Question Number: 1

 # 1 ☑ **RO** ☑ **SRO** **Question ID: 28345 Origin: Bank** ☐ **Memory Level**

From 100% power and 100% flow, the "B" reactor recirculation pump (RRP) inadvertently trips.

How will indicated jet pump flow respond to this event?

Flow indications for the "A" loop jet pumps will . . .

A . . . initially increase, then return to their original values. Flow indication for the "B" jet pumps will decrease to zero as the pump coasts down, then increase to a positive value as flow reverses in the "B" loop jet pumps.

B . . . decrease, then increase to their original values as flow through the "B" loop jet pumps slows, then reverses. Flow indication for the "B" jet pumps will immediately read zero.

C . . . increase during the transient. Flow indication for the "B" loop jet pumps will decrease to zero as the "B" RRP coasts down, then remain at zero.

D . . . increase during the transient. Flow indications for the "B" loop jet pumps will decrease to zero as the "B" RRP coasts down, then increase to a positive value as flow reverses in the "B" loop jet pumps.

Question Number: 30

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: Wrong Level, ST & FW changes
VALID DISTRACTOR: correct power changes.

CHOICE (B) - No
WRONG: Wrong RPV Water Level Effect.
VALID DISTRACTOR: Correct Power, ST and FW changes

CHOICE (C) - No
WRONG: Reverses the actual FW and ST changes - both affect Level Error.
VALID DISTRACTOR: Correct Power and Level change

CHOICE (D) - YES
Steam Flow RISES cause HPCI Turbine Operating. Therefore, RPV pressure drops cause ST rises and Power rises due to colder FW.
RPV Water Level will rise because FW now > ST. Stable when Level Error offsets Flow Error
Total Steam Flow will rise because now have additional steam flow path
Indicated FW Flow lowers to create the Flow Error that offsets Level Error.

References

Adopted directly from SQ exam bank. Editorial and format changes only.

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

1. Gil 09/26/05 - could not validate with enclosed references. Note for justification "A" Power increases due to lowering feedwater temperature with
HPCI injection.
R: Low risk of error because it is drawn from SSES Exam Bank and is theoretical rather than plant specific.

2. Todd 09/30/05 - changed "INITIAL to FINAL" to "INITIAL change from SS"

3. SQ 10/14/05 - moved "Thermal Power will RISE" from choices to stem.

NRC K/A System/E/A

System 20600 High Pressure Coolant Injection System
0
Number A1.01 **RO** 4.3 **SRO** 4.4 **CFR Link** (CFR 41.5 / 45.5)
Ability to predict and/or monitor changes in parameters associated with operating the HIGH PRESSURE COOLANT INJECTION SYSTEM controls including Reactor water level (BWR-2,3,4)

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 31

 # 31 ☑ RO ☑ SRO **Question ID: 29601 Origin: New** ☑ **Memory Level**

With the plant at full power, quarterly surveillance testing of the High Pressure Coolant Injection (HPCI) system per SO-152-002 causes the HPCI system to be __(1)__. The liquid flow path is __(2)__.

A (1) NOT OPERABLE because injection valve HV155F006 is deenergized in the closed position.
(2) from the Suppression Pool to the Pumps and return to the Suppression Pool.

B (1) NOT OPERABLE because injection valve HV155F006 is deenergized in the closed position.
(2) from the Condensate Storage Tank to the Pumps and return to the Condensate Storage Tank.

C (1) OPERABLE because HPCI will automatically realign to the injection mode upon receipt of an initiation signal.
(2) from the Suppression Pool to the Pumps and return to the Suppression Pool.

D (1) OPERABLE because HPCI will automatically realign to the injection mode upon receipt of an initiation signal.
(2) from the Condensate Storage Tank to the Pumps and return to the Condensate Storage Tank.

Question Number: 31

Answers: A ☐ B ☑ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: Path is CST to Pps to CST
VALID DISTRACTOR: system is Inoperable.

CHOICE (A) - YES

CHOICE (C) - No
WRONG: Path is CST to Pps to CST. System is NOT operable (no auto realign)
VALID DISTRACTOR: mirror imaging distracters.

CHOICE (C) - No
WRONG: System is NOT operable (no auto realign)
VALID DISTRACTOR: correct flow path

References

SO-152-002

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

Get the correct surveillance (I've got the 24 month one)

Gil 09/26/05 - OK

Todd 09/30/05 - ask SSES if initial power level changes the answer.

SQ 10/14/05 - inserted HPCI into stem before system.

SQ 11/04/05 - initial power could change the answer because HPCI not required below 150 psig. Changed stem accordingly.

NRC K/A System/E/A

System 20600
0

Number	**RO**	**SRO**	**CFR Link**

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.12 **RO** 3.0 **SRO** 3.4 **CFR Link** (CFR: 41.10 / 45.13)

Knowledge of surveillance procedures.

Question Number: 32

 # 32 ☑ **RO** ☑ **SRO** **Question ID: 29602 Origin: Mod** ☐ **Memory Level**

Both SSES units were at full power and SSES Unit 1 was running Core Spray pumps 1P206A and 1P206C for surveillance testing when the site experienced a Loss of Offsite Power (LOOP).

- Both units are now maintaining Reactor Pressure Vessel (RPV) pressure and inventory with the Reactor Core Isolation Cooling (RCIC) system.
- All engineered safeguards (ES) buses are powered from their associated emergency diesel generators (EDG).

Subsequently, a transient affects SSES Unit 2 and results in the following conditions:

- SSES Unit 2 RPV Water Level is -60 inches.
- SSES Unit 2 RPV Pressure is 350 psig.
- SSES Unit 2 Drywell Pressure is 1.8 psig.

Which ONE of the following describes the AUTOMATIC actions of the SSES Unit 2 Core Spray Pumps?

A Core Spray pumps 2P206A, 2P206B, 2P206C and 2P206D start after a 15 second time delay.

B Core Spray pumps 2P206A, 2P206B, 2P206C and 2P206D start after a 10.5 second time delay.

C Core Spray pumps 2P206B and 2P206D start after a 10.5 second time delay. Core Spray pumps 2P206A and 2P206C do NOT start.

D Core Spray pumps 2P206B and 2P206D start after a 15 second time delay. Core Spray pumps 2P206A and 2P206C do NOT start.

Question Number: 32

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: the 15 sec TD occurs if ES busses are energized from normal/off-site power.
VALID DISTRACTOR: all four pumps do start after a TD

CHOICE (B) - YES
the 15 sec does time out. However, its start signal comes AFTER the 10.5 sec TD sends its signal.
LOOP: K3A opens, EDGs start and energize ES busses, K3A closes and the EDG breaker 52 contacts swap (a closes & b opens)
LOCA: K10A closes on DW Hi pressure and RPV Low pressure, K116A energizes 10.5 sec TD concurrently with K16A's 15 sec TD. K116A closes before K16A closes, K12A energizes.

CHOICE (C) - No
WRONG: CS pumps A & C will also start.
VALID DISTRACTOR: Correct TD and pumps B & D are "Preferred" unit 2 pumps for concurrent CS initiation signals (electrical load considerations).

CHOICE (D) - No
WRONG: Wrong TD and CS pumps A& C will also start.
VALID DISTRACTOR: CS pumps B & D are "Preferred" unit 2 pumps for concurrent CS initiation signals (electrical load considerations).

References

Modified from SSES submittal.
TM-OP-051

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

Gil 09/26/05 - OK
Todd 09/30/05 - changed "plant" to "site" in the stem.

SQ 10/14/05 - editorial changes.

NRC K/A System/E/A

System 20900 Low Pressure Core Spray System 1
Number K4.08 **RO** 3.8 **SRO** 4.0 **CFR Link** (CFR 41.7)

Knowledge of LOW PRESSURE CORE SPRAY SYSTEM design feature(s) and/or interlocks which provide for the Automatic system initiation

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 33

 # 33 ☑ **RO** ☑ **SRO** **Question ID: 29691 Origin: New** ☐ **Memory Level**

Both SSES units are at full power. During shift turnover, you notice that the:

- white indicating light for Standby Liquid Control (SBLC) squib valve 148F004A is EXTINGUISHED
- white indicating light for Standby Liquid Control (SBLC) squib valve 148F004B is ILLUMINATED

Before accepting the shift, you go to the Relay Room and determine that the Unit 1 SBLC squib valve CONTINUITY METERS read:
- 0.1 milliamps (ma) for squib valve 148F004A.
- 4.7 milliamps (ma) for squib valve 148F004B.

Which ONE of the following correctly describes the status of the SBLC squib valves?

A 148F004A is Operable
148F004B is Operable

B 148F004A is NOT Operable
148F004B is Operable

C 148F004A is Operable
148F004B is NOT Operable

D 148F004A is NOT Operable
148F004B is NOT Operable

Question Number: 33

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES
The stem establishes conditions indicative of a burned out light bulb.

CHOICE (B) - No
WRONG: Neither valve is inoperable.
VALID DISTRACTOR: White light out is the first indication of an inoperable squib valve.

CHOICE (C) - No
WRONG: Neither valve is inoperable
VALID DISTRACTOR: Tests Applicants' understanding of the normal/expected condition.

CHOICE (D) - No
WRONG: Neither valve is inoperable
VALID DISTRACTOR: Mirror imaging and tests Applicants' understanding of normal/expected condition.

References

AR-107-A03
TM-OP-053

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/26/05 - suggest using 5 milliamps in stem if this is technically correct, albeit a little higher than normal. 4 milliamps is too easily recognizable.
R: accepted. Changed from 4 to 5 and deleted sentence saying "These are the NORMAL values". Recategorized to Higher Cognitive Level.

Todd 09/30/05 - added "Unit 1" before SBLC in the stem.

SQ 10/14/05 - changed stem to indicate INOPERABLE Squib valve because not realistic to not replace bulb before going to the Relay Room. Saved original question as 331.

NRC K/A System/E/A

System 21100 Standby Liquid Control System
0

Number K4.04 **RO** 3.8 **SRO** 3.9 **CFR Link** (CFR 41.7)

Knowledge of STANDBY LIQUID CONTROL SYSTEM design feature(s) and/or interlocks which provide for Indication of fault in explosive valve firing circuits

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 34

 # 34 ☑ **RO** ☑ **SRO** **Question ID: 29692 Origin: Mod** ☐ **Memory Level**

SSES Unit 1 is operating at full power. The following Standby Liquid Control System (SBLC) conditions exist following SBLC tank filling:

- SLC tank temperature is 70 F
- AR 107 B03, STANDBY LIQUID TANK HI/LO TEMP is in alarm
- SLC tank level is 5100 gallons
- AR 107 C03, STANDBY LIQUID TANK HI/LO LEVEL is in alarm
- Chemistry sample results after filling indicate that the concentration of the sodium pentaborate solution in the SLC tank is 15.4% by weight

Which ONE of the following actions, if any, are required to meet Technical Specifications?

A No action required. The LCO is satisfied.

B Raise SBLC Tank Temperature.

C Lower SBLC Tank Volume/Level.

D Raise Sodium pentaborate concentration.

Question Number: 34

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☑

Justification

!! THIS QUESTION APPEARED ON THE AUGUST 2002 SUSQUEHANNA EXAM !!

CHOICE (A) - No
WRONG: The temperature-concentration combination is in the UNACCEPTABLE range.
VALID DISTRACTOR: Applicant must determine this from Figure 3.1.7-2

CHOICE (B) - YES

CHOICE (C) - No
WRONG: Volume falls in the acceptable region of Figure 3.1.7-2
VALID DISTRACTOR: Applicant determine this from Figure 3.1.7-2

CHOICE (D) -
WRONG: Concentration falls in the acceptable region of Figure 3.1.7-2
VALID DISTRACTOR: Applicant determine this from Figure 3.1.7-2

References

!! THIS QUESTION APPEARED ON THE AUGUST 2002 SUSQUEHANNA EXAM !!

INPO Bank Question ID 23895

Provide TS figures 3.1.7-1, 2 without words indicating acceptable or unacceptable regions if possible.

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

!! THIS QUESTION APPEARED ON THE AUGUST 2002 SUSQUEHANNA EXAM !!

Gil 09/26/05 - Not sure it is plausible for an operator to NOT acknowledge any annunciator. How about "acknowledge but do not reset" for "A".
R: accepted. Changed distracters "A" and "B"

?? Does SSES have the RESET function ??

*** REJECTED K/A CAUSE LOD UNREACHABLE ***

Reselected 2.1.33 and found this in an SSES old exam.

SQ 10/14/05 - rejected because two potentially correct answers. Reworded the stem and modified the choices to ask for actions to fix rather than identify problem. Recategorized to Modified. Saved original as 341.

NRC K/A System/E/A

System 21100
0

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.1 Conduct of Operations

Number 2.1.2 **RO** 3.0 **SRO** 4.0 **CFR Link** (CFR: 41.10 / 45.13)
Knowledge of operator responsibilities during all modes of plant operation.

Question Number: 35

 # 35 ☑ **RO** ☑ **SRO** **Question ID: 29605 Origin: Bank** ☐ **Memory Level**

SSES Unit 2 scrams from full power. All systems, structures and components operated as expected EXCEPT the Scram Pilot Solenoid Valves for all twenty (20) Group 2 Hydraulic Control Units (HCU) on Reactor Side 2 failed to vent their associated HCUs.

Which ONE of the following describes the Control Rod response?

A All control rods will insert at the same time and
All control rods will insert at the same speed.

B Group 2 control rods will insert LATER than all other control rods and
Group 2 control rods will insert at a SLOWER speed than all other control rods.

C Group 2 control rods will insert LATER than all other control rods and
All control rods will insert at the same speed.

D All control rods will insert at the same time and
Group 2 control rods will insert at a SLOWER speed than all other control rods.

Question Number: 35

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: The rods will INSERT at a slower rate as ARI and Backup Scram valves act to depressurize the air header
VALID DISTRACTOR: The rod still inserts

CHOICE (B) - No
WRONG: The rods will insert without Operator action
VALID DISTRACTOR: valid method directed by EO-100-113, Control Rod Insertion

CHOICE (C) - YES

CHOICE (D) - No
WRONG: The rods will insert without Operator action
VALID DISTRACTOR: using RMC may be plausible once the Scram and ARI are reset.

References

Taken directly from SSES Exam Bank.
TM-OP-055, 055B, 058.

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

Gil 09/26/05 - Once a rod is scrammed (from any means) it will insert at the same rate (about 4 seconds). Recommends:
A - All control rods will automatically insert in < 10 seconds.
C - All control rods will automatically insert in > 10 seconds.
R: no known basis for the 10 second threshold. Will request SSES input. Not sure I accept the proposition that all rods will insert at the same rate. Seems reasonable to believe that the rods for which the Scram Pilot Solenoid Valves did NOT open would move a bit slower because their air is vented through a smaller area.

09/27/05: Now understand the issue. All rods insert at the same rate once the scram valves open. However, for the affected 20 HCUs, the scram valves take longer to open. Must have SSES verify/evaluate the 10 second threshold.

Todd 09/30/05 - replaced "Both units are at full power when one unit scrams for unknown reasons." with "SSES Unit 2 scrams from full power."

SQ 10/14/05 - major changes to improve/clarify. Original not saved.

NRC K/A System/E/A

System 21200 Reactor Protection System
0
Number K4.09 **RO** 3.8 **SRO** 3.9 **CFR Link** (CFR 41.7)
Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the Control rod insertion following RPS system electricalfailure

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 36

 # 36 ☑ **RO** ☑ **SRO** **Question ID: 29606 Origin: Mod** ☐ **Memory Level**

A reactor STARTUP is in progress. All Intermediate Range Neutron Monitors (IRM) are on Range 4. Which ONE of the following IRM readings will ONLY cause a HALF SCRAM?

Note: INOP = Inoperable and NOT bypassed.

	A	B	C	D	E	F	G	H
A	INOP	109	108	106	110	INOP	107	107
B	124	124	108	106	110	103	107	108
C	110	107	INOP	123	112	118	109	111
D	INOP	105	108	110	124	112	116	109

Question Number: 36

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

IRMs are assigned to RPS as follows:
RPS "A": IRM channels "A", "C", "E", "G"
RPS "A": IRM channels "B", "D", "F", "H"
To yield a half scram, one or more APRMs in a SINGLE and only a SINGLE RPS channel must either trip on high flux (>122 / 125 scale) or INOP

CHOICE (A) - No
WRONG: INOP IRM channels "A" and "F" yield a FULL scram.
VALID DISTRACTOR: Two inoperable channels.

CHOICE (B) - No
WRONG: IRM channels "A" and "B" yield a FULL scram.
VALID DISTRACTOR: Two channels > high flux set point

CHOICE (C) - No
WRONG: IRM channels "D" and "E" yield a FULL scram
VALID DISTRACTOR: Two channels above high flux set point.

CHOICE (D) - YES
IRM channel "A" trips RPS "A"
IRM channel "E" trips RPS "A"

References

Clinton 1 August 2002 exam
T.S. Table 3.3.1.1-1

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☑ SSES

1. Gil 09/26/05 - explanation talks about APRMs rather than IRMs.
R: corrected explanation to IRMs.

2. SQ 10/18/05 - OK

NRC K/A System/E/A

System 21200 Reactor Protection System
0

Number A3.01 **RO** 4.4 **SRO** 4.4 **CFR Link** (CFR 41.7 / 45.7)

Ability to monitor automatic operations of the REACTOR PROTECTION SYSTEM including Reactor Power

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 37

 # 37 ☑ **RO** ☑ **SRO** **Question ID: 29607 Origin: Mod** ☐ **Memory Level**

SSES Unit 1 in Mode 2. Heavy grounds on the Division I 24-VDC system cause a loss of Load Center 1D672. For unknown reasons, the 1B216 ESS 480-VAC MCC also deenergizes.

Which ONE of the following correctly describes the status of Intermediate Range Monitors (IRM)?

