Incorrect, the 2nd failed instrument remains in service and creates a rising level transient; ON-145-001 should be used to transfer level control to single element and manually bypass the 2nd failed feed flow input. Candidates may select this if they incorrectly assume that ICS/DCS will automatically bypass the second failed flow input, RPV level will remain stable, and that level control should remain in 3 element control.
- C. Incorrect, the 2nd failed instrument remains in service and creates a rising level transient. Candidates may select this if they assume that ICS/DCS will automatically shift to single element control and level will remain stable.
- D. Incorrect, Level will return to approximately +35". Level control should be shifted to single element control and the second feed flow input must be manually bypassed. Candidates may select this if they incorrectly assume that ICS/DCS compensate for the lost feed flow input by establishing a higher level setpoint.

K/A Match Justification:

This question matches the stated K/A since candidates must predict plant response to a 2nd failed feed flow instrument and determine the actions required per the stated procedure.

References: ON-145-001 rev 27 Reference Required none

Learning Objective: 16014.d

Question source: New

Question History: New

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

10CFR55 41(b)5

Comments: Created by: T. North, 9/2/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 17

Unit 1 has experienced a LOCA resulting in the following:

- RPV level is -160", down fast
- RPV pressure is 40 psig, down slow

The crew is directed by EOPs to open 6 ADS valves.

The PCOP manually actuates the ADS logic, then notes the following conditions:

- RPV pressure is 35 psig, down slow
- All 6 ADS valve solenoid energized lights are LIT
- All acoustic monitor LEDs are NOT LIT

The PCOP should report that...

- A. Six ADS valves are open because the acoustic monitor LEDs are normally lit and extinguish when the valves open.
- B. Six ADS valves are open because the acoustic monitor may not indicate at low RPV pressures.
- C. NO ADS valves are open because the acoustic monitor LEDs will illuminate when the valves open under these conditions.
- D. NO ADS valves are open because the ADS valve solenoids de-energize to open the valves.

QUESTION 18

Unit 1 was operating at full power with all systems in a normal full power lineup when a transient occurs, resulting in drywell pressure rising to 2.0 psig.

In this condition, operators should closely monitor (1) because (2) .

- A. (1) Reactor Recirc Pump (RRP) motor winding temperatures
(2) Reactor Building Closed Cooling Water flow to the RRP motor winding coolers automatically isolated
- B. (1) Reactor Recirc Pump (RRP) motor winding temperatures
(2) RRP motor winding cooling automatically shifted from Reactor Building Chilled Water to Reactor Building Closed Cooling Water
- C. (1) Reactor Recirc Pump (RRP) motor bearing and seal temperatures
(2) Reactor Building Closed Cooling Water flow to the Recirc pump bearing and seal coolers automatically isolated
- D. (1) Reactor Recirc Pump (RRP) motor bearing and seal temperatures
(2) RRP bearing and seal cooling automatically shifted from Reactor Building Chilled Water to Reactor Building Closed Cooling Water

K&A # 400000 A3.01
Importance Rating 3.0

QUESTION 18

RO Tier 2 Group 1

K&A Statement:

Ability to monitor automatic operations of the CCWS including:
Setpoints on instrument signal levels for normal operations,
warnings, and trips that are applicable to the CCWS

Justification:

- A. Incorrect, although cooling flow to the winding coolers will have isolated, the isolation of RBCCW will not affect this load since it is normally cooled by RBCW. Candidates may select this if they do not recall that the normal cooling supply to the winding coolers is RBCW vice RBCCW.
- B. Incorrect, cooling flow to the winding coolers will only shift to RBCCW upon a failure of RBCW. In this condition, RBCW flow to the winding coolers is isolated by the high DW pressure. Candidates may select this if they incorrectly apply the RBCCW shift for these plant conditions.
- C. **Correct, RBCCW piping that penetrates the primary containment will isolate when DW pressure exceeds 1.72 psig, stopping flow to recirc pump coolers, therefore recirc pump temperatures should be closely monitored.**
- D. Incorrect, bearing and seal cooler cooling flow is normally provided by RBCCW and will isolate on high DW pressure, therefore there will be no shift in cooling flow. Candidates may select this if they do not correctly recall the normal cooling water supply for these coolers and that cooling flow will isolate on high DW pressure.

K/A Match Justification:

This question matches the stated K/A since the candidates are required to recall the automatic actions associated with the RBCCW and RBCW system when drywell pressure is above the high drywell pressure setpoint, determine which loads are affected by the RBCCW containment isolation and will require additional monitoring.

References: ON-159-002 rev 29, TM-OP-014 rev 1, Reference Required none
TM-OP-064C rev 10, ON-114-001 rev 21

Learning Objective: 1694.c

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 5/24/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 19

Unit 1 has experienced a transient that requires rapid depressurization due to a PRIMARY system leaking into SECONDARY containment.

The Automatic Depressurization System (ADS) has been manually initiated by arming and depressing the ADS manual initiation pushbuttons on 1C601.

Immediately after all ADS valves open, the PCOP reports a very rapid rise in suppression chamber and drywell pressure.

Which one of the following completes the statement below describing the response observed by the PCOP?

This pressure rise is (1), and is the result of (2).

- A. (1) NORMAL
(2) the rapid rush of steam entering the suppression pool below the water line.
- B. (1) NORMAL
(2) the automatic opening of drywell to suppression pool vacuum breakers.
- C. (1) ABNORMAL
(2) a failure of primary containment downcomer piping.
- D. (1) ABNORMAL
(2) a failure of a Safety Relief Valve tailpipe above the water line.

K&A # 218000 A4.01

Importance Rating 4.4

QUESTION 19

RO Tier 2 Group 1

K&A Statement:

Ability to manually operate and/or monitor in the control room:
ADS valves

Justification:

- A. Incorrect, the suppression pool water inventory is sized to accommodate the full energy released by the RPV when ADS is initiated. By design this results in relatively little impact on SP and DW pressure. Candidates may select this if they are unfamiliar with or cannot correctly recall the normal containment pressure response following multiple SRV opening.
- B. Incorrect, the DW-SP vacuum breakers are not expected to operate during ADS valve actuation, therefore this pressure rise is considered abnormal. Candidates may select this if they are unfamiliar with the normal containment pressure response following multiple SRV opening.
- C. Incorrect, the response is abnormal. A failure of a downcomer would tend to equalize SP and DW pressures, but provided the ADS valves discharge under the water line, this failure would not result in a rapid PC pressure rise. Candidates may select this if they confuse primary containment downcomers with SRV tailpipes or are generally unfamiliar with primary containment structure and design, and potential abnormalities associated with SRV tailpipe failures.
- D. **Correct, this failure would result in steam energy from the RPV released directly into the suppression chamber air space. This will result in a very rapid rise in SP and DW pressures.**

K/A Match Justification:

This question matches the stated K/A since candidates must evaluate the response of parameters that should be monitored after ADS actuation and determine if proper system and component operation has occurred.

References: TM-OP-059 rev 1

Reference Required

none

Learning Objective: 2092.d

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 9/1/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 20

Unit 1 is in mode 4, with RHR pump A in shutdown cooling mode.

A LOCA occurs, resulting in RPV level rapidly lowering until the leak is stopped. RPV level stabilizes at +5”

Which one of the following describes the actions the PCOP should take with regard to the RHR system?

- A.
 - Verify that RHR Shutdown Cooling suction isolation valves F008, F009 AND RHR loop A injection valve F015A automatically SHUT;
 - Verify RHR pump A automatically trips.

- B.
 - Verify that RHR Shutdown Cooling suction isolation valves F008 and F009, AND RHR pump A Shutdown Cooling suction valve F006A automatically SHUT;
 - Verify RHR pump A automatically trips.

- C.
 - Verify that RHR Shutdown Cooling suction isolation valves F008 , F009 AND RHR loop A injection valve F015A automatically SHUT;
 - Manually trip RHR pump A.

- D.
 - Verify that RHR Shutdown Cooling suction isolation valves F008 and F009, AND RHR pump A Shutdown Cooling suction valve F006A automatically SHUT;
 - Manually trip RHR pump A.

K&A # 205000 A4.02
Importance Rating 3.6

QUESTION 20

RO Tier 2 Group 1

K&A Statement:

Ability to manually operate and/or monitor in the control room:
SDC/RHR suction valves

Justification:

- A. **Correct, when RPV level reaches +13", SDC suction valves F008 & F009 auto close. This results in a loss of suction path automatic trip of RHR pump A, since F004A will also be shut due to the SDC lineup.**
- B. Incorrect, F006A will remain open. The candidate may select this if they incorrectly believe that F006A will also auto close.
- C. Incorrect, the A RHR pump will automatically trip due to loss of suction. The candidate may select this if they incorrectly believe that the RHR pump will remain running with no suction path.
- D. Incorrect, F006A will not shut, and RHR pump A will trip. The candidate may select this if they incorrectly believe that the RHR pump will remain running with no suction path and F006A will auto close.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the RHR suction valve interlocks in order to properly monitor the system response following a low RPV level condition.

References: TM-OP-049 rev 7 Reference Required none

Learning Objective: 181.q

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created/Modified by: T. North, 9/2/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 21

EO-100-113, "Level/Power Control", directs operators to reset the Main Generator lockout relays if a Main Turbine trip has occurred.

This action is required to...

- A. maintain normal power to the auxiliary busses by preventing transfer to the startup supply.
- B. maintain the MSIVs open by preventing a spurious isolation signal due to loss of auxiliary busses.
- C. prevent loss of significant equipment due to an undesired load shed on auxiliary busses.
- D. prevent loss of equipment required for accident mitigation due to a load shed of the ESS busses.

QUESTION 22

Unit 1 is operating in MODE 1.

During functional testing of the Automatic Depressurization System (ADS) system, it is determined that the “ADS MANUAL INITIATION A” Pushbutton, HS-B21-1S30 A, has failed.

The pushbutton CANNOT be armed OR depressed.

Determine the affect this failure will have on the ADS system; AND, given Tech Specs 3.3.5.1, “Emergency Core Cooling System Instrumentation” determine the status of LCO 3.3.5.1:

- A.
 - ADS CAN be manually initiated because BOTH the B and D pushbuttons are still operable.
 - LCO 3.3.5.1 is NOT met because the required number of manual channels are NOT operable.

- B.
 - ADS CAN be manually initiated because BOTH the B and D pushbuttons are still operable.
 - LCO 3.3.5.1 IS met because the required number of manual channels ARE operable.

- C.
 - ADS CANNOT be manually initiated because ALL FOUR pushbuttons are required to actuate the logic.
 - LCO 3.3.5.1 is NOT met because the required number of manual channels are NOT operable.

- D.
 - ADS CANNOT be manually initiated because ALL FOUR pushbuttons are required to actuate the logic.
 - LCO 3.3.5.1 IS met because the manual initiation function is NOT required in this condition.

K&A # 218000 2.2.40

Importance Rating 3.6

QUESTION 22

RO Tier 2 Group 1

K&A Statement:

Equipment Control: Ability to apply technical specifications for a system.

Justification:

- A. **Correct, arming and depressing the B and D pushbuttons will result in manual initiation of the ADS logic. The minimum number of required channels for the manual function of ADS instrumentation not met per table 3.3.5.1-1, therefore LCO 3.3.5.1 is not met.**
- B. Incorrect, see A above. Candidates may select this if they do not correctly apply table 3.3.5.1-1 requirements.
- C. Incorrect, arming and depressing the B and D pushbuttons will result in manual initiation of the ADS logic. BOTH buttons in EITHER logic can initiate ADS. Candidates may select this if they incorrectly recall that all 4 buttons are required.
- D. Incorrect, ADS can be initiated using the B and D pushbuttons. LCO 3.3.5.1 is not met due to the manual function. Candidates may select this if they incorrectly determine that the manual function is not required in mode 1.

K/A Match Justification:

This question matches the stated K/A since candidates must apply tech specs for the given conditions.

References: TS 3.3.5.1 rev 3

Reference Required

TS
3.3.5.1

Learning Objective: 12701

Question source: New

Question History: New

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

10CFR55 41(b)10

Comments: Created by: T. North, 11-12-10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 23

Which one of the following power supplies is required in order for the High Pressure Coolant System (HPCI) to automatically perform its intended safety function WITHOUT manual operator action?

- A. 120 VAC panel 1Y216
- B. 480 VAC MCC 1B237
- C. 125 VDC panel 1D614
- D. 125 VDC panel 1D624

K&A # 206000 K2.03
Importance Rating 2.8

QUESTION 23

RO Tier 2 Group 1

K&A Statement:

Knowledge of electrical power supplies to the following: Initiation logic: BWR-2,3,4

Justification:

- A. Incorrect, this panel only provides power to the div 1 steam leak detection, F100 warmup isolation solenoid, and BIS indication. Loss of power to these components would not prevent HPCI auto start on a LOCA signal. Candidates may select this if they do not correctly recall the HPCI initiation logic power supply.
- B. Incorrect, this MCC only provides power to F002 inboard isolation valve MOV. Loss of power to this valve would not prevent HPCI auto start on a LOCA signal, since the valve is normally open and would not reposition. Candidates may select this if they do not correctly recall the HPCI initiation logic power supply.
- C. Incorrect, this panel only provides power to the div 1 isolation logic; F028, steam line drain solenoid; and F026 barometric condenser drain solenoid. The isolation logic is not required for auto start on a LOCA signal. F026 and F028 would remain closed but are not required for automatic injection on a LOCA signal. Candidates may select this if they do not correctly recall the HPCI initiation logic power supply.
- D. **Correct, HPCI auto initiation logic is powered by 1D624. Without power to this panel, HPCI would not automatically start and inject when required by a valid LOCA signal.**

K/A Match Justification:

This question matches the stated K/A since candidates must correctly recall the power supply for HPCI initiation logic.

References: TM-OP-052 rev 4 Reference Required none

Learning Objective: 10367.c

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 6/20/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 24

With both units operating in MODE 1, HSS-0653B, one of the four Channel 'C' Common Load Manual Transfer Switches (for diesel generator ESW Valve control and indication and, Diesel Generator Fuel Oil Booster Pump control), is transferred from its NORMAL position to its ALTERNATE position.

Which one of the following statements describes what will occur as a result of this?

The loads powered via HSS-0653B are now powered from (1); AND there will be (2) .

- A. Unit 2;
a MOMENTARY loss of power to the affected loads since this switch is "break-before-make"
- B. Unit 1;
a MOMENTARY loss of power to the affected loads since this switch is "break-before-make"
- C. Unit 2;
NO loss of power to the affected loads since this switch is "make-before-break"
- D. Unit 1;
NO loss of power to the affected loads since this switch is "make-before-break"

K&A # 263000 K4.02
Importance Rating 3.1

QUESTION 24

RO Tier 2 Group 1

K&A Statement:

Knowledge of D.C. ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following: Breaker interlocks, permissives, bypasses and cross ties: Plant-Specific

Justification:

- A. **Correct, the alternate supply is from unit 2. The switch is break-before-make and will result in a momentary power loss to affected loads**
- B. Incorrect, power supply is from unit 1 in NORMAL. Candidates may select this if they do not correctly recall the normal and alternate power sources for the common DC loads
- C. Incorrect, power supply is from unit 1 in NORMAL. A momentary power loss to affected loads will occur due to the "break-before-make" switch operation. Candidates may select this if they do not correctly recall how the transfer switch is interconnected between units and the annunciator arrangement.
- D. Incorrect, a momentary power loss to affected loads will occur due to the "break-before-make" switch operation. Candidates may select this if they believe this transfer is annunciated.

K/A Match Justification:

This question matches the stated k/A since candidates must recall knowledge of DC distribution system cross tie switches.

References: TM-OP-002-ST rev 5, OP-102-002 rev 13 Reference Required none

Learning Objective: 10144

Question source: MODIFIED SSES
OPS_INITIAL_LICENSE Bank
TMOP002/10144 004

Question History: MODIFIED Bank

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

10CFR55 41(b)7

Comments: *modified to remove reference to annunciation and add switch details.* Modified by: T. North, 11-22-10
Reviewed by: E. Brice, A. Avery, 11-23-10

QUESTION 25

A failure of the Reactor Protection System (RPS) has occurred at Unit 1 requiring manual initiation of Alternate Rod Insertion (ARI).

The PCOP attempts to arm and depress BOTH the Div 1 AND Div 2 ARI manual initiation pushbuttons on 1C601.

The DIV 1 pushbutton is armed and depressed successfully; HOWEVER, the arming collar on the DIV 2 ARI manual pushbutton FAILS; AND the DIV 2 pushbutton CANNOT be armed OR depressed.

The PCOM must then report that (1), because (2) ARI vent and block valves repositioned.

- A. (1) ALL Control Rods inserted
(2) ALL FOUR
- B. (1) Control Rods DID NOT insert
(2) ONLY the DIV 1
- C. (1) Control Rods DID NOT insert
(2) NONE of the
- D. (1) ALL Control Rods inserted
(2) ONLY the DIV 1

K&A # 212000 A4.16
Importance Rating 4.4

QUESTION 25

RO Tier 2 Group 1

K&A Statement:

Ability to manually operate and/or monitor in the control room:
Manually activate anticipated transient without SCRAM
circuitry/RRCS: Plant-Specific

Justification:

- A. Incorrect, the div 2 ARI valves can only be repositioned by the div 2 logic. Both div 1 and div 2 ARI valves are required to cause rod motion. Candidates may select this if they fail to recall that ARI logic requires both div 1 and div 2 pushbuttons to satisfy the complete logic and reposition all 4 valves.
- B. Correct, the failure of div 2 logic results in only the div 1 valves repositioning, and since all 4 ARI valves are required to reposition to cause rod motion, no rod motion occurs.**
- C. Incorrect, the div 1 valves will reposition. Candidates may select this if they incorrectly believe that both pushbuttons are required to actuate either division's logic.
- D. Incorrect, no rod motion will occur. Candidates may select this if they fail to recall that the scram air header requires both div 1 and div 2 valves to vent and cause rod motion.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the logic arrangement of the ARI system to predict what the correct report will be following this failure.

References: TM-OP-058 rev 9 Reference Required none

Learning Objective: 11480.j

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 9/18/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 26

Unit 1 was operating at 20 percent power when a loss of all high pressure feed occurs.

- Reactor water level dropped to -140 inches
- Offsite power is available
- Unit 2 RHR pumps are in standby

Which one of the following describes the Unit 1 RHR Pump start sequence under these conditions?

- A. All four RHR Pumps start immediately.
- B. A and B RHR Pumps start immediately;
C and D RHR pumps start after a 7 second time delay.
- C. A and B RHR Pumps start after a 3 second time delay;
C and D RHR pumps start after a 7 second time delay.
- D. All four RHR Pumps start after a 3 second time delay.

K&A # 203000 A3.08

Importance Rating 4.1

QUESTION 26

RO Tier 2 Group 1

K&A Statement:

Ability to monitor automatic operations of the RHR/LPCI:
INJECTION MODE (PLANT SPECIFIC) including: System
initiation sequence

Justification:

- A. Incorrect, C/D on seven second delay. This answer would be correct only if all 4 ESS busses were energized by the DGs. Candidates may select this if they do not recall that C/D have a 7 sec time delay.
- B. Correct, A/B start immediately, C/D on 7 sec TD to prevent O/L the ESS busses**
- C. Incorrect, A/B start immediately, 3 sec TD is only applicable with LOOP. Candidates may select this if the incorrectly apply the 3 sec LOOP time delay to this plant condition.
- D. Incorrect, 3 sec TD is only applicable with LOOP. Candidates may select this if the incorrectly apply the 3 sec LOOP time delay to this plant condition.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the correct LPCI pump start sequence to properly monitor automatic system operation.

References: TM-OP-049 rev 7

Reference Required none

Learning Objective: 181.f

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP049/192 001

Question History: Bank

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

10CFR55 41(b)7

Comments: Created by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 27

A LOCA has occurred on Unit 1 causing drywell pressure and temperature to rise.

The Unit Supervisor has determined that drywell sprays are REQUIRED in accordance with EO-100-103, "PC Control", HOWEVER, PCOs report that NO Residual Heat Removal (RHR) Pumps are operable.

Which one of the following describes ALTERNATE equipment that can be used to perform drywell sprays?

- A. BOTH Emergency Service Water, AND RHR Service Water pumps.
- B. ONLY RHR Service Water pumps.
- C. ONLY Emergency Service Water pumps.
- D. Emergency Service Water, RHR Service Water OR Fire pumps.

K&A # 226001 K1.11
Importance Rating 2.8

QUESTION 27

RO Tier 2 Group 2

K&A Statement:

Knowledge of the physical connections and/or cause- effect relationships between RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE and the following: Component cooling water systems

Justification:

- A. Incorrect, only RHRSW pumps can be aligned for this purpose.
- B. Correct, RHRSW pumps can be aligned to provide spray flow by opening RHR/RHRSW crosstie valves per PO-116-001.**
- C. Incorrect, see A above. Candidates may select this if they do not correctly recall the physical connections between ESW and RHR.
- D. Incorrect, see A above. Candidates may select this if they do not correctly recall the physical connections between ESW, Fire suppression and RHR.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall the physical connections and relationship between RHR and RHRSW.

References: OP-116-001 rev 29, EO-000-103 rev 7 Reference Required none

Learning Objective: 14621

Question source: New

Question History: New

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

10CFR55 41(b)8

Comments: Created by: T. North, 11/22/10
Reviewed by: E. Brice, A. Avery, 11-23-10

QUESTION 28

Unit 1 was operating at 90% power when the following sequence of events occur:

- The inboard MSIVs failed closed.
- RPV level reached -42" before being restored to 35".
- RPV pressure dropped to 1,020 psig and is being maintained between 800 and 1,087 psig.
- RHR Loop A was placed in Suppression Pool Cooling.
- The feeder breaker to MCC 1B237 tripped
- A small LOCA caused Drywell pressure to reach 2.5 psig.

Which valve(s) will reposition as a result of these conditions?

- A. HV-151-F007A, RHR Pump A/C Min Flow Valve.
- B. HV-151-F017A, RHR Injection Flow Control Valve, AND HV-151-F028A, Suppression Spray Test Shutoff Valve.
- C. HV-151-F027A, Suppression Pool Spray Control Valve, AND HV-151-F048A, Heat Exchanger A Shell Side Bypass Valve.
- D. HV-11210A, RHR Service Water Heat Exchanger Inlet Valve.

K&A # 219000 K2.01

Importance Rating 2.5

QUESTION 28

RO Tier 2 Group 2

K&A Statement:

RHR/LPCI: Torus/Suppression Pool Cooling Mode:

Knowledge of electrical power supplies to the following: Valves

Justification:

- A. **Correct, HV-151-F007A (powered from 1B219) will receive an open signal due to low system flow when HV-151-F028A (powered from 1B216) closes as a result of Drywell pressure exceeding 1.72 psig.**
- B. Incorrect, HV-151-F017A is closed per OP-149-004 when aligning for Suppression Pool Cooling and will not automatically reposition unless RPV pressure reaches 420 psig. HV-151-F028A (powered from 1B216) is open while in supp pool cooling and does close due to the high Drywell pressure signal.
- C. Incorrect, HV-151-048A (powered from 1B237) will receive an open signal from the high Drywell pressure but will not reposition due to the loss of power. HV-151-F027A (powered from 1B236) is already closed when it receives a closed signal due to the high Drywell pressure.
- D. Incorrect, HV-11210A heat exchanger RHRSW inlet valve, although powered from MCC 1B237, does not receive a closed signal from the -38" RPV level signal and will remain open. It is the RHRSW Pump that trips on the -38" signal.

K/A Match Justification:

This question matches the stated K/A since candidates are required to correctly recall the power supplies to various motor operated valves utilized in suppression pool cooling mode of RHR.

References: TM-OP-049 rev 7

Reference Required none

Learning Objective: 10499.b

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: M. Jacopetti 11/30/10
Reviewed by: M. Shaffer, G. Shellenberger, R. Klinefelter 11-30-10

QUESTION 29

Unit 1 is operating in mode 1 with the following steady state conditions present:

- Reactor power: 90%
- Recirc flow: 89% of rated
- RPV pressure: 1015 psig

A failure of the Reactor Recirc Flow Control System then causes a slow RISE in the speed of BOTH Recirc pumps.

Predict the INITIAL effect this failure will have on the Main Turbine control system, and RPV pressure:

- A. Main Turbine Bypass Valves will slowly open as reactor power rises above 90%, and RPV pressure will be maintained at 1015 psig.
- B. Main Turbine Bypass Valves will slowly open as reactor power rises above 90%, and RPV pressure will slowly rise above 1015 psig.
- C. Main Turbine Control Valves will slowly open as reactor power rises above 90%, and RPV pressure will be maintained at 1015 psig.
- D. Main Turbine Control Valves will slowly open as reactor power rises above 90%, and RPV pressure will slowly rise above 1015 psig.

K&A # 202002 K3.04

Importance Rating 2.9

QUESTION 29

RO Tier 2 Group 2

K&A Statement:

Knowledge of the effect that a loss or malfunction of the RECIRCULATION FLOW CONTROL SYSTEM will have on following: Reactor/turbine pressure regulation system

Justification:

- A. Incorrect, bypass valves will not begin to open until turbine load limits are reached. Pressure will rise as reactor power rises due to the rise in recirc pump speed. Candidates may select this if they do not correctly recall that the load limit is set above 100% turbine load.
- B. Incorrect, bypass valves will not begin to open until turbine load limits are reached. Pressure will rise as reactor power rises due to the rise in recirc pump speed. Candidates may select this if they do not correctly recall that the load limit is set above 100% turbine load.
- C. Incorrect, pressure will rise as reactor power rises due to the rise in recirc pump speed. Candidates may select this if they do not recall that RPV pressure will rise as power is ramped up.
- D. **Correct, the rise in recirc pump speed will cause a corresponding rise in reactor power. The turbine control system will allow RPV pressure to rise proportionally with the power rise and cause the control valves to open, increasing turbine load.**

K/A Match Justification:

This question matches the stated K/A since candidates must predict the response of the main turbine control system following a failure of the reactor recirc flow control system.

References: TM-OP-093L rev 6, TM-OP-064E rev 0 Reference Required none

Learning Objective: 10341.a

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 9/19/10I
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 30

Input to the Reactor Feed Pump level 8 trip logic is provided by Reactor Vessel Narrow Range Water Level Transmitters A, B and C.

With Unit 1 at full power:

PREDICT the impact on Reactor Feed Pumps (RFP) if the "A" Narrow Range Water Level Transmitter were to fail UPSCALE (false high RPV level signal), AND why:

- A. All three (3) RFPs will trip because the logic only requires one (1) upscale signal to cause a trip.
- B. ONLY RFP "A" will trip because each transmitter only feeds its respective RFP trip logic.
- C. NONE of the RFPs will trip because the trip logic requires at least two (2) redundant trip signals.
- D. All three (3) RFPs will trip because the Feedwater Level Control System will cause actual RPV level to rise above level 8.

K&A # 216000 K4.03

Importance Rating 3.4

QUESTION 30

RO Tier 2 Group 2

K&A Statement:

Knowledge of NUCLEAR BOILER INSTRUMENTATION design feature(s) and/or interlocks which provide for the following:
Redundancy of sensors

Justification:

- A. Incorrect, no RFPs trip. Logic is 2 out of 3. Candidates may select this if they do not correctly recall the RFP trip logic arrangement.
- B. Incorrect, logic is not arranged this way. Candidates may select this if they do not correctly recall the RFP trip logic arrangement.
- C. **Correct, the logic requires 2 out of 3 redundant level 8 signals to actuate the trip. This trip is applied to all 3 feed pumps when met.**
- D. Incorrect, the ICS/DCS FWLC system contains sufficient redundant RPV level signals to be impervious to one level input failing, so actual RPV level will not falsely respond to the failure. Candidates may select this if they do not correctly recall that ICS/DCS will not respond to the level transmitter failure

K/A Match Justification:

This question matches the stated K/A since candidates must recall how the RFP trip logic and ICS/DCS utilizes redundant sensors to monitor and control RPV water level.

References: TM-OP-080 rev 9 Reference Required none

Learning Objective: 10561.d

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 6/2/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 31

Unit 2 is in mode 5 with the following conditions present:

- Reactor Mode Switch is in REFUEL
- Unit 2 Refueling platform Reactor Select Switch selected to NORM
- Unit 2 Refueling platform is positioned over the unit 2 reactor
- Refuel switch #1 is activated
- Fuel grapple is UNLOADED
- Monorail hoist is UNLOADED
- Frame mounted hoist is UNLOADED
- Control Rod 10-23 is at position 48

Given these conditions, which one of the following changes would prevent reverse refueling platform motion?

- A. The Frame mounted hoist is loaded.
- B. Refuel Switch #2 is activated.
- C. A second control rod is withdrawn beyond position 00.
- D. Refuel switch #1 is DE-activated.

K&A # 234000 K5.01
Importance Rating 2.9

QUESTION 31

RO Tier 2 Group 2

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to FUEL HANDLING EQUIPMENT : Crane/hoist operation

Justification:

- A. **Correct, reverse movement is blocked if selected to NORM and over NORM; a control rod is withdrawn; refuel switch #1 is activated; and EITHER fuel grapple loaded >550lbs, OR frame hoist >500lbs; OR monorail hoist >500lbs. Raising the frame hoist load above this limit completes the REVERSE movement block circuit.**
- B. Incorrect, refuel switch #2 is not in this circuit and conditions to enable it to prevent reverse motion are not present. Candidates may select this if they incorrectly believe that refuel switch #2 provides input to the circuit.
- C. Incorrect, an additional rod withdrawn will not affect the circuit and would not be permitted by RMCS. Candidates may select this if they incorrectly believe that a second control rod may be withdrawn in this condition.
- D. Incorrect, de-activation of refuel switch #1 would indicate the bridge is no longer above the normal reactor and would permit reverse motion. Candidates may select this if they do not correctly recall the purpose and function of refuel switch #1.

K/A Match Justification:

This question matches the stated K/A since candidates must correctly recall details of fuel handling crane and hoist equipment operation.

References: TM-OP-081B rev 3 Reference Required none

Learning Objective: 10787.c

Question source: New

Question History: New

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

10CFR55 41(b)5

Comments: Created by: T. North, 6/2/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 32

Unit 1 is shutdown in mode 4 when a seismic event occurs.

As a result of the earthquake, the weld connecting the Unit 1 Main Condenser Hotwell Reject line to the "A" Condensate Storage Tank severs, and the reject line becomes completely detached from the CST tank wall.

The "A" Control Rod Drive pump is in service when the seismic event occurs.

This line break (1) affect the running CRD pump because (2) .

- A. (1) WILL NOT;
(2) pump suction is re-aligned to the CRDH system return line when in mode 4
- B. (1) WILL NOT;
(2) pump cooling is re-aligned to the TBCCW system when in mode 4
- C. (1) WILL;
(2) net positive suction head for the pump will be lost
- D. (1) WILL;
(2) cooling to the pump gearbox and bearings will be lost

QUESTION 33

Both SSES Units are operating at full power with Control Room Emergency Outside Air Supply System (CREOASS) in the following lineup:

- CREOASS Fan "A" (0V101A) is selected to AUTO-STANDBY
- CREOASS Fan "B" (0V101B) is selected to AUTO-LEAD

The mode switch for the "A" Outside Air Radiation Monitor, RISHH-D12-0K618A, is then placed to the TRIP TEST position.

Which one of the following is the correct response of the CREOASS system?

- A. Fan "A" will automatically start, fan "B" will remain off.
- B. Fan "B" will automatically start, fan "A" will remain off.
- C. BOTH "A" AND "B" Fan auto start function on HI-HI outside air radiation is disabled.
- D. ONLY the Fan "A" auto start function on HI-HI outside air radiation is disabled.

K&A # 290003 A1.05
Importance Rating 3.2

QUESTION 33

RO Tier 2 Group 2

K&A Statement:

Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROOM HVAC controls including: Radiation monitoring (control room)

Justification:

- A. **Correct, placing the rad monitor to TRIP TEST will auto start its associated divisional fan. The A monitor starts the A fan. Fan A will auto start regardless of the position of the auto-standby switch.**
- B. Incorrect, despite that the B fan is selected to lead, only the B rad monitor will start the B fan. Candidates may select this if they incorrectly believe that placing the A rad monitor to trip test will start the fan selected to lead.
- C. Incorrect, the auto start feature for the fans is not disabled in trip test. Candidates may select this if they incorrectly believe that the trip test position will disable the fan auto start feature.
- D. Incorrect, the auto start feature for the fans is not disabled in trip test. Candidates may select this if they incorrectly believe that the trip test position will disable the fan auto start feature.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the functional relationship between rad monitors and control room ventilation components and predict the effect of operating the rad monitor controls.

References: TM-OP-030 rev 4, OP-030-002 rev 26 Reference Required none
E-197-sheet 1 rev 16, -sheet 3 rev 22

Learning Objective: 1965.b

Question source: New

Question History: New

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

10CFR55 41(b)5

Comments: Created by: T. North, 6/3/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 34

Unit 1 is operating in mode 1 at 70% power. Power ascension is in progress following refueling outage 17.

Control rod 38-31 is being withdrawn from position 12 to position 16 when a valid Rod Block Monitor (RBM) upscale trip halts rod motion.

Annunciator AR-103-C04, "RBM UPSCALE OR INOP ROD BLOCK" is illuminated.

In this condition, control rod motion stopped when RBM reached (1); AND, in accordance with alarm response procedure AR-103-001-C04, operators must (2) in order to continue rod withdrawal.

- A. (1) 117%
(2) select an edge rod to clear the rod block, then re-select rod 38-31
ONLY
- B. (1) 117%
(2) verify thermal limits will not be exceeded; de-select then re-select rod 38-31
- C. (1) 109.2%
(2) select an edge rod to clear the rod block, then re-select rod 38-31
ONLY
- D. (1) 109.2%
(2) verify thermal limits will not be exceeded; de-select then re-select rod 38-31

K&A # 215002 A2.01
Importance Rating 3.3

QUESTION 34

RO Tier 2 Group 2

K&A Statement:

Ability to (a) predict the impacts of the following on the ROD BLOCK MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
Withdrawal of control rod in high power region of core: BWR-3,4,5

Justification:

- A. Incorrect, it is inappropriate in this condition to simply clear the rod block by selecting an edge rod. This action may work to temporarily clear the block, however, since the rod block was due to a valid local overpower condition, this action alone is insufficient to permit continued rod motion. Verification of thermal limit margin is required to ensure fuel damage will not occur due to the local power conditions. Candidates may select this since the procedure permits this action when the rod block is spurious.
- B. **Correct, per the cycle 17 COLR, the intermediate setpoint applies when reactor power is >61%. The alarm response procedure requires that the crew verify with RE that there is sufficient margin to thermal limits, then reselect the rod to reset the rod block (the rod must first be de-selected, although the procedure does not state this directly).**
- C. Incorrect, the intermediate rod block setpoint of 117% is in effect when power is >61% and < 81%. Candidates may select this if they do not correctly recall the RBM setpoint, and they assume they can continue rod motion without thermal limit verification (See A above).
- D. Incorrect, the intermediate rod block setpoint of 117% is in effect when power is >61% and < 81%. Candidates may select this if they do not correctly recall the intermediate RBM setpoint.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall the conditions necessary to provide a valid rod block when withdrawing a control rod in a central (high powered) region of the core. Additionally, they must recognize the appropriate action to be taken in accordance with the approved procedure for the stated condition of a valid rod block.

References: COLR/TRM section 3.2 rev 11; TM- Reference Required none
OP-078K rev 4; AR-103-001-C04 rev 38.

Learning Objective: 15806.i, 15811.e

Question source: Modified INPO bank #25961

Question History: Pilgrim 2003 NRC Exam

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

10CFR55

41(b)5

Comments:

Modified by: T. North, 8/31/10

Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 35

Unit 1 is in mode 2 with a reactor startup in progress.

The PCOM selects control rod 10-31 and momentarily depresses the W/DRAW ROD pushbutton to withdraw the rod one notch.

In order to determine if the COMPLETE rod withdraw sequence has taken place as designed, what indications should be observed, AND in what sequence?

- A. (1) rod w/draw light momentarily lit
 (2) withdraw flow of 2-3 gpm
 (3) rod settle light lit, then off

- B. (1) rod insert light lit, then off
 (2) insert flow of 2-3 gpm
 (3) rod w/draw light lit, then off
 (4) withdraw flow of 4-5gpm
 (5) rod settle light lit, then off

- C. (1) rod w/draw light lit, then off
 (2) withdraw flow of 2-3 gpm
 (3) rod insert light momentarily lit
 (4) rod settle light lit, then off

- D. (1) rod insert light momentarily lit
 (2) rod w/draw light lit, then off
 (3) withdraw flow of 2-3 gpm
 (4) rod settle light lit, then off

K&A # 201002 A3.02
Importance Rating 2.8

QUESTION 35

RO Tier 2 Group 2

K&A Statement:

Ability to monitor automatic operations of the REACTOR MANUAL CONTROL SYSTEM including: Rod movement sequence lights

Justification:

- A. Incorrect, the insert light must be observed to momentarily light. Candidates may select this if they do not correctly recall the light sequence following rod withdrawal.
- B. Incorrect, the insert light is lit only momentarily, and insert flow will not be observed. Withdraw flow is normally 2-3 gpm, not 4-5. Candidates may select this if they do not correctly recall the light sequence following rod withdrawal and that withdraw flow is 2-3 gpm.
- C. Incorrect, the insert light will momentarily light before the w/d light. Candidates may select this if they do not correctly recall the light sequence following rod withdrawal.
- D. **Correct, OP-156-001 defines this as the correct indications for a one notch rod withdrawal sequence.**

K/A Match Justification:

This question matches the stated K/A since candidates must recall the correct sequence of rod movement lights that must be observed following control rod withdrawal.

References: OP-156-001 rev 16 Reference Required none

Learning Objective: 2469.d

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP056A/2470 001

Question History: Bank

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

10CFR55 41(b)7

Comments: Created by:
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 36

Unit 2 has experienced a reactor scram following a trip of BOTH Reactor Recirc Pumps.

- Feedwater Pump A is in service for reactor water level control
- Reactor Water Cleanup (RWCU) is in letdown mode
- BOTH Reactor Recirc loops are NOT isolated

Operators have been directed to monitor Reactor Pressure Vessel (RPV) water temperature to assess the status of RPV thermal stratification in accordance with ON-200-101, "Scram, Scram Imminent".

In addition to RPV saturation pressure and temperature, which one of the following temperature indications should be used for this purpose?

- A. Reactor Recirc loop temperatures.
- B. RWCU bottom head drain temperature.
- C. Reactor Vessel wall and flange temperatures.
- D. Feedwater system RPV inlet temperature.

K&A # 204000 A4.09

Importance Rating 2.9

QUESTION 36

RO Tier 2 Group 2

K&A Statement:

Ability to manually operate and/or monitor in the control room:
Reactor water temperature

Justification:

- A. Incorrect, ON-200-101 directs the use of bottom head drain temp. Recirc loop temperatures will not provide accurate RPV water level temps with recirc pumps off. Candidates may select if they incorrectly believe that loop temperature indicators can provide accurate indication with the loops not isolated.
- B. Correct. ON-200-101 directs that RWCU bottom head drain temperature be used to determine the status of thermal stratification since it provides the most appropriate and accurate temperature in the bottom head region necessary to assess the degree of RPV thermal stratification.**
- C. Incorrect, although these thermocouples may provide useful information regarding the surface temperature of the vessel itself, these temperatures are not relied upon in ON-200-101 to provide the status of thermal stratification. Candidates may select this if they incorrectly assume these indicators will provide information about stratified temperature layers on the vessel wall and flange.
- D. Incorrect, feedwater RPV inlet temperature will not provide temperature indication for conditions internal to the RPV that are required to assess stratification conditions. Candidates may select this if they believe this indicator will provide accurate temperature for the vessel downcomer and inlet plenum with the FW system in service.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall that RWCU system provides the most accurate and useful RPV water temperature indication needed to monitor for thermal stratification.

References: ON-200-101 rev 19

Reference Required

none

Learning Objective: 1700.a

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 8/31/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 37

Which one of the following statements describes the purpose of Speed Limiter #2 in the Reactor Recirc Flow Control system?

- A. Limits recirc pump speed to 48% to lower reactor power to within the capacity of the main condenser in the event of a Circ water pump trip.
- B. Limits recirc pump speed to ³⁰/~~20~~% to lower reactor power to within the capacity of the main condenser in the event of a Circ water pump trip.
- C. Limits recirc pump speed to 48% to ensure sufficient NPSH to jet pumps in the event of a low RPV water level condition.
- D. Limits recirc pump speed to ³⁰/~~20~~% to ensure sufficient NPSH to jet pumps in the event of a low RPV water level condition.

K&A # 202002 2.1.28

Importance Rating 4.1

QUESTION 37

K&A Statement:

RO Tier 2 Group 2

Recirc Flow Control:

Conduct of Operations: Knowledge of the purpose and function of major system components and controls.

Justification:

- A. **Correct, this is the setpoint and basis for speed limiter #2 per TM-OP-064E.**
- B. Incorrect, this setpoint is recirc pump minimum speed. Limiter #2 will only run the recirc pump to 48%. Candidates may select this if they do not correctly recall the setpoint for limiter 2.
- C. Incorrect, this is the basis for limiter #1. Candidates may select this if they incorrectly recall the limiter #2 basis.
- D. Correct, this is the minimum speed setpoint and the limiter #1 basis. Candidates may select this if they incorrectly apply the speed limiter #1 basis and minimum speed setpoint to limiter #2.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the purpose and function of recirc pump speed limiters.

References: TM-OP-064E rev 0

Reference Required

none

Learning Objective: 16021.d

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 7/1/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 38

Which one of the following describes the correct sequence used when Reactor Building Zone 1 ventilation system is started in accordance with OP-134-002, "Reactor Building HVAC Zones 1 and 3", AND WHY this sequence is used?

- A.
 - The filtered exhaust fan is started first
 - Once a negative pressure has been drawn the operator starts the supply and exhaust fans
 - This sequence minimizes the pressure transient on the building.

- B.
 - The filtered exhaust fan is started first.
 - Once a negative pressure has been drawn the operator starts the supply and exhaust fans.
 - This sequence prevents an immediate trip of the supply fan on low flow.

- C.
 - The control switches for the supply and exhaust fans are first placed in start
 - The filtered exhaust fan is then started, causing all three fans to start simultaneously.
 - This sequence minimizes the pressure transient on the building.

- D.
 - The control switches for the supply and exhaust fans are first placed in start
 - The filtered exhaust fan is then started, causing all three fans to start simultaneously.
 - This sequence prevents an immediate trip of the supply fan on low flow.