A IRMs "A", "C", "E", and "G" are deenergized and failed DOWNSCALE
IRMs "B", "D", "F", and "H" are energized and OPERABLE
IRMs "A", "C", "E", and "G" CAN be inserted or withdrawn
IRMs "B", "D", "F", and "H" CAN be inserted or withdrawn

B IRMs "A", "C", "E", and "G" are deenergized and failed DOWNSCALE
IRMs "B", "D", "F", and "H" are energized and OPERABLE
IRMs "A", "C", "E", and "G" CAN be inserted or withdrawn
IRMs "B", "D", "F", and "H" can NOT be inserted or withdrawn

C IRMs "A", "C", "E", and "G" are deenergized and failed UPSCALE
IRMs "B", "D", "F", and "H" are energized and OPERABLE
IRMs "A", "C", "E", and "G" can NOT be inserted or withdrawn
IRMs "B", "D", "F", and "H" CAN be inserted or withdrawn

D IRMs "A", "C", "E", and "G" are deenergized and failed DOWNSCALE
IRMs "B", "D", "F", and "H" are energized and OPERABLE
IRMs "A", "C", "E", and "G" can NOT be inserted or withdrawn
IRMs "B", "D", "F", and "H" can NOT be inserted or withdrawn

Question Number: 37

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☐

Justification

IRMs "A", "C", "E", and "G" are powered from 1D672. The stem establishes that the associated battery is not available to provide backup power to 1D672 and that both battery chargers are abnormally configured to be powered from the same buss (1Y216). 1Y216 is powered from 1B216 which, according to the stem, is lost. Therefore, 24-VDC to 1D672 is also lost.

The IRM Detector Drive motors for all 8 IRMs are powered from 1Y218. Although the normal power to 1Y218 is lost, the Non-class 1E Uninterruptible Power Supply (UPS) 1D240 keeps 1Y218 powered from a 250-VDC battery and ES Buss 1B236. Therefore all 8 detectors can be moved.

CHOICE (B) - No
WRONG: IRM Detectors "B", "D", "F", and "H" can be moved. IRMs "A", "C", "E", and "G" are deenergized and fail downscale
VALID DISTRACTOR: Applicant may erroneously associate drive motors with associated detectors. Applicant may believe detectors fail upscale.

CHOICE (C) - No
WRONG: All IRMs are movable.
VALID DISTRACTOR: Applicant may understand that 1Y218 is affected by the loss of 1B216 but forget that 1Y218 is protected by an UPS.

CHOICE (D) - No
WRONG: IRMs fail down, not up
VALID DISTRACTOR: everything else is correct.

References

Grand Gulf exam of August 2002 (Question ID 24195)
TM-OP-075
TM-OP-017
TM-OP-078B

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

Gil 09/26/05 - Please confirm that there is at least one indicator in the plant (not necessarily IRMs) that will fail upscale on loss of power; otherwise C and D are not plausible. I can't think of any at the plants I worked.
R: will ask. Easy fix by also varying the status of Div II IRMs or Div I IRMs.

Changed Distracter "D" to fail DOWNSCALE and IRMs B, D, F, H can NOT be withdrawn. Request sent to SSES to determine if any meters fail high. If so, may return to UPSCALE.

09/28/05 Phone conversation with SSES: they agree it is implausible for an IRM to fail UPSCALE and indicated that this could happen on plants with DC powered IRMs. They did not consider an UPSCALE failure credible. Therefore, changes indicated above should alleviate this concern because now only one distracter contains the UPSCALE failure. Adjusted the ability to withdraw IRMs to make distracter "C" more enticing.

Todd 09/30/05 - changed "fail" to "failed" in all four choices.

SQ 10/18/05 - deleted conditions leading to loss of 1D672 because LOD = 5 and because unrealistic scenario. Simply stated that the Load Center is lost due to heavy grounds. During phone conversation on 10/17/05, SSES indicated that this system is the only ungrounded DC system at the plant. Therefore, grounds would be a realistic concern. SSES initially indicated that asking whether the detectors could be inserted/withdrawn was trivial (LOD=5) - later reconsidered this and indicated it was fair to ask.

The following SSES Learning Objectives support this question:

2347 Describe the relationships between the Intermediate Range Monitor System and the following:
a. 24 VDC Distribution System

10230 State the power supply to the Intermediate Range Monitor System channels and detectors.

2337 Predict the effect that the following conditions will have on the Intermediate Range Monitor System:
a. Loss of 24 VDC
b. Detector drive failure

NRC K/A System/E/A

Question Number: 37

System 21500 Intermediate Range Monitor (IRM) System 3

Number K2.01 **RO** 2.5 **SRO** 2.7 **CFR Link** (CFR 41.7)

Knowledge of electrical power supplies to the IRM channels/detectors

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 38

 # 38 ☑ RO ☑ SRO **Question ID:** 29608 **Origin:** Mod ☐ Memory Level

SSES Unit 2 is in Mode 2, conducting a normal reactor startup per GO-200-102, PLANT STARTUP, HEATUP AND POWER OPERATION. The following conditions exist:

- the reactor is CRITICAL.
- RPV Pressure is 0 psig.
- All Intermediate Range Monitors (IRM) are on Range 3
- Source Range Monitor (SRM) detectors are being withdrawn intermittently, TWO AT A TIME.
- SRM level is being maintained between 5E3 (5,000) and 5E4 (50,000) counts per second (CPS).
- SRM Channel "A" reads 6.1E3 (6,100) CPS and slowly rising.
- SRM Channel "B" reads 7.2E4 (72,000) CPS and slowly rising.
- SRM Channel "C" reads 6.0E3 (6,000) CPS and slowly rising.
- SRM Channel "D" reads 6.1E3 (6,100) CPS and slowly rising.

Which ONE of the following correctly describes (1) the cause of these indications and (2) actions required to continue the startup?
(1) SRM Detector "B" is stuck & located . . .
(2) The reactor startup may . . .

A (1) . . . LOWER in the core than SRM Detectors "A", "C", & "D".
(2) . . . continue. The SRM Upscale Block is AUTOMATICALLY bypassed when all IRMs are on Range 3 or above.

B (1) . . . LOWER in the core than SRM Detectors "A", "C", & "D".
(2) . . . continue if Operators MANUALLY bypass SRM "B" to prevent a Rod Withdrawal BLOCK at 2E5 (20,000) CPS.

C (1) . . . HIGHER in the core than SRM Detectors "A", "C", & "D".
(2) . . . continue if Operators MANUALLY bypass SRM "B" to prevent a Rod Withdrawal BLOCK at 2E5 (20,000) CPS.

D (1) . . . HIGHER in the core than SRM Detectors "A", "C", & "D".
(2) . . . continue. The SRM Upscale Block is AUTOMATICALLY bypassed when all IRMs are on Range 3 or above.

Question Number: 38

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: The detector is stuck HIGHER in the core and AUTO bypass occurs on Range 8 or higher.
VALID DISTRACTOR: Mirror imaging.

CHOICE (B) - No
WRONG: The detector is stuck HIGHER.
VALID DISTRACTOR: Manual bypass is required.

CHOICE (C) - YES
Detector is stuck HIGHER.
MANUAL bypass is required to continue.

CHOICE (D) - No
WRONG: Auto bypass occurs on Range 8 or higher.
VALID DISTRACTOR: SRM is stuck HIGHER.

References

NM1 October 2002 Exam (Question ID 22068)
TM-OP-056A
TM-OP-078A

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

Gil 09/26/05 - OK

Todd 09/30/05 - grammatical corrections to stem.

SQ 10/18/05 - SQ recommends moving "SRM Detector "B" is stuck & located" to the stem.
R - revised wording in attempt to accommodate.

NRC K/A System/E/A

System 21500 Source Range Monitor (SRM) System
4

Number K5.03 **RO** 2.8 **SRO** 2.8 **CFR Link** (CFR 41.5 / 45.3)

Knowledge of the operational implications of the following concepts as it applies to SOURCE RANGE MONITOR (SRM) SYSTEM : Changing detector position

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 39

 # 39 ☑ **RO** ☑ **SRO** **Question ID: 29699 Origin: Bank** ☐ **Memory Level**

SSES Unit 2 is at 12% reactor power with the Reactor Mode Switch in STARTUP/HOT STANDBY. The present status of LPRM inputs and APRM power levels is:

	APRM A	APRM B	APRM C	APRM D	APRM E	APRM F
D Level inputs	4	3	2	4	3	4
C Level inputs	3	2	4	4	3	3
B Level inputs	4	3	3	4	4	2
A Level inputs	3	2	4	3	4	5
Power indicated	12%	11 %	14%	11 %	14%	10%

Which ONE of the following correctly describes the plant response to these conditions?

A No AUTOMATIC action. The "B" APRM is administratively INOPERABLE.

B A control rod block and ONLY a half reactor scram in channel "B" will occur.

C A control rod block and ONLY a half reactor scram in channel "A" will occur.

D A control rod block and a full reactor scram will occur.

Question Number: 39

Answers: A ☐ B ☐ C ☐ D ☑ References Provided to Applicant: ☐

Justification

CHOICE (A) - NO
WRONG: less than 14 LPRMs will cause an INOP trip.
VALID DISTRACTOR: less than 2 per level is an Admin INOP

CHOICE (B) - NO
WRONG: Gonna get the full scram
VALID DISTRACTOR: Applicant may not recognize that B & C are < 14 or confuse RPS Division assignments.

CHOICE (C) - NO
WRONG: Gonna get the full scram
VALID DISTRACTOR: Applicant may not recognize that B & C are < 14 or confuse RPS Division assignments.

CHOICE (D) - YES

References

Hatch exam of March 1997
TM-OP-078D

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

NRC K/A System/E/A

System 21500 Average Power Range Monitor/Local Power Range Moni 5

Number A1.02 **RO** 3.9 **SRO** 4.0 **CFR Link** (CFR 41.5 / 45.5)

Ability to predict and/or monitor changes in parameters associated with operating the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM controls including RPS status

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 40

 # 40 ☑ **RO** ☑ **SRO** **Question ID: 29610 Origin: New** ☑ **Memory Level**

How is the integrity of Primary Containment protected if one of the RCIC Turbine Steam Supply Instrument Sensing Lines break?

The Instrument Sensing Lines are . . .

A . . . Normally Open and are AUTOMATICALLY isolated in response to a line break.

B . . . equipped with a Flow Orifice, a MANUALLY Operated Primary Containment Isolation Valve (PCIV) and an Excess Flow Check Valve.

C . . . equipped with a Flow Orifice, an AUTOMATICALLY Operated Primary Containment Isolation Valve (PCIV) and an Excess Flow Check Valve.

D . . . Normally Isolated and are AUTOMATICALLY placed in service when RCIC actuates.

Question Number: 40

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: they do penetrate CTMT
VALID DISTRACTOR: Applicant may believe that the sensors are EQ.

CHOICE (B) - YES

CHOICE (A) - No
WRONG: The PCIV is Manual.
VALID DISTRACTOR: everything else is correct.

CHOICE (A) - No
WRONG:
VALID DISTRACTOR:

References

TM-OP-050
TM-OP-059B

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☑ SSES

* * * * * * N O T E: SSES rejected this K/A in 2002 because it was too difficult to write a LOD>1 question. * * * * * *

Gil 09/26/05 - . . . penetrate the RCIC Turbine . . . . . these RCIC INSTRUMENT . . . .
R: issue is unclear.
Clarified by phone - revisions made by inserting "RCIC"

Todd 09/30/05 - deleted long winded explanation of the line from stem and replaced "A" with distracter better balanced with "D" and more enticing.

SQ 10/14/05 - moved "The Instrument Sensing Lines are" from choices to stem.

NRC K/A System/E/A

System 21700 Reactor Core Isolation Cooling System (RCIC)
0

Number K1.02 **RO** 3.5 **SRO** 3.5 **CFR Link** (CFR 41.2 to 41.9 / 45.7 to 45.8)

Knowledge of the physical connections and/or cause-effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and the Nuclear boiler system

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 41

 # 41 ☑ RO ☑ SRO **Question ID:** 29611 **Origin:** New ☐ Memory Level

With SSES Unit 2 at full power, a Safety Relieve Valve (SRV) inadvertently opened and is now indicating CLOSED. What is the expected tailpipe temperature 45 minutes later if the SRV is leaking?

Assume Suppression Pool Pressure is 0.2 psig.

Select the closest answer.

A 551 degrees Fahrenheit.

B 545 degrees Fahrenheit.

C 296 degrees Fahrenheit.

D 252 degrees Fahrenheit.

Question Number: 41

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☑

Justification

CHOICE (A) - No
WRONG: this is Tsat for normal RPV pressure of 1040 psig.
VALID DISTRACTOR: TMI lesson learned.

CHOICE (B) - No
WRONG: this is Tsat for normal MS Header pressure of 985 psig.
VALID DISTRACTOR: TMI lesson learned.

CHOICE (C): YES
At 1040 psig (1055 psia), the steam vapor enthalpy is 1190.8 BTU/lbm. Throttling is an isenthalpic process. From the Mollier diagram, we see that the expected tailpipe temperature is in the vicinity of 280 deg F. From the tables, we can interpolate to 296 deg F.

CHOICE (D) - No
WRONG: this is 2 deg F above the alarm set point.
VALID DISTRACTOR: the alarm set point is 250 deg F

References

Standard Steam Tables

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

Gil 09/26/05 - K/A mismatch.
R: will reconsider. Agree that this does not DIRECTLY test automatic ADS valve operation. But Applicant should understand whether tailpipe temperatures are trending to ambient or not following an open SRV.

Todd 09/30/05 - verify with SSES that 45 minutes eliminates "D" as potentially correct.

SQ 10/14/05 - changed 14.7 psig to 0.2 psig.

NRC K/A System/E/A

System 21800 Automatic Depressurization System
0

Number A3.01 **RO** 4.2 **SRO** 4.3 **CFR Link** (CFR 41.7 / 45.7)

Ability to monitor automatic operations of the AUTOMATIC DEPRESSURIZATION SYSTEM including: ADS valve operation

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 42

 # 42 ☑ **RO** ☑ **SRO** **Question ID: 29612 Origin: New** ☑ **Memory Level**

A loss of 250-VDC Load Center 1D662 would affect the __(1)__ system by preventing the __(2)__ Steam Supply Primary Containment Isolation Valves (PCIV) from closing.

A (1) High Pressure Coolant Injection (HPCI)
(2) Outboard

B (1) Reactor Core Isolation Cooling (RCIC)
(2) Outboard

C (1) High Pressure Coolant Injection (HPCI)
(2) Inboard

D (1) Reactor Core Isolation Cooling (RCIC)
(2) Inboard

Question Number: 42

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☐

Justification

From TM-OP-088, the 1D264 and 1D274 busses are powered from 1D662. 1D662 is powered from the 1D663 Battery Charger or the 1D660 Battery. The stem specifies a loss of 1D662. Therefore, the cause of this loss is irrelevant. However, the successful Applicant must recognize that loss of 1D662 will also cause a loss of 1D274 and 1D264. Alternatively, the successful Applicant may know that RCIC DC-powered MOVs are powered from Div I and HPCI DC-powered MOVs are powered from Div II of the 250-VDC system.

CHOICE (A) - YES
1D264 and 1D274 provide power to the HPCI outboard PCIVs.

CHOICE (B) - No
WRONG: It's HPCI, not RCIC
VALID DISTRACTOR: correct valves.

CHOICE (C) - No
WRONG: Wrong Valves
VALID DISTRACTOR: Correct system

CHOICE (D) - No
WRONG: Wrong valves and system.
VALID DISTRACTOR: Mirror image.

References

TM-OP-088.

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☑ SSES

1. Gil 09/26/05 - can't see connection between 1D662 and Outboard MOV.
R: INBD Vvs AC pwrd to prevent sparking inside PC that could ignite H2 if present. OTBD Vvs are DC powered for reliability & diversity. Added text to justification section explaining 250-VDC distribution. Also added word "PUMP" to stem to preclude "B" from being a potentially correct second answer. HV-149F084, RCIC TURB EXH VAC BKR OB VLV, is powered from 1D264 and is an Outboard PCIV.

2. Todd 09/30/05 - OK.

3. SQ 10/14/05 - deleted "system" and added "Suction and Discharge" to stem to eliminate second correct answer.

4. SQ 10/17/05 - preferred STEAM SUPPLY to pump suct and disch.

NRC K/A System/E/A

System 22300 Primary Containment Isolation System/Nuclear Steam 2
Number K6.02 **RO** 3.0 **SRO** 3.2 **CFR Link** (CFR 41.7 / 45.7)

Knowledge of the effect that a loss or malfunction of D.C. electrical distribution will have on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 43

 # 43 ☑ **RO** ☑ **SRO** **Question ID: 29700 Origin: New** ☐ **Memory Level**

During a plant transient the Control Room is EVACUATED. You report to the SSES Unit 2 Remote Shutdown Panel (1C201). The following conditions now exist:

- Main Steam Isolation Valves (MSIV) are CLOSED.
- Drywell Pressure is 1.9 psig.
- Safety Relief Valve (SRV) control has been transferred to the Remote Shutdown Panel.

Which ONE of the following correctly describes status of the Safety Relief Valves (SRV)?

A SRVs "A", "B", and "C" can ONLY operate MANUALLY in the Overpressure RELIEF Mode.
AUTOMATIC Overpressure SAFETY operation is still functional for all SRVs.

B SRVs "A", "B", and "C" can operate AUTOMATICALLY or MANUALLY in the Overpressure RELIEF Mode.
AUTOMATIC Overpressure SAFETY operation is still functional for all SRVs.

C SRVs "A", "B", and "C" can ONLY operate MANUALLY in the Overpressure RELIEF Mode.
AUTOMATIC Overpressure SAFETY operation is functional ONLY for SRVs "D" through "S".

D SRVs "A", "B", and "C" can operate AUTOMATICALLY or MANUALLY in the Overpressure RELIEF Mode.
AUTOMATIC Overpressure SAFETY operation is functional ONLY for SRVs "D" through "S".

Question Number: 43

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☐

Justification

Complete rewrite of original question. Old question saved as Order 431.

CHOICE (A) - YES

CHOICE (B) - No
WRONG: "A", "B", "C" can NOT be AUTO once transferred to the RSD.
VALID DISTRACTOR: Safety mode is correct

CHOICE (C) - No
WRONG: Safety Mode of "A", "B", "C" is still available
VALID DISTRACTOR: Correct RSD effect.

CHOICE (D) - No
WRONG: mirror imaging.
VALID DISTRACTOR: mirror imaging.

References

TM-OP-083
TM-OP-050
TM-OP-083E
TM-OP-025

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

NOTE: per ON-100-009, ADS valves can be operated from the Relay Rooms.

Revised correct answer to "A" after telephone discussion with SSES. Accumulators will provide some operation of SRVs A, B, C from the RSD in this condition. Operation in SAFETY mode will not deplete the accumulator.

? ? ? ? ? QUESTION: would the accumulators have depleted in RELIEF mode by now? ? ? ? ? ? ? ?

1. Gil 09/26/05 - believes SRVs always operate in Overpresssure Relief mode before safety relief mode. This will deplete the air supply. Question may have NO correct answer if this is true.
R: The stem conditions state that pressure is cycling between 1180 and 1150. At these higher values, the SRVs have to be in the Safety mode because RPV pressures would be lower in the Relief mode. Applicant should be sufficiently familiar with the set points to recognize this.

May need to delete second half of question regarding which SRVs have controls at the RSD to make the entire question plausible. Distracters c/b RELIEF, ADS, RCIC/HPCI.

Agree to toss second half out and make corrections to remaining distracters. Essentially rewrote the question. Saved old one as 431.

NOTE: from ON-100-009, learned that Automatic RELIEF mode operation is NOT possible when control transferred to RSD panel. May be able to use this if further revision required.

Todd 09/30/05 - grammatical correction to accommodate distracter "D".

SQ 10/18/05 - original rejected as too confusing and relies on RSD panel during accident - not design based. Saved original as 431.

NRC K/A System/E/A

System 23900 Relief/Safety Valves
2
Number K5.02 **RO** 3.7 **SRO** 3.8 **CFR Link** (CFR 41.5 / 45.3)
Knowledge of the operational implications of the Safety function of SRV operation as it applies to RELIEF/SAFETY VALVES

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 44

 # 44 ☑ **RO** ☑ **SRO** **Question ID: 29614 Origin: New** ☐ **Memory Level**

Reactor power is 27% and rising pursuant to a normal reactor startup. The Rod Worth Minimizer (RWM) is in the transition zone between LPSP and LPAP. Which ONE of the following would cause the RWM to enforce the programmed rod pattern?

A Intermediate Range Monitor Detector is FULLY INSERTED.

B Main Turbine FIRST-STAGE Pressure instrument fails LOW.

C WIDE RANGE RPV Water Level REFERENCE leg ruptures.

D One Main Steam Flow instrument fails DOWNSCALE.

Question Number: 44

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: At 50% power, the MODE switch is in RUN - that bypasses the IRM UPSCALE Scram and Block.
VALID DISTRACTOR: Fully inserted would yield a Block if not bypassed because the IRM would read >108%

CHOICE (B) - No
WRONG: This would not cause a rod block
VALID DISTRACTOR: First Stage pressure is an input to RSCS which would cause a rod block if it failed low.

CHOICE (C) - No
WRONG: RPV Water Level has no Rod Block function and this failure would cause a HIGH condition.
VALID DISTRACTOR: The Narrow Range instrument is an input to FWLCS but is not sent onto to RWM from there. Moreover, the Ref leg rupture would cause a HIGH level indication that would NOT actuate any other protective features that could cause an RPS Scram which would block rods.

CHOICE (D) - YES

References

TM-OP-031D

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☑ SSES

Gil 09/26/05 - K/A mismatch.
R: Disagree. MS flow does affect RWM. FWLCS uses Steam Flow as an input. FWLCS also sends TOTAL Steam Flow to the RWM to determine if the plant is above/below LPSP or LPAP. At 50%, each steam line is inputting 12.5%. If one goes to zero, the TOTAL steam flow goes to 37.5%. This is the ONLY relationship between the Reactor Water Level Control System and the Rod Worth Minimizer.

The following is copied from TM-OP-031D
Main Steam Line (MSL) flow is measured by the Feed Water Level Control (FWLC) System to determine when the plant is operating at 22 percent of Rated Thermal Power (RTP). This monitored parameter is inputted to the RDCS and PICSY to activate the LPSP. The set point can be adjusted by varying the trip value in the MSL flow sensor.

Noted computational and typographical errors:
Changed 50% power to 27% to ensure loss of one MS flow instrument puts total steam flow below LPSP of 22%.
Corrected reference to TM-OP-031D from TM-OP-078K.

Gil is now OK.

SQ 10/18/05 - per SSES, the original question had no correct answer and would not cause a block without Rod Program Errors. SSES also asserted a K/A mismatch.
R - changed stem and distractor "C". Stem now asks what will cause RWM enforcement. "C" now fails First Stage Pressure low - the actual RSCS failure that would cause RSCS to enforce rod pattern.

NRC K/A System/E/A

System 25900 Reactor Water Level Control System
2

Number K3.03 **RO** 2.7 **SRO** 2.9 **CFR Link** (CFR 41.7 / 45.4)

Knowledge of the effect that a loss or malfunction of the REACTOR WATER LEVEL CONTROL SYSTEM will have on Rod worth minimizer (Plant-Specific)

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 45

 # 45 ☑ **RO** ☑ **SRO** **Question ID:** **29701** **Origin:** **Mod** ☑ **Memory Level**

Following a Reactor Feed Pump Turbine (RFPT) trip, what AUTOMATIC INTERLOCKS must be satisfied BEFORE resetting the RFPT trip?

A RFP Min Flow (FV-10604) in MAN
Min Flow (FIC-10604) set for 2,000 gpm
RFP Disch (HV-10603) CLOSED
EAP Control (SIC-C32-1R601) at 0

B RFPT Exhaust (HV-12731) 100% OPEN
RFPT Stop Valves (SV) ARE Reset
RFPT LP Isol (HV-12709) 100% CLOSED
RFPT HP Isol (HV12710) 100% CLOSED

C RFPT Exhaust (HV-12731) 100% OPEN
RFPT Stop Valves (SV) are NOT Reset.
RFPT LP Isol (HV-12709) 100% OPEN
RFPT HP Isol (HV12710) 100% OPEN

D RFPT Exhaust (HV-12731) 100% OPEN
RFPT Control Valves 100% CLOSED
RFPT LP Isol (HV-12709) 100% CLOSED
RFPT HP Isol (HV12710) 100% CLOSED

Question Number: 45

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: All MANUAL actions per procedure.
VALID DISTRACTOR: All correct manual actions.

CHOICE (B) - No
WRONG: SVs s/b NOT RESET.
VALID DISTRACTOR: rest of conditions is correct.

CHOICE (C) - No
WRONG: LP and HP Isolations s/b closed, not open
VALID DISTRACTOR: rest is correct.

CHOICE (D) - YES

References

TM-OP-045
OP-124-001, Section 2.18

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☑ SSES

Modified from SSES Exam Bank essay question.
09/19/2005: Per SSES staff, MSC must be on LSS per simulator attempt to reset RFPT Trip during previous weekend.
Changed answer "D" to reflect MSC on LSS as an Automatic Interlock.

Gil 09/26/05 - Change justification for "D" (correct answer).
R: corrected justification.

Todd 09/30/05 - too busy. reduced to four Manual actions. original saved as 451.

SQ 10/17/05 - not fair to ask memorized procedural requirements.
R - will ask for automatic interlocks.

NRC K/A System/E/A

System 25900 Reactor Water Level Control System 2

Number A4.09 **RO** 3.4 **SRO** 3.1 **CFR Link** (CFR 41.7 / 45.5 to 45.8)

Ability to manually operate and/or monitor TDRFP lockout reset: TDRFP in the control room

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 46

 # 46 ☑ **RO** ☑ **SRO** **Question ID: 29616 Origin: New** ☐ **Memory Level**

The following conditions exist on SSES Unit1:

- Recently entered Mode 4 in preparation for a planned refueling outage.
- Primary Containment is PURGING.

SSES Unit 2 has a Loss of Coolant Accident (LOCA) and DRYWELL PRESSURE quickly rises above 1.72 psig.

Which ONE of the following describes the correct ventilation system response?

A All three Reactor Building Zones (1, 2 and 3) Isolate and automatically reconfigure to RECIRCULATION.

Standby Gas Treatment (SGTS) automatically takes suction on the Reactor Building Exhaust ventilation stack.

SSES Unit 1 PURGE automatically ISOLATES.

–

B Reactor Building Zones 2 and 3 Isolate and automatically reconfigure to RECIRCULATION.

Standby Gas Treatment (SGTS) automatically takes suction on the Reactor Building Exhaust ventilation stack.

SSES Unit 1 PURGE automatically ISOLATES.

–

C Reactor Building Zones 2 and 3 Isolate and automatically reconfigure to RECIRCULATION.

Standby Gas Treatment (SGTS) automatically takes suction on the Reactor Building Recirculation plenum.

SSES Unit 1 PURGE Continues.

–

D All three Reactor Building Zones (1, 2 and 3) Isolate and automatically reconfigure to RECIRCULATION.

Standby Gas Treatment (SGTS) automatically takes suction on the Reactor Building Recirculation plenum.

SSES Unit 1 PURGE Continues.

Question Number: 46

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: Only Zones 2 and 3 Isolate. SGTS does not take suction on the Exhaust Vent
VALID DISTRACTOR:

CHOICE (B) - No
WRONG: SGTS does NOT take suction on the Exhaust Vent
VALID DISTRACTOR: reasonable misconception to believe SGTS would draw suction on the normal exhaust path.

CHOICE (C) - YES
Zones 2 (Unit 2) and 3 (Common) Isolate and reconfigure to Recirc
SGTS automatically takes suction on RB Recirc plenum
Unaffected unit does not isolate. Therefore, purge continues.

CHOICE (D) - No
WRONG: Only Zones 2 and 3 isolate
VALID DISTRACTOR: Purge continues and SGTS suction is correct.

References

TM-OP-070
TM-OP-073
TM-OP-034

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

Confirm with SSES that unaffected unit's purge will continue.

Gil 09/26/05 - OK

Todd 09/30/05 - OK

SQ 10/14/05 - OK.

NRC K/A System/E/A

System 26100 Standby Gas Treatment System 0

Number K1.01 **RO** 3.4 **SRO** 3.6 **CFR Link** (CFR 41.2 to 41.9 / 45.7 to 45.8)

Knowledge of the physical connections and/or cause-effect relationships between STANDBY GAS TREATMENT SYSTEM and the following: Reactor building ventilation system

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 47

 # 47 ☑ **RO** ☑ **SRO** **Question ID: 29702 Origin: Mod** ☐ **Memory Level**

Both SSES Units are at full power. The 13.8-kVAC, 4.16-kVAC and 480-VAC electrical power distribution systems are in their NORMAL configurations. A fault develops in ESS Transformer T-201 (0X203).

(1) How does the Electric Plant respond to this event?
(2) What action MUST the Operator take to mitigate this event?

A (1) ESS busses 1D (1A204) and 2D (2A204) are DEENERGIZED.
(2) Energize ESS busses 1D (1A204) and 2D (2A204) by closing the feeder breakers from ESS Transformer T-101 (0X201).

B (1) ESS busses 1D (1A204) and 2D (2A204) are ENERGIZED from Emergency Diesel Generator "D".
(2) ENSURE ESW in service to provide cooling to diesel generator.

C (1) ESS busses 1D (1A204) and 2D (2A204) are DEENERGIZED and Feeder Breakers can NOT be closed.
(2) CROSSTIE Instrument Air to CIG 90# header.

D (1) ESS busses 1D (1A204) and 2D (2A204) are ENERGIZED from ESS Transformer T-101 (0X201).
(2) Restore RBCW to Reactor Recirculation Pump (RRP) motor winding coolers.

Question Number: 47

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: Mometary loss, not sustained. Should AUTO transfer.
VALID DISTRACTOR: asks Applicant to manually energize.

CHOICE (B) - No
WRONG: EDGs start but won't power the buss.
VALID DISTRACTOR: must have ESW if EDGs are running.

CHOICE (C) - No
WRONG: This fault allows alternate power supply to feed the buss.
VALID DISTRACTOR: Applicant could confuse T-201 (0X203) with buss fault.

CHOICE (D) - YES

References

ON-104-204
TM-OP-004
SSES Exam of August 2002 (Question ID 23823)

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Question originally rejected as SRO level. Removed procedural references to remain at RO level. Returned classification to MOD instead of NEW.

NRC K/A System/E/A

System 26200 A.C. Electrical Distribution
1

Number A2.05 **RO** 2.9 **SRO** 3.3 **CFR Link** (CFR 41.5 / 45.6)

Ability to (a) predict the impacts of Bus grounds on the A.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 48

 # 48 ☑ **RO** ☑ **SRO** **Question ID:** **29657** **Origin:** **New** ☐ **Memory Level**

SSES has a Loss of Offsite Power (LOOP). Emergency Diesel Generator (EDG) "A" fails to start. Operators start EDG "E" and energize 1A201 and 2A201 one hour later.

Both VITAL AC UPS (1D666 & 2D666) are energized from their __(1)__ source.

All four NON-CLASS 1E INSTRUMENT AC UPS (1D240, 1D130, 2D240, 2D130) are energized from their __(2)__ source.

Note: UPS = UNINTERRUPTIBLE POWER SUPPLIES

A 250-VDC ALTERNATE source (1D662, 2D142).
250-VDC ALTERNATE source (1D652, 1D662, 2D652, 2D662)

B 480-VAC ALTERNATE source (1B246, 2B246).
250-VDC BATTERY source (1D243, 1D133, 2D243, 2D133)

C 480-VAC PREFERRED source (1B246, 2B246).
480-VAC PREFERRED source (1B216, 1B226, 2B216, 2B226)

D 250-VDC PREFERRED source (1D662, 2D142).
480-VAC ALTERNATE source (1B216, 1B226, 2B216, 2B226)

Question Number: 48

Answers: A ☐ B ☐ C ☐ D ☑ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: Vital: Pfd v. Alt. Inst: wrong source of 250-VDC & would not be on 250-VDC

CHOICE (B) - No
WRONG: Would not transfer to ALTERNATE These batteries deplete after 20 minutes.

CHOICE (C) - No
WRONG: Vital: 480-VAC is not Pfd. This is NOT Pfd source.

CHOICE (D) - YES

WRONG: Vital: no reason to shift to 480-VAC alt Inst: would have shifted back to Pfd 480-VAC source

HOD because Applicant must distinguish LOOP from Blackout. Here, following a LOOP, the EDGs respond to power the ES busses.

References

TM-OP-017
See also, 480 VAC, 250 VDC.

Comments and Question Modification History

☑ GXJ ☐ THF ☑ RJC ☐ SSES

Gil 09/26/05 - "A" and "C" not plausible with "all ...components operate as designed". That is, everyone should know 1E equipment will be energized. Use a different term (RPS MG Set or Instrument AC Distribution Panel 1Y216, etc) rather than "CLASS 1E".

Answer B does not appear correct. The way I read the references the preferred will be lost for about 10 seconds and the UPS will run on DC. Then when the EDG energizes the bus the UPS will automatically shift back to preferred.

R: will revisit this question.

Added "one minute after" to expressly show question is asking for conditions after the transient.

Suggestion: don't say "Class 1E" and just identify the buss itself.

COMPLETE REWRITE 27 SEPTEMBER 2005

Todd 09/30/05 - same question with substantial revisions. Saved old one as 481.

SSES 10/16/05 - EDG "E" can NOT be started in under 45 minutes. Therefore, changed from 20 minutes to one hour and revised answer and distractors accordingly.

NRC K/A System/E/A

System 26200 Uninterruptable Power Supply (A.C./D.C.)
2
Number K6.01 **RO** 2.7 **SRO** 2.9 **CFR Link** (CFR 41.7 / 45.7)
Knowledge of the effect that a loss or malfunction of A.C. electrical power will have on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.)

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 49

 # 49 ☑ **RO** ☑ **SRO** **Question ID: 29618 Origin: Bank** ☑ **Memory Level**

250 VDC Battery Charger 2D663 has the following front panel indications:

- Battery Charger Float-Equalize switch is in FLOAT.
- Battery Charger Interval Timer set to FIVE HOURS.

Which ONE of the following is correct concerning charger operation?

A Output voltage will be between 279 and 287 VDC for five hours, then LOWER to between 265 and 271 VDC thereafter.

B Output voltage will be between 265 and 271 VDC for five hours, then RISE to between 279 and 287 VDC thereafter.

C Output voltage will be between 279 and 287 VDC for five hours and will remain between 279 and 287 VDC thereafter.

D Output voltage will be between 265 and 271 VDC for five hours and will remain between 265 and 287 VDC thereafter.

Question Number: 49

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - YES
Per TM-OP-088 and OP-1(2)88-001, this provides Equalizing Charge for five hours, then automatically reconfigures to the FLOAT mode.

CHOICE (B) - No
WRONG: Reverse of correct answer
VALID DISTRACTOR: First FLOAT, then EQUALIZE

CHOICE (C) - No
WRONG: Stay on EQUALIZE
VALID DISTRACTOR: Correct if Float-Equalize switch in EQUALIZE

CHOICE (D) - No
WRONG: Stay on Float
VALID DISTRACTOR: Applicant my believe that the Float-Equalize switch must be in EQUALIZE to conduct charge.

References

TM-OP-088
OP-1(2)88-001.

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☑ SSES

Gil 09/26/05 - add to stem: ...switch has just been placed in FLOAT. This ensures the full five hours at 279-287 will occur; making "A" correct
R: added "up to" in each answer choice. Pfd concept of Operator on tour discovering these conditions.

deleted "up to" and added "is" to the stem.

Todd 09/30/05 - OK

SQ 10/14/05 - change lower to rise in "B".

NRC K/A System/E/A

System 26300 D.C. Electrical Distribution
0

Number K1.02 **RO** 3.2 **SRO** 3.3 **CFR Link** (CFR 41.2 to 41.9 / 45.7 to 45.8)

Knowledge of the physical connections and/or cause-effect relationships between D.C. ELECTRICAL DISTRIBUTION and Battery charger and battery

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 50

 # 50 ☑ RO ☑ SRO **Question ID:** 29619 **Origin:** Mod ☑ Memory Level

How and why does the Operator reduce and stabilize Diesel Generator load at 300 - 500 KW before opening the EDG-to-Bus breaker?

A By adjusting the Diesel Generator Voltage Adjust (HS-00053),
To prevent an ENGINE Trip on Reverse Power.

B By adjusting the Diesel Generator Voltage Adjust (HS-00053),
To prevent a STARTUP TRANSFORMER TAP Change which can cause a Diesel Generator Trip.

C By adjusting the Diesel Generator Speed Governor (HS-00054),
To prevent an ENGINE Trip on Reverse Power.

D By adjusting the Diesel Generator Speed Governor (HS-00054),
To prevent a STARTUP TRANSFORMER TAP Change which can cause a Diesel Generator Trip.

Question Number: 50

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: adjusting voltage changes reactive load (KVAR not KW).
VALID DISTRACTOR: Correct Engine trip

CHOICE (B) - No
WRONG: adjusting voltage changes reactive load (KVAR not KW).
VALID DISTRACTOR: S/U XFMR TAP Changer adjustments can cause EDG trips but this is not why REAL load is reduced. Reactive load is minimized (kept close to zero) to prevent TAP changes.