K&A # 290001 K4.02
Importance Rating 3.4

QUESTION 38

RO Tier 2 Group 2

K&A Statement:

Knowledge of SECONDARY CONTAINMENT design feature(s) and/or interlocks which provide for the following: Protection against over pressurization

Justification:

- A. Incorrect, the switches are interlocked to ensure they are operated simultaneously. Candidates may select this if they do not recall that the fans are interlocked.
- B. Incorrect, the switches are interlocked to ensure they are operated simultaneously to limit the pressure transient. Candidates may select this if they do not recall that the fans are interlocked, and do not correctly recall the basis for the interlock.
- C. **Correct. Each of these fans is interlocked with the other so the switches are operated in this manner to start all off one switch change. This interlock prevents building overpressure by ensuring an exhaust fan is running when a supply fan is running.**
- D. Incorrect, the purpose of the interlock is to limit the building pressure transient. Candidates may select this if they do not correctly recall the basis for the interlock.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall knowledge of the fan starting interlock for RB zone 1 ventilation, and its basis.

References: OP-134-002 rev 47 Reference Required none

Learning Objective: 1274.n

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP034/1277 001

Question History: Bank

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

10CFR55 41(b)7

Comments: Created by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 39

Unit 2 is operating in mode 4, with RHR pump C in shutdown cooling.

RHR pump C then TRIPS.

- ALL other RHR pumps are UNAVAILABLE
- BOTH Reactor Recirc Pumps are UNAVAILABLE
- RPV Level is +75", steady

Per ON-249-001, "Loss Of RHR Shutdown Cooling Mode", RPV level is currently (1) to promote natural circulation because it is (2).

- A. (1) TOO LOW
(2) BELOW the top of the steam separators
- B. (1) HIGH ENOUGH
(2) ABOVE the top of the steam separators
- C. (1) TOO LOW
(2) BELOW the bottom of the steam dryer skirt
- D. (1) HIGH ENOUGH
(2) ABOVE the bottom of the steam dryer skirt

K&A # 295001 AK1.01
Importance Rating 3.5

QUESTION 39

RO Tier 1 Group 1

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Natural circulation

Justification:

- A. Incorrect, RPV level at or above 45" promotes natural circulation since level will be above the top of the steam separators. Therefore, level is currently sufficient since it is below the required level. Candidates may select this if they incorrectly recall the internal location of RPV components and/or the RPV level required to allow natural circ to take place.
- B. **Correct, level must be above +45" and the top of the steam separators. With level at +75" the top of the steam separators will be covered.**
- C. Incorrect, level is currently above the bottom of the dryer skirt (approximately 0"), however this is not the level required to promote natural circ which is significantly higher. Candidates may select this if they incorrectly recall the internal location of RPV components and the RPV level required to allow natural circ to take place.
- D. Incorrect, although level is above the bottom of the steam dryer skirt, this is not high enough to allow circulation to take place, since level must be above the steam separators. Candidates may select this if they incorrectly recall the RPV level required to allow natural circ to take place.

K/A Match Justification:

This question matches the stated K/A since candidates must determine the operation implications of current RPV level with respect to the promotion of natural circulation from a procedural and physical standpoint following a complete loss of all forced circulation.

References: ON-149-001 rev 23 Reference Required none

Learning Objective: 15310.o

Question source: New

Question History: New

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

10CFR55 41(b)3

Comments: Created by: T. North, 9/7/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 40

Unit 1 has been operating at full power for the past year. A half scram is in on RPS Channel B when the "A" High Drywell Pressure Scram instrument, PSH-C72-N002A, fails UPSCALE.

Which one of the following describes plant conditions approximately 10 seconds later?

Reactor thermal power generation will be approximately (1) of full power, and this heat will be removed via the (2).

- A. (1) 7%
(2) Safety Relief Valves
- B. (1) 1%
(2) Bypass Valves
- C. (1) 100%
(2) Main Turbine Control Valves
- D. (1) 7%
(2) Bypass Valves

K&A # 295006 AK1.01
Importance Rating 3.7

QUESTION 40

RO Tier 1 Group 1

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to SCRAM : Decay heat generation and removal

Justification:

- A. Incorrect, There is no condition that would result in an MSIV isolation, and BPVs are available. Candidates may select this if they incorrectly believe that bypass valves will not be available.
- B. Incorrect, decay heat will be approximately 7%. Candidates may select this if they cannot correctly recall the amount of decay heat following a full scram from 100% power.
- C. Incorrect, the instrument failure will cause a full scram. Candidates may select this if they do not correctly determine that a full scram will occur.
- D. **Correct, The instrument failure will result in a full scram combined with the half scram in trip system B; and decay heat following a scram from full power will be approximately 7% after 10 seconds. Since there is no condition that would cause an MSIV isolation, turbine bypass valves will be available to control pressure and remove decay heat.**

K/A Match Justification:

This question matches that stated K/A since candidates must first determine that a full scram will occur, and then determine the operational impact of the generation of decay heat following this scram.

References: TM-OP-058 rev 9 Reference Required none

Learning Objective:

Question source: Modified INPO Bank #25978

Question History: 2003 Pilgrim NRC exam

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

10CFR55 41(b)8

Comments: Modified by: T. North, 10-3-10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 41

Complete the following statement regarding a degraded voltage condition on 480 VAC safety busses:

Protection against a LOW voltage condition in the Reactor Protection power distribution system is provided by the ____ (1) ____, because the low voltage condition may cause ____ (2) ____.

- A. (1) RPS motor generator set voltage regulator;
(2) scram pilot solenoids to chatter and potentially lose the ability to actuate when required.
- B. (1) RPS motor generator set voltage regulator;
(2) instrument setpoints to drift in a NON-conservative direction affecting their scram safety functions.
- C. (1) Electrical Protection Assembly Breaker;
(2) scram pilot solenoids to chatter and potentially lose the ability to actuate when required.
- D. (1) Electrical Protection Assembly Breaker;
(2) instrument setpoints to drift in a NON-conservative direction affecting their scram safety functions.

K&A # 295003 AK1.03
Importance Rating 2.9

QUESTION 41

RO Tier 1 Group 1

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Under voltage/degraded voltage effects on electrical loads

Justification:

- A. Incorrect, while the RPS MG set provides voltage regulation, it is not relied upon for protection against an undervoltage condition. It also provides no ability to control the voltage in the alternate supply. Candidates may select this if they do not recall which component protects against the UV condition.
- B. Incorrect, while the RPS MG set provides voltage regulation, it is not relied upon for protection against an undervoltage condition. It also provides no ability to control the voltage in the alternate supply. Instrument setpoint drift is not the basis for the UV trip. Candidates may select this if they do not recall which component protects against the UV condition, or the resultant effect.
- C. **Correct, the low voltage trip of the EPA breakers in both the normal and alternate RPS supply is designed to provide the undervoltage protection for this condition. Per TSB 3.3.8.2 "In the event of a low voltage condition for an extended period of time, the scram solenoids can chatter and potentially lose their pneumatic control capability, resulting in a loss of primary scram function."**
- D. Incorrect, instrument setpoint drift is not the basis for the UV trip. Candidates may select this if they do not correctly recall the operational implication of the UV condition on RPS busses.

K/A Match Justification:

This question matches the stated K/A since candidates must understand the operational implications of a degraded voltage condition on 480 VAC busses and the component that prevents this.

References: TM-OP-058 rev 9, TSB 3.3.8.2 Reference Required none

Learning Objective: 10071.b, 15970

Question source: New

Question History: New

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

10CFR55 41(b)8

Comments: Created by: T. North, 5/26/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 42

Unit 1 is operating at full power when a grid disturbance causes the Main Generator output breaker to trip.

- The “Turbine Control Valve Fast Closure Scram” instruments fail to initiate a Reactor Protection System (RPS) scram
- RPV pressure peaks at 1106 psig until bypass valves regain pressure control
- APRM power peaks at 102%
- NO operator action has been taken

Which one of the following describes the status of control rods following this event?

- A. All control rods inserted due to Alternate Rod Insertion actuation on high RPV pressure.
- B. All control rods inserted due to automatic RPS actuation on high RPV pressure.
- C. Control rods will NOT insert until operators arm & depress the Manual Scram pushbuttons on 1C651.
- D. Control rods will NOT insert until operators arm & depress the Alternate Rod Insertion pushbuttons on 1C601.

K&A # 295025 EK2.01
Importance Rating 4.1

QUESTION 42

RO Tier 1 Group 1

K&A Statement:

Knowledge of the interrelations between HIGH REACTOR PRESSURE and the following: RPS

Justification:

- A. Incorrect, the ARI automatic setpoint on high pressure has not been exceeded, and since the high pressure scram and BPVs function properly, ARI auto initiation will not occur. Candidates may select this if they incorrectly believe the ARI setpoint has been exceeded and do not recall that the RPS high pressure scram will actuate.
- B. Correct, RPV pressure has exceeded the scram setpoint for high RPV pressure, resulting in all rods in.**
- C. Incorrect, auto scram will occur on high pressure. Candidates may select this if they do not recall that the pressure transient will cause an automatic scram.
- D. Incorrect, auto scram will occur on high pressure. Candidates may select this if they do not recall that the pressure transient will cause an automatic scram.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the relationship between high reactor pressure and RPS scram actuation setpoints.

References: TM-OP-058 Reference Required none

Learning Objective: 2486.a

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 6/7/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 43

A LOCA has occurred at Unit 1.

- The PCOP is operating Residual Heat Removal (RHR) pumps in LPCI mode to maintain RPV water level above -129".
- NO other sources of injection to the RPV are available.
- A suppression pool (SP) leak then occurs resulting in RHR pump operation BELOW the RHR pump vortex limit.

The PCOP can expect to be directed to...

- A. stop injection and secure ALL RHR pumps until SP level can be restored.
- B. secure RHR pumps ONLY if SP temperature rises causing a further reduction in net positive suction head.
- C. continue RPV injection with RHR pumps, but limit RHR flow to LESS THAN 7000 gallons per minute.
- D. continue RPV injection with RHR pumps with NO restrictions.

K&A # 295030 EK2.04

Importance Rating 3.7

QUESTION 43

RO Tier 1 Group 1

K&A Statement:

Knowledge of the interrelations between LOW SUPPRESSION POOL WATER LEVEL and the following: RHR/LPCI

Justification:

- A. Incorrect, injection should not be stopped since RHR is required to ensure adequate core cooling. Candidates may select this if they incorrectly determine that exceeding vortex limits will preclude use of RHR for this purpose.
- B. Incorrect, a rise in SP temp may likely reduce RHR pump NPSH, however it is not evaluated in EOPs for the purpose of restricting RHR pump operation. Further, RHR pumps are required to assure adequate core cooling and may continue to inject without restriction per EOP guidance.
- C. Incorrect, unlike core spray, the RHR vortex limit is a straight line, below which any flowrate is not permitted, UNLESS RHR pumps are required to maintain RPV level. Candidates may select this if they incorrectly believe flow restrictions apply in this condition.
- D. **Correct, since RHR pumps are required for adequate core cooling this takes precedence over exceeding vortex limits, and RHR injection may continue without restriction.**

K/A Match Justification:

This question matches the stated K/A since candidates must recall the relationship between suppression pool level and operation of RHR pumps and correctly apply the procedural vortex limit.

References: EO-100-103 rev 9, EO-000-103 rev 7 Reference Required none

Learning Objective: 14616

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 11-14-10
Reviewed by: E. Brice, A. Avery, 11-23-10

QUESTION 44

Unit 1 is operating at full power, when a steam line rupture occurs inside the drywell.

- Drywell temperature is 275°F, up fast
- Drywell pressure is 4.5 psig, up slow
- The crew has determined that drywell sprays are required

In this situation, which condition must the crew observe, AND why?

- A. Limit initial drywell spray flow to between 1000 and 2800 gpm to prevent excessive evaporative cooling that could damage primary containment internal components and structures.
- B. Do not start drywell sprays until suppression chamber pressure exceeds 13 psig to prevent excessive evaporative cooling that could damage primary containment internal components and structures.
- C. Limit initial drywell spray flow to between 1000 and 2800 gpm to prevent the cyclic condensation of steam at the downcomer openings of the drywell vents.
- D. Do not start drywell sprays until suppression chamber pressure exceeds 13 psig to prevent the cyclic condensation of steam at the downcomer openings of the drywell vents.

K&A # 295028 EK2.02

Importance Rating 3.2

QUESTION 44

RO Tier 1 Group 1

K&A Statement:

Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: Components internal to the drywell

Justification:

- A. **Correct, the spray flow limit is applicable in this instance and prevents an excessive evaporative cooling pressure drop that could challenge the drywell to suppression chamber dp limits, and damage primary containment components or structure.**
- B. Incorrect, While this statement is true, this limit is not applicable in this scenario, since the decision to spray is based solely on DW temperature trend. Candidates may select this if they incorrectly determine that DW sprays may not be initiated until Supp Chmbr pressure exceeds 13 psig.
- C. Incorrect, the cyclic steam condensation at the downcomer (chugging) is the reason drywell sprays are not started until 13 psig when spraying from the PC/P leg of the PC control EOP, and is N/A for this condition. Candidates may select this if they incorrectly determine that DW sprays may not be initiated until Supp Chmbr pressure exceeds 13 psig.
- D. Incorrect, drywell sprays should be started to limit the DW temperature excursion. The chugging phenomenon does not apply in this situation. Candidates may select this if they do not correctly recall the basis for the DW sprays flow limit.

K/A Match Justification:

This question matches the stated K/A since candidates must interrelate the potential for internal component damage with required actions taken to mitigate a high drywell temperature condition.

References: EPG rev 2, SSES-PSTG rev 8 Reference Required none

Learning Objective: 14613

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 5/26/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 45

Which one of the following describes the reason for the 'Drywell Pressure-High' function for the Reactor Protection System Instrumentation?

- A. Decrease the probability of exceeding primary containment design limits following a complete loss of drywell cooling.
- B. Prevent the loss of equipment inside the drywell needed for accident mitigation following a complete loss of drywell cooling.
- C. Prevent the loss of equipment inside the drywell needed for accident mitigation following a break in the Reactor Coolant Pressure Boundary.
- D. Decrease the probability of fuel damage following a break in the Reactor Coolant Pressure Boundary.

K&A # 295024 EK3.06
Importance Rating 4.0

QUESTION 45

RO Tier 1 Group 1

K&A Statement:

Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE : Reactor SCRAM

Justification:

- A. Incorrect, see below. Candidates may select this if they do not correctly recall the basis for the high drywell pressure scram.
- B. Incorrect, see below. Candidates may select this if they do not correctly recall the basis for the high drywell pressure scram.
- C. Incorrect, see below. Candidates may select this if they do not correctly recall the basis for the high drywell pressure scram.
- D. **Correct, per TSB 3.3.1.1; “High pressure in the drywell could indicate a break in the RCPB. A reactor scram is initiated to minimize the possibility of fuel damage and to reduce the amount of energy being added to the coolant and the drywell. The Drywell Pressure—High Function is assumed in the analysis of the recirculation line break (Ref. 6). The reactor scram reduces the amount of energy required to be absorbed and, along with the actions of Emergency Core Cooling Systems (ECCS), ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.”**

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of the reason for generating an automatic reactor scram following a high drywell pressure transient.

References: TSB 3.3.1.1 rev 4 Reference Required none

Learning Objective: 15970

Question source: INPO bank #21805, Perry 2001
NRC exam

Question History: Bank

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

10CFR55 41(b)7

Comments: Created/Modified by:
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 46

Complete the following statement:

The operator actions specified in ON-013-001, "Response to Fire", are intended to ...

- A. define the specific firefighting tactics and requirements in the event of a fire in areas outside the control room ONLY.
- B. define the specific firefighting tactics and requirements in the event of a fire in areas inside AND outside the control room.
- C. establish safe plant shutdown and cooldown capabilities in the event of a fire in areas outside the control room ONLY.
- D. establish safe plant shutdown and cooldown capabilities in the event of a fire in areas inside AND outside the control room.

K&A # 600000 AK3.04
Importance Rating 2.8

QUESTION 46

RO Tier 1 Group 1

K&A Statement:

Knowledge of the reasons for the following responses as they apply to PLANT FIRE ON SITE: Actions contained in the abnormal procedure for plant fire on site

Justification:

- A. Incorrect, specific firefighting tactics and requirements are defined in pre-fire plans established for each fire zone. Candidates may select this if they do not correctly recall the reasons for actions specified in ON-01-001.
- B. Incorrect, specific firefighting tactics and requirements are defined in pre-fire plans established for each fire zone. Candidates may select this if they do not correctly recall the reasons for actions specified in ON-01-001.
- C. **Correct, ON-013-001 establishes a method and identifies available equipment to meet appendix R safe shutdown paths for fires in zones outside the control room only. Fires inside the control room are not addressed in this procedure.**
- D. Incorrect, Fires inside the control room are not addressed in this procedure. The control room abandonment procedure provides the necessary steps for fires in the control room. Candidates may select this if they do not correctly recall the reasons for actions specified in ON-01-001.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the basis for actions contained in the fire on site abnormal procedure, ON-013-001, "Response To Fire".

References: ON-013-001 rev 28 Reference Required none

Learning Objective: 15310.b

Question source: New

Question History: New

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

10CFR55 41(b)10

Comments: Created by: T. North, 6/7/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 47

Complete the following statement regarding Extraction Steam Non-Return Valves:

Following a Main Turbine trip, Extraction Steam Non-Return Valves (Bleeder Trip Valves) are (1) in order to (2).

- A. (1) OPEN
(2) divert steam flow from the turbine to prevent a turbine overspeed.
- B. (1) SHUT
(2) prevent a turbine overspeed by stopping reverse steam flow from the feedwater heaters.
- C. (1) OPEN
(2) divert steam flow from the turbine to allow a faster turbine coastdown.
- D. (1) SHUT
(2) stop the flow of extraction steam to feedwater heaters to raise core inlet subcooling.

K&A # 295005 AK3.05
Importance Rating 2.5

QUESTION 47

RO Tier 1 Group 1

K&A Statement:

Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: Extraction steam/moisture separator isolations

Justification:

- A. Incorrect, NRVs are shut on a turbine trip because the residual steam will reverse and continue to turn the turbine. Candidates may select this if they incorrectly believe that NRVs open following turbine trip.
- B. **Correct, NRVs shut to prevent turbine overspeed caused by the steam from feedwater heaters reversing and continuing to drive the main turbine with no electrical load.**
- C. Incorrect, NRVs are shut on a turbine trip. Coastdown is related to friction created by turbine and generator bearings and main condenser vacuum, and will be relatively unaffected by extraction steam flow. Candidates may select this if they incorrectly believe that NRVs open following turbine trip.
- D. Incorrect, although RPV inlet temperature will indeed drop, the reason for stopping extraction steam to FW heaters is not related to core inlet subcooling since the reactor will be shutdown in this condition. Candidates may select this if they incorrectly recall the basis for isolating NRVs after turbine trip.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the basis for isolating extraction steam following a main turbine trip.

References: TM-OP-093 rev 10 Reference Required none

Learning Objective: 1614.f

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: *TM-OP-093 refers to NRVs as "Extraction Steam Non-Return Valves"; OP-193-001 refers to NRVs as "Bleeder Trip Valves" therefore **BOTH** terms are included in the question stem.* Created by: T. North, 5/26/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 48

Unit 1 has experienced a LOCA resulting in entry into EO-100-102, RPV Control, and EO-100-103, PC Control.

The following conditions exist:

- Suppression Pool level is 20 feet and steady
- The PCOP is controlling RPV pressure using Safety Relief Valve manual operation, resulting in rising suppression pool temperature

The Unit Supervisor directs the PCOP to report suppression pool temperature.

Which one of the following describes the instrumentation available to the PCOP to accurately determine Suppression Pool temperature?

- A. SPOTMOS Divisions ~~1 and 2 average temperature.~~ ^{Lower RTDs ONLY}
- B. SPOTMOS Division 1 average temperature ONLY.
- C. PICSY Division 1 and 2 Bulk Temperature A (MAT 37).
- D. SPOTMOS Division 1 lower RTDs ONLY.

K&A # 295026 EA1.03

Importance Rating 3.9

QUESTION 48

RO Tier 1 Group 1

K&A Statement:

Ability to operate and/or monitor the following as they apply to
SUPPRESSION POOL HIGH WATER TEMPERATURE:
Temperature monitoring

Justification:

- A. Incorrect, these sensors will not be submerged and will not provide an accurate value. Candidates may select this if they do not correctly recall which temperature indicators are accurate with low SP level.
- B. Incorrect, these sensors will not be submerged and will not provide an accurate value. Candidates may select this if they do not correctly recall which temperature indicators are accurate with low SP level.
- C. Incorrect, this computer data utilizes sensors ~~that~~ are not submerged, therefore will not be accurate. Candidates may select this if they do not correctly recall which temperature indicators are accurate with low SP level. *SP*
- D. **Correct, the sixteen RTDs are located near the water surface at a level of 20.5 feet above Suppression Pool bottom. Normal Suppression Pool operating level is 23 feet - minimum level is 22 feet. For Division I only, four additional RTDs provide input to SPOTMOS. These RTDs (TE-15751, TE-15756, TE-15761, and TE-15764) are located deep in the pool, three feet above Suppression Pool bottom.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine which SP level monitoring indication is appropriate with high SP temp and low SP level.