CHOICE (C) - YES

CHOICE (D) - No
WRONG: S/U XFMR TAP Changer adjustments can cause EDG trips but this is not why REAL load is reduced. Reactive load is minimized (kept close to zero) to prevent TAP changes.
VALID DISTRACTOR: Correct DG control scheme.

References

OP-024-001, Section 2.3

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/26/05 - OK

Todd 09/30/05 - revised from (1) (2) format to simple sentence structure.

SQ 10/14/05 - reversed why and how to how and why.

NRC K/A System/E/A

System 26400 Emergency Generators (Diesel/Jet)
0

Number A1.09 **RO** 3.0 **SRO** 3.1 **CFR Link** (CFR 41.5 / 45.5)

Ability to predict and/or monitor changes in parameters associated with operating the EMERGENCY GENERATORS (DIESEL/JET) controls including Maintaining minimum load on emergency generator (to prevent reverse power)

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 51

 # 51 ☑ RO ☑ SRO **Question ID:** 29620 **Origin:** Bank ☑ Memory Level

Unit 2 is at 100% power with "A" Instrument Air Dryer Skid in service and the "B" Instrument Air Dryer Skid out of service for planned maintenance. The Turbine Building NPO reports that the dryer transfer valves have failed and that Instrument Air is being vented to atmosphere. Which ONE of the following describes the impact of this failure on the Instrument Air system?

Instrument Air system pressure will . . .

A . . . remain constant at a lower than normal value because the "Unit 1-to-Unit 2 Crosstie" (025091) automatically opens to supply air.

B . . . remain constant at a lower than normal value because the "IA-to-SA Crosstie" (PCV-22560) automatically opens to supply air.

C . . . lower until Operators manually open Service Air cross-tie (PCV-22560) BYPASS (225143).

D . . . lower until Operators manual place Dryer Skid "C" in service.

Question Number: 51

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: This is a MANUAL valve
VALID DISTRACTOR: This cross-tie does connect downstream of the malfunctioning dryer.

CHOICE (B) - No
WRONG: This cross-tie connects upstream of the malfunctioning dryer such that the malfunction will prevent this from solving the problem
VALID DISTRACTOR: This is an AUTOMATIC action.

CHOICE (C) - No
WRONG: This cross-tie connects upstream of the malfunctioning dryer such that the malfunction will prevent this from solving the problem
VALID DISTRACTOR: Applicant may believe that the bypass will bypass the dryers.

CHOICE (D) - YES

References

Bank Question
TM-OP-018

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/26/05 - Don't believe "B" is correct as worded. The SA crosstie will "fix" an IA supply problem at the inlet to the dryers but will NOT resolve a dryer capacity problem.
R: Will question SSES on this because it is a BANK question.

Changed "D" to correct answer - typographical error.

Todd 10/05/06 - delete "and the required remedial actions" from the stem. Part (b) of the K/A is not RO related.

Applicable SSES Lesson Objectives:
R1772: Predict the effect the following will have on the Instrument Air System:
d. Air Dryer malfunction

Unable to adequately test both ability to predict and use procedures of this two part K/A. Per authority of NUREG 1021, ES401, Section D.2.a., second paragraph [When selecting or writing questions for K/As that test coupled knowledge or abilities (e.g., the A.2 K/A statements in Tiers 1 and 2 and a number of generic K/A statements, such as 2.4.1, in Tier 3), try to test both aspects of the K/A statement. If that is not possible without expending an inordinate amount of resources, limit the scope of the question to that aspect of the K/A statement requiring the highest cognitive level (e.g., the (b) portion of the A.2 K/A statements) or substitute another randomly selected K/A.], the test question tests the ability to predict the impact of an air dryer malfunction.
18 October 2005.

NRC K/A System/E/A

System 30000 Instrument Air System (IAS)
0

Number A2.01 **RO** 2.9 **SRO** 2.8 **CFR Link** (CFR 41.5 / 45.6)

Ability to (a) predict the impacts of Air dryer and filter malfunctions following on the INSTRUMENT AIR SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 52

 # 52 ☑ **RO** ☑ **SRO** **Question ID: 29621** **Origin: New** ☐ **Memory Level**

Both SSES Units are at full power with NORMAL Instrument Air loads when the following conditions develop on SSES Unit 2:

- Instrument Air Compressor 2K107A is in LEAD-MANUAL-FULL mode.
- Instrument Air Compressor 2K107B is in STANDBY-AUTO-FULL mode.
- ESS 480V LC 2B210 TROUBLE (AR-016-001, A05) annunciates
- INSTRUMENT AIR PANEL 2C140A,B SYSTEM TROUBLE (AR-224-01, D01) annunciates.
- Instrument Air pressure (PI-22511A on 2C668) is 100 psig and steady.
- Instrument Air Header pressure (PI-22564 on 2C668) is 92 psig and steady.

Which ONE of the following CORRECTLY explains the cause of these indications?

A Instrument Air Compressor 2K107A is running 100% LOADED.
Instrument Air Compressor 2K107B is cycling between 50% and 100% LOADED.
Both Instrument Air Compressors are making up for a small Instrument Air LEAK.

B Instrument Air Compressor 2K107A tripped.
Instrument Air Compressor 2K107B tripped.
Service Air to Instrument Air cross-connect (PCV-22560) is carrying all Instrument Air loads.

C Instrument Air Compressor 2K107A tripped.
Service Air to Instrument Air cross-connect (PCV-22560) is carrying all Instrument Air loads.

D Instrument Air Compressor 2K107A tripped.
Instrument Air Compressor 2K107B assumed the LEAD compressor loading sequence.

Question Number: 52

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: ESS 480 V Trouble alarm tells us that something tripped. Given these conditions, we would expect 2K107B to maintain pressure lower less than the normal value of 100 psig (cycle between 93 and 99 psig).
VALID DISTRACTOR: Accurate description for a leak.

CHOICE (B) - No
WRONG: SA-to-IA begins opening at 95 psig and lowering, full open at 90 psig.
VALID DISTRACTOR: PCV-22560 is meant to carry IA loads.

CHOICE (C) - No
WRONG: Would expect 2K107B to start and assume LEAD role given these conditions.
VALID DISTRACTOR: If 2K107A did not trip, PCV-22560 would open BEFORE 2K107B started in STBY.

CHOICE (A) - YES

References

TM-OP-018
AR-224-D01
AR-016-A05

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Revised stem IRT phone conversation with SSES staff. Still need to consider distracter "A" as potentially correct or too close to call.

1. Gil 09/26/05 - Is 2C668 in the control room?
R: yes. I verified that during the earlier conversation with SSES but will reconfirm during validation.

2. Gil 09/26/05 - Add to stem: "...full power with normal loads on the instrument air system..."
Why is Instrument Air Pressure steady? Should be cycling between 93 and 99 psig (or between 93 and 102 psig if lightly loaded). *Similar comment for Instrument Air Header Pressure.*
R: question originally drafted as Gil suggests. Per phone conversation with SSES Staff, learned that pressure cycling is not apparent on the 2C668 panel.

Will revisit with SSES - try to run on simulator.

Todd 10/05/05 - Backwards logic but acceptable because it is HCL

Rich 10/09/05 - why two IA questions?
R: question 9 asks for power supplies at the HCL. This asks for IA response to tripped lead compressor.

NRC K/A System/E/A

System 30000 Instrument Air System (IAS)
0

Number A4.01 **RO** 2.6 **SRO** 2.7 **CFR Link** (CFR 41.7 / 45.5 to 45.8)

Ability to manually operate and / or monitor Pressure gauges in the control room

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 53

 # 53 ☑ **RO** ☑ **SRO** **Question ID: 29622 Origin: New** ☑ **Memory Level**

Both units are at full power when the following conditions develop on SSES Unit 1:

- RBCCW HEAD TANK HI-LO LEVEL (AR-123-001, E06) annunciates.
- Auxiliary Operators check RBCCW DEMIN WTR SUPPLY ISO 113024 Closed.
- Auxiliary Operators drain the RBCCW Head tank to 5/8 full.

After several hours:

- RBCCW HEAD TANK HI-LO LEVEL (AR-123-001, E06) annunciates.
- All other conditions in the plant are NORMAL.
- The STA reports that RBCCW Head Tank level has been slowly rising since it was drained several hours ago and that all other RBCCW indications are normal.

Per established SSES procedures, the Operating Crew must:

A Swap CRD Pumps and Isolate the previously running CRD Pump.

B Remove the RWCU system from service and Isolate RBCCW to the NRHX.

C Swap RBCCW Heat Exchangers (1E201A/B) and Isolate the previously in-service Heat Exchanger.

D Check RBCCW DEMIN WTR SUPPLY ISO 113024 Closed and drain the RBCCW Head tank to 5/8 full.

Question Number: 53

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: This is a TBCCW load
VALID DISTRACTOR: Might work for high TBCCW Surge Tank.

CHOICE (B) - No
WRONG: This would be correct if higher radiation levels accompanied the high level. However, no radiation present.
VALID DISTRACTOR: correct if higher rad levels evident.

CHOICE (C) - YES

CHOICE (D) - No
WRONG: already did this once.
VALID DISTRACTOR: Per AR-123-001, E06 - time to suspect the RBCCW HX and isolate it.

References

AR-123-E06
ON-114-001

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/26/05 - OK

Rich 10/09/05 - If not immediate action, should we specify procedure?
R: the action required by answer "C" is part of the alarm response and not part of the ON. Given these indications and choices, the successful Applicant should be able to recognize "C" as the only answer that would address these conditions. "A" is obviously wrong because it is NOT a RBCCW load. "B" is wrong because all conditions are otherwise normal which implies no radiation or high temperatures to indicate NRHX leak. "D" has already been done and will not alleviate the continuing rise in level. I did add another bullet to drive the Applicant further away from "D".

Todd 10/17/05 - 2-part K/A at the RO level.

The following SSES Learning Objectives support this question:

10258 Given appropriate alarm response procedures, determine the following for any annunciator associated with the Reactor Building Closed Cooling Water System:
1. Probable cause of the alarm
2. Adverse consequences of continued operation in the alarm state
3. Appropriate course of action

Applicant should be able to reason the correct course of action without the Alarm Response Procedure.

1676 Predict the effect that the following conditions will have on the Reactor Building Closed Cooling Water System:
h. High or low RBCCW Head Tank level

Unable to adequately test both ability to predict and use procedures of this two part K/A. Per authority of NUREG 1021, ES401, Section D.2.a., second paragraph [When selecting or writing questions for K/As that test coupled knowledge or abilities (e.g., the A.2 K/A statements in Tiers 1 and 2 and a number of generic K/A statements, such as 2.4.1, in Tier 3), try to test both aspects of the K/A statement. If that is not possible without expending an inordinate amount of resources, limit the scope of the question to that aspect of the K/A statement requiring the highest cognitive level (e.g., the (b) portion of the A.2 K/A statements) or substitute another randomly selected K/A.], the test question tests the ability to predict the impact of an air dryer malfunction.
18 October 2005.

NRC K/A System/E/A

System 40000 Component Cooling Water System (CCWS)
0

Number A2.02 **RO** 2.8 **SRO** 3.0 **CFR Link** (CFR 41.5 / 45.6)

Ability to (a) predict the impacts of High/low surge tank level on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation

NRC K/A Generic

Question Number: 53

System Number	RO	SRO	CFR Link

Question Number: 54

 # 54 ☑ **RO** ☑ **SRO** **Question ID: 29624** **Origin: New** ☐ **Memory Level**

SSES Unit 1 tripped following a Main Turbine trip. The Reactor Protection System (RPS) has been RESET. However, the following annunciator has not cleared:

- SCRAM DISCHARGE VOLUME NOT DRAINED (AR-103-001, G02)

Which ONE of the following is a cause for this alarm?

A BACKUP SCRAM VALVE (SV-147-110B) remained ENERGIZED when RPS was reset.

B ALTERNATE ROD INSERTION BLOCK VALVE (SV-147-101) remained DEENERGIZED when RPS was reset.

C ALTERNATE ROD INSERTION VENT VALVE (SV-147-099) remained DEENERGIZED when RPS was reset.

D One or more SCRAM PILOT SOLENOID VALVES remained ENERGIZED when RPS was reset.

Question Number: 54

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - YES
The B/U Scram Vvs energize to vent the I/A header and allow the scram valves to reposition.

CHOICE (B) - No
WRONG: ARI Vvs ENERGIZE to cause a scram on ATWS-RPT (L2 or High Pressure) - independent of RPS and would not have actuated on the given scram condition.
VALID DISTRACTOR: These valves would hold the scram valves open if they were energized.

CHOICE (C) - No
WRONG: ARI Vvs ENERGIZE to cause a scram on ATWS-RPT (L2 or High Pressure) - independent of RPS and would not have actuated on the given scram condition.
VALID DISTRACTOR: These valves would hold the scram valves open if they were energized.

CHOICE (D) - No
WRONG: The Scram Pilot Solenoid Valves are normally energized and are DEENERGIZED to cause a scram.
VALID DISTRACTOR: These valves could hold the scram valves open they were deenergized.

NOTE: the SDV is filling from the CRD charging header through the scram valves. The scram valves are held open because SV-147-110B (B/U Scram Valve) is energized (held open by an energized solenoid).

References

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/26/05 - OK

Todd 10/05/05 - delete "The Main Turbine was inadvertently tripped during maintenance on the Electrohydraulic Control System (EHC)." from stem. Backward logic OK because HCL.

Rich 10/09/05 - replace "possible explanation" with "cause".
R: done.

NRC K/A System/E/A

System 20100 Control Rod Drive Hydraulic System
1

Number A3.11 **RO** 3.5 **SRO** 3.5 **CFR Link** (CFR 41.7 / 45.7)

Ability to monitor automatic operations of the CONTROL ROD DRIVE HYDRAULIC SYSTEM including SDV level

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 55

 # 55 ☑ RO ☑ SRO **Question ID:** 29625 **Origin:** Bank ☑ Memory Level

Complete the following statement concerning the ACTIVITY CONTROL CARDS in the Reactor Manual Control System (RMCS).

The cards . . .

A . . . work in conjunction with various Control Rod Block initiating systems to determine when a Control Rod motion block is required.

B . . . control the directional control valves and returns information concerning the present state of the Hydraulic Control Unit (HCU).

C . . . sample all Hydraulic Control Units (HCU) for information concerning the status of all valves and controls.

D . . . compare REQUEST signals to ensure MATCH and supervises MODES of operation.

Question Number: 55

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES
Both references support this.

CHOICE (B) - No
WRONG: The Rod Motion Timer Card does this.
VALID DISTRACTOR: This is part of the Rod Drive Control Cabinet

CHOICE (C) - No
WRONG: The Transponder does this.
VALID DISTRACTOR: This is part of the Rod Drive Control Cabinet

CHOICE (D) - No
WRONG: The Analyzer does this.
VALID DISTRACTOR: This is part of the Rod Drive Control Cabinet

References

SSES Bank
TM-OP-078K
TM-OP-056A

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/26/05 - No references were included to validate the answer as correct. Otherwise looks OK.
R: Low likelihood of error because this is a BANK question.

Todd 10/05/05 - change question to statement.

NRC K/A System/E/A

System 20100 Reactor Manual Control System
2

Number K1.04 **RO** 3.5 **SRO** 3.6 **CFR Link** (CFR 41.2 to 41.9 / 45.7 to 45.8)

Knowledge of the physical connections and/or cause-effect relationships between REACTOR MANUAL CONTROL SYSTEM and the Rod block monitor (Plant-Specific)

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 56

 # 56 ☑ **RO** ☑ **SRO** **Question ID: 29626** **Origin: Mod** ☐ **Memory Level**

The Rod Sequence Control System (RSCS) PREVENTS continuous Control Rod WITHDRAWAL between notches 00 and 12 in which of the following categories:

I. 100% rod density to 75% rod density
II. 75% rod density to 50% rod density
III. 50% rod density to Low Power Set point (LPSP)
IV. LPSP to 100% rated Core Thermal Power (CTP)

A I and II

B II and III

C III and IV

D I and IV

Question Number: 56

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: No rod motion blocks imposed in Category I (100% to 75% rod density)
VALID DISTRACTOR: Rod motion blocks are imposed at N1, N2, N3, N4 in Category II (75% to 50% rod density)

CHOICE (B) - YES
Rod motion blocks are imposed at N1, N2, N3, N4 in Category II (75% to 50% rod density)
Rod motion blocks are imposed at N1 in Category III (50% rod density to LPSP)

CHOICE (C) - No
WRONG: No rod motion blocks imposed in Category IV (LPSP to 100% CTP)
VALID DISTRACTOR: Rod motion blocks are imposed at N1 in Category III (50% rod density to LPSP)

CHOICE (D) - No
WRONG: No rod motion blocks imposed in Category IV (LPSP to 100% CTP)
WRONG: No rod motion blocks imposed in Category I (100% to 75% rod density)
VALID DISTRACTOR: mirror image. Also the correct answer on the BANK question from which this was drawn.

References

Bank question
TM-OP-056Z

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/26/05 - Add to stem: "...WITHDRAWAL between notches 00 and 12..."
R: done.

NRC K/A System/E/A

System 20100 Rod Sequence Control System (Plant Specific)
4
Number A3.05 **RO** 3.5 **SRO** 3.7 **CFR Link** (CFR 41.7 / 45.7)
Ability to monitor automatic operations of the ROD SEQUENCE CONTROL SYSTEM (PLANT SPECIFIC) including:
†Verification of proper function/ operability: BWR-4,5

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 57

 # 57 ☑ **RO** ☑ **SRO** **Question ID:** **29627** **Origin:** **New** ☐ **Memory Level**

SSES Unit 1 is in Mode 5 with the Reactor Mode Switch locked in REFUEL. It is necessary to withdraw one Control Rod to support routine Technical Specification Surveillance requirements.

Which ONE of the following correctly describes operation of the Rod Worth Minimizer for this activity?

A The Rod Worth Minimizer (RWM) is AUTOMATICALLY BYPASSED when the Reactor Mode Switch is NOT in RUN.

B The Rod Worth Minimizer (RWM) is MANUALLY BYPASSED by rotating the RWM Keylock Bypass Switch to BYPASS.

C The Rod Worth Minimzer (RWM) permits withdrawal of a single rod if the Control Room Operator selects "Rod Test" at the RWM Main Display.

D The Rod Worth Minimzer (RWM) permits withdrawal of multiple rods if the Control Room Operator selects "Rod Test" at the RWM Main Display.

Question Number: 57

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: This is NOT an automatic bypass
VALID DISTRACTOR: Applicant could reasonably believe this to be true given that a "Refuel Position One-Rod-Out" interlock exists.

CHOICE (B) - No
WRONG: RWM Keylock Bypass Switch can only be used in the following two instances:
The RWM Bypass Switch can be used by the operator to override active RWM rod blocks during any operating condition. There are administrative controls regarding the use of the RWM Bypass function in NDAP-QA-0338 (Reactivity Management and Control Program), Technical Specifications and Emergency Operating Procedures (EOPs). NDAP-QA-0338 permits bypassing for Special Tests. This is not a Special Test.

During a failure to SCRAM (ATWS) condition, execution of EOPs EO-000-113, "Level/Power Control" in the section for Control Rod Insertion, there is a step requiring this switch to be placed in the bypass position. This is not an EOP directed activity

VALID DISTRACTOR: This would work but is ADMINISTRATIVELY impermissible.

CHOICE (C) - YES
The ROD TEST function allows single rod withdrawal.

CHOICE (D) - No
WRONG: Selecting a second rod with one already withdrawn causes a Select Error, an Insert Block and a Withdraw Block.
VALID DISTRACTOR: this works for one, and only one, control rod under these conditions.

References

TM-OP-031D
TS 3.9.2
OP-131-001
NDAP-QA-0338
SO-156-003
GO-100-006

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/26/05 - K/A mismatch. The question is about system interlocks, not administrative requirements. "A" and "D" look implausible to me. RWM has to work in RUN. Everyone should know only one rod can be withdrawn in REFUEL.
R: need to beef up link to Administrative requirements. Disagree on plausibility of A and D. AUTO bypass is plausible if you understand that the RWM is not the primary means of enforcing the one rod out requirement. D is weaker but permits psychometric balance. Also somewhat plausible if you know that the RWM can be bypassed and that bypassing it allows multiple rods to be moved. Only error is method of bypassing.

Satisfied with "A". Gil is not satisfied that this addresses the "administrative requirements" associated with refueling. However, the K/A requires a nexus between the RWM and refueling administrative requirements. The ROD TEST function is the only nexus I am aware of. Therefore, added second part of question concerning ONE-ROD-OUT Interlock functional test.

09/28/05: SSES is considering how to better include administrative requirements.

Todd 10/05/05 - may not be RO unless L.O. exists to memorize test frequency.
R - deleted second part of question concerning TSS frequency.

Returning to original concept - nexus between RWM and Refueling Admin - this hits it by testing the Applicant's knowledge of the RWM Keylock Bypass Switch. Use of the keylock is ADMINSTRATIVELY prohibited.

NRC K/A System/E/A

System 20100
6

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

Question Number: 57

System 2.2 Equipment Control
Number 2.2.26 **RO** 2.5 **SRO** 3.7 **CFR Link**
Knowledge of refueling administrative requirements.

Question Number: 58

 # 58 ☑ **RO** ☑ **SRO** **Question ID: 29672** **Origin: New** ☑ **Memory Level**

Which ONE of the following correctly describes the operation of Reactor Recirculation System (RRS) valves when starting a Reactor Recirculation Pump (RRP)?

A The RRS Recirculation Pump Trip (RPT) breakers will close if:
- the ASSOCIATED RRP Suction Valve HV-F023A or B is 100% OPEN and
- the ASSOCIATED RRP Discharge Bypass Valve HVF-32A or B is 100% OPEN.
- the ASSOCIATED RRP Discharge Valve HV-F031A or B will OPEN when the RRP reaches rated speed.

B The RRS Motor-Generator Drive Motor breaker will close if:
- the ASSOCIATED RRP Suction Valve HV-F023A or B is 100% OPEN and
- the ASSOCIATED RRP Discharge Valve HV-F031A or B is 100% CLOSED.
- the ASSOCIATED RRP Discharge Valve HV-F031A or B will OPEN when the RRP reaches rated speed.

C The RRS Recirculation Pump Trip (RPT) breakers will close if:
- the ASSOCIATED RRP Suction Valve HV-F023A or B is 100% OPEN and
- the ASSOCIATED RRP Discharge Valve HV-F031A or B is 100% CLOSED and
- the ASSOCIATED RRP Discharge Bypass Valve HVF-32A or B is 100% OPEN.

D The RRS Motor-Generator Drive Motor breaker will close if:
- the ASSOCIATED RRP Suction Valve HV-F023A or B is 100% OPEN and
- the ASSOCIATED RRP Discharge Valve HV-F031A or B is 100% CLOSED and
- the ASSOCIATED RRP Discharge Bypass Valve HVF-32A or B is 100% OPEN.

Question Number: 58

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: The RPT breakers are not affected. The discharge valve does not AUTO open.
VALID DISTRACTOR: mirror image

CHOICE (B) - No
WRONG: The discharge valve does not AUTO open.
VALID DISTRACTOR: Applicant may misunderstand the start circuit or system configuration. Some CW pumps operate in this manner.

CHOICE (C) - No
WRONG: The RPT breakers are not affected.
VALID DISTRACTOR: Applicant may misunderstand purpose of the RPT breakers.

CHOICE (D) - YES

References

TM-OP-064C

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/26/05 - OK.

Todd 10/05/05 - focus is on Pumps, not valves. Explained operating and accepted but need to fix distracters. Difference is ONLY "and" v. "or". Therefore, amended "A" and "B" to both improve focus on valves and make sharper distinctions between the distracters. Saved original as 581.

NRC K/A System/E/A

System 20200 Recirculation System 1

Number A4.02 **RO** 3.5 **SRO** 3.4 **CFR Link** (CFR 41.7 / 45.5 to 45.8)

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

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 59

 # 59 ☑ RO ☑ SRO **Question ID:** 29703 **Origin:** Mod ☐ Memory Level

SSES Unit 2 is operating at 49% reactor power on a SINGLE Recirculation Loop with the following conditions:

- Reactor Recirculation Pump (RRP) "B" is secured.
- Reactor Recirculation Pump (RRP) speed is 80%.
- Rods are withdrawn to 80% (80% Rod Line).

The SCOOP TUBE of RRP "A" fails and repositions itself to the LOWER ELECTRICAL STOP.

Which ONE of the following correctly describes:
(1) the expected change in core flow and
(2) Operator actions required to mitigate this event?

A (1) Core Flow will INCREASE and
(2) Lower RRP Speed to 80% or be in Mode 3 within 12 hours.

B (1) Core Flow will DECREASE and
(2) Raise RRP Speed or Insert Control Rods to Exit Stability Region II

C (1) Core Flow will INCREASE and
(2) Lower RRP Speed to 80% or enter Technical Specification 3.0.3 immediately.

D (1) Core Flow will DECREASE and
(2) Reduce RRP Speed or Withdraw Control Rods to Exit Stability Region II

Question Number: 59

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☑

Justification

CHOICE (A) - No
WRONG: Flow will decrease.
VALID DISTRACTOR: If Applicant believes speed increases, there is a TS limit on how the speed.

CHOICE (B) - YES

CHOICE (C - No
WRONG: Flow decreases.
VALID DISTRACTOR: Applicant may go to 3.0.3 if speed can't be reduced.

CHOICE (D - No
WRONG: further speed reduction or rod withdrawal pushes plant into Region I - worsens the situation
VALID DISTRACTOR: mirror imaging.

References

Dresden 2 exam of February 2001
NDAP-QA-0338
TM-OP-084A & C
TS 3.4.1
GO-200-009

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Applicant must have NDAP-QA-0338 or other source of Power-to-Flow map.

NRC K/A System/E/A

System 20200 Recirculation Flow Control System
2

Number K3.01 **RO** 3.5 **SRO** 3.5 **CFR Link** (CFR 41.7 / 45.4)

Knowledge of the effect that a loss or malfunction of the RECIRCULATION FLOW CONTROL SYSTEM will have on Core flow

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 60

 # 60 ☑ **RO** ☑ **SRO** **Question ID: 29630** **Origin: Mod** ☑ **Memory Level**

Both SSES Units are operating at full power. SSES Unit 1 loses Reactor Building Closed Cooling Water (RBCCW) when the in-service heat exchanger fouls. Without Operator action (e.g., the standby heat exchanger is NOT placed in service) which ONE of the following will occur next?

A INSTRUMENT AIR PANEL 1C140 A, B SYSTEM TROUBLE (AR-124-001, D01)

B CONTAINMENT DRWL CLG LOOP B HI TEMP (AR-112-001, E03) will annunciate.

C RWCU FILTER INLET HI TEMP ISO (AR-101-001, A01) will annunciate.

D CRD PUMP A TRIP (AR-107-001, D01).

Question Number: 60

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: IA Compressors are TBCCW load
VALID DISTRACTOR: Potential alarm on loss of TBCCW

CHOICE (B) - No, set point is 150 deg F.
WRONG: RWCU NRHX is RBCCW's largest heat load, comprising 80% of the system load.
VALID DISTRACTOR: RBCCW is backup to RB Chilled Water system. RB Chilled Water cools the Drywell Coolers.

CHOICE (C) - YES. Set point is 145 deg F.

CHOICE (D) - No.
WRONG: CRD Pp Brg and Gear Oil cooler are TBCCW loads
VALID DISTRACTOR: could occur on loss of TBCCW.

References

TM-OP-014
ON-114-001
Alarm Responses

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

1. Gil 09/26/05 - Is this a loss of RBCCW flow or a rise in RBCCW temperature due to loss of SW flow? If the RBCCW flow is normal albeit with elevated temperature it may be possible that "A" or "B" could occur first. Depends on the alarm/trip set points for each.
R: neither. It's a rise in RBCCW temperature caused by fouling in the heat exchanger. If inaccurate, will change to loss of RBCCW flow.

09/28/05 phone conversation with SSES => better use distracters that are NOT RBCCW loads to be certain that the distracters are absolutely wrong.

2. Todd 10/05/05 - editorial changes to stem.

3. Rich 10/09/05 - careful with need to check answer out on simulator.
R: no longer necessary because all wrong distracters were replaced with impossible answers. (2 TBCCW loads and 1 Chilled Water load).

Gil's concern no longer at issue because of changes above.

NRC K/A System/E/A

System 20400 Reactor Water Cleanup System
0

Number K6.01 **RO** 3.1 **SRO** 3.3 **CFR Link** (CFR 41.7 / 45.7)

Knowledge of the effect that a loss or malfunction of Component cooling water systems will have on the REACTOR WATER CLEANUP SYSTEM

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 61

 # 61 ☑ **RO** ☑ **SRO** **Question ID:** **29631** **Origin:** **New** ☐ **Memory Level**

Both units are at full power when SSES Unit 2 receives the following alarm:

- CRD PANEL 2C007 HI TEMP (AR-103-001, H05).

On panel 1C601, you observe the following:

- COOLING WATER HEADER FLOW (FI-C12-2R605) reads 63 gpm.
- RPV-CRD DRIVE WATER DIFF (PDI-C12-2R602) reads 250 psi.

Which ONE of the following caused the alarm?

A Cooling Orifices of the affected CRD are too large.

B The Scram Outlet Valve of the affected CRD has an internal leak.

C CRD pressure is too low.

D CRD Cooling Water Header Flow is too low.

Question Number: 61

Answers: A ☐ B ☑ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: this would keep the CRD cooler, not hotter.
VALID DISTRACTOR: clogged orifices could cause this alarm

CHOICE (B) - YES

CHOICE (C) - No
WRONG: The Stem gives CRD pressure at the normal value.
VALID DISTRACTOR: low pressure could cause low flow rate and a hotter CRD

CHOICE (D) - No
WRONG: the stem gives CRD header flow rate at the normal value.
VALID DISTRACTOR: low flow rate could cause a hotter CRD.

References

AR-103-H05
TM-OP-055B

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

1. Gil 09/26/05 - what is the K/A description? Need K/A statement otherwise looks OK.
R: added K/A (corrected system number)

2. Rich 10/06/05 - delete "could have". Backward logic at Memory Level.
R: deleted. Not really memory level - need to understand internal flow path of the CRD cooling water, that the indications given are normal and figure that larger orifices would pass more flow, causing cooler conditions.

NRC K/A System/E/A

System 21400 Rod Position Information System
0

Number K4.02 **RO** 2.5 **SRO** 2.5 **CFR Link** (CFR 41.7)

Knowledge of ROD POSITION INFORMATION SYSTEM design feature(s) and/or interlocks which provide for the following: *Thermocouple*

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 62

 # 62 ☑ RO ☑ SRO **Question ID:** 29704 **Origin:** New ☐ Memory Level

SSES Unit 1 is at full rated power with all Systems, Structures and Components operable and in their normal configurations.

SSES Unit 2 is at full rated power with Residual Heat Removal (RHR) loop "B" isolated and drained for planned maintenance.

It becomes necessary to shutdown and cooldown both units to Mode 4.

Which ONE of the following correctly describes the status of RHR pumps?

A SSES Unit 1: All RHR Pumps are available.
SSES Unit 2: Only RHR Pumps "A" and "C" are available.
Only ONE RHR pump may be run on a buss to limit buss loading.

B SSES Unit 1: All RHR Pumps are available.
SSES Unit 2: Only RHR Pumps "A" and "C" are available.
All available RHR pumps may be run because off-site power is available.

C SSES Unit 1: RHR Pump "B" is available.
SSES Unit 2: RHR Pump "C" is available.
RHR Pump "A" may run on ONE unit ONLY to limit buss loading.
RHR Pump "D" is NOT available on either unit.

D SSES Unit 1: Only RHR Pumps "A", "B" and "C" are available.
SSES Unit 2: Only RHR Pumps "A" and "C" are available.
RHR Pump "D" is NOT available on either unit.

Question Number: 62

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES

CHOICE (B) - No
WRONG: Interlocked to prevent running more than one per buss at any time.
VALID DISTRACTOR: Applicant may confuse buss loading with EDG power limits.

CHOICE (C) - No
WRONG: All unit 1 pumps are available.
VALID DISTRACTOR: Confuses preferred arrangement for simultaneous LOCA with the given conditions.

CHOICE (D) - No
WRONG: All unit 1 pumps are available.
VALID DISTRACTOR: Confuses preferred arrangement for simultaneous LOCA with the given conditions.

References

TM-OP-049

Comments and Question Modification History

☑ CXJ ☑ THF ☑ RJC ☐ SSES

NRC K/A System/E/A

System 21900 RHR/LPCI: Torus/Suppression Pool Cooling Mode 0

Number K2.02 **RO** 3.1 **SRO** 3.3 **CFR Link** (CFR 41.7)

Knowledge of electrical power supplies to the following: Pumps

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 63

 # 63 ☑ RO ☑ SRO **Question ID:** 29633 **Origin:** New ☐ Memory Level

SSES Unit 1 has recently completed a routine Technical Specification Surveillance of the High Pressure Coolant Injection (HPCI) system. Residual Heat Removal (RHR) loop "B" is in the Suppression Pool Cooling (SPC) and Suppression Pool Spray (SPS) mode. A small steam leak develops on SSES Unit 1 and raises Drywell Pressure to 1.5 psig. At the Unit Supervisor's direction, the Operating Crew manually initiates Divisions I and II LOCA signals.

(1) What effect does this have on SSES Unit 1 RHR system?

Subsequently, the leak worsens and Reactor Pressure Vessel level lowers and stabilizes at -140 inches.

(2) What must the Operating Staff do to initiate Drywell Spray?

A (1) RHR Loop "A" starts in the LPCI mode. RHR Loop "B" automatically reconfigures to the SPS mode ONLY.
(2) Depress the RHR LOOP B INIT SIG RESET PUSHBUTON (HS-151-1S56A/B) and manually reconfigure the selected RHR loop.

B (1) RHR Loop "A" starts in the LPCI mode. RHR Loop "B" automatically reconfigures to the LPCI mode.
(2) Place LOCA ISOLATION MANUAL OVERRIDE (HS-E11-1S17B) to OVERRIDE and manually reconfigure the selected RHR loop.

C (1) RHR Loop "A" starts in the LPCI mode. RHR Loop "B" automatically reconfigures to the SPS mode ONLY.
(2) Place LOCA ISOLATION MANUAL OVERRIDE (HS-E11-1S17B) to OVERRIDE and manually reconfigure the selected RHR loop.

D (1) RHR Loop "A" starts in the LPCI mode. RHR Loop "B" automatically reconfigures to the LPCI mode.
(2) Depress the RHR LOOP B INIT SIG RESET PUSHBUTON (HS-151-1S56A/B) and manually reconfigure the selected RHR loop.

Question Number: 63

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: This switch will NOT clear the LOCA signal because the low level is still present (below -129)
VALID DISTRACTOR: mirror imaging.

CHOICE (B) - YES

CHOICE (C) - No
WRONG: RHR Loop "B" auto reconfigs to LPCI.
VALID DISTRACTOR: correct switch.

CHOICE (D) - No
WRONG: This switch will NOT clear the LOCA signal because the low level is still present (below -129)
VALID DISTRACTOR: correct effect on RHR.

References

TM-OP-049
OP-149-004

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

1. Gil 09/26/05 - what is TAF (-XXX")? "C" not plausible at -140". There may, also be a cue from another question to help answer this.
R: 366.3 inches from bottom of RPV. Instrument zero is 527.5 inches. 527.5 minus 366.3 yields 161.2 inches. Therefore, TAF is ~ -161. Don't know what other question is cuing the Applicant.
Unclear why "C" is implausible.

Changed A & C to auto reconfigure to SPS only to improve plausibility.

The following Lesson Objectives support this question:

181 Describe the following Residual Heat Removal System design features and interlocks, including initiating signals, setpoints, automatic actions, and control logic, as applicable:
a. Automatic LPCI initiation/injection
v. Suppression Pool cooling
w. SDC actions on LPCI initiation

10495 Predict the Residual Heat Removal System response to manipulation of the following controls:
d. LOCA isolation manual override switches

Unable to adequately test both ability to predict and use procedures of this two part K/A. Per authority of NUREG 1021, ES401, Section D.2.a., second paragraph [When selecting or writing questions for K/As that test coupled knowledge or abilities (e.g., the A.2 K/A statements in Tiers 1 and 2 and a number of generic K/A statements, such as 2.4.1, in Tier 3), try to test both aspects of the K/A statement. If that is not possible without expending an inordinate amount of resources, limit the scope of the question to that aspect of the K/A statement requiring the highest cognitive level (e.g., the (b) portion of the A.2 K/A statements) or substitute another randomly selected K/A.], the test question tests the ability to predict the impact of an air dryer malfunction.