References: TM-OP-059Z rev 5

Reference Required

None

Learning Objective: 330.a

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP059Z/330 003

Question History: Bank

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

10CFR55 41(b)7

Comments: Created/Modified by:
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 49

Unit 1 has experienced an accident resulting in fuel damage and a radioactive release via the Turbine Building Stack.

- All unit 1 SPING field units are UNAVAILABLE due to a loss of Instrument AC panel 1Y219

Which one of the following describes the use of the Post Accident Vent Stack Sampling System (PAVSSS) in this condition:

The PAVSSS ...

- A. CANNOT be utilized to monitor the release, since the PAVSSS field units can ONLY be used to monitor the Reactor Building Stack.
- B. CAN be utilized to monitor the release and can provide BOTH noble gas AND particulate concentrations.
- C. CAN be utilized to monitor the release but can ONLY provide noble gas concentration.
- D. CANNOT be utilized to monitor the release since the PAVSSS field units can ONLY be used to monitor the Standby Gas Treatment Exhaust.

K&A # 295038 EA1.05
Importance Rating 3.0

QUESTION 49

RO Tier 1 Group 1

K&A Statement:

Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: Post accident sample system (PASS): Plant-Specific

Justification:

- A. Incorrect, the PAVSSS can only monitor the TB stack and SGTS vent. Candidates may select this if they do not correctly recall the purpose and function of PAVSSS monitors.
- B. Incorrect, the PAVSSS cannot monitor particulate concentrations. Candidates may select this if they do not correctly recall the purpose and function of PAVSSS monitors.
- C. **Correct, the PAVSSS is designed to be a backup to the SPING under accident conditions and its ability to monitor the stack release will not be affected by the power loss. It can only provide noble gas concentration.**
- D. Incorrect, the PAVSSS stack monitoring components will not be affected by the loss of 1Y219. Candidates may select this if they do not correctly recall the power supply to PAVSSS monitors.

K/A Match Justification:

This question matches the stated K/A since candidates must recall facts regarding use and response of PAVSSS monitors during a high off site release event.

References: TM-OP-079Z rev 4 Reference Required none

Learning Objective: 10396.b

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 9/19/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 50

Unit 1 is in a refueling outage. Unit 2 is at 100% power. A refueling accident has occurred on 818' level resulting in the following annunciators alarming on Unit 1:

- REFUEL FLOOR WALL EXH HI RADIATION (AR-112-D1)
- REFUEL FLOOR WALL EXH HI-HI RADIATION (AR-101-A5)

Which one of the following describes the Standby Gas Treatment (SGTS) system response (if any) to the event?

- A. BOTH SGTS trains start and align to Zone III.
- B. BOTH SGTS trains start and align to Zone I AND Zone III.
- C. ONLY ONE SGTS train starts and aligns to Zone III.
- D. NO SGTS trains start and ventilation remains in a normal lineup.

K&A # 295023 AA1.07

Importance Rating 3.6

QUESTION 50

RO Tier 1 Group 1

K&A Statement:

Ability to operate and/or monitor the following as they apply to
REFUELING ACCIDENTS : Standby gas treatment

Justification:

- A. **Correct, the high high refuel floor wall rad monitor setpoint has been exceeded and results in the auto start of BOTH SGTS trains and alignment to zone 3 only.**
- B. Incorrect, SGTS aligns to zone 3. Candidates may select this if they do not correctly recall that SGTS aligns only to zone 3 upon this initiation signal.
- C. Incorrect, both SGTS trains start. Candidates may select this if they do not recall that both SGTS trains will respond.
- D. Incorrect, SGTS auto start will occur. Candidates may select this if they do not correctly recall that SGTS will start and align to Zone 3 following only the refuel floor wall hi-hi rad.

K/A Match Justification:

This question matches the stated K/A since candidates must correctly recall the SGTS system response in order to properly monitor SGTS automatic action following the annunciators.

References: TM-OP-070 rev 5

Reference Required none

Learning Objective: 1991

Question source: SSES NRC Bank #6

Question History: Bank

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

10CFR55 41(b)7

Comments: Created/Modified by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 51

Unit 1 was operating at full power when a LOCA concurrent with a loss of all high pressure feed occurred resulting in the following conditions:

- RPV level is -208", steady
- NO RHR pumps are available
- Core Spray loop A is injecting to the RPV at 6500 gpm
- Core Spray loop B is NOT injecting to the RPV
- RPV pressure is 75 psig, down slow
- 6 ADS SRVs are open
- RPV injection has been maximized using ALL available systems

Which one of the following statements describes the status of Adequate Core Cooling, and why?

- A. Adequate Core Cooling is NOT assured;
RPV Water level is below Top of Active Fuel.
- B. Adequate Core Cooling IS assured;
Core Spray loop A flow is above 6350 gpm
- C. Adequate Core Cooling is NOT assured;
Core Spray loop B flow is below 6350 gpm.
- D. Adequate Core Cooling IS assured;
RPV pressure is above the Minimum Steam Cooling Pressure.

K&A # 295031 EA2.04
Importance Rating 4.6

QUESTION 51

RO Tier 1 Group 1

K&A Statement:

Ability to determine and/or interpret the following as they apply to
REACTOR LOW WATER LEVEL : Adequate core cooling

Justification:

- A. Incorrect, adequate core cooling IS assured even though RPV level is below TAF since CS A is injecting >6350 gpm. The candidate may choose this if they incorrectly believe that ACC cannot be assured when level is below TAF.
- B. **Correct, with RPV level below -161" but above -210", adequate core cooling can only be assured by spray cooling...at least one CS loop above design flow of 6350 gpm**
- C. Incorrect, ACC IS assured. Core spray flow needs to be ≥ 6350 gpm in at least one loop alone. As long as CS A is >6350 gpm, CS B flow is not required to assure ACC. The candidate may choose this if they incorrectly believe that both CS loops must be injecting to assure ACC.
- D. Incorrect, The MSCP value only applies during ATWS conditions when RPV level is undetermined. In this case MSCP is irrelevant and does not factor into ACC determination. The candidate may choose this if they incorrectly believe that MSCP is a relevant determinant to ACC.

K/A Match Justification:

This question matches the stated K/A since candidates are required to evaluate current plant conditions with RPV water level below TAF to determine if adequate core cooling can be assured.

References: EO-000-102 rev 8 Reference Required none

Learning Objective: 14591

Question source: New

Question History: New

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

10CFR55 41(b)10

Comments: Created by: T. North, 8/31/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 52

Unit 1 is at 100% power when a leak develops in the Reactor Building Chilled Water (RBCW) discharge piping.

If RBCW flow continues to degrade due to the leak with NO operator action, determine which one of the following describes the Reactor Building Closed Cooling Water (RBCCW) system response:

- A. RBCCW will provide cooling flow to the Reactor Recirc Pump motor winding coolers IMMEDIATELY AFTER RBCW drops below 1 psid.
- B. RBCCW will provide cooling flow to the Drywell coolers AFTER RBCW drops below 1 psid for 13 seconds.
- C. RBCCW flow to the Reactor Water Cleanup NON-regenerative Heat Exchanger (NRHX) ISOLATES IMMEDIATELY AFTER RBCW drops below 1 psid.
- D. RBCCW flow to the Reactor Building Sump Cooler ISOLATES AFTER RBCW drops below 1 psid for 13 seconds.

K&A # 295018 AA2.04
Importance Rating 2.9

QUESTION 52

RO Tier 1 Group 1

K&A Statement:

Ability to determine and/or interpret the following as they apply to
**PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING
WATER : System flow**

Justification:

- A. Incorrect, RBCCW assumes cooling flow to the RRP winding coolers occurs after a 13 second time delay. Candidates may select this if they do not correctly recall the details of the low flow transfer signal.
- B. Correct, the flow degradation will result in transfer of cooling for RBCW drywell loads to RBCCW 13 seconds after RBCW flow drops below 1psid. RBCCW flow to the NRHX will also be isolated by this signal.**
- C. Incorrect, RBCCW cooling to the NRHX will isolate upon the low RBCW system flow signal after a 13 second time delay. Candidates may select this if they do not correctly recall the time delay portion of system response.
- D. Incorrect, RBCCW will continue to provide flow to the sump cooler regardless of the status of RBCW. Candidates may select this if they do not correctly recall that sump cooling flow is unaffected by the system response.

K/A Match Justification:

This question matches the stated K/A since candidates must determine how a reduction in RBCW system flow will impact the RBCW and RBCCW systems.

References: TM-OP-014 rev 3, TM-OP-300 rev 3, Reference Required none
ON-134-001 rev 26

Learning Objective: 1694.d

Question source: New

Question History: New

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

10CFR55 41(b)10

Comments: Created by: T. North, 10/18/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 53

Unit 1 was operating at full power when a control room fire occurred requiring evacuation of the control room in accordance with ON-100-009, "Control Room Evacuation".

- All remote shutdown transfer switches have been repositioned
- The control room has been successfully evacuated
- NO systems, structures or components have been damaged as a result of the fire
- RPV pressure is 1040 psig, steady
- RPV level is +35", steady

Direction has been given to depressurize the RPV per ON-100-009.

Given ON-100-009 attachments A and B, which one of the following is the CORRECT action operators should take to accomplish this?

- A. ADS SRVs G, J, K, L, M, or N should be operated from the Upper Relay Room to reduce RPV pressure to LESS THAN 100 psig as soon as possible to allow RHR to be placed in Shutdown Cooling.
- B. ADS SRVs G, J, K, L, M, or N should be operated from the Upper Relay Room to reduce RPV pressure to NO LESS THAN 400 psig over the next hour.
- C. SRVs A, B or C should be operated from the Remote Shutdown Panel to reduce RPV pressure to LESS THAN 100 psig as soon as possible to allow RHR to be placed in Shutdown Cooling.
- D. SRVs A, B or C should be operated from the Remote Shutdown Panel to reduce RPV pressure to NO LESS THAN 400 psig over the next hour.

K&A # 295016 AA2.03
Importance Rating 4.3

QUESTION 53

RO Tier 1 Group 1

K&A Statement:

Ability to determine and/or interpret the following as they apply to
CONTROL ROOM ABANDONMENT : Reactor pressure

Justification:

- A. Incorrect, ADS valves should only be operated if SRVs A, B and C are unavailable. No condition is present allowing the CDR to be exceeded. Candidates may select this if they incorrectly determine that CDR may be exceeded and SRVs A,B and C may be used.
- B. Incorrect, ADS valves should only be operated if SRVs A, B and C are unavailable. Candidates may select this if they incorrectly determine that SRVs A,B and C may be used.
- C. Incorrect, No condition is present allowing the CDR to be exceeded. Candidates may select this if they incorrectly determine that CDR may be exceeded.
- D. **Correct, ON-100-009 directs operators to cooldown using SRVs A, B, and C. The cooldown should be conducted less than 100°F/hr since there is no condition present requiring RD or anticipation of RD. Limiting the pressure drop to 400 psig over the next hour keeps CDR below TS limits.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine the change in pressure necessary to depressurize in accordance with the procedure provided and within required limits.

References: ON-100-009 rev 21

Reference Required: ON-100-009 Att A & B

Learning Objective: 15306, 15307

Question source: New

Question History: New

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

10CFR55 41(b)10

Comments: Created by: T. North, 6/24/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 54

Unit 1 is in mode 5, with RHR pump "A" in Shutdown Cooling (SDC).

A leak develops on the "A" RHR pump suction piping resulting in rising water level in the "A" RHR pump room, and lowering reactor cavity water level.

- AR-109-H08, "RHR LOOP A PUMP ROOM FLOODED", alarm is illuminated
- Operators manually close the SDC inboard and outboard isolation valves PRIOR to reaching the SDC auto isolation signal on low RPV water level
- RPV water level stabilizes at +15"
- The leakage stops when the SDC isolation valves are shut

Which one of the following identifies the procedures that REQUIRE IMMEDIATE ENTRY?

- A. ON-149-001, "Loss of RHR Shutdown Cooling Mode" ONLY
- B. ON-149-001, "Loss of RHR Shutdown Cooling Mode"; AND EO-100-104, "Secondary Containment Control", ONLY
- C. ON-149-001, "Loss of RHR Shutdown Cooling Mode"; AND EO-100-102, "RPV Control", ONLY
- D. ON-149-001, "Loss of RHR Shutdown Cooling Mode"; AND EO-100-102, "RPV Control"; AND EO-100-104, "Secondary Containment Control"

QUESTION 55

Unit 1 is operating at full power when a failure of the Div 1 +24 VDC Battery Charger 1D673 occurs.

As a result of this failure, Div 1 24 VDC Panel 1D672 will...

- A. remain ENERGIZED from the (-)24 VDC battery charger 1D674.
- B. remain ENERGIZED from battery bank 1D670.
- C. be DE-ENERGIZED until operators can place the (-)24 VDC battery charger 1D674 in service.
- D. be DE-ENERGIZED until operators can reposition the Alternate Power Transfer Switch HS-111501.

K&A # 295004 AK2.01
Importance Rating 3.1

QUESTION 55

K&A Statement:

RO Tier 1 Group 1

Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF D.C. POWER and the following: Battery Charger

Justification:

- A. **Correct, the 24 vdc bus is normally powered by a positive and negative battery charger. The battery is divided into a positive and negative bank. Per TM-OP-075, upon failure of the positive charger, the negative charger will assume the full load.**
- B. Incorrect, the (-) charger will remain in service powering the DC panel. Candidates may select this if they do not correctly recall 24 vdc distribution details.
- C. Incorrect, the panel will remain energized via the + battery and (-) charger. Candidates may select this if they do not correctly recall 24 vdc distribution details.
- D. Incorrect, the panel will remain energized. The alternate power transfer switch only switches ac power to both chargers simultaneously and will not need to be repositioned. Candidates may select this if they do not correctly recall 24 vdc distribution details.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of battery charger and DC bus response following failure of a battery charger.

References: TM-OP-075 rev 2 Reference Required none

Learning Objective: 10102

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 11/22/10
Reviewed by:

QUESTION 56

Unit 1 is in Mode 4 with preparations for a reactor startup in progress.

A seismic event occurs resulting in a complete loss of instrument air and a small LOCA inside the drywell.

Given the following plant conditions:

- RPV level is +5", down slow
- Condensate system was in long path recirc prior to the seismic event

Which one of the following statements is CORRECT regarding the RPV level control strategy?

Condensate pumps...

- A. CANNOT be used to feed the RPV because the Condensate Pump Discharge Valves have failed shut.
- B. CAN be used to feed the RPV, BUT FLOW CANNOT BE THROTTLED since The Low Load Flow Control and the Low Load Bypass Valves have FAILED SHUT.
- C. CAN be used to feed the RPV since the air loss will NOT affect the low load flow control and bypass valves.
- D. CANNOT be used to feed the RPV since the Short Path Recirc AND Feed Pump Min Flow Recirc valves have FAILED OPEN.

K&A # 295019 2.4.9

Importance Rating 3.8

QUESTION 56

RO Tier 1 Group 1

K&A Statement:

Loss of Instrument Air:

Emergency Procedures / Plan: Knowledge of low power / shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

Justification:

- A. Incorrect, condensate pump discharge valves are motor operated and will not be affected by the air loss. Candidates may select this if they do not correctly recall this fact.
- B. Incorrect, condensate will be unavailable due to the short path recirc and disch vents open. Long path recirc valves also fail open. Candidates may select this if they do not correctly recall these facts.
- C. Incorrect, the low load FCV and bypass valve fail shut on loss of air. Candidates may select this if they do not correctly recall this fact.
- D. **Correct, the loss of IA will result in the short path and RFP min flow recirc valves failing open preventing the use of condensate pumps in this condition.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine how the loss of air impacts EOP mitigating strategies during shutdown conditions.

References: ON-118-001 rev 23, TM-OP-044 rev 8, Reference Required none
-045 rev 13

Learning Objective: 1823.a

Question source: New

Question History: New

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

10CFR55 41(b)10

Comments: Created by: T. North, 6/21/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 57

Which one of the following statements is CORRECT regarding 4KV ESS busses when abandoning the Control Room per ON-100-009, "Control Room Evacuation"?

- A. ALL ESS busses should be transferred to their respective Emergency Diesel Generators by operating the diesels and switchgear locally.
- B. ALL ESS busses should remain energized via their normal source unless offsite power is lost to the startup transformers.
- C. ONLY the Division 1 ESS busses should be transferred to their respective Emergency Diesel Generators by operating the diesels and circuit breakers locally.
- D. ONLY the Division 2 ESS busses should be transferred to their respective Emergency Diesel Generators by operating the diesels and circuit breakers locally.

K&A # 295016 AA1.04

Importance Rating

QUESTION 57

RO Tier 1 Group 1

K&A Statement:

Ability to operate and/or monitor the following as they apply to
CONTROL ROOM ABANDONMENT : A.C. electrical distribution

Justification:

- A. Incorrect, ESS busses are allowed to remain powered from the S/U XFMRS. Candidates may select this if they incorrectly believe ESS busses should be transferred.
- B. Correct, the ON does not direct any action to transfer power to diesels unless offsite power is lost.**
- C. Incorrect, ESS power remains from S/U XFMRS. Candidates may select this if they incorrectly believe ESS busses should be transferred.
- D. Incorrect, ESS power remains from S/U XFMRS. Candidates may select this if they incorrectly believe ESS busses should be transferred.

K/A Match Justification:

This question matches the stated K/A since candidates must recall how the AC distribution system is operated when abandoning the control room.

References: ON-100-009 rev 21

Reference Required none

Learning Objective: 15310.d

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 7/1/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 58

Unit 1 is operating at full power when disturbances in the electrical grid result in entry into ON-198-001, "Unit 1 Main Generator MVAR Control For Auto Voltage Regulator Operation When Synched To Grid".

Given the data obtained by the crew and recorded on ON-198-001, page 3, and attachment "A", "Main Generator Reactive Capability Curve":

(the data obtained was taken 5 minutes ago, and is unchanged)

Determine the CORRECT action for this condition AND why:

- A.
 - RAISE GENERATOR MW OUTPUT;
 - This will cause a corresponding reduction in reactive load to within the capability curve.

- B.
 - RAISE GENERATOR EXCITATION;
 - This will raise the allowable reactive load by increasing the lagging power factor.

- C.
 - REDUCE GENERATOR EXCITATION;
 - This will reduce the reactive load to within the capability curve.

- D.
 - REDUCE HYDROGEN GAS PRESSURE;
 - This will shift the capability curves to allow additional reactive load.

K&A # 700000 AK3.02
Importance Rating 3.6

QUESTION 58

RO Tier 1 Group 1

K&A Statement:

Knowledge of the reasons for the following responses as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Actions contained in abnormal operating procedure for voltage and grid disturbances.

Justification:

- A. Incorrect, raising generator MW would not be permissible in this case since it would require exceeding reactor license MWth limit. Additionally, this action would not have the desired effect, and would bring conditions further outside the capability curve. Candidates may select this if they do not fully understand the actions required to maintain generator parameters within the capability curve.
- B. Incorrect, raising generator excitation would raise generator voltage and thereby raise the reactive load further outside the capability curve. Candidates may select this if they do not fully understand the actions required to maintain generator parameters within the capability curve.
- C. **Correct, since the combination of reactive load and MW output exceed the capacity curve, reducing generator excitation will reduce generator voltage and the corresponding reactive load will be reduced. This action is directed by the ON to bring reactive load to within the capability curve.**
- D. Incorrect, reducing generator gas pressure would make reactive load limits more restrictive since generator cooling capability would be reduced, and is not a desired action in this case. Candidates may select this if they do not fully understand the actions required to maintain generator parameters within the capability curve.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of the reasons why actions required by the off normal procedure are taken following grid disturbances.

References: ON-198-001 rev 11, TM-OP-098 rev 5 Reference Required ON-198-001 page 3 of 16 with data, and attachment A

Learning Objective: 15306, 15307, 15318

Question source: New

Question History: New

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

10CFR55 41(b)4,5,7,10

Comments: Created by: T. North, 7/3/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 59

OSCAR has been dispatched as a result of a refueling accident on the refuel floor (818'). The Standby Gas Treatment System (SGTS) automatically initiates. The following conditions exist:

- Zone 1 and III differential pressure is -0.31 inches WG.
- SGTS SPING Noble Gas is 1.0E06 micro curies per minute.
- OSCAR whole body dose readings are 0.05 mRem/hour.

A siding panel fails on the Refuel Floor. Zone III differential pressure now indicates 0 inches WG.

- (1) How do SPING readings relate to the offsite release rate; AND
- (2) How will OSCAR whole body dose readings respond to the panel failure?

- A. (1) SBGT SPING Noble Gas IS representative of the Total Offsite Release.
(2) OSCAR whole body dose readings will NOT change.
- B. (1) SBGT SPING Noble Gas IS representative of the Total Offsite Release.
(2) OSCAR whole body dose readings will increase.
- C. (1) SBGT SPING Noble Gas is NOT representative of the Total Offsite Release.
(2) OSCAR whole body dose readings will NOT change.
- D. (1) SBGT SPING Noble Gas is NOT representative of the Total Offsite Release.
(2) OSCAR whole body dose readings will increase.

K&A # 295035 EK1.01
Importance Rating 3.9

QUESTION 59

RO Tier 1 Group 2

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: Secondary Containment Integrity

Justification:

- A. Incorrect, the SC integrity failure results in a release bypassing SGTS and causing dose rates to rise. Candidates may select this if they do not consider the impact of the SC siding failure.
- B. Incorrect since the SC integrity failure causes SGTS to be bypassed resulting in SGTS sping readings not indicative of total release rates. Candidates may select this if they do not consider the impact of the SC siding failure.
- C. Incorrect, OSCAR readings will rise as release rate increases. Release rate increases through the siding failure. Candidates may select this if they do not consider the impact of the SC siding failure.
- D. **Correct, with SC integrity no longer intact, and dP high, radioactive material released due to the refueling accident will bypass SGTS and cause site dose rates as indicated by OSCAR to rise.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine the operational impact due to the rise in offsite dose following a secondary containment failure due to a rise in secondary containment pressure.

References: TM-OP-034 rev 7 Reference Required none

Learning Objective: 1266.a, b

Question source: SSES NRC Exam Bank #650

Question History: SSES 2005 NRC Exam

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

10CFR55 41(b)8

Comments: Created/Modified by:
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 60

Unit 1 is operating in mode 1 with reactor power at 75%. A primary leak into secondary containment is in progress.

Radiation levels in the reactor building are rising, with the following Area Radiation Monitor indications:

- ARM channel 50, "CRD NORTH" indicates 2×10^4 MR/HR
- ARM channel 52. "RWCU RECIRC PP ACC" indicates 3×10^4 MR/HR ✓
- All other ARM channels are reading between 100 and 500 MR/HR

Refer to EO-100-004, "Secondary Containment Control", table 9 below and determine which one of the following describes the impact of these conditions on plant operation:

TABLE 9
REACTOR BUILDING RADIATION

RB AREA EL (FT)	ARM NUMBER		ARM CHANNEL DESCRIPTION	MAX NORMAL RADIATION	MAX SAFE RADIATION	EO104 (R/HR)	RB RAD (R/HR)	
	LO RANGE	HIGH RANGE		FIELD	FIELD (MR/HR)			
818	35+	N/A	CASK STOR AREA	HI ALARM	10^4	10	_____	_____
	14+	N/A	SPENT FUEL CRIT MON				_____	_____
	15*	N/A	REFUEL FLOOR NORTH				_____	_____
	42+	N/A	REFUEL FLOOR WEST				_____	_____
	47*	N/A	SPENT FUEL CRIT MON				_____	_____
	N/A	49	REFUEL FLOOR AREA				_____	_____
748	8+	52	RWCU RECIRC PP ACC				_____	_____
	10*	34	FUEL POOL PP AREA	HI ALARM	10^4	10	_____	_____
	11+	N/A	RX BLD SAMPLE ST				_____	_____
719	5*	50	CRD NORTH				_____	_____
	8*	51	CRD SOUTH	HI ALARM	10^4	10	_____	_____

The crew is required to insert a reactor scram AND...

- stabilize RPV pressure below 1087 psig.
- perform Rapid Depressurization using ADS SRVs.
- anticipate Rapid Depressurization using turbine bypass valves.
- cooldown the RPV within normal cooldown rates.

K&A # 295033 EK2.01
Importance Rating 3.8

QUESTION 60

RO Tier 1 Group 2

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS : Area radiation monitoring system

Justification:

- A. Incorrect, a rapid depressurization using ADS is also required. Candidates may select this if they do not recall that 2 areas above max safe values requires RD with a primary leak in to SC.
- B. Correct, scram AND RD with ADS valves are both required since 2 ARMs from 2 separate areas are reading above max safe values.**
- C. Incorrect, depressurization may not be performed with BPVs in this case since conditions requiring RD with ADS valves are met. The candidate may select this if they do not recall that use of BPVs is not permitted.
- D. Incorrect, RD exceeding cooldown rates is required. The candidate may select this if they confuse actions required when rad levels are caused by conditions other than a primary leak into SC.

K/A Match Justification:

This question matches the stated K/A since candidates are required to determine the impact on plant operation of area rad monitor readings above max safe values.

References: EO-100-104, rev 7, EO-000-104, rev 6 Reference Required none

Learning Objective: 14586.m, 14594

Question source: INPO Bank #22275

Question History: Nine Mile Point U2 2002 NRC exam

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

10CFR55 41(b)7

Comments: Created by: T. North, 8/31/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 61

Under ATWS conditions, operators are directed by EO-100-113, "Level/Power Control", sheet 2, Control Rod Insertion, to bypass the Rod Worth Minimizer (RWM).

Which one of the following is the reason for this action?

The RWM will prevent inward rod motion due to an abnormal rod pattern if reactor power ...

- A. remains ABOVE the Low Power Setpoint (LPSP) ONLY.
- B. remains ABOVE BOTH the Low Power Setpoint (LPSP) AND Low Power Alarm Point (LPAP).
- C. drops BELOW the Low Power Setpoint (LPSP) ONLY.
- D. drops BELOW the Low Power Alarm Point (LPAP) ONLY.

K&A # 295015 AK3.01
Importance Rating 3.4

QUESTION 61

RO Tier 1 Group 2

K&A Statement:

Knowledge of the reasons for the following responses as they apply to INCOMPLETE SCRAM : Bypassing rod insertion blocks

Justification:

- A. Incorrect, the RWM will not enforce the sequence unless power is BELOW the LPSP. Candidates may select this if they misunderstand the relationship between LPSP, LPAP and sequence enforcement.
- B. Incorrect, the RWM will not enforce the sequence with power above both the LPAP and LPSP. Candidates may select this if they misunderstand the relationship between LPSP, LPAP and sequence enforcement.
- C. **Correct, the RWM rod block features are enabled only when power is below the LPSP. These features may enforce a control rod insert block if rods are selected that are not in accordance with the loaded sequence. The RWM must be manually bypassed to ensure that rod blocks are not activated when rod insertion is attempted.**
- D. Incorrect, the RWM will not enforce the rod sequence until power is below the LPSP. Power may have dropped below the LPAP, but the RWM will not enforce the sequence and stop rod motion. Candidates may select this if they misunderstand the relationship between LPSP, LPAP and sequence enforcement.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall the conditions that provide the basis for bypassing the rod worth minimizer and its related rod insertion blocks under incomplete scram conditions.

References: EO-000-113 rev 8, TM-OP-031D rev 4 Reference Required none

Learning Objective: 14613

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 8/31/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 62

Unit 1 is operating at 100% when a spurious Generator Load Reject results in an ATWS.

The following conditions are present:

- Reactor power is 60%, steady
- MSIVs are OPEN

Which one of the following statements describes the RPV pressure response to this event?

- A. Bypass Valves will open fully, and RPV pressure will rise until Safety Relief Valves open to limit the pressure rise.
- B. Bypass Valves ALONE will automatically throttle steam flow and maintain RPV pressure stable.
- C. Bypass Valves AND Turbine Control Valves will automatically throttle steam flow and maintain RPV pressure stable.
- D. Bypass Valves AND Turbine Control Valves will remain shut and RPV pressure will rise until Safety Relief Valves open to limit the pressure rise.

K&A # 295007 AA1.05
Importance Rating 3.7

QUESTION 62

RO Tier 1 Group 2

K&A Statement:

Ability to operate and/or monitor the following as they apply to
HIGH REACTOR PRESSURE : Reactor/turbine pressure
regulating system

Justification:

- A. **Correct, current reactor power is beyond the total steam flow capacity of BPVs. EHC will cause BPVs to fully open, but RPV pressure will rise and require the use of SRVs to gain control of RPV pressure.**
- B. Incorrect, the steam flow demand will cause BPVs to fully open, and is beyond the capacity of BPVs to throttle and control pressure alone. Candidates may select this if they do not correctly recall the full capacity of turbine bypass valves.
- C. Incorrect, TCVs will be shut as a result of the load reject scram. Candidates may select this if they incorrectly assume that turbine control valves will receive an open signal to assist in pressure control.
- D. Incorrect, BPVs will be open. Candidates may select this if they incorrectly assume that bypass valves will be shut

K/A Match Justification:

This question matches the stated K/A since candidates are required to evaluate plant conditions to determine the correct response of the reactor/turbine pressure regulating system. This enables proper monitoring of the system response following the rise in reactor pressure resulting from ATWS power exceeding bypass valve capability.

References: TM-OP-093 rev 9, -093L rev 6 Reference Required none

Learning Objective: 1641.o

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 6/21/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 63

The Unit 1 Reactor Building Stack Monitor Panel - Rad Measurement 1C216B (29-818') alarm horn has actuated AND the Green High light is illuminated.

Which one of the following identifies a source of airborne radioactivity that would result in this panel alarming?

- A. Unit 1 Turbine Building Ventilation Exhaust. ?
- B. Standby Gas Treatment Exhaust.
- C. Zone 2 Ventilation Exhaust.
- D. Unit 1 Zone 3 Ventilation Exhaust.

K&A # 295034 EA2.02
Importance Rating 3.7

QUESTION 63

RO Tier 1 Group 2

K&A Statement:

Ability to determine and/or interpret the following as they apply to
**SECONDARY CONTAINMENT VENTILATION HIGH
RADIATION** : Cause of high radiation levels

Justification:

- A. incorrect - would alarm U1 TB stack. Candidates may select this if they are unfamiliar with the potential causes of local radiation alarms.
- B. incorrect - would alarm SBTG stack alarm. Candidates may select this if they are unfamiliar with the potential causes of local radiation alarms.
- C. incorrect - would alarm U2 stack alarm. Candidates may select this if they are unfamiliar with the potential causes of local radiation alarms.
- D. Correct, Unit 1 zone 3 ventillation exhausts thru unit 1 reactor building stack.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine the cause of the secondary containment high radiation alarm.

References: TM-OP-034 rev 7, TM-OP-079Z rev 4 Reference Required none

Learning Objective: 1942.a

Question source: INPO Bank # 23810

Question History: SSES 2002 NRC Exam

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

10CFR55 41(b)10

Comments: Created by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 64

Unit 1 was operating at 35% power when a small steam leak inside the Drywell (DW) occurred. The following conditions exist:

- Reactor manually scrammed, all rods in
- DW temperature is 140°F, up slow
- DW pressure is 0.9 psig, up slow
- RPV level dropped to +15", and is now +35", steady

The Unit Supervisor directs that all available drywell cooling be placed in service.

To accomplish this, the PCO must:

- A. Reset the DW cooling logic isolation ONLY.
- B. Reset the DW cooling logic isolation then place additional DW coolers to START LOW.
- C. Place additional DW coolers to START HIGH ONLY.
- D. Place the DW cooler keylock test switch to TEST LOCA, then place additional DW coolers to START LOW.

K&A # 295012 2.1.23

Importance Rating 4.4

QUESTION 64

RO Tier 1 Group 2

K&A Statement:

High Drywell Temperature:

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Justification:

- A. Incorrect, a DW cooling logic isolation has not occurred. Candidates may select this if they incorrectly believe a DW cooling logic isolation has occurred.
- B. Incorrect, see A above
- C. Correct, since there is no LOCA signal present, additional coolers can be started in high speed.**
- D. Incorrect, no LOCA signal is present, therefore repositioning the TEST LOCA switch is not required. Candidates may select this if they incorrectly believe that a LOCA signal is present.

K/A Match Justification:

This question matches the stated K/A since candidates must possess the ability to perform required procedural actions during a high drywell temperature transient.

References: OP-160-001 rev 13, TM-OP-073 rev 2 Reference Required none

Learning Objective: 10419.a

Question source: New

Question History: New

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

10CFR55 41(b)10

Comments: Created by: T. North, 6/30/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 65

Unit 1 was operating at full power when a false High Drywell Pressure signal was received, resulting in a reactor scram and HPCI injection into the RPV.

One (1) minute after the scram, the following conditions are present:

- All rods at position 00
- Both Reactor Recirc Pumps are running at 30% speed
- RPV level is +56"
- RPV pressure is 820 psig
- HPCI and Reactor Feed Pumps have tripped
- Immediate operator actions have been performed

Which one of the following can the crew expect to occur over the next 10 minutes with NO additional operator action?

- A. RPV level will rise due to decay heat generation; RPV pressure will remain constant due to bypass valve operation.
- B. RPV level AND pressure will BOTH drop due to bypass valve operation.
- C. RPV level will rise and RPV pressure will drop due to continued CRD pump flow.
- D. RPV level AND pressure will BOTH rise due to decay heat generation.

K&A # 295008 AA2.04
Importance Rating 3.1

QUESTION 65

RO Tier 1 Group 2

K&A Statement:

Ability to determine and/or interpret the following as they apply to
HIGH REACTOR WATER LEVEL : Heatup rate: Plant-Specific

Justification:

- A. Incorrect, bypass valves will not open until RPV pressure rises to approximately 934 psig. Candidates may select this if they are unfamiliar with post scram RPV water level, pressure and temperature interaction, and the causes.
- B. Incorrect, bypass valves will not open until RPV pressure rises to approximately 934 psig. Candidates may select this if they are unfamiliar with post scram RPV water level, pressure and temperature interaction, and the causes.
- C. Incorrect, the cold water injected by CRD will not be sufficient to overcome the decay heat immediately following the scram. Candidates may select this if they are unfamiliar with post scram RPV water level, pressure and temperature interaction, and the causes.
- D. **Correct, with no operator action, decay heat will cause both level and pressure to rise slowly**

K/A Match Justification:

This question matches the stated K/A since candidates must determine the effect of post scram decay heat on RPV level and pressure after level has been allowed to rise to level 8.

References: ON-100-101 rev 24 Reference Required none

Learning Objective: 15300

Question source: New New

Question History: New New

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

10CFR55 41(b)5

Comments: Created by: T. North, 6/7/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 66

It is currently 10:30 AM on DAY shift, and the PCOM requires a SHORT TERM (30 minutes) shift relief of the Operator At The Controls (OATC) duties in order to attend a very brief meeting with Operations department management. The PCOM will be turning the OATC duties over to a licensed operator from the work control center.

Which one of the following describes the PROCEDURALLY REQUIRED elements for this short term mid-shift relief?

- A. Verbal turnover, panel walkdown, ~~review~~ ^{REVIEW} of current plant conditions AND completed turnover sheets.
- B. Verbal turnover, panel walkdown AND review of current plant conditions ONLY.
- C. Verbal turnover AND review of current plant conditions ONLY.
- D. Verbal turnover, panel walkdown AND ~~completed~~ ^{REVIEW OF} turnover sheets ONLY.

K&A # 2.1.3
Importance Rating 3.7

QUESTION 66

RO Tier 3

K&A Statement:

Knowledge of shift or short-term relief turnover practices.

Justification:

- A. Incorrect, turnover sheets are not required. Candidates may select this if they incorrectly believe that turnover sheets are required in this situation.
- B. Correct, per OP-AD-002 7.4.8.b.1, all turnover elements are required except completion of turnover sheets.**
- C. Incorrect, panel walkdown is also required. Candidates may select this if they do not correctly recall turnover required elements.
- D. Incorrect, review of current plant conditions is also required. Candidates may select this if they do not correctly recall turnover required elements.

K/A Match Justification:

This question matches the stated K/A since candidates must recall required elements of a proper short term mid-shift turnover per OP-AD-002.

References: OP-AD-002 rev 34 Reference Required none

Learning Objective: 4086

Question source: Modified INPO Bank #19050

Question History: Clinton 2000 NRC exam

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

10CFR55 41(b)10

Comments: Modified by: T. North, 10/26/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 67

What alternate methods of determining valve position may be utilized when inaccessibility prevents physical operation or observation of indication?

- A. Obtaining their positions as noted on the most current Status Control Log.
- B. Verifying system parameters (flow, pressure, etc) are as expected for the current plant conditions.
- C. Noting the inaccessible valves for verification on the next planned or unplanned entry.
- D. Referring to the most recently completed checkoff list on the system.

K&A # 2.1.29
Importance Rating 4.1

QUESTION 67

RO Tier 3

K&A Statement:

Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.

Justification:

- A. Incorrect, the valves are not necessarily under Status Control. Candidates may select this if they do not realize that not all valve positions are tracked under status control.
- B. Correct per OP-000-002, Valves, section 6.9**
- C. Incorrect, this does not provide current valve position indication. Candidates may select this if they do not understand that this will not provide the current valve position as required by procedure
- D. Incorrect, this is not procedurally directed and is not a "positive" method of determining valve position as required by procedure. Candidates may select this if assume that this is a "positive" method of position verification.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall procedural requirements for the conduct of valve lineups.

References: OP-000-002 rev 8

Reference Required

none

Learning Objective: 14829

Question source: SSES OPS_INITIAL_LICENSE
Bank # AD044/14829

Question History: Bank

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

10CFR55 41(b)10

Comments: Created/Modified by:
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 68

Which condition below constitutes a Technical Specification SAFETY LIMIT violation, AND what action must be taken?

- A. THERMAL POWER at 11% with reactor pressure at 650 psig;
~~Reduce thermal power below the limit within 24 hours ONLY.~~
- B. Reactor steam dome pressure at 1,350 psig:
Reduce pressure below the limit within 2 hours ONLY. *And report violation to NRC within 30 days*
- C. THERMAL POWER at 3995 MWth for 60 minutes.
Immediately reduce power to below the limit AND report the violation to the NRC within 30 days.
- D. THERMAL POWER at 30% with core flow at 6 Mlbm/hr.
Reduce core thermal power below the limit AND insert all control rods within 2 hours.

K&A # 2.2.22
Importance Rating 4.0

QUESTION 68

RO Tier 3

K&A Statement:
Justification:

Knowledge of limiting conditions for operations and safety limits

- A. Incorrect, TS SL has not been violated, thermal power must be $\leq 23\%$ when <785 # or < 10 MLB/hr. Violations of TS SLs require actions to be taken within 2 hours. Candidates may select this if they confuse 10 mlb/hr with 23% power as stated in TS, and cannot correctly recall the required actions.
- B. Incorrect, stated pressure is above the SL, however, compliance with TS SL AND insertion of control rods must be completed within 2 hours. Candidates may select this if they cannot correctly recall required actions,
- C. Incorrect, exceeding MWth license limit is not a safety limit. Candidates may select this if they confuse license power limits and TS SLs.
- D. **Correct, thermal power is $>23\%$ while flow is <10 MLB/hr which is a violation of SL 2.1.1.1. Per TS 2.2, compliance with the TS SL and insertion of all control rods must be completed within 2 hours.**

K/A Match Justification:

This question is a match to the stated K/A since candidates must recall safety limit required values and evaluate current plant parameters to determine compliance.

References: TS 2.0 rev 4 Reference Required none

Learning Objective: 13427, 13429

Question source: SSES OPS_INITIAL_LICENSE
Bank# TMOP401/0000 004

Question History: Bank

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

10CFR55 41(b)5

Comments: Modified by: T. North, 5/27/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 69

Using Standby Liquid Control System (SBLC) Piping and Instrumentation Diagram M-148, determine the effect of the following on SBLC system operation:

- Unit 1 is operating at full power when SBLC pressure control valve PCV-14811C (grid location B-2) fails SHUT.

Unit 1 SBLC system is...

- A. NOT capable of performing its intended safety function because the loss of air sparge will allow sediment to clog SBLC pump suction lines.
- B. capable of performing its intended safety function, but remote SBLC tank level indication will NOT be available.
- C. NOT capable of performing its intended safety function because the remote SBLC tank level alarms will prevent pump operation.
- D. capable of performing its intended safety function, but sparging air will NOT be available for tank chemical additions.

QUESTION 70

Reactor power is 80% and being returned to 100% power following special testing and a control rod sequence exchange. The following alarms are received in the control room.

- AR-015-D04, "STACK MONITORING SYS 0C630/0C677 HI-HI RADIATION"
- AR-015-E04, "STACK MONITORING SYS 0C630/0C677 HI RADIATION"

Further investigation reveals that Turbine Building Exhaust Radiation (Point #5) is the cause of the alarm and

Offgas subtrain flow is 75% of the value it was before the power increase began. Offgas recombiner flow has increased as power has increased.

Given ON-070-001, "Abnormal Gaseous Radiation Release/CAM Alarms", what actions are required for this situation?

- A. Isolate the Primary Coolant Degasifier.
- B. Start the Common Offgas Recombiner and shutdown the Unit 1 Offgas recombiner.
- C. Shutdown Radwaste Ventilation.
- D. Isolate the failed open pair of OFFGAS DELAY LINE DRAIN VLVS.

K&A # 2.3.11
Importance Rating 3.8

QUESTION 70

RO Tier 3

K&A Statement:

Ability to control radiation releases.

Justification:

- A. incorrect - this action would be appropriate ONLY after chemistry sampled the degasifiers and determined that they are the source of the high radiation..
- B. incorrect - with the drop in offgas flow, a candidate may believe the source of the problem to be with the recombiners, in which case shutting down the ineffective recombiner and starting the common recombiner would be appropriate
- C. incorrect - appropriate if Radwaste is believed to be the source, but this is not consistent with the indications given the drop in offgas flow.
- D. **Correct, Per ON-070-001 step 3.2 this is the probable cause given the drop in offgas flow**

K/A Match Justification:

This question matches the stated K/A since candidates determine the correct method to control the radiation release based on plant conditions and the procedure provided

References: ON-070-001 rev 16 Reference Required none

Learning Objective: 15308

Question source: SSES NRC Bank #364

Question History: SSES 2003 Cert exam

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

10CFR55 41(b)11

Comments: Created/Modified by: Bank
Reviewed by: A. Avery, E. Brice 11-23-10

QUESTION 71

Unit 1 is in MODE 5 with the drywell open for maintenance.

In order to operate the TIP system in accordance with OP-178-001, "TIP System", under these conditions the Health Physics department must restrict access to the:

TIP room AND ...