NRC K/A System/E/A

System 22600 RHR/LPCI: Containment Spray System Mode 1

Number A2.03 **RO** 3.1 **SRO** 3.1 **CFR Link** (CFR 41.5 / 45.6)

Ability to (a) predict the impacts of the following on the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Valve closures

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 64

 # 64 ☑ RO ☑ SRO **Question ID: 29634 Origin: Mod** ☐ Memory Level

SSES Unit 2 is at 70% power when ONE string of Feedwater Heating is taken out of service per OP-247-001, FEEDWATER HEATERS, for emergent maintenance.

Which ONE of the following correctly describes effect on:
(1) CORE POWER and
(2) PLANT POWER LIMITS?

A (1) Core Power RISES because Feedwater temperature lowers.
(2) Plant power is limited to 90% by FEEDWATER Flow capability.

B (1) Core Power LOWERS because Feedwater temperature rises.
(2) Plant power is limited to 90% by FEEDWATER Flow capability.

C (1) Core Power LOWERS because Feedwater temperature rises.
(2) Plant power is limited to 75% by Feedwater DRAIN Flow capability.

D (1) Core Power RISES because Feedwater temperature lowers.
(2) Plant power is limited to 75% by Feedwater DRAIN Flow capability.

Question Number: 64

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: Limit is based on Drain capacity.
VALID DISTRACTOR: Core power is greater because subcooling increases. FW flow is limited to 91.4%.

CHOICE (B) - No
WRONG: Plant power limit is 75% and limited by FW Drains, not FW itself. Per TM-OP-047, FW flow rate with one Heater string isolated is 91.4% of "uprate design feedwater flow".
VALID DISTRACTOR: mirror imaging. FW flow is limited to 91.4%.

CHOICE (C) - No
WRONG: Core Power rises.
VALID DISTRACTOR: correct power limit.

CHOICE (D) - YES

References

Clinton 1 exam of July 2001
ON-147-001, 002

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/28/05: Add to stem: "...effect on and reason for..."

Have SSES run this on the simulator to ensure no automatic actions occur (runback, etc.)

SQ 11/04/05 - added reference to OP-247-001 to eliminate potential for automatic actions. SSES will try to run this on the Simulator.

NRC K/A System/E/A

System 23900 Main and Reheat Steam System 1
Number A1.10 **RO** 3.8 **SRO** 3.8 **CFR Link** (CFR 41.5 / 45.5)
Ability to predict and/or monitor changes in parameters associated with operating the MAIN AND REHEAT STEAM SYSTEM controls including Reactor power

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 65

 # 65 ☑ RO ☑ SRO **Question ID:** 29673 **Origin:** Mod ☑ Memory Level

In response to a HIGH RADIATION signal at the outside air intake, the Access Control and Laboratory area supply fans __(1)__ and the Outside Air Inlet Dampers 02A and 02B __(2)__.

A (1) Automatically START
(2) Automatically CLOSE

B (1) Automatically START
(2) Remain OPEN

C (1) Automatically TRIP
(2) Automatically CLOSE

D (1) Automatically TRIP
(2) Remain OPEN.

Question Number: 65

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☐

Justification

SSES BANK QUESTION.

TM-OP-030

See justification from 651.

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/28/05: The correct answer ("A") is implausible. There is NO connection with SGTS. Makes the question LOD=1. Recommend replacing "A" with "Access control and lab area supply fan auto starts". Per reference the fan will trip, not auto start.

R: done. other stem changes to support the new answer.

Todd 10/05/05 - complete revision to restate the question. Saved original as 651.

NRC K/A System/E/A

System 28800 Plant Ventilation Systems
0

Number K5.01 **RO** 3.1 **SRO** **CFR Link**

Knowledge of the operational implications of the following concepts they apply to PLANT VENTILATION SYSTEMS: Airborne contamination control.

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 66

 # 66 ☑ **RO** ☑ **SRO** **Question ID: 29643** **Origin: New** ☑ **Memory Level**

You are preparing to conduct a Technical Specification Surveillance and retrieve a Controlled Copy of the applicable Plant Procedure from the Document Control System (DCS). You notice that three PCAFs are attached to the Plant Procedure.

Per NDAP-QA-0002, PROCEDURE PROGRAM AND PROCEDURE CHANGE PROCESS, you must:

A Print and use the Plant Procedure. DCS automatically inserts the attached PCAFs.

B Print and use the Plant Procedure. It is NOT necessary to incorporate the PCAFs.

C Print both the PCAFs and the Plant Procedure. Page insert the PCAFs before procedure use. Unit Supervisor authorization is NOT required before using the procedure with PCAFs inserted.

D Print both the PCAFs and the Plant Procedure. Page insert the PCAFs before procedure use. Unit Supervisor authorization IS REQUIRED before using the procedure with PCAFs inserted.

Question Number: 66

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: DCS does NOT insert PCAFs
VALID DISTRACTOR: Applicant could believe that attached PCAFs are automatically inserted.

CHOICE (B) - No
WRONG: PCAFs must be inserted
VALID DISTRACTOR: Applicant could believe that PCAFs are not substantive changes requiring inclusion.

CHOICE (C) - YES

CHOICE (D) - No
WRONG: PCAFs must be included.
VALID DISTRACTOR: Applicant could believe that US can authorize use.

References

NDAP-QA-002, Section 6.12.2.a.(5)

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

PCAF used to be the SSES acronym for "Procedure Change Authorization Form". The PCAF no longer exists at SSES procedure control process. However, the acronym lives on as part of institutional knowledge. Therefore, PCAF is not defined in the question.

Gil 09/28/05: Change distracter "D" "Obtain Unit Supervisor authorization before using the PCAF's". This will make the distracter more plausible and balance with other distracters.
R: done.

Todd 10/05/05 - changed distracter "D" to more closely mirror answer "C". Added statement concerning US authorization wrt PCAFs.

NRC K/A System/E/A

System Number | **RO** | **SRO** | **CFR Link**

NRC K/A Generic

System 2.1 Conduct of Operations

Number 2.1.21 **RO** 3.1 **SRO** 3.2 **CFR Link** (CFR: 45.10 / 45.13)
Ability to obtain and verify controlled procedure copy.

Question Number: 67

 # 67 ☑ **RO** ☑ **SRO** **Question ID: 29636** **Origin: Bank** ☑ **Memory Level**

ON-164-003, REACTOR RECIRCULATION PUMP DUAL SEAL FAILURE, directs closing of RRP suction valve HV-143-F023A/B BEFORE closing the RRP discharge valve HV-143-F031A/B because it ensures . . .

A Reactor Water Cleanup (RWCU) suction will limit the leak rate to containment to less than 420 gpm.

B RRP suction valve will close without exceeding its design limit of 50 psid.

C nominal 500 psid across the Lower #1 Seal will NOT be exceeded.

D RRP Discharge valve HV-143-F031A/B will close with additive force.

Question Number: 67

Answers: A ☐ B ☑ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: No such limit
VALID DISTRACTOR: RWCU does take suction from the RRP suction line.

CHOICE (B) - YES

CHOICE (C) - No
WRONG: If at full power, d/p is 500 psi
VALID DISTRACTOR: Applicant may believe that the suction is at lower pressure

CHOICE (D) - No
WRONG: discharge pressure of unaffected RRP does NOT affect closing force of affected discharge valve.
VALID DISTRACTOR: Applicant may believe that discharge of unaffected loop assists closure in this condition.

References

ON-164-003
TM-OP-030

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/28/05: Confirm the RWCU suction is between the RRP suction valve and the pump. Otherwise this distracter is implausible.
R: per SSES Dwgs M-143 and 144, the suction is between the RRP and its associated suction valve.

Todd 10/05/05 - deleted "Following a Reactor Recirculation Pump (RRP) dual seal failure," from the stem.

NRC K/A System/E/A

System Number		RO	SRO	CFR Link

NRC K/A Generic

System 2.1 Conduct of Operations
Number 2.1.32 **RO** 3.4 **SRO** 3.8 **CFR Link** (CFR: 41.10 / 43.2 / 45.12)
Ability to explain and apply all system limits and precautions

Question Number: 68

 # 68 ☑ **RO** ☑ **SRO** **Question ID: 29710** **Origin: New** ☐ **Memory Level**

Which ONE of the following activities would REQUIRE implementation of the Temporary Modification process per NDAP-QA-1218?

A Installation of a GAGGING DEVICE on an Air Operated Valve which normally FAILS OPEN.

B Place Diesel Engine Driven Fire Pump (0P511) in "MAN A" because it starts intermittently when no automatic start is required. Engineering and Maintenance have determined that the inadvertent starts will NOT occur while 0P511 is in manual.

C Install tygon tubing to drain piping downstream of a leaking Fire Service deluge valve. This is necessary to prevent inadvertent actuation of the deluge valve until permanent repairs can be made.

D Replace component labels on the Residual Heat Removal system.

Question Number: 68

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: NDAP-QA-0323 controls this.

CHOICE (B) - No
WRONG:
VALID DISTRACTOR:

CHOICE (C) - YES

CHOICE (D) - No
WRONG: per SSES, this would not require a T.mod.

References

NDAP-QA-1218
TM-OP-013

Comments and Question Modification History

☐ GXJ ☐ THF ☐ RJC ☐ SSES

Need SSES to closely study distracters to ensure they are NOT potentially correct.

Need input on whether to provide copies of each of these NDAP procedures as references.

Gil 09/28/05: Confirm "Standard Blocking Practices" includes the use of yellow tags, otherwise pick a procedure that is closer to using temporary changes/modifications. Also consider that the use of yellow tags may be required for this situation and makes "B" another correct answer.

Availability of these procedures should NOT be necessary. It should be fair game that the applicant's know which procedure to go to. On second thought this may make the question SRO only.

R: will query SSES on this

Todd 10/05/05 - agree that this may be SRO level question. Check with SSES to determine if it is fair for an RO.

SQ 11/04/05 - SSES agrees that this is SRO level only and, more importantly, considers all four answers correct to some degree. Suggests revising to "Which of the following would require implementation of the Temporary Modification process?".
R - Saved original question as 681.

NRC K/A System/E/A

System Number | **RO** | **SRO** | **CFR Link**

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.11 **RO** 2.5 **SRO** 3.4* **CFR Link** (CFR: 41.10 / 43.3 / 45.13)
Knowledge of the process for controlling temporary changes.

Question Number: 69

 # 69 ☑ **RO** ☑ **SRO** **Question ID: 29638** **Origin: Bank** ☑ **Memory Level**

To maintain fuel integrity and the capability to properly blow down and re-flood the reactor following a design basis loss of coolant accident (DB LOCA):

A All low pressure ECCS must be AVAILABLE.

B Operation within permissible areas of the Power-to-Flow map must be MAINTAINED.

C Reactor Recirculation Pump (RRP) speeds must be MATCHED.

D All Jet Pumps must be OPERABLE.

Question Number: 69

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: Must have the refloodable volume intact
VALID DISTRACTOR: Do need LP ECCS systems to blowdown and reflood.

CHOICE (B) - No
WRONG: has not effect on B/D or Reflood.
VALID DISTRACTOR: Applicant could mistakenly believe that N-F is based on LOCA

CHOICE (C) - No
WRONG: RRP has no impact (suction valves close anyway).
VALID DISTRACTOR: Applicant could believe that loop d/p affects blowdown or reflood.

CHOICE (D) - YES

References

SSES Bank

SSES TS Basis.

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/28/05: Looks like an SRO only question. Otherwise OK.
R: SSES recommended this from their BANK specifically for the RO exam.

Todd 10/05/05 - agree; too close to TS/FSAR basis Q. Not for RO exam. Check with SSES.

NRC K/A System/E/A

System Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.25 **RO** 2.5 **SRO** 3.7 **CFR Link** (CFR: 43.2)
Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.

Question Number: 70

 # 70 ☑ RO ☑ SRO **Question ID:** 29705 **Origin:** Bank ☑ Memory Level

SSES Unit 1 refueling operations are in progress with the reactor vessel head removed and a partial load of fuel is in the vessel. Shutdown margin check has been performed.

Which ONE of the following is a CORE ALTERATION?

A Install a control rod blade into an empty cell.

B Perform a friction test on a control rod in a loaded cell.

C Drive a Source Range Monitor detector to full in.

D Insert the LPRM Instrument Handling Tool below the top guide.

Question Number: 70

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: Conrol Rod movement with no fuel is a specified exception
VALID DISTRACTOR: control rods are a normal reactivity adjustment.

CHOICE (B) - YES

CHOICE (C) - No
WRONG: SRM motion is a specified exception.
VALID DISTRACTOR: SRM monitoring required in this mode.

CHOICE (D) - No
WRONG: LPRM is a specified exception.
VALID DISTRACTOR: Applicant could misunderstand use of LPRMs.

References

Cooper Exam of June 2003
TS 1.1 Definitions.

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Original rejected as K/A mismatch.

NRC K/A System/E/A

System Number | **RO** | **SRO** | **CFR Link**

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.27 **RO** 2.6 **SRO** 3.5 **CFR Link** (CFR: 43.6 / 45.13)

Knowledge of the refueling process.

Question Number: 71

 # 71 ☑ RO ☑ SRO **Question ID:** 29706 **Origin:** Mod ☐ Memory Level

Under which ONE of the following circumstances may a VERIFICATION requirement be OMITTED?

A Application of Blocking Tags on the Backup Diesel Fire Pump.

B Independent Verification of a Reactor Water Cleanup (RWCU) system lineup that requires at least 14 mrem of exposure.

C Clearing a Blocking Tag from a Normally LOCKED CLOSED River Water Makeup System (RWMU) valve.

D Clearing a Blocking Tag from a Normally THROTTLED Control Rod Hydraulics (CRD) valve in the Reactor Building.

Question Number: 71

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: OP-AD-002, Section 7.3.1.a - application of Blocking on any SSC requires CV
VALID DISTRACTOR: not a Safety Related system and no ALARA concern.

CHOICE (B) - YES

CHOICE (C) - No
WRONG: OP-AD-002, Section 7.3.1.c - IV required when clearing Blocking from locked component
VALID DISTRACTOR: not a Safety Related system and no ALARA concern.

CHOICE (D) - No
WRONG: OP-AD-002, Section 7.3.5.a.(1) - CV required when IV would nullify first positioning.
VALID DISTRACTOR: safety related but CV required in lieu of IV.

References

Modifed from River Bend February 2003 Exam
OP-AD-002

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

original number 70 rejected as too simple. Saved as 711

NRC K/A System/E/A

System Number | **RO** | **SRO** | **CFR Link**

NRC K/A Generic

System 2.3 Radiation Control
Number 2.3.1 **RO** 2.6 **SRO** 3.0 **CFR Link** (CFR: 41.12 / 43.4. 45.9 / 45.10)
Knowledge of 10 CFR: 20 and related facility radiation control requirements.

Question Number: 72

 # 72 ☑ RO ☑ SRO **Question ID: 29641 Origin: Bank** ☐ **Memory Level**

A job must be completed in a room in the plant. The value for the general radiation levels if NO shielding is installed, and the value for the work area if shielding is installed is listed below:

- Unshielded general radiation field: 100 millirem per hour (0.1 R/hr)
- Shielded general radiation field: 10 millirem per hour (0.02 R/hr)

Which ONE of the following methods of performing the job will result in the radiation exposures as low as reasonably achievable (ALARA)?

A One person does the job without shielding in 2.5 hours.

B Two people do the job without shielding in 1.5 hours.

C One person installs shielding in 1 hour. Then a second person does the job in 2.5 hours.

D Two people install shielding in 45 minutes. Then another two people do the job in 1.5 hours.

Question Number: 72

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

Total exposure is calculated by multiplying the time by the number of people by the dose rate. For the correct answer, the total exposure is 100 mR/hr times 1 hour to install shielding plus 10 mR/hr times 2.5 hours to do the job for a total of 125 mR. The Applicant must select the answer that yields the lowest total cumulative dose for the job.

CHOICE (A) - No
VALID DISTRACTOR: Total dose is 250 mR.

CHOICE (B) - No
VALID DISTRACTOR: Total dose is 150 mR.

CHOICE (C) - YES, total dose is 125 mR.

CHOICE (D) - No
VALID DISTRACTOR: Total dose is 180 mR.

References

SSES Bank
NDAP-QA-0625

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/28/05: Question OK. Add to justification: "...that yields the lowest total ..."

Todd 10/05/05 - delete conversion of hours to hours, minutes.

Rich 10/19/05 - acceptable if 71 changed.
R - 71 changed.

NRC K/A System/E/A

System Number		RO	SRO	CFR Link

NRC K/A Generic

System 2.3 Radiation Control
Number 2.3.2 **RO** 2.5 **SRO** 2.9 **CFR Link** (CFR: 41.12 / 43.4. 45.9 / 45.10)
Knowledge of facility ALARA program.

Question Number: 73

 # 73 ☑ RO ☑ SRO **Question ID:** 29642 **Origin:** Bank ☐ Memory Level

A rapid loss of condenser vacuum from 100% power has resulted in the following plant conditions:

- Reactor power is 25%.
- Standby Liquid Control (SBLC) is injecting.
- Main Steam Isolation Valves (MSIVs) are closed.
- Reactor Pressure Vessel (RPV) Pressure is being controlled between 800 to 1,000 psig with Safety Relief Valves (SRVs).
- High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) are NOT available.
- RPV level is -165 inches and can NOT be restored nor maintained above -161 inches.

Which ONE of the following actions are required?

A Stop injection from all sources EXCEPT Control Rod Drive (CRD) and SBLC and perform a rapid depressurization.

B Stop all injection and continue steam cooling until RPV water level reaches -205 inches.

C Open SRVs to lower pressure to 600 psig and maximize injection with Table 15 systems.

D Stop injection from all Table 15 systems and perform a rapid depressurization.

Question Number: 73

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☑

Justification

CHOICE (A) - YES, LQ/L-14

CHOICE (B) - No
WRONG: Steam cooling is not called for by the EOPs
VALID DISTRACTOR: Stopping injection is called for.

CHOICE (C) - No
WRONG: Maximizing injection is not called for by the EOPs
VALID DISTRACTOR: Opening SRVs to Depress is called for.

CHOICE (D) - No
WRONG: Table 15 includes CRD and SBLC flow.
VALID DISTRACTOR: Stopping injection and Depress is called for.