- A. Drywell AND CIG mezzanine ONLY.
- B. Drywell AND north HCU area ONLY.
- C. CIG mezzanine ONLY.
- D. CIG mezzanine, AND north HCU area ONLY.

K&A # 2.3.12
Importance Rating 3.2

QUESTION 71

RO Tier 3

K&A Statement:

Knowledge of Radiological Safety Principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

Justification:

A. Correct per OP-178-001

B. Incorrect, north HCU area access is not restricted. Candidates may select this if they are unfamiliar with areas affected by elevated rad levels in the TIP room.

C. Incorrect, drywell access is also restricted. Candidates may select this if they are unfamiliar with areas affected by elevated rad levels in the TIP room.

D. Incorrect, north HCU area access is not restricted, and DW access is controlled. Candidates may select this if they are unfamiliar with areas affected by elevated rad levels in the TIP room.

K/A Match Justification:

This question matches the stated K/A since candidates must recall radiological principles associated with high radiation levels in the TIP room (locked high rad area).

References: OP-178-001 rev 19

Reference Required none

Learning Objective: 10152

Question source: New

Question History: New

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

10CFR55 41(b)12

Comments: Modified by: T. North, 6/22/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 72

Which one of the following identifies conditions of thermal hydraulic instability in the core following a Reactor Recirc pump trip from 80% RTP per ON-178-002, "Core Flux Oscillations"?

- A. APRM "A" Simulated Thermal Power rod block occurs and immediately clears.
- B. APRM peak to peak oscillations are approximately 7% and rising.
- C. LPRM upscale alarms occur and clear 10 seconds later.
- D. Recirc loop flow peak to peak oscillations are 3% and steady.

K&A # 2.4.21
Importance Rating 4.0

QUESTION 72

RO Tier 3

K&A Statement:

Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.

Justification:

- A. incorrect - this may normally occur as flow drops followed by flux dropping. Candidates may select this if they do not correctly recall parameters and logic needed to assess the status of THI.
- B. Correct per ON step 3.3.3.a: "Peak to peak oscillations trending towards 10% on APRMs (Oscillations measured from minimum peak to maximum peak)"**
- C. incorrect - LPRM indications for oscillations have a 1-5 second period. Candidates may select this if they do not correctly recall that LPRM alarm frequency of 1-5 seconds is required.
- D. incorrect - core flow has some cycling due to flow noise or may indicate a Recirc problem. Candidates may select this if they do not correctly recall parameters and logic needed to assess the status of THI.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the parameters and logic used to assess the presence of thermal hydraulic instabilities and the potential for fuel damage.

References: ON-178-002 rev 16 Reference Required none

Learning Objective: 15308

Question source: INPO Bank #23870

Question History: SSES 2002 NRC Exam

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

10CFR55 41(b)7

Comments: Created/Modified by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 73

Which one of the following conditions will require entry into EO-100-102, "RPV Control", EO-100-103, "PC Control", AND EO-100-113, "Level/Power Control".

(consider only current values of the stated parameters)

- A. A small LOCA causes drywell pressure to rise to 1.80 psig, one control rod sticks at position 48, all other rods fully insert.
- B. HPCI operation causes suppression pool water temperature to rise to 108°F, and a manual scram results in NO rod motion.
- C. A Main Turbine trip occurs, reactor power remains at 35%, and a loss of drywell cooling causes drywell temperature to rise to 145°F.
- D. A loss of feed causes RPV water level to drop to +1", 10 control rods stick at position 48, and RCIC operation causes suppression pool level to rise to 23.5 ft.

K&A # 2.4.4
Importance Rating 4.5

QUESTION 73

RO Tier 3

K&A Statement:

Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Justification:

- A. Incorrect, conditions requiring L/P control entry are not met with only one rod not full in. Candidates may select this if they do not correctly recall the entry conditions for L/P control EOP.
- B. Correct, SP temp >90F, and ATWS will require entry into all 3 of the stated EOPs**
- C. Incorrect, drywell temp is not high enough for PC control entry. Candidates may select this if they do not correctly recall the entry conditions for PC control EOP.
- D. Incorrect, SP level is not high enough for PC Control entry. Candidates may select this if they do not correctly recall the entry conditions for PC control EOP.

KA Match Justification:

This question matches the stated K/A since candidates must correctly recognize abnormal parameter indications that will require EOP entry.

References: EO-000-102 rev 8, -103 rev 7, -113 rev 8 Reference Required none

Learning Objective: 14585

Question source: New

Question History: New

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

10CFR55 41(b)10

Comments: Created by: T. North, 6/22/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 74

Which one of the following will result in a violation of the Unit 1 facility operating license, NPF-14?

- A. Continued operation above 94.4% Core Thermal Power.
- B. Operation at power with NO reactor recirc pumps in operation.
- C. Briefly exceeding 100.1% of 3952 MWth on NBA01, "CTP Instantaneous".
- D. Operation at power within region 1 of TRM 3.2.1 "Power/Flow Map".

QUESTION 75

Unit 1 was operating at 100% power when a small steam leak occurs inside the Reactor Building steam tunnel.

- Main Steam tunnel temperature is 180°F, up slow
- Main Steam Isolation Valves (MSIV) are OPEN
- All other Reactor Building temperatures are normal

Which one of the following sets of actions must the crew take as a DIRECT result of the trend in steam tunnel temperature?

- A.
 - Enter ON-159-002, "Containment Isolation", AND EO-100-104, "Secondary Containment Control"
 - Verify that the MSIVs shut after a 15 minute time delay
- B.
 - Enter ON-159-002, "Containment Isolation", ONLY
 - Verify that the MSIVs shut after a 15 minute time delay
- C.
 - Enter ON-159-002, "Containment Isolation", AND EO-100-104, "Secondary Containment Control"
 - Shut the MSIVs
- D.
 - Enter ON-159-002, "Containment Isolation", ONLY
 - Shut the MSIVs

K&A # 2.4.2
Importance Rating 4.5

QUESTION 75

RO Tier 3

K&A Statement:

Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.

Justification:

- A. Incorrect, the MSIVs will isolate immediately upon exceeding 177°F in the RB steam tunnel without a time delay. Candidates may select this if they believe the MSIVs have a 15 minute time delay that is common with other steam valve isolations.
- B. Incorrect, entry conditions for SC Control EOP have been met and MSIVs should already be shut. Candidates may select this if they believe the MSIVs have a 15 minute time delay that is common with other steam valve isolations, and do not recognize the entry to the SC control EOP.
- C. **Correct, MSL tunnel temperature >157°F is an entry condition to SC Control EOP. The isolation setpoint of 177°F for MSIVs has also been exceeded requiring entry into ON-159-002. Since the MSIVs have failed to close, the crew should immediately complete the isolation manually.**
- D. Incorrect, entry conditions for SC Control EOP have been met. Candidates may select this if do not recognize the entry to the SC control EOP.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of MSIV isolation setpoints that are associated with Secondary Containment control EOP entry.

References: RM-OP-059B rev 5, EO-000-104 rev 6, Reference Required none
ON-159-002 rev 29

Learning Objective: 14583.c

Question source: New

Question History: New

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

10CFR55 41(b)7

Comments: Created by: T. North, 6/22/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 76
SRO ONLY

Unit 1 is at in MODE 1 at full power with the following conditions:

- Total core flow is 105 Mlbm/hr
- BOTH Recirc pump speeds are at 90%
- Recirc Pump A scoop tube positioner control power is de-energized

Moments later a spurious Recirc Speed Limiter #1 runback is initiated.

Which one of the following is the status of the Reactor Recirc system; AND what action must be taken?

- A.
- Pump A is at 90% speed, Pump B is at 30% speed; Operating in the allowable region of the Power/Flow map at 78% power.
 - Declare loop B “out of service” due to flow mismatch per Tech Spec 3.4.1, “Recirculation Loops Operating”.
- B.
- Pump A is at 90% speed, Pump B is at 30% speed; Operating in the allowable region of the Power/Flow map at 78% power.
 - Take manual control of the A scoop tube and reduce speed to 30% per Tech Spec 3.4.1, “Recirculation Loops Operating”.
- C.
- BOTH pumps are at 30% speed; Operating in region 1 of the Power/Flow map at 63% power.
 - Insert control rods to exit region 1 per ON-164-002, “Loss Of Reactor Recirculation Flow”.
- D.
- BOTH pumps are at 30% speed; Operating in region 1 of the Power/Flow map at 63% power.
 - Reset Limiter #1 and raise Pump B speed to exit region 1 per ON-164-002, “Loss Of Reactor Recirculation Flow”.

QUESTION 77
SRO ONLY

Unit 1 has experienced an accident with a Primary System is discharging into Secondary Containment (SC) and significant fuel failure.

An uncontrolled offsite release is in progress, AND an ALERT EAL declaration has been declared due to offsite release rates ABOVE the ALERT level.

The crew should (1) because (2) .

- A. (1) isolate ALL Primary systems discharging into SC
(2) it is the most direct and effective method for terminating the radioactivity release.
- B. (1) isolate ALL Primary systems discharging into SC
(2) actions required for the emergency plan have a higher priority than those required for EOPs.
- C. (1) isolate ONLY those Primary systems discharging into SC that are NOT required to support EOP/DSP actions
(2) isolation of those systems may result in a much larger uncontrolled release.
- D. (1) isolate ONLY those Primary systems discharging into SC that are NOT required to support EOP/DSP actions
(2) EOP required actions have a higher priority than those required for the emergency plan.

*Per
Bases
document*

K&A # 295038 2.4.18

Importance Rating 4.0

QUESTION 77

SRO Tier 1 Group 1

K&A Statement:

High Offsite Release Rate:

Emergency Procedures / Plan: Knowledge of the specific bases for EOPs.

Justification:

- A. Incorrect, systems needed for EOP/DSP actions should not be isolated. Candidates may select this if they do not correctly recall the required action and its basis
- B. Incorrect, see A above.
- C. **Correct, EO-100-105, Rad Release, step RR-2 requires that systems needed for important EOP or DSP actions remain in service because isolation of those systems and not taking the required actions may result in a much larger release.**
- D. Incorrect, EOP actions do not necessarily have priority over EP actions. Candidates may select this if they do not correctly recall the basis for this EOP step

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must evaluate plant conditions, determine the correct EOP action required, and recall the basis for that action.

References: EO-000-105 rev 3

Reference Required none

Learning Objective: 14594

Question source: Modified INPO bank #25837

Question History: SSES 2003 NRC exam

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

10CFR55 43(b)5

Comments: *modified to raise to SRO level, and better match the selected K/A.* Created by: T. North, 11/17/10
Reviewed by:

QUESTION 78
SRO ONLY

Both Units are operating at full power when a fire is detected in the Unit 2 turbine building. The fire brigade is activated.

Several minutes later the following conditions occur:

- Simplex alarm FIRE DET 106_Z4 ALM, "Control Structure Outside Air Intake" actuates
- A SLIGHT smell of smoke is detected in the control room
- The fire brigade reports that the fire is still in progress, but under control

Which one of the following is REQUIRED?

- A. Direct the abandonment of the Control Room due to smoke intrusion per ON-100(200)-009, "Control Room Evacuation".
- B. Direct actions to place the Smoke Removal System in service to ensure long term control room habitability per ON-013-001, "Response to Fire".
- C. Direct actions to place the CREOASS system in PRESSURIZATION/FILTRATION MODE to isolate control room ventilation system from the source of smoke per ON-013-001, "Response to Fire".
- D. Direct actions to place the CREOASS system in RECIRCULATION MODE to prevent further smoke intrusion to the control room per ON-013-001, "Response to Fire".

K&A # 600000 AA2.03
Importance Rating 3.2

QUESTION 78

SRO Tier 1 Group 1

K&A Statement:

Ability to determine and interpret the following as they apply to
PLANT FIRE ON SITE: Fire alarm

Justification:

- A. Incorrect, conditions do not yet require control room evacuation. ON-100(200)-009 requires CR abandonment upon “dense smoke, extreme heat, or hazardous gas”. These conditions are not present, nor is there any other condition that should inspire Shift Supervision to abandon the control room. Candidates may select this if they believe the presence of the smell of smoke is sufficient to direct CR abandonment.
- B. Incorrect, per ON-013-001, the smoke removal system should not be placed in service until the fire is no longer in progress. Candidates may select this if they incorrectly believe the smoke removal system should be placed in service in this instance and do not correctly recall the mitigating strategies contained in ON-013-001
- C. Incorrect, the pressurization mode of CREOASS, outside air intake to the control room is shifted to the CREOASS trains, and will not prevent smoke intrusion. Candidates may select this if they do not correctly understand CREOASS system lineups or the mitigating strategies contained in ON-013-001.
- D. **Correct, ON-013-001 directs that CREOASS be placed in recirculation mode if smoke is detected in the MCR.**

K/A Match Justification:

This question matches the stated K/A since candidates must interpret plant conditions following receipt of a fire alarm resulting from a fire on site.

SRO Only Justification:

This question is SRO only since candidates must correctly select and apply the required procedure and mitigating strategy based on plant conditions.

References: ON-013-001 rev 28, TM-OP-030 rev 4, Reference Required none
ON-100(200)-009 rev 21, OP-030-002
rev 26

Learning Objective: 15306

Question source: New

Question History: New

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

10CFR55 43(b)5

Comments: Created by: T. North, 9/6/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 79
SRO ONLY

Unit 1 was at full power when a reactor scram occurred.

The following conditions are currently present:

- RPV water level is being controlled at +20" with one reactor feed pump
- RPV pressure is being controlled with bypass valves in automatic
- 2 control rods are stuck at position 48
- All other control rods are at position 00
- Reactor power is midscale on IRM range 4, down slow
- Reactor period is -80 seconds
- NO boron has been injected

Which one of the following RPV pressure control strategies is CORRECT?

- A. Commence a reactor cooldown < 100°F/hour UNLESS re-criticality is observed OR the shutdown cooling interlock clears.
- B. Stabilize RPV pressure < 1087 psig UNTIL BOTH stuck rods are fully inserted, then commence a cooldown < 100°F/hour.
- C. Stabilize RPV pressure < 1087 psig UNTIL AT LEAST 1 of the stuck rods is fully inserted, then commence a cooldown < 100°F/hour.
- D. Stabilize RPV pressure < 1087 psig UNTIL Cold Shutdown Boron Weight has been injected, then commence a cooldown < 100°F/hour.

K&A # 295006 2.1.7
Importance Rating 4.7

QUESTION 79
K&A Statement:

SRO Tier 1 Group 1

Scram:

Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Justification:

- A. **Correct, per EO-000-113, Level/Power Control, if the reactor is subcritical on control rods and no boron has been injected, cooldown may commence <100F/hr, unless re-criticality is observed.**
- B. Incorrect, cooldown may commence regardless of the status of the stuck rods as long as the reactor is subcritical and no boron has been injected. Candidates may select this if they incorrectly believe that cooldown cannot commence until the reactor meets the shutdown criteria for exiting the ATWS EOP, and do not correctly recall that criteria.
- C. Incorrect, cooldown may commence regardless of the status of the stuck rods as long as the reactor is subcritical and no boron has been injected. Candidates may select this if they incorrectly believe that cooldown cannot commence until the reactor meets the shutdown criteria for exiting the ATWS EOP.
- D. Incorrect, injecting cold shutdown boron weight is not necessary and if boron injection is started cooldown will be precluded. Candidates may select this if they incorrectly determine that boron injection should be started and that they must wait for CSBW to commence a cooldown.

K/A Match Justification:

This question matches the stated K/A since candidates must evaluate IRM and SRM reactor power and period indications and determine that a reactor cooldown may commence in accordance with the EOP provided.

SRO Only Justification:

This question is SRO only since candidates must evaluate plant conditions and select the correct emergency procedural strategy based on that evaluation as required by 10 CFR 43(b)(5)

References: EO-000-113-1 rev 9

Reference Required

Learning Objective: 14622

Question source: New

Question History: New

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

10CFR55 43(b)5

Comments: Created by: T. North, 9/7/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 80
SRO ONLY

Unit 1 has experienced a failure of the Electrohydraulic Control (EHC) system causing an uncontrolled RPV pressure rise.

The Reactor Protection System AND Alternate Rod Insertion systems failed to shutdown the reactor resulting in the following INITIAL transient conditions:

- RPV Pressure peaked at 1150 psig
- INITIAL ATWS power was 10%

SEVERAL MOMENTS LATER the following conditions are present:

- Reactor power is CURRENTLY 2%, down slow due to boron injection
- Control rods have NOT yet been inserted
- RPV pressure is 1090 psig, being controlled with SRVs
- Suppression Pool temperature is 190°F, up slow
- Suppression Pool Level is 22 ft., up slow

Given the Suppression Pool Temperature (SP/T) leg and figure 2, Heat Capacity Temperature Limit, from EO-100-103, "PC Control", determine which one of the following is the CORRECT action:

The Unit Supervisor must (1) because (2) .

- A. (1) WAIT until the reactor is shutdown with control rods AND RPV pressure exceeds 1106 psig prior to directing Rapid Depressurization
(2) large amplitude power swings may occur at low pressure and high power
- B. (1) WAIT until RPV pressure exceeds 1106 psig ONLY prior to directing Rapid Depressurization
(2) the suppression pool can still absorb all the energy from the RPV without exceeding primary containment pressure limits.
- C. (1) WAIT until the reactor is shutdown with control rods prior to directing Rapid Depressurization
(2) large amplitude power swings may occur at low pressure and high power
- D. (1) DIRECT Rapid Depressurization NOW based on current plant conditions
(2) the suppression pool may not absorb all the energy from the RPV without exceeding primary containment pressure limits.

K&A # 295025 2.2.44
Importance Rating 4.4

QUESTION 80

SRO Tier 1 Group 1

K&A Statement:

High Reactor Pressure:

Equipment Control: 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. Incorrect, RD will only need to be postponed due to initial ATWS power. The current combination of RPV pressure, SP level and SP temp should be plotted on the unsafe side of the HCTL curve. RPV pressure rise above 1106 will not change this status. Candidates may select this if they improperly interpret the HCTL curve.
- B. Incorrect, since initial ATWS power was >5% RD must be postponed regardless of HCTL status due to potential power excursions at low RPV pressure. Current values of RPV pressure, SP level and temp should be plotted on the unsafe side of the HCTL curve, therefore, the SP currently MAY NOT be able to absorb RPV energy without exceeding 65 psig. Candidates may select this if they incorrectly evaluate the HCTL curve, and fail to recognize that RD must be postponed due to initial ATWS power.
- C. **Correct, per EO-000-103, SP/T-5, if initial ATWS power is >5% further actions in the SP/T leg may be postponed. Although the plot of RPV pressure, SP temp and level results in operation on the unsafe side of the HCTL curve, RD ~~is~~ must be postponed until the Rx is S/D with control rods to preclude large power oscillations at low RPV pressure.**
- D. Incorrect, although operation is currently on the unsafe side of the HCTL curve and SP pool safety function is in jeopardy, RD cannot be performed at this time due to initial ATWS power >5%. Candidates may select this if they fail to recognize that RD is precluded by initial ATWS power.

K/A Match/SRO Only Justification:

This question matches the stated K/A since SRO candidates must evaluate and interpret plant indications and use these to evaluate the status of the suppression pool. They must further determine the correct EOP action to be directed and understand the impact this action will have on plant operation.

References: EO-000-103 rev 7; EO-100-103 rev 9. Reference Required EO-100-103, SP/T leg and HCTL curve with SPOTMOS note removed, only.

Learning Objective: 14594

Question source: MODIFIED SSES
OPS_INITIAL_LICENSE bank
#PP002/2680 002

Question History: MODIFIED BANK

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

10CFR55 43(b)5

Comments: Created by: T. North, 9/9/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 81
SRO ONLY

Unit 1 is operating at full power when I & C reports that LIS-B21-1N025A, ATWS-RPT Level Indicating Switch, has failed.

Given Tech Spec 3.3.4.2, determine which one of the following is CORRECT for this situation:

- A. Restore ATWS-RPT trip capability within 72 hours because this trip function is required to prevent jet pump and recirc pump cavitation when RPV water level is lowered in an ATWS event.
- B. Restore the inoperable ATWS-RPT instrument channel within 14 days because this instrument is required to prevent jet pump and recirc pump cavitation when RPV water level is lowered in an ATWS event.
- C. Restore ATWS-RPT trip capability within 72 hours because this trip function is required to provide negative reactivity if a failure to scram event occurs.
- D. Restore the inoperable ATWS-RPT instrument channel within 14 days because this instrument is required to provide negative reactivity if a failure to scram event occurs.

K&A # 295037 2.2.25
Importance Rating 4.2

QUESTION 81

SRO Tier 1 Group 1

K&A Statement:

SCRAM Condition Present and Reactor Power Above APRM
Downscale or unknown:

Equipment Control: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.

Justification:

- A. Incorrect, ATWS-RPT trip capability is not lost since the B trip system is unaffected by the LIS failure, therefore the 72 hour action is not required. The basis for this function is not jet pump or recirc pump cavitation. Candidates may select this if they incorrectly determine trip capability is lost, and do not correctly recall the TS basis.
- B. Incorrect, the basis for this function is not jet pump or recirc pump cavitation. Candidates may select this if they do not correctly recall the TS basis.
- C. Incorrect, ATWS-RPT trip capability is not lost since the B trip system is unaffected by the LIS failure, therefore the 72 hour action is not required. Candidates may select this if they incorrectly determine trip capability is lost.
- D. **Correct, a failure of a single LIS in the ATWS-RPT logic makes one channel inoperable. Per TS 3.3.4.2 two channels are required per trip system. This function consists of 2 trip systems either of which can independently provide ATWS-RPT trip capability. Therefore, LCO condition A applies, and action A.1 is required...restore the channel within 14 days. (A.2 may also be performed but this option is not addressed in this question)
The basis for this trip function is to provide negative reactivity by tripping recirc pumps in an ATWS event.**

K/A Match Justification:

This question matches the stated K/A since candidates must correctly recall TS bases for instruments relied upon to mitigate an ATWS condition.