References

SSES Bank.
EO-100-112, 113

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/28/05: Looks like a direct lookup to the ATWS EOP with the current stem. Suggest modifying the stem to: "...condenser vacuum from 100% power has resulted..." In this case the applicants have to derive from stem conditions that an ATWS has occurred and go to the right procedure. Takes the DLO part out.
R: done

Todd 10/05/05 - what references? chance of direct look-up?
R: No, Applicant must determine from the given conditions that an ATWS occurred.

Todd 10/05/05 - why fair game for RO? check with SQ.
R: o.k.

SQ 11/04/05 - SSES staff belive it is fair to ask this of an RO but will inquire further before rendering final opinion.

NRC K/A System/E/A

System Number		RO	SRO	CFR Link

NRC K/A Generic

System 2.4 Emergency Procedures /Plan

Number 2.4.6 **RO** 3.1 **SRO** 4.0 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)

Knowledge symptom based EOP mitigation strategies.

Question Number: 74

 # 74 ☑ **RO** ☑ **SRO** **Question ID: 29644 Origin: Mod** ☐ **Memory Level**

SSES Unit 2 has the following conditions:

- A Reactor Scram condition is present.
- 24 Control Rods are at Position 04.
- All other Control Rods are at Position 00.
- Reactor Pressure Vessel level is stable at +35 inches.
- IRMs are not yet fully inserted.

What is the status of the Reactor?

A The Reactor IS shutdown and WILL remain shutdown under ALL conditions without Boron.

B The Reactor IS shutdown but will NOT remain shutdown under ALL conditions without Boron.

C The Reactor IS shutdown but MAY NOT remain shutdown (indeterminate). Need input from Reactor Engineering.

D The Reactor is NOT shutdown and will NOT remain shutdown under ALL conditions without Boron.

Question Number: 74

Answers: A ☐ B ☐ C ☐ D ☑ References Provided to Applicant: ☐

Justification

Per EO-000-113, LQ-2, the Reactor is shutdown and expected to remain shutdown under all conditions without Boron if no more than one rod position is greater than 00. Alternatively, with more than one rod above position 00, the Reactor is shutdown and expected to remain shutdown under all conditions without Boron if all Control Rods are inserted to the Maximum Subcritical Banked Withdrawal Position (MSBWP). For SSES Unit 2, the MSBWP is 02.

CHOICE (A) - No
WRONG: SSES Unit 2 MSBWP is 02. Here, 24 rods are at position 04.
VALID DISTRACTOR: Applicant could erroneously apply Unit 1 data to Unit 2. Good question on unit differences.

CHOICE (B) - No
WRONG: the Reactor can NOT be deemed shutdown under all conditions . . .
VALID DISTRACTOR: Applicant could erroneously believe that the Reactor is S/D but not assured to remain shutdown under all conditions . . .

CHOICE (C) - No
WRONG: the reactor can NOT be deemed to be SHUTDOWN.
VALID DISTRACTOR: Applicant could erroneously believe that the Reactor will remain S/D even though it's not currently declared S/D with more than rod above 00.

CHOICE (D) - YES

References

Limerick Unit 1 exam of October 2002, (Question ID 24312)
EO-000-113, LQ-2

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/28/05: Distracter "C" is implausible NO not shutdown and Yes it will remain shutdown. Change part (2) to "Indeterminate. Need input from Reactor Engineering"
R: done.

Todd 10/05/05 - changed question call and choices from (1)-(2) selection to single bullet/sentence.

Harry 10/05/05 - changed distracter "C" from implausible "NOT S/D and INDETERMINANT" to more plausible "IS S/D but future status is INDETERMINANT".

SQ 11/04/05 - SSES does not like this question. Concern is that distracter "C" is not clearly wrong because all Operators are taught that S/D requires all but the most reactive rod fully inserted. Unable to reach resolution.

NRC K/A System/E/A

System Number	RO	SRO	CFR Link

NRC K/A Generic

System 2.4 Emergency Procedures /Plan

Number 2.4.17 **RO** 3.1 **SRO** 3.8 **CFR Link** (CFR: 41.10 / 45.13)
Knowledge of EOP terms and definitions.

Question Number: 75

 # 75 ☑ **RO** ☑ **SRO** **Question ID: 29645 Origin: Bank** ☐ **Memory Level**

Which ONE of the following correctly describes EO-000-103 requirements for HPCI and RCIC operation with Suppression Pool level below 17 feet and the basis for any differences?

A RCIC operation may continue to operate because the RCIC turbine exhaust is within the Primary Containment Vent capacity.

B RCIC operation must be isolated at the same time as HPCI to minimize Primary Containment pressure rise.

C RCIC operation may continue ONLY if it is the LAST available source of high pressure coolant injection to ensure adequate core cooling.

D RCIC operation may continue IF Suppression Pool Spray is on to condense RCIC turbine exhaust steam.

Question Number: 75

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES

CHOICE (B) - No
WRONG: Not true.
VALID DISTRACTOR: RCIC and HPCI have similar designs.

CHOICE (C) - No
WRONG: The EOP does NOT say this. Rather, RCIC is expected to trip on high backpressure BEFORE HPCI does.
VALID DISTRACTOR: Reasonable to believe that EOPs would preserve last source of HP injection.

CHOICE (D) - No
WRONG: RCIC and HPCI have similar designs.
VALID DISTRACTOR: Reasonable to believe they could affect each other adversely.

References

Fitzpatrick 1 exam of July 2003 (Question ID 25693)
EO-000-103, SP/L-6

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/28/05: Distracter "D" can be improved by changing to "RCIC operation may continue as long as suppression pool sprays are on to condense exhaust steam."
R: done.

Todd 10/05/05 - changed stem of question (editorial). Is this a RO level question?
R - will ask SSES.

SQ 11/04/05 - SSES considers this a fair RO question with no dissenting or concurring opinions within SSES staff.

NRC K/A System/E/A

System Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.4 Emergency Procedures /Plan

Number 2.4.22 **RO** 3.0 **SRO** 4.0 **CFR Link** (CFR: 43.5 / 45.12)
Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.

Question Number: 76

 # 76 ☐ **RO** ☑ **SRO** **Question ID: 29708 Origin: Mod** ☐ **Memory Level**

Following a STATION BLACKOUT, which one of the following describes SSES's coping strategy and the instrumentation available to monitor the plant?

A RPV pressure is reduced by opening up to THREE SRVs at a time.
RCIC operates to control RPV level & supplement depressurization.
HPCI is SECURED to minimize DC electrical loads.
SPOTMOS & Accident Monitoring Instrumentation (purple ID labels) REMAIN energized.

B RPV pressure is reduced by opening ONE SRV at a time.
RCIC operates to control RPV level & supplement depressurization.
HPCI operates to control RPV level and supplement depressurization.
SPOTMOS & Accident Monitoring Instrumentation (purple ID labels) REMAIN energized.

C RPV pressure is reduced by opening ONE SRV at a time.
RCIC operates to control RPV level & supplement depressurization.
HPCI operates in CST-to-CST full flow test mode to supplement depressurization.
SPOTMOS & Accident Monitoring Instrumentation (purple ID labels) are MANUALLY reenergized.

D RPV pressure is reduced by opening up to THREE SRVs at a time.
RCIC operates in CST-to-CST full flow test mode to supplement depressurization.
HPCI operates to control RPV level & supplement depressurization.
SPOTMOS & Accident Monitoring Instrumentation (purple ID labels) are MANUALLY reenergized.

Question Number: 76

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - NO
WRONG: EO-000-102, RC/P-6 allows opening of only one SRV. SPOTMOS and Acc Mon Inst must be manually reenergized with HSE switches. HPCI is not secured.
VALID DISTRACTOR: All other conditions are correct.

CHOICE (B) - NO
WRONG: HPCI operation would flood the RPV and cause HPCI & RCIC turbines to trip. SRMs remain energized continuously from 24-VDC
VALID DISTRACTOR: All other conditions are correct.

CHOICE (C) - YES

CHOICE (D) - NO
WRONG: EO-000-102, RC/P-6 allows opening of only one SRV. EO-100/200-030 uses RCIC for Inventory and puts HPCI in CST-to-CST mode.
VALID DISTRACTOR: All other conditions are correct.

References

SSES Bank Question
EO-100-003
TM-OP-017
EO-000-102

Comments and Question Modification History

☐ GXJ ☐ THF ☐ RJC ☐ SSES

10 CFR 55.43 (b)(5)

Gil 10/16/05 - Did not see SRM operation or SPOTMOS in references.
R: SRM operation is protected DC power. SPOTMOS is Suppression Pool Temperature Monitoring System. Could not confirm technical detail.

NRC K/A System/E/A

System 29500 Partial or Complete Loss of A.C. Power
3

Number AA2.02 **RO** 4.2 **SRO** 4.3 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)

Ability to determine and/or interpret the following as
they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Reactor power / pressure / and level

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 77

 # 77 ☐ **RO** ☑ **SRO** **Question ID: 29652** **Origin: Mod** ☐ **Memory Level**

Both units are operating at 90% of full rated power. SSES Unit 2 Main Steam Isolation Valves (MSIV) on the "D" steam line (B21-F022D and B21-F028D) inadvertently close. All systems, structures and components (SSC) operate as expected.

Which ONE of the following
(1) correctly describes the plant response and
(2) the required Operator response?

A (1) The reactor MAY scram on APRM high flux or Main Steam line high flow.
(2) Reduce power per GO-200-012, POWER MANEUVERS.

B (1) The reactor MAY scram on RPV low level or Main Steam line high flow.
(2) Recover the plant per ON-284-001, MAIN STEAM LINE ISOLATION AND QUICK RECOVERY

C (1) The reactor WILL scram on APRM high flux or RPV high pressure.
(2) Enter EO-200-102, RPV CONTROL.

D (1) The reactor WILL scram on MSIV closure or RPV low level.
(2) Perform ON-200-100, SCRAM, SCRAM INNIMENT.

Question Number: 77

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

Question is slightly modified to include whether the scram is possible or certain.

CHOICE (A) - NO
WRONG: The reactor WILL scram but not on MSL high flow (MSL high flow may cause other MSIVs to close though - not a direct cause)
VALID DISTRACTOR: Rx will scram, high APRM flux is correct, MSIVs may close (indirectly causing scram on MSIV closure)

CHOICE (B) - NO
WRONG: The Rx WILL scram but NOT on low level or high MSL flow.
VALID DISTRACTOR: Scram, high MSL flow may close all MSIVs, Pressure rise will shrink level.

CHOICE (C) - Yes

CHOICE (D) - NO
WRONG: Rx scram is not directly caused by MSIV closure and not expected on low level.
VALID DISTRACTOR: WILL scram, MSIV closure may happen and indirectly cause scram. Level will shrink.

References

SSES Bank
FSAR 15.2.4.1.2.2 and 15.2.4.4.2
TS Basis 3.3.1.1

Comments and Question Modification History

☐ GXJ ☐ THF ☐ RJC ☐ SSES

10 CFR 55.43 (b) (5) & (6)

Gil 10/16/05 - Appears to be a system-level question, not SRO level. "D" may also be correct if MSIVs close at 133% flow or less. If this is the case, may "fix" by having power 90%
R - reduced initial power to 90%.

Rich/Todd 10/31/05 - system level RO question.
R - added procedural requirement to question to adhere to 10 CFR 55.43 (b)(5)

NRC K/A System/E/A

System 29500 SCRAM 6
Number AA2.06 **RO** 3.5 **SRO** 3.8 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)
Ability to determine and/or interpret the following as they apply to SCRAM : Cause of reactor SCRAM

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 78

 # 78 ☐ **RO** ☑ **SRO** **Question ID:** **29653** **Origin:** **New** ☐ **Memory Level**

The control room has been evacuated and, as Unit Supervisor, you are directing SSES Unit 2 operations from the Remote Shutdown Panel. The following conditions exist:

- Suppression Pool temperature is 96 degrees Fahrenheit and steady.
- Residual Heat Removal (RHR) pump 2P202A is running
- RHR is operating in the Suppression Pool Cooling (SPC) and Suppression Pool Spray (SPS) mode.
- The Drywell is being vented through the Standby Gas Treatment System (SGTS).
- Drywell Pressure is 1.7 psig and lowering.
- Reactor Pressure Vessel (RPV) pressure is 90 psig and slowly lowering.
- Reactor Pressure Vessel (RPV) water level is 60 inches and rising.
- You have directed the PCO to establish RPV water level above 90 inches and below 100 inches.

Which ONE of the following correctly describes your priorities?

A Reconfigure RHR loop "A" to the Drywell Spray mode.

B Maintain Suppression Pool Cooling and Spray using either RHR loop.

C Reconfigure RHR loop "A" to the Shutdown Cooling mode using RHR pump 2P202A only.

D Locally start RHR pump 2P202C and use RHR loop "A" to provide SPC, SPS & Shutdown Cooling concurrently.

Question Number: 78

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - NO
WRONG: Drywell spray is not necessary because DW pressure is lowering via SGTS
VALID DISTRACTOR: PC/P-7 requires DW spray if needed to reduce DW press and if RHR not needed for core cooling.

CHOICE (B) - YES
EO-200-113 takes precedence over ON-200-009. SP/T-2 requires that RHR be used to maintain SP temps below 90. ON-200-009 directs user to align RHR for SDC. The EOP has priority over the ON.

CHOICE (C) - NO
WRONG: EO-200-113 takes precedence over ON-200-009. SP/T-2 requires that RHR be used to maintain SP temps below 90. ON-200-009 directs user to align RHR for SDC. The EOP has priority over the ON.
VALID DISTRACTOR: ON-200-009 directs the user to establish SDC.

CHOICE (D) - NO
WRONG: Not possible because even with operation shifted to RSD, F004A and F006A are interlocked to prevent concurrent opening. Also, this would cross-connect the RPV with the SP through the RHR suction lines. Consequently, there is no procedure that directs this activity.
VALID DISTRACTOR: Plausible if the Applicant sees the conflict between establishing SDC and maintaining SPC/SPS but forgets the design of the RHR system.

References

EO-100-113
ON-100-009
TM-OP-049

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(5)

Gil 10/16/05 - none

NRC K/A System/E/A

System 29501
6

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.4 Emergency Procedures /Plan

Number 2.4.22 **RO** 3.0 **SRO** 4.0 **CFR Link** (CFR: 43.5 / 45.12)
Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.

Question Number: 79

 # 79 ☐ RO ☑ SRO **Question ID:** 29654 **Origin:** Bank ☐ Memory Level

A spent fuel bundle just removed from the Reactor Vessel has been dropped into the Fuel Pool. Health Physics reports that general area dose rates on the Refuel Floor are 1,200 millirem (1.2 Rem) to 1,400 millirem (1.4 Rem) per hour.

The "B" channel of the Refuel Floor High Exhaust duct monitor and the Refuel Floor Wall Exhaust duct monitors do NOT respond to the increased radiation levels.

(1) The radioactive release caused by the dropped fuel bundle will be . . .
(2) What is the minimum initial emergency classification level?

A (1) . . . less than 10 CFR 100 (REACTOR SITE CRITERIA) limits.
(2) ALERT.

B (1) . . . greater than Updated Final Safety Analysis Report (UFSAR) values.
(2) UNUSUAL EVENT.

C (1) . . . less than 10 CFR 20 (STANDARDS FOR PROTECTION AGAINST RADIATION) limits.
(2) ALERT.

D (1) . . . less than 10 CFR 50.72 (IMMEDIATE NOTIFICATION REQUIREMENTS FOR OPERATING NUCLEAR POWER REACTORS) limits.
(2) UNUSUAL EVENT.

Question Number: 79

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☑

Justification

CHOICE (A) - YES

CHOICE (B) - NO
WRONG: Wrong EAL and TS basis is 10 CFR 100
VALID DISTRACTOR: One channel still works to limit values. UFSAR describes expected consequences.

CHOICE (C) - NO
WRONG: Rad Monitors not designed to 10 CFR 20 limits.
VALID DISTRACTOR: correct EAL

CHOICE (D) - NO
WRONG: Rad Monitors not designed to 10 CFR 50.72 limits.
VALID DISTRACTOR: This may be a REPORTABLE event.

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

10 CFR 55.43 (b)(4)

Gil 10/16/05 - "C" also appears correct. With 1200 mr release it should be >10CFR20 limits
R - changed from > to < per the original Bank question.

Todd/Rich 10/31/05 - deleted sentence referring to fuel bundle dropped onto another recently removed bundle.

NRC K/A System/E/A

System 29502 Refueling Accidents
3

Number AA2.05 **RO** 3.2 **SRO** 4.6 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)

Ability to determine and/or interpret the following as
they apply to REFUELING ACCIDENTS : †Entry conditions of emergency plan

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 80

 # 80 ☐ **RO** ☑ **SRO** **Question ID: 29665** **Origin: Bank** ☐ **Memory Level**

A seismic event has occurred and the following conditions exist on SSES Unit 1:

- Complete loss of offsite power (LOOP).
- Steam leak inside the drywell.
- ESS bus1C (1A203) is deenergized due to a fault.
- All ON-100-101 (SCRAM, SCRAM IMMINENT) actions are complete.
- Reactor Pressure Vessel (RPV) LEVEL is 27 inches and lowering at 2 inches per minute.
- Reactor Pressure Vessel (RPV) PRESSURE is 720 psig and lowering.
- Drywell (DW) TEMPERATURE is 255 degrees Fahrenheit and rising at 5 degrees per minute.
- Drywell (DW) PRESSURE is 9 psig and rising.
- Suppression Pool (SP) TEMPERATURE is 104 degrees Fahrenheit.
- Suppression Pool (SP) PRESSURE is 8 psig and rising.

Which ONE of the following describes the next required action?

A RHR Pumps will be continuously needed for Adequate Core Cooling.

B Perform a Rapid Depressurization

C Initiate Suppression Pool (SP) Cooling.

D Initiate Drywell (DW) Spray.

Question Number: 80

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - NO
WRONG: Core Cooling is assured by core submergence. With level at 27 inches and dropping by 2 ipm, it will take 78 minutes to reach L1 (-129) where LPCI will be needed.
VALID DISTRACTOR: Core cooling is a plausible alternative given the dropping pressure - especially if the Applicant sees a need to Depressurize.

CHOICE (B) - NO
WRONG: Rapid Depressurization would be required if HCTL limits of Figure 2 or PSL limits of Figure 4 were threatened. The given conditions do NOT provide justification for depressurization.
VALID DISTRACTOR: SBLOCA could cause Applicant to depressurize and utilize low pressure ECCS injection sources.

CHOICE (C) - NO
WRONG: DW spray lineup would be complicated by SPC and DW spray takes priority.
VALID DISTRACTOR: Temperature is above 90 deg F.