References: TS & TSB 3.3.4.2 rev 0, TM-OP-080 Reference Required TS
rev 9 3.3.4.2

Learning Objective: 10070

Question source: New

Question History: New

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

10CFR55 43(b)2

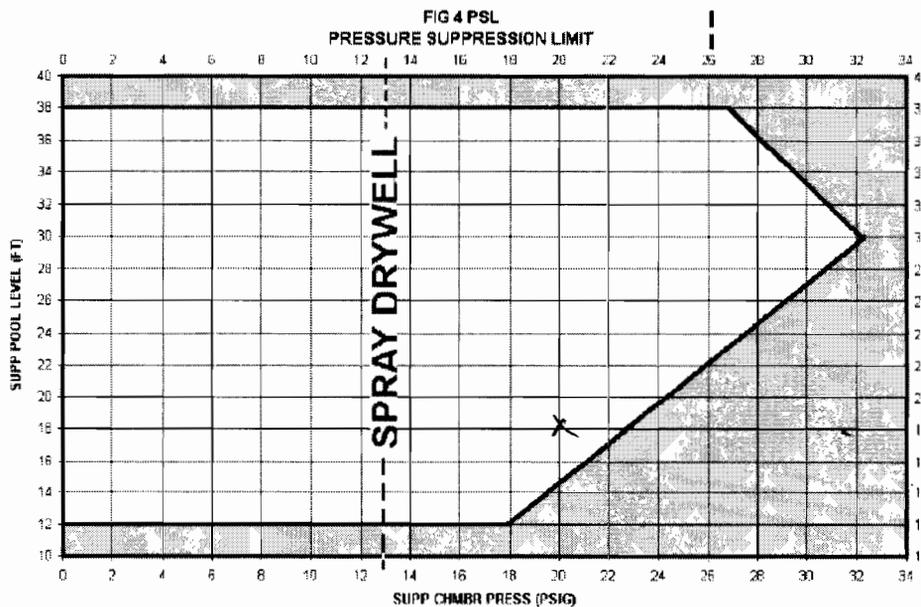
Comments: Created by: T. North, 7/11/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 82
SRO ONLY

Unit 1 has experienced a seismic event resulting in a LOCA and an UN-ISOLABLE leak of the suppression pool into Secondary Containment:

- RPV Pressure is 850 psig, down slow
- Drywell pressure is 25.5 psig, up slow
- Drywell AND Suppression Chamber sprays are UNAVAILABLE
- Suppression Chamber pressure is 20 psig, up slow
- Suppression Pool water level is 18 feet, down slow

Given figure 4 PSL below, determine which one of the following actions is required:



- A. Fully open ALL turbine bypass valves UNTIL suppression pool level drops to 14.5 ft, then perform EO-100-112, "Rapid Depressurization".
- B. Perform EO-100-112, "Rapid Depressurization", NOW because the Pressure Suppression Limit WILL BE exceeded.
- C. Cooldown the RPV $\leq 100^\circ\text{F/hr}$ UNTIL suppression pool level drops to 12 ft, then perform EO-100-112, "Rapid Depressurization".
- D. Fully open ALL turbine bypass valves UNTIL suppression chamber pressure reaches 22 psig, then perform EO-100-112, "Rapid Depressurization".

K&A # 295030 2.4.6
Importance Rating 4.7

QUESTION 82

SRO Tier 1 Group 1

K&A Statement:

Low Suppression Pool Water Level:
Emergency Procedures/Plan: Knowledge of EOP mitigation strategies.

Justification:

- A. Incorrect, PSL curve status requires RD since parameters cannot be maintained in the safe region of the curve. Candidates may select this if they believe they must wait until SP level reaches unsafe side of the curve before RD is performed.
- B. Correct, the rapidly lowering SP level and rising SC pressure will soon result in operation in the unsafe region of the PSL curve, therefore parameters cannot be maintained in the safe region. This requires RD now.**
- C. Incorrect, PC parameters cannot be maintained on the safe side of figure 4, therefore RD is required now. Candidates may select this if they believe they must wait until they reach the unsafe region due to SP level reaching 12'.
- D. Incorrect, PC parameters cannot be maintained on the safe side of figure 4, therefore RD is required now. Candidates may select this if they believe they must wait until they reach the unsafe region due to SC pressure.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must evaluate plant conditions and correctly determine the required EOP mitigating strategy.

References: EO-000-103 rev 7; EO-100-103 rev 9, Reference Required none
PP002, rev 10

Learning Objective: 14622, 14624

Question source: New

Question History: New

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

10CFR55 43(b)2

Comments: Created by: T. North, 11/16/10
Reviewed by:

QUESTION 83
SRO ONLY

Unit 1 is operating at 100% power with Control Rod Drive (CRD) Pump “B” out of service for corrective maintenance.

Unit 2 is in mode 4 with the CRD Hydraulic system out of service for a major modification.

Unit 1 CRD Pump “A” then trips due to a lockout and cannot be restarted. Electrical maintenance reports that the pump motor has failed.

The following is a timeline of events:

Time (minutes)	Event
T_0	Unit 1 CRD pump “A” trips
$T_0 + 10$	FIRST accumulator trouble alarm
$T_0 + 13$	NPO reports HCU 22-23 pressure is 935 psig, down slow. Rod 22-23 is at position 24 and is declared INOPERABLE
$T_0 + 15$	SECOND accumulator trouble alarm
$T_0 + 18$	NPO reports HCU 42-15 pressure is 940 psig, down slow. Rod 42-15 is at position 48 and is declared INOPERABLE

Which one of the following is the REQUIRED action?

- A. Enter GO-100-004, “Plant Shutdown to Minimum Power” and COMMENCE A REACTOR SHUTDOWN IMMEDIATELY.
- B. Enter ON-100-001, “Scram, Scram Imminent” and place the reactor MODE SWITCH TO SHUTDOWN IMMEDIATELY.
- C. Enter ON-100-001, “Scram, Scram Imminent” and place the reactor MODE SWITCH TO SHUTDOWN PRIOR TO time $T_0 + 35$
- D. Enter ON-100-001, “Scram, Scram Imminent” and place the reactor MODE SWITCH TO SHUTDOWN PRIOR TO time $T_0 + 38$

K&A # 295022 AA2.02
Importance Rating 3.4

QUESTION 83

SRO Tier 1 Group 2

K&A Statement:

Ability to determine and/or interpret the following as they apply to
LOSS OF CRD PUMPS : CRD system status

Justification:

- A. Incorrect, the normal shutdown procedure will not meet the procedural requirement to place the Rx mode switch to S/D within 20 minutes. Candidates may select this if they choose the incorrect procedure to comply with the 20 minute requirement.
- B. Incorrect, The immediate scram requirement is not applicable unless RPV pressure is <900#. RPV pressure at 100% power is normally >1000#. Candidates may select this if they incorrectly apply the immediate scram requirement with RPV pressure >900#
- C. Incorrect, the scram REQUIREMENT will not expire until T+38. Candidates may select this if they incorrectly apply the 20 minute requirement to the receipt of the 2nd HCU low pressure alarm at T+15. This alarm comes in at 975, so the accumulator should not be declared inop until confirmed <940 psig.
- D. **Correct, ON-155-007, Loss of All CRD Flow, requires that the mode switch be placed in shutdown within 20 minutes following the DISCOVERY of the 2nd inop control rod due to low accumulator pressure. HCU 42-15 was discovered to be <940 psig at T+18, therefore the scram is REQUIRED prior to T+38. Cross connect to Unit 2 CRD system is unavailable due to U2 status.**

K/A Match Justification:

This question matches the stated K/A since candidates must interpret the status of HCU operability following a loss of both CRD pumps.

SRO Only Justification:

This question is SRO only since SRO candidates must evaluate system status and determine the required, procedurally directed mitigating strategy following the declaration of multiple inoperable control rods.

References: ON-155-007 rev 21; TM-OP-055, rev 5 Reference Required none

Learning Objective: 10034.c

Question source: SSES OP002 Requal Bank
#AD045/15304 008

Question History: Bank

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

10CFR55 43(b)5

Comments: Created/Modified by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 84
SRO ONLY

Unit 1 is operating at full power when a central control rod drifts from position 24 to position 48.

The STA reports that the 60 minute average Core Thermal Power is 3954 MWth.

The Unit Supervisor (US) enters and directs actions in accordance with ON-155-001, "Control Rod Problems" due to the drifting control rod.

Which ADDITIONAL procedure(s) must the US enter, AND what action must be taken?

- A.
 - ON-100-004 "Reactor Power Greater Than Authorized Limit" AND ON-156-001, "Unanticipated Reactivity Change"
 - Attempt to select and insert the drifting control rod then reduce power with recirc flow if the rod will not remain at "00".

- B.
 - ON-100-004 "Reactor Power Greater Than Authorized Limit", AND ON-156-001, "Unanticipated Reactivity Change"
 - Individually scram the drifting control rod then disarm the HCU.

- C.
 - ON-156-001, "Unanticipated Reactivity Change" ONLY
 - Declare the drifting control rod inoperable, insert it to "00", then disarm the HCU.

- D.
 - ON-100-004 "Reactor Power Greater Than Authorized Limit" ONLY
 - Attempt to select and insert the drifting control rod then reduce power with recirc flow if the rod will not remain at "00".

QUESTION 85
SRO ONLY

Unit 1 has experienced a PRIMARY system leak into SECONDARY Containment.

EO-100-102, "RPV Control", and EO-100-104, "Secondary Containment Control" have been entered.

Reactor Building 749' Fire Suppression System Simplex Fire Alarm X218_Z7 is ALARMING.

Which one of the following is the operational impact of this alarm; AND what action should the crew take?

- A.
 - Reactor building temperatures are rising toward max safe values.
 - Take actions to anticipate rapid depressurization.

- B.
 - Reactor building 749' level may be inaccessible due to a potential fire.
 - Immediately activate the Fire Brigade.

- C.
 - Reactor building 749' level may become flooded due to fire system initiation.
 - Evaluate further EOP actions for Secondary Containment flooding

- D.
 - Reactor building 749' level may be above 212°F
 - Limit the use of the RPV Wide Range Level indicator to ABOVE -125".

QUESTION 86
SRO ONLY

With Unit 1 at full power, Recirc Flow Transmitter FT-B31-1N014A fails
DOWNSCALE.

Which one of the following describes the expected response of the Power
Range Neutron Monitoring System (PRNMS); AND what procedure should the
Unit Supervisor implement?

- A.
 - Half-scam from the two out of four voters in Division I for APRM 1; Rod Block; "APRM Flow Reference Off-Normal" Alarm AR-103-E06;
 - GO-100-012, "Power Maneuvers", to reduce power and clear the Half scam, Rod Block, and APRM Flow Reference Off-Normal Alarm.

- B.
 - Half-scam from the two out of four voters in Division I for APRM 1; Rod Block; "APRM Flow Reference Off-Normal" Alarm AR-103-E06;
 - AR-103-001-E06 to bypass APRM 1 and clear the Rod Block and Half-scam.

- C.
 - Single Vote on all two out of four voters for APRM 1; Rod Block; "APRM Flow Reference Off-Normal" Alarm AR-103-E06;
 - AR-103-001-E06 to bypass APRM 1 and clear the Rod Block and APRM vote.

- D.
 - Single Vote on all two out of four voters for APRM 1; Rod Block; "APRM Flow Reference Off-Normal" Alarm AR-103-E06;
 - GO-100-012, "Power Maneuvers", to reduce power and clear the Rod Block, APRM vote, and APRM Flow Reference Off-Normal Alarm.

K&A # 215005 A2.05
Importance Rating 3.6

QUESTION 86
K&A Statement:

SRO Tier 2 Group 1

Ability to (a) predict the impacts of the following on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions Loss of recirculation flow signal

Justification:

- A. Incorrect, No half scram will occur. Power reduction is not necessary, since actual power has not changed. Candidates may select this if they believe conditions will generate a half scram and that a power reduction is necessary to clear the condition.
- B. Incorrect, no half scram will occur. Candidates may select this if they believe conditions will generate a half scram.
- C. **Correct, with flow sensed by APRM 1 now significantly reduced, power will be above the rod block and flow biased trip setpoints. This generates a single APRM vote and a rod block. The APRM off normal flow alarm will actuate due to a >7% flow comparator signal.**
The alarm response procedure provides direction for bypassing APRM 1. This will clear the input to RPS and RMCS.
Whit a failed flow transmitter, the off normal flow alarm will remain lit.
- D. Incorrect, no power reduction is necessary. Candidates may select this if they believe a power reduction is necessary to clear the condition.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must predict the plant impact of a failure of the recirc flow transmitter, and select the correct procedural strategy to correct the condition.

References: TM-OP-078D rev 6, AR-103-001 E06 Reference Required none
rev 38

Learning Objective: 15716

Question source: Modified SSES OP002 Requal
Bank #TMOP078D/15716 003

Question History: Modified Bank

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

10CFR55 43(b)5

Comments: Modified by: T. North, 7/19/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 87
SRO ONLY

Unit 1 was operating at full power when an ATWS occurred.

The following conditions are present:

- Initial ATWS power was 35%, and is currently 25%, down slow
- MSIVs are open
- SBLC pump A injecting at 30 GPM
- SBLC pump B is unavailable

Given the condition of the SBLC system, the crew should...

- A. secure SBLC injection AND inject boron with RCIC because Suppression Pool Heat Capacity Temperature Limits may be exceeded.
- B. continue to inject boron with SBLC ONLY because cold shutdown boron weight can still be achieved.
- C. continue to inject boron with SBLC AND inject boron with RCIC because cold shutdown boron weight may not be achieved using SBLC.
- D. Secure SBLC injection AND inject boron with RCIC because cold shutdown boron weight cannot be achieved using SBLC.

K&A # 211000 A2.04

Importance Rating 3.4

QUESTION 87

SRO Tier 2 Group 1

K&A Statement:

Ability to (a) predict the impacts of the following on the STANDBY LIQUID CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
Abnormal System Flow

Justification:

- A. Incorrect, RCIC should not be used in this situation since SBLC injection at reduced flow will still result in significant power reduction and ultimately CSBW. RCIC is used only if SBLC pumps are unavailable, since RCIC is lined up to utilize the SBLC tank. HCTL is not directly related to the minimum flow requirements for SBLC. Candidates may select this if they believe the reduced SBLC flow warrants utilizing RCIC for boron injection and incorrectly believe the reduced flow will threaten HCTL.
- B. Correct, although SBLC flow is below the expected flowrate for one pump, the reduced flowrate will not prevent CSBW from being achieved. CSBW is not related to the rate of boron injection.**
- C. Incorrect, RCIC cannot be used in conjunction with SBLC. Candidates may select this if they believe the reduced SBLC flow warrants utilizing RCIC for boron injection and that it can be used in conjunction with SBLC.
- D. Incorrect, CSBW can be achieved using SBLC. Candidates may select this if they believe the reduced flowrate will prevent achievement of CSBW.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO Candidates must predict the impact of abnormal SBLC system flow and select the correct procedurally directed mitigating strategy to implement.

References: EO-000-113 rev 8, ES-150-002 rev 19 Reference Required none

Learning Objective: 1214.g

Question source: MODIFIED SSES
OPS_INITIAL_LICENSE Bank
#TMOP053/1205 001

Question History: Modified Bank

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

10CFR55 43(b)2

Comments: modified by: T. North, 9/20/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 88
SRO ONLY

Unit 1 is in Mode 4 preparing for a plant startup when a review of In Service Testing (IST) program records indicate that the safety function lift setpoint was UNSATISFACTORY for three (3) Safety Relief Valves (S/RV).

All other S/RV's setpoints are satisfactory.

Given Tech Spec 3.4.3, determine which one of the following is correct and the reason why:

Unit 1 CANNOT transition to Mode 2 until:

- A. ALL THREE (3) of the S/RVs have been repaired because they are required to prevent the reactor vessel from exceeding its design pressure of 1250 psig.
- B. AT LEAST ONE (1) of the S/RVs has been repaired because they are required to prevent the reactor vessel from exceeding its design pressure of 1250 psig.
- C. ALL THREE (3) of the S/RVs have been repaired because they are required to prevent the reactor vessel from exceeding its ASME code pressure limit of 1375 psig.
- D. AT LEAST ONE (1) of the S/RVs has been repaired because they are required to prevent the reactor vessel from exceeding its ASME code pressure limit of 1375 psig.

K&A # 239002 2.2.25
Importance Rating 4.2

QUESTION 88
K&A Statement:

SRO Tier 2 Group 1
Safety Relief Valves:
Equipment Control: Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits

Justification:

- A. Incorrect, the LCO does not require all 3 to be repaired, since 13 SRVs are currently operable, only one needs to be repaired. SRVs do NOT prevent exceeding the RPV design pressure. Candidates may select this if they do not correctly apply TS required actions, nor correctly recall TS basis for SRV operability.
- B. Incorrect, SRVs do NOT prevent exceeding the RPV design pressure. Candidates may select this if they cannot correctly recall the correct TS basis.
- C. Incorrect, the LCO does not require all 3 to be repaired, since 13 SRVs are currently operable, only one needs to be repaired. Candidates may select this if they incorrectly apply TS requirements.
- D. **Correct, TS 3.4.3 requires that the safety function of 14 SRVs are operable, or the plant must be in mode 4. Repair to one SRV will satisfy the LCO to enable transition to mode 2. The purpose of the safety function is to prevent the RPV from exceeding the ASME code limit of 1375 psig following analyzed pressure transients.**

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall the tech spec basis for SRV operability.

SRO Only Justification:

This question is SRO only since candidates must determine the actions required to satisfy tech specs for SRV operability and changing modes, and recall the basis for this tech spec.

References: TS 3.4.3 & bases rev 2 Reference Required TS 3.4.3

Learning Objective: 1655.a, 13400

Question source: New

Question History: New

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

10CFR55 43(b)2

Comments: Created by: T. North, 7/12/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 89
SRO ONLY

Unit 1 is operating at full power with the following conditions present:

- “A” TBCCW Pump and Heat Exchanger are in service
- AR-123-G05, “TBCCW HEADER HI-LO TEMP” is received
- TBCCW Cooler Temp TIC-10946 vertical meter is FAILED DOWNSCALE
- TIC-10946 will NOT respond in MANUAL

The Unit Supervisor should enter ON-115-001, “Loss of TBCCW”, and direct the...

- A. NPO to throttle OPEN the TBCCW HX Temp CV Bypass Valve (BPV 101083) to LOWER TBCCW header temperature.
- B. NPO to MANUALLY throttle CLOSED the TBCCW HX Temp Control Valve (TV 10946) to RAISE TBCCW header temperature.
- C. PCOM to place the “B” TBCCW heat exchanger in service to LOWER TBCCW header temperature.
- D. PCOM to align emergency service water “A” TBCCW heat exchanger to LOWER TBCCW header temperature.

K&A # 400000 2.4.11
Importance Rating 4.0

QUESTION 89
K&A Statement:

SRO Tier 2 Group 1
Component Cooling Water System:
Emergency Procedures / Plan: Knowledge of abnormal condition procedures.

Justification:

- A. **Correct, the TIC false downscale failure provides input to the TIC to attempt to raise TBCCW header temp by throttling closed TV 10946 to reduce SW flow. This results in high TBCCW temp. ON-115-001 requires that the temperature control valve bypass be manually throttled open locally by NPOs to raise SW flow and reduce TBCCW temp.**
- B. Incorrect, the HI-LO alarm is due to high temp resulting from the TIC failure. The bypass valve should be throttled open to provide additional SW flow to lower TBCCW temps. Candidates may select this if they incorrectly diagnose the result of the TIC failure.
- C. Incorrect, since the TIC and SW control valve are common to both A and B HXs, this will not have the desired effect. Candidates may select this if they do not recall this fact.
- D. Incorrect, this action would only be taken if the CV bypass valve cannot be manually opened. Candidates may select this if they do not correctly recall the proper mitigating strategy sequence.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must recall knowledge abnormal condition procedure ON-115-001 strategy required to mitigate a degradation of the TBCCW system.

References: ON-115-001 rev 17, TM-OP-015 rev 4 Reference Required none

Learning Objective: 15304

Question source: SSES OPS_INITIAL_LICENSE
Bank #AD045/15304 020

Question History: Bank

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

10CFR55 43(b)5

Comments: Created/Modified by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 90
SRO ONLY

Unit 1 is operating at full power with Emergency Diesel Generator "A" inoperable. The DG has been disassembled for repairs to the cylinder liners, and the repair is expected to take 48 hours.

LCO 3.8.1 condition B is in effect, and all required actions have been taken.

Electrical engineering later reports that Startup Transformer T-10 must be declared inoperable due to oil contamination discovered during a recent sample. Repairs are expected to take a minimum of 24 hours.

The following is a timeline of events:

Day 1	0600	DG "A" declared inoperable
	1200	DG "A" repairs commence
Day 2	0600	T-10 declared inoperable
	0800	T-10 repairs commence

Given Tech Spec 3.8.1 determine which one of the following identifies the required actions?

- A. Be in mode 3 by day 2 at 1800, and mode 4 by day 3 at 1800.
- B. Be in mode 3 by day 3 at 0600, and mode 4 by day 4 at 0600.
- C. Be in mode 3 by day 3 at 0800, and mode 4 by day 4 at 0800.
- D. Enter LCO 3.0.3 on day 2 at 0600, and be in mode 3 by day 2 at 1900.

QUESTION 91
SRO ONLY

Unit 1 is in mode 2 conducting a reactor startup with the following conditions present:

- Reactor Power is midscale on IRM range 6, steady
- Control rods are being withdrawn to maintain heatup rate

Power is then lost to the plant process computer (PICSY) resulting in a loss of the Rod Worth Minimizer (RWM).

Given TS 3.3.2.1, determine which one of the following is correct:

(Consider ONLY the effect of the loss of the RWM)

The startup...

- A. CANNOT continue until power to PICSY and the RWM is restored because Tech Specs require that rod movement be immediately suspended.
- B. CANNOT continue because the crew will NOT be able to verify that ≥ 12 control rods have been withdrawn with the RWM unavailable.
- C. CAN continue provided that the crew verify that a startup without the RWM has NOT been performed in the last calendar year; AND ensures that ≥ 12 control rods have been withdrawn.
- D. CAN continue provided that the crew verify that a startup without the RWM has NOT been performed in the last calendar year, AND ensures compliance with the pull sequence by a 2nd licensed operator.

K&A # 201006 A2.01
Importance Rating 2.8

QUESTION 91

SRO Tier 2 Group 2

K&A Statement:

Ability to (a) predict the impacts of the following on the ROD WORTH MINIMIZER SYSTEM (RWM) (PLANT SPECIFIC) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Power supply loss: P-Spec(Not-BWR6)

Justification:

- A. Incorrect, tech specs provides other methods to compensate for the loss of the RWM in order to continue the s/u. Rod w/d need not be suspended. Candidates may select this if they incorrectly believe that the RWM is required for the S/U to continue.
- B. Incorrect, the 12 rod requirement is verifiable without the RWM. The s/u may continue provided other required actions are met. Candidates may select this if they incorrectly believe that the RWM is required to verify 12 rods w/d.
- C. Incorrect, EITHER the 12 rod verification OR no previous s/u w/o the RWM in a year must be performed. Additionally, a 2nd operator/qualified person must verify the BPWS is followed. Candidates may select this if they incorrectly believe that both these requirements must be met.
- D. **Correct, startup procedure GO-100-002 note states that the startup may continue with the RWM inop provided TS 3.3.2.1 is met. This TS requires that a 2nd operator/qualified person AND EITHER: verify ≥ 12 rods W/D OR verify no S/U has been done w/o the RWM in the last calendar year.**

K/A Match Justification:

This question matches the stated K/A since candidates must predict how the failure of the RWM will impact the startup, and apply a procedural note permitting continuation of the S/U after compliance with TS.

References: GO-100-002 rev 66, TS 3.3.2.1 rev 2 Reference Required TS
3.3.2.1

Learning Objective: 12567

Question source: Modified SSES
OPS_INITIAL_LICENSE Bank
#TMOP031D/12567 001

Question History: Modified Bank

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

10CFR55 43(b)6

Comments: Modified by: T. North, 7/6/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 92
SRO ONLY

Unit 1 is operating at full power, when I&C reports that Reactor Steam Dome Pressure Switches, PS-B21-1N023A AND B, have BOTH failed their quarterly surveillance test.

These switches provide the High Reactor Steam Dome Pressure Scram signal.

- PS-B21-1N023A “as left” setpoint was 1093 psig
- PS-B21-1N023B “as left” setpoint was 1097 psig

NEITHER switch can be adjusted and BOTH must be replaced.

Suitable replacement pressure switches will NOT be available for 3 weeks.

Given Tech Spec 3.3.1.1, “RPS Instrumentation” determine which one of the following is REQUIRED:

- A. Place channel A OR B in TRIP within 6 hours; AND Be in mode 3 within 12 hours.
- B. Place BOTH failed channels in TRIP within 12 hours.
- C. Be in mode 3 within 12 hours ONLY.
- D. Place channel A OR B in TRIP within 6 hours ONLY.

K&A # 216000 2.2.40
Importance Rating 4.7

QUESTION 92

SRO Tier 2 Group 2

K&A Statement:

Nuclear Boiler Instrumentation:

Equipment Control: Ability to apply Tech Specs for a system.

Justification:

- A. Incorrect, action G, mode 3 in 12 hours, will not apply provided action B can be performed. Candidates may select this if they incorrectly determine that the delay in repair will result in exceeding required action times.
- B. Incorrect, condition A does not apply since one channel in each trip system is inoperable. Also, this action will result in a full scram. Candidates may select this if they incorrectly determine that condition A should be applied for each channel and attempt to apply tech specs without regard for the operational impact.
- C. Incorrect, see A above.
- D. **Correct, action B applies, and requires that 1 of the 2 inoperable channels be placed in TRIP within 6 hours. No other action needs to be taken regardless of the extended replacement time.**

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates be able to apply tech specs following a loss of nuclear boiler instrumentation.

References:	TS 3.3.1.1 rev 3, SI-158-303 rev 22	Reference Required	TS 3.3.1.1 with APRM setpoints redacted.
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Learning Objective: 13426

Question source: New

Question History: New

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

10CFR55 43(b)2

Comments: Ensure reference provided has APRM setpoints redacted to prevent providing answer to RO#7 for SROI candidates
Created by: T. North, 11/16/10
Reviewed by: E. Brice, A. Avery, 11-23-10

QUESTION 93

SRO ONLY

Unit 1 is operating at 100% power when the Main Turbine trips due to false High Reactor Vessel Level signals.

After the Turbine trip, the Control Room Operators report the following conditions and alarms:

- Auxiliary Buses 11A (1A101) and 11B (1A102) transferred to Startup Bus 10 (0A103)
- Main Generator Sync breaker (1R101) – OPEN
- 230 kV Switchyard Breakers, 3W (Generator 1 West) and 3T (Generator 1 East) – OPEN
- Main Generator Exciter Field Breaker – OPEN
- AR-106-A08, “GEN LOCKOUT RELAYS TRIP”
- AR-106-E08, “GEN ANTI MOTORING TRIP”

What actions must be directed as a result of the above information?

- A.
- Enter ON-100-101, “Scram, Scram Imminent” and ON-003-001, “Loss Of Startup Bus 10”
 - CONTACT Transmission Control Center (TCC) to investigate the cause of the 3W and 3T 230 KV breaker trip and reclose
 - Re-energize Auxiliary Busses 11A and 11B
- B.
- Enter EO-100-102, “RPV Level Control” and ON-104-201, “Loss Of 4kv ESS Bus 1A & 1C”
 - CONTACT Transmission Control Center (TCC) to re-energize Auxiliary Busses 11A and 11B
 - Verify “A” & “C” D/Gs running with cooling water
- C.
- Enter ON-100-101, “Scram, Scram Imminent and ON-193-002, “Main Turbine Trip”
 - CONTACT the Scranton System Operator to investigate the cause of the 3W and 3T 230 kV breaker trip
 - Restart Reactor Recirculation Pumps
- D.
- Enter ON-198-004, “Unit 1 Main Generator Unable To Disconnect From Grid After A Turbine Trip”
 - CONTACT the Scranton System Operator to block open 230 kV breakers, 3W and 3T
 - Verify AR-106-E08, “GEN ANTI MOTORING TRIP” cleared after 30 seconds

K&A # 245000 A2.05
Importance Rating 3.8

QUESTION 93

SRO Tier 2 Group 2

K&A Statement:

Ability to (a) predict the impacts of the following on the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Generator Trip

Justification:

- A. Incorrect, The startup bus has not been lost and the Aux buses are still energized. Scranton not the TCC should be contacted to operate the switchyard breakers. If the candidate does not recognize this, this answer may be chosen.
- B. Incorrect, Power was not lost to the Aux buses or the ESS buses. The power supplies to the aux buses have transferred, but power is automatically restored. If the candidate does not recognize this, this answer may be chosen.
- C. **Correct answer. ON-100-101 and ON-193-002 should be entered simultaneously. Scranton should be contacted to operate the switchyard breakers. The RR pumps tripped on EOC-RPT and should be restarted per procedure for forced circulation through the core.**
- D. Incorrect, The main generator has separated from the grid (the Main Generator Sync breaker is open). The operator should not enter ON-198-004. If the candidate does not recognize this, this answer may be chosen.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must predict the effect of the main turbine and main generator trip conditions and determine the correct procedural actions.

References: ON-100-101 rev 25 ; ON-193-002 rev Reference Required None
17

Learning Objective: 15304

Question source: SSES NRC Exam Bank #127

Question History: SSES 2004 NRC Exam

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

10CFR55 43(b)5

Comments: Created by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 94
SRO ONLY

Due to a significant plant transient beyond the design basis of the plant, the Shift Manager has authorized an operation in accordance with 10CFR50.54X.

Which one of the following describes the action(s) required, if any?

NRC notification (1) ; and NRC approval of the actions to be taken (2).

- A. (1) IS NOT required
(2) NOT required
- B. (1) IS required and MUST be made BEFORE OR IMMEDIATELY
AFTER taking action
(2) NOT required
- C. (1) IS required BEFORE taking action
(2) IS required
- D. (1) IS required BEFORE taking action
(2) NOT required

K&A # 2.1.2
Importance Rating 4.4

QUESTION 94

SRO Tier 3

K&A Statement:

Knowledge of operator responsibilities during all modes of plant operation.

Justification:

- A. Incorrect, NRC notification is required. Candidates may select this if they are unfamiliar with SRO responsibilities regarding 10CFR50.54x notification requirements.
- B. Correct, per OP-AD-001 NRC notification of 10CFR50.54X actions should be made prior to if practical, or immediately after action has been taken. NRC approval of the action is not required.**
- C. Incorrect, NRC notification can be made immediately after taking action, and NRC approval is not required. Candidates may select this if they are unfamiliar with SRO responsibilities regarding 10CFR50.54x notification requirements.
- D. Incorrect, NRC notification can be made immediately after taking action. Candidates may select this if they are unfamiliar with SRO responsibilities regarding 10CFR50.54x notification requirements.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must correctly recall their responsibilities with respect to compliance with 10CFR50.54X and OP-AD-001.

References: OP-AD-001 rev 44 Reference Required none

Learning Objective: 14715

Question source: SSES OPS_INITIAL_LICENSE
Bank # AD044/14715 002

Question History: Bank

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

10CFR55 43(b)1

Comments: Created by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 95
SRO ONLY

Which of following examples would **NOT** require a Temporary Engineering Change?

- A. A thermocouple is installed on the exterior of process pipe and connected to a recorder plugged into a wall outlet via a procedure or an open PCWO.
- B. Installation of Watt-meters into the 13.8 kV System that monitor the output voltage and have the potential if they failed to adversely impact the 13.8 kV System.
- C. A breaker is opened to isolate a component. The breaker also feeds components in other subsystems, which remain operable. There is no open WO.
- D. Isolate a circuit to a defective pump vibration probe to eliminate a nuisance alarm, or to eliminate a condition that is masking other valid alarms.

K&A # 2.2.5
Importance Rating 3.2

QUESTION 95

SRO Tier 3

K&A Statement:

Knowledge of the process for making design or operating changes to the facility.

Justification:

- A. **Correct - Temporary Engineering Change not required if the installation of temporary test instruments does not affect plant equipment nor have any potential to affect plant equipment.**
- B. Incorrect - Temporary Engineering Change may be required because this action is invasive. Candidates may select this if they do not correctly evaluate the need for a temporary engineering change.
- C. Incorrect - Temporary Engineering Change may be required if components are not restored following the completion of troubleshooting activity and the WO is closed. Candidates may select this if they do not correctly evaluate the need for a temporary engineering change.
- D. Incorrect - Temporary Engineering Change not required if the installation of temporary test instruments does not affect plant equipment nor have any potential to affect plant equipment. Candidates may select this if they do not correctly evaluate the need for a temporary engineering change.

K/A Match and SRO Only Justification:

This question matches the stated K/A since SRO candidates must determine whether a specific case meets the requirements of the process for implementing temporary engineering changes to the facility. Only SRO candidates are required to make this determination at SSES.

References: NDAP-QA-1218 Reference Required none

Learning Objective: 15313

Question source: SSES OPS_INITIAL-LICENSE
Bank #AD044/15313 026

Question History: Bank

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

10CFR55 43(b)2

Comments: Created by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 96
SRO ONLY

Which of the following sets of instruments are utilized during emergency plan implementation to evaluate the status of fission product barrier integrity per EP-TP-001, "Emergency Classification Level Manual" Category F, "Fission Product Barrier Degradation"?

- A. Offgas Pre-treatment Logarithmic Rad Monitors and Main Steam Line Rad Monitors
- B. Turbine Building Area Rad Monitors and Containment High Range Monitors
- C. Turbine Building Area Rad Monitors and Reactor Building Area Rad Monitors
- D. Containment High Range Monitors and Reactor Building Area Rad Monitors

K&A # 2.3.15
Importance Rating 3.1

QUESTION 96

SRO Tier 3

K&A Statement:

Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc

Justification:

- A. Incorrect, neither of these are used for this purpose.
- B. Incorrect, TB ARMs not used for this purpose.
- C. Incorrect, TB ARMs not used for this purpose.
- D. **Correct, per EP-TP-001 table F, both the containment hi rad and RB ARMs can provide input to the determination of the status of fission product barriers.**

K/A Match & SRO Only Justification:

This question matches the stated K/A for SRO only since candidates must recall knowledge of rad monitoring instrumentation utilized for determining the status of fission product barriers while evaluating EAL classification levels. This task is "SRO only" at SSES.

References: EP-TP-001 rev 3 Reference Required none

Learning Objective:

Question source: New

Question History: New

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

10CFR55 43(b)4

Comments: Created by: T. North, 7/13/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 97
SRO ONLY

Unit 1 is conducting a reactor shutdown prior to a refueling outage per GO-100-004, "Shutdown To Minimum Power".

The reactor mode switch is placed in SHUTDOWN as directed by the procedure.

As a result, reactor level drops to +8", and is subsequently restored to +35".

Given NDAP-QA-0720, "Station Report Matrix And Reportability Evaluation Guidance" Attachment K, determine which one of the following is REQUIRED:

- A.
 - Enter EO-100-102, "RPV Control" ONLY
 - NO NRC notification is required

- B.
 - Enter EO-100-102, "RPV Control" ONLY
 - Make a 4 hour ENS notification to the NRC

- C.
 - Enter EO-100-102, "RPV Control", AND ON-100-101, "Scram, Scram Imminent"
 - NO NRC notification is required

- D.
 - Enter EO-100-102, "RPV Control", AND ON-100-101, "Scram, Scram Imminent"
 - Make a 4 hour ENS notification to the NRC

K&A # 2.4.30
Importance Rating 4.1

QUESTION 97

SRO Tier 3

K&A Statement:

Emergency Procedures / Plan: Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.

Justification:

- A. Incorrect, ON-100-101 must be entered. Candidates may select this if they believe the scram procedure is not required.
- B. Incorrect, ON-100-101 must be entered and no notification is necessary. Candidates may select this if they believe the scram procedure is not required, and incorrectly apply the NDAP.
- C. **Correct, RPV control must be entered because level dropped below +13". ON-100-101 entry is directed by the GO. No ENS notification is required since the scram is planned and expected by procedural direction.**
- D. Incorrect, no notification is required. Candidates may select this if they incorrectly apply the NDAP.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must.

References: NDAP-QA-0720 attachment K rev 17; Reference Required NDAP-
EO-000-102 rev 9; GO-100-004 rev 53 QA-0720
Att K

Learning Objective: 14585

Question source: SSES OPS_INITIAL_LICENSE
Bank #PP002/14585 010

Question History: Bank

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

10CFR55 43(b)5

Comments: Created by: Bank
Reviewed by:

QUESTION 98
SRO ONLY

Which set of statements below correctly describes an EXAMPLE of an OPERABILITY TEST versus a FUNCTIONAL TEST in accordance with NDAP-QA-0482, "Post-Maintenance/Modification Test Guidelines"?

- A.
 - An Operability Test demonstrates that the Service Water System can deliver water to the Main Generator Hydrogen Coolers.
 - A Functional Test demonstrates RCIC can provide 600 GPM against a system head corresponding to Reactor pressure.

- B.
 - An Operability Test demonstrates that RCIC can provide 600 GPM against a system head corresponding to Reactor pressure.
 - A Functional Test demonstrates that Service Water System can supply water to the Main Steam Pipe Tunnel Coolers.

- C.
 - An Operability Test demonstrates that Service Water can supply 300,000 Gallons of water from the Cooling Tower.
 - A Functional Test demonstrates that the Diesel Generator can carry 4 MWe load.

- D.
 - An Operability Test demonstrates that the Clarified Water System can provide 100,000 Gallons of water to the Demin Water header.
 - A Functional Test demonstrates that the HPCI System can inject within 10 seconds of an initiation signal.

K&A # 2.2.21
Importance Rating 4.1

QUESTION 98

SRO Tier 3

K&A Statement:

Knowledge of pre- and post-maintenance operability requirements.

Justification:

- A. Incorrect, Service water flow is not a safety function, RCIC flow is a safety function. Candidates may select this if they incorrectly recall system safety functions.
- B. **Correct, per NDAP-QA-0482... “OPERABILITY TEST - Activities or tests which ensure that the structures, systems, components affected by the maintenance or modification activities are capable of providing the safety functions specified in the Current Licensing Basis. FUNCTIONAL TEST - Activities or tests which ensure that structures, systems, components meet design performance requirements. Generally applies to non-Tech Spec equipment, where operability testing is not applicable.”**
- The demonstration that RCIC can deliver its design flow is an activity intended to verify safety function capability. The Service Water flow to Main Steam tunnel coolers is NOT designed to verify a safety function.**
- C. Incorrect, Service water flow is not a safety function, DG loading is a safety function. Candidates may select this if they incorrectly recall system safety functions.
- D. Incorrect, Clarified water flow is not a safety function, HPCI injection response time is a safety function. Candidates may select this if they incorrectly recall system safety functions.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must recall procedural rules for post maintenance operability testing. Ensuring that PMT is sufficient to determine safety system operability is strictly an SRO function.

References: NDAP-QA-0482 rev 4 Reference Required None

Learning Objective: 15018

Question source: SSES OPS_INITIAL_LICENSE
Bank #AD044/15018 002

Question History: Bank

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

10CFR55 43(b)2

Comments: Created/Modified by: Bank
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 99
SRO ONLY

Unit 1 is operating at full power when it is determined that the following Standby Liquid Control (SBLC) tank chemistry conditions currently exist:

- Tank temperature is 67°F
- Sodium Pentaborate concentration is 9.0 weight-%
- Tank volume is 1400 gallons

Given Tech Spec 3.1.7, determine which one of the following is correct:

- A. The pH of the suppression pool may exceed 7.0 following an ATWS concurrent with a LOCA because sodium pentaborate concentration is too low.
- B. Re-evolution of iodine in the suppression pool may occur following a Design Basis LOCA because sodium pentaborate concentration is too high.
- C. Cold shutdown will be achieved during ATWS conditions because sodium pentaborate concentration meets requirements for the given tank volume and temperature.
- D. Cold shutdown may NOT be achieved during an ATWS because the sodium pentaborate concentration is too low.

K&A # 2.1.34
Importance Rating 3.5

QUESTION 99

SRO Tier 3

K&A Statement:

Knowledge of primary and secondary plant chemistry limits.

Justification:

- A. Incorrect, suppression pool pH is a concern only during DBA LOCA. In that case, SBLC is used to keep pH above 7.0, vice below 7.0 as this distractor implies. Candidates may select this if they incorrectly apply the SP pH basis for the boron concentration tech spec.
- B. Incorrect, although this is a valid result of the current conditions, tank volume is currently too LOW for the given concentration of solution. Candidates may select this if they incorrectly plot the given variables in the TS graph.
- C. Incorrect, tank boron concentration is not acceptable for the given conditions. Candidates may select this if they incorrectly plot the given variables in the TS graph.
- D. Correct, sodium pentaborate solution is lower than required. With inadequate solution, the SBLC system may not perform its safety.**

K/A Match & SRO Only Justification:

This question matches the stated K/A since SROs must correctly apply the standby liquid control system chemistry requirements, and correctly recall the TS basis for those requirements.

References: TS 3.1.7 rev 3, TSB 3.1.7 rev 3 Reference Required TS 3.1.7

Learning Objective: 10099

Question source: MODIFIED SSES
OPS_INITIAL_LICENSE Bank
#TMO053/10099 003

Question History: MODIFIED Bank

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

10CFR55 43(b)5

Comments: Modified by: T. North, 7/5/10
Reviewed by: T. Ebert, L. Casperson 11-12-10

QUESTION 100
SRO ONLY

Unit 1 is operating at 2% power.

Maintenance personnel have entered the primary containment to perform emergent repairs on elevation 738'.

Due to anticipated Xenon burnout reactor power begins to rise slowly.

Given NDAP-QA-0309, "Primary Containment Access & Control", determine what action (if any) the crew should take:

- A. Place the mode switch to SHUTDOWN.
- B. No action is necessary until reactor power approaches 10%.
- C. Direct all personnel to immediately exit the drywell.
- D. Insert Control Rods to maintain reactor power \leq 3%.