CHOICE (D) - YES

Loss of 1A203 causes loss of RHR Pp 1C, CS Pp 1C, RHR SW Pp 1A, 1B230.
Loss of 1B230 causes loss of 1B236 which causes loss of "C" RHR valves.
The "A" loop s/b available with one pump.
Therefore, this condition complicates the Applicant's analysis but has no effect on the result.

References

NM1 Exam of October 2002 (Question ID 22128)
EO-000-103

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(5)

Gil 10/16/05 - Did not have Figures 2 and 4 to complete technical review. Could not verify distractors A, B and C wrong.

Todd/Rich 10/31/05 - OK

NRC K/A System/E/A

System 29502 High Drywell Temperature
8
Number EA2.04 **RO** 4.1 **SRO** 4.2 **CFR Link** (CFR 41.10, 43.5, 45.13)
Ability to determine and/or interpret Drywell pressure as it applies to HIGH DRYWELL TEMPERATURE

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 81

81 | ☐ RO ☑ SRO Question ID: 29667 Origin: New ☑ Memory Level

Which ONE of the following is a basis for the Technical Specification limits on Suppression Pool water level?

A The LOW level limit ensures peak containment pressure is maintained below the maximum allowable pressure for containment.

B The LOW level limit protects the ability to quench a LOCA before down comer openings become uncovered.

C The HIGH level limit ensures that HPCI and RCIC turbine exhaust lines do not fill with water and cause a high backpressure trip.

D The HIGH level limit ensure the Suppression Pool to Drywell Vacuum Breakers do not become water sealed.

Question Number: 81

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A): YES

CHOICE (B) - NO
WRONG: This is not the TS basis for the TS low level limit of 22 feet.
VALID DISTRACTOR: This is the basis for Rapid RPV Depressurization if SP level lowers to 12 feet.

CHOICE (C) - NO
WRONG: The TS high level limit is 24 feet and is based on SRV clearing loads and excessive pool swells.
VALID DISTRACTOR: This is the EOP basis for starting HPCI and RCIC if level approaches 25 feet.

CHOICE (D) - NO
WRONG: Not a stated basis for SP water level and would not expect them to seal because they would pass higher SP level into the tailpipe to maintain same level in both the SP and the Down comer.
VALID DISTRACTOR: Water above the check valves could cause sealing if the down comer level were greater than the SP level.

References

TS 3.6.2.2.
EOP-000-103

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(2)

Gil 10/16/05 - OK.

Todd/Rich 10/31/05 - OK

NRC K/A System/E/A

System 29503
0

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.25 **RO** 2.5 **SRO** 3.7 **CFR Link** (CFR: 43.2)
Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.

Question Number: 82

 # 82 ☐ **RO** ☑ **SRO** **Question ID: 29668** **Origin: New** ☐ **Memory Level**

Instrumentation and Controls (I&C) is performing a Technical Specification Surveillance on Reactor Protection System (RPS) train "B" (Division II).

1. RPS train "B" is currently deenergized (half-scram) pursuant to the aforementioned surveillance.
2. Average Power Range Monitor (APRM) "E" is mistakenly taken out of OPERATE.
3. RPS train "A" remains energized.
4. The plant remains at full power.

As Unit Supervisor, you must . . .

A . . . enter ON-100-101, SCRAM, SCRAM IMMINENT at step 3.1.

B . . . enter EO-103-113 SH2, CONTROL ROD INSERTION at step CR-1.

C . . . enter EO-100-113 SH1, LEVEL/POWER CONTROL at step LQ-1.

D . . . enter EO-100-102, RPV CONTROL, at step RC-1.

Question Number: 82

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - NO
WRONG: the EOP has priority over an ON. A scram condition exists and a scram did not ensue.
VALID DISTRACTOR: Applicant may elect to pursue a misperceived imminent scram.

CHOICE (B) - NO
WRONG: the entry condition is EXISTING SCRAM CONDITION AND POWER > 5%.
VALID DISTRACTOR: Applicant will get to this eventually if attempts to scram rods fail.

CHOICE (C) - NO
WRONG: the entry condition is EXISTING SCRAM CONDITION AND POWER > 5%.
VALID DISTRACTOR: Applicant will get to this almost immediately. However, the correct path is through EO-100-102

CHOICE (D) - YES

References

EOPs
OP-AD-001, Section 6.2.1

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(5)

Gil 10/16/05 - If "E" APRM is "A" RPS channel, then there IS a Scram condition. Looks like "C" is correct, not "D"
R - EO-100-113 has NO entry conditions. The only way to get there is through EO-100-102.

Todd/Rich 10/31/05 - change "should" to "must".

NRC K/A System/E/A

System 29503
7

Number		**RO**	**SRO**	**CFR Link**

NRC K/A Generic

System 2.4 Emergency Procedures /Plan

Number 2.4.11 **RO** 3.4 **SRO** 3.6 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)
Knowledge of abnormal condition procedures.

Question Number: 83

 # 83 ☐ **RO** ☑ **SRO** **Question ID: 29707 Origin: Bank** ☐ **Memory Level**

SSES Unit 2 is at 40% of rated power. Main Condenser back-pressure readings over the next ten minutes are as follows:

- 1 Minute 4 in HG absolute
- 2 Minutes 8 in HG absolute
- 4 Minutes 10 in HG absolute
- 6 Minutes 12 in HG absolute
- 8 Minutes 14 in HG absolute
- 10 Minutes 23 in HG absolute

When and why should the Unit Supervisor direct the Primary Control Operator to manually scram the Reactor?

A AFTER the Main Turbine trips to prevent opening of Turbine Bypass Valves.

B AFTER the Main Turbine trips ONLY IF the Reactor fails to scram automatically.

C BEFORE the Main Turbine trips to prevent forcing an automatic protective action.

D BEFORE the Main Turbine trips because an automatic reactor scram will not occur at this power level.

Question Number: 83

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - NO
WRONG: Manual scram should precede the Turbine trip
VALID DISTRACTOR: sequence of events is correct.

CHOICE (B) - NO
WRONG: Manual scram should precede the Turbine trip. Sequence of events is wrong.
VALID DISTRACTOR: Reactor will automatically scram from above 30% if Turbine trips.

CHOICE (C) - YES

CHOICE (D) - NO
WRONG: Sequence of events is wrong. Auto scram will occur cause >30%.
VALID DISTRACTOR: Correct to scram before Turbine trips. (Stop heat generation BEFORE removing the heat sink).

References

Clinton June 200 exam (Question ID 18955)
Cooper 1 August 2002 exam (Question ID 23963)
ON-143-001
ON-100-101

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(5)

Tough K/A match. Alternative may be to present sequence of events and ask what could have caused it.

Gil 10/16/05 - Question is about what happens with decreasing vacuum. NOT a match to K/A. Suggest a table of absolute pressure readings with time and ask when the various things wiull happen. In any event, RX will Scram on Turbine Trip >30% power.
R - This was an acceptable K/A match on another NRC exam. I see no difference between asking for the correct sequence of events and the suggested fix. Agree that the Rx will scram upon Turbine Trip. Question is asking if the Applicant recognizes that the heat sink is about to be lost and, therefore, it is best to preemptively stop the heat source - without reliance on automatic action.

Gil 10/17/05 - per phone conversation, add table of values to test Applicant's ability to interpret the indication.
R - done.

Todd/Rich 10/31/05 - Saved original as 832 and deleted first part of the question.

NRC K/A System/E/A

System 29500 Loss of Main Condenser Vacuum
2

Number AA2.01 **RO** 2.9 **SRO** 3.1 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)

Ability to determine and/or interpret the following as
they apply to LOSS OF MAIN CONDENSER VACUUM : Condenser vacuum/absolute pressure

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 84

 # 84 ☐ **RO** ☑ **SRO** **Question ID:** **29670** **Origin:** **New** ☐ **Memory Level**

SSES Unit 1 is at full rated power. SSES Unit 2 is in Mode 5 for an unplanned refueling outage. You are the Unit 2 Unit Supervisor and are responding to a Standby Gas Treatment System (SGTS) Exhaust Ventilation Hi-Hi alarm per ON-070-001, ABNORMAL GASEOUS RADIATION RELEASE/CAM ALARMS.

The Shift Manager has just declared an ALERT based on RA1.

As Unit Supervisor, you . . .

A . . . stop implementation of ON-070-001,ABNORMAL GASEOUS RADIATION RELEASE/CAM ALARMS and enter EO-200-105, RADIOACTIVITY RELEASE CONTROL .

B . . . remain in ON-070-001,ABNORMAL GASEOUS RADIATION RELEASE/CAM ALARMS and enter EO-200-105, RADIOACTIVITY RELEASE CONTROL .

C . . . stop implementation of ON-070-001,ABNORMAL GASEOUS RADIATION RELEASE/CAM ALARMS and enter EO-200-103, PRIMARY CONTAINMENT CONTROL.

D . . . remain in ON-070-001,ABNORMAL GASEOUS RADIATION RELEASE/CAM ALARMS and enter EO-200-103, PRIMARY CONTAINMENT CONTROL.

Question Number: 84

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - NO
WRONG: Not necessary to leave ON-070-001. Rather, concurrent performance of ON-070-001 is desirable because it provides more specific direction.
VALID DISTRACTOR: Required to enter EO-200-105 at the ALERT level.

CHOICE (B) - YES

CHOICE (C) - NO
WRONG: other EOP entry is SECONDARY CTMT control, not PRIMARY.
VALID DISTRACTOR: Applicant could confuse CTMT control EOPs.

CHOICE (D) - NO
WRONG: other EOP entry is SECONDARY CTMT control, not PRIMARY.
VALID DISTRACTOR: Applicant could confuse CTMT control EOPs.

References

EP-TP-1
ON-070---1
EO-100-112
EO-100-105
EO-100-102

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(4).

Gil 10/16/05 - Should NOT be in EO-200-105 with given stem conditions. Must have SGTS off to have unmonitored release.
R: The entry condition for EO-200-105 is "OFFSITE RAD RELEASE RATE ABOVE ALERT ANTICIPATED". If the Shift Manager has declared an ALERT in response to the offsite release rate, you should enter the EOP.

Todd/Rich 10/31/05 - editorial changes and "C" and "D" are implausible.
C - Scram the reactor and enter EO-200-112, RAPID DEPRESSURIZATION.
D - Scram the reactor and enter EO-200-102, RPV CONTROL.
changed distractors.

NRC K/A System/E/A

System 29501
7

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.4 Emergency Procedures /Plan

Number 2.4.6 **RO** 3.1 **SRO** 4.0 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)
Knowledge symptom based EOP mitigation strategies.

Question Number: 85

 # 85 ☐ RO ☑ SRO **Question ID: 29671 Origin: Bank** ☐ Memory Level

OSCAR has been dispatched as a result of an unisolable primary to secondary containment leak on SSES Unit 1. A cool down is in progress with the MSIVs closed. Standby Gas Treatment System is in service with the following parameters:

- Secondary Containment differential pressure is -0.31 inches WG.
- SGTS SPING Noble Gas is 1.0E06 (1,000,000) micro curies per minute.
- OSCAR whole body dose readings are 0.05 millirem per hour.

A siding panel fails on the Refuel Floor. Secondary Containment 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 NOT representative of the Total Offsite Release.
(2) OSCAR whole body dose readings will increase.

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

C (1) SBGT SPING Noble Gas IS representative of the Total Offsite Release.
(2) OSCAR whole body dose readings will increase.

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

Question Number: 85

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES

CHOICE (B) - NO
WRONG: OSCAR readings as release rate increases. Release rate increases through the siding failure.
VALID DISTRACTOR: Applicant may misunderstand how OSCAR works and think it sees the increased release. SBGT part is correct.

CHOICE (C) - NO
WRONG: The panel failure cause bypass of SBGT.
VALID DISTRACTOR: OSCAR does see increase

CHOICE (D) - NO
WRONG: The panel failure causes bypass of SBGT
VALID DISTRACTOR: Applicant may misunderstand how OSCAR works and think it sees the increased release. Mirror imaging.

References

SSES Bank
TM-OP-070

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(4).

Gil 10/16/05 - No K/A statement with question. Looks like a system-level, not SRO level *(no choice of procedures)*. How does OSCAR "see" the release?
R - K/A statement added. OSCAR is an Off-site Rad Monitoring team.

Gil 10/17/05 - K/A match is acceptable. Accepts SRO under (b)(4).

Todd/Rich 10/31/05 - editorial changes.

NRC K/A System/E/A

System 29503 Secondary Containment High Differential Pressure
5

Number EA2.02 **RO** 2.8 **SRO** 4.1 **CFR Link** (CFR 41.8 to 41.10)

Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: Off-site release rate: Plant-Specific.

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 86

 # 86 ☐ RO ☑ SRO **Question ID:** 29674 **Origin:** Mod ☐ **Memory Level**

SSES Unit 2 is in Mode 2. The following conditions exist:

- all Intermediate Range Monitors (IRM) read approximately 65 on Range 2.
- Source Range Monitor (SRM) "A" reads 1.9E5 (190,000) counts per second (cps).
- Source Range Monitor (SRM) "B" is BYPASSED
- Source Range Monitor (SRM) "C" reads 2.0E5 (200,000) counts per second (cps).
- Source Range Monitor (SRM) "D" reads 2.1E5 (210,000) counts per second (cps).
- Reactor Period on all four SRMs is approximately 400 seconds.
- Reactor Engineering requests additional control rod withdrawal to continue raising Reactor power.

Which ONE of the following is correct?

A Control Rods may be withdrawn when ALL Division I IRMs are on Range 3.
Technical Specification requirements for SRMs are satisfied.

B Control Rods can be withdrawn when ANY Division I IRM is on Range 3.
Suspend Control Rod withdrawal immediately.

C Control Rods may be withdrawn when ALL Division II IRMs are on Range 3.
Technical Specification requirements for SRMs are satisfied.

D Control Rods can be withdrawn when ANY Division II IRM is on Range 3.
Suspend Control Rod withdrawal immediately.

Question Number: 86

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: SRM "D" > 2E5 causes RMCS rod block. Block is auto byp when associated IRMs go to R3.
VALID DISTRACTOR: Applicant may confuse Divisional assignments.

CHOICE (B) -
WRONG: SRM "D" > 2E5 causes RMCS rod block. Block is auto byp when associated IRMs go to R3 - ALL of them.
VALID DISTRACTOR: Applicant may confuse Divisional assignments. Applicant may overreact to TS issue.

CHOICE (C) - YES

CHOICE (D) - No
WRONG: must have all four associated IRMs on R3 to auto byp.
VALID DISTRACTOR: Applicant could misunderstand system operation. Applicant may overreact to TS issue.

References

Grand Gulf exam of April 2000
AR-104-B06
TM-OP078A

Comments and Question Modification History

☐ GXJ ☐ THF ☐ RJC ☐ SSES

10 CFR 55.43 (b)(2)

Gil 10/16/05 - Looks like a system-level question, not SRO. Distractors do not appear to address "plant status"
R - Grand Gulf exam at the SRO level. Could add period requirements (300 to 100).

Gil 10/17/05 - version given to Gil included question for current plant status.
R - added Tech Spec issues to raise to SRO level.

NRC K/A System/E/A

System 21500 Source Range Monitor (SRM) System
4

Number A2.02 **RO** 3.4 **SRO** 3.7 **CFR Link** (CFR 41.5 / 45.6)

Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR (SRM) SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: SRM inop condition.

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 87

 # 87 ☐ **RO** ☑ **SRO** **Question ID:** **29675** **Origin:** **New** ☐ **Memory Level**

Both Units are at full rated power. The Control Room receives the following alarm:

- RAILROAD ACCESS HI HI RADIATION (AR-016-001, F12)

The CRO reports that Zone 3 Exh Railroad Access Shaft Radiation Monitor (RR-D12-1R608) reads 5.2 millirem per hour and is slowly trending up. Operators report from the Upper and Lower Relay Rooms that RISHH-D12-1K616A read 5.4 and 5.3 millirem per hour respectively. Maintenance is staging equipment in the Railroad Access Shaft and Reactor Building Zone 3 is open to the Railroad Access Shaft. Control Room Operators are NOT able to establish communication with personnel working in the Railroad Access Shaft.

As Shift Manager, you must direct the Unit Supervisor to __(1)__ for the purpose of __(2)__:

A (1) Enter EO-100-104 and ES-070-001,
(2) Isolating Zone 1 Reactor Building HVAC and initiating SGTS.

B (1) Enter EO-100-104 and ES-070-001,
(2) Isolating Zone 3 Reactor Building HVAC and initiating SGTS.

C (1) Enter EO-100-104 and ON-159-002,
(2) Isolating Zone 3 Reactor Building HVAC and initiating SGTS.

D (1) Enter EO-100-104 and ON-134-003
(2) Isolate the Railroad Access Shaft by restoring HVAC to normal.

Question Number: 87

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: Need to isolate Zone 3.
VALID DISTRACTOR: Correct procedures.

CHOICE (B) - YES

CHOICE (C) - No
WRONG: EO-100-104 directs the user to the ON to confirm ISO/INIT and to the ES if the ISO/INIT did NOT auto occur.
VALID DISTRACTOR: Correct EO, correct strategy and the ON can direct the user to ISO/INIT.

CHOICE (D) - No
WRONG: Wrong strategy. Goal is to ISO RB HVAC.
VALID DISTRACTOR: Correct EO and goal is to isolate the radiation.

References

ES-070-001
TM-OP-034, 079E
ON-159-002
ON-070-001
AR-016-F12

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(4)

Gil 10/16/05 - The RAILROAD ACCESS is an area rad monitor, not exhaust monitor (does not match K/A). Looks like "B" is wrong and "C" is correct.
R - "C" is not correct because there has been no AUTO initiation of Zone III isolation and SGTS. Uncertain about K/A match. The RB HVAC system responds to the RR access area monitor to prevent a release. Per SSES materials, the initiators are EXHAUST ducts.

Todd/Rich 10/31/05 - editorial changes

NRC K/A System/E/A

System 26100 Standby Gas Treatment System
0

Number A2.13 **RO** 3.4 **SRO** 3.7 **CFR Link** (CFR 41.5 / 45.6)

Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High secondary containment ventilation exhaust radiation.

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 88

 # 88 ☐ RO ☑ SRO **Question ID: 29623 Origin: Bank** ☐ **Memory Level**

SSES experienced a seismic event. Consequently, a loss of offsite power (LOOP) occurred. Both units have establish Reactor Pressure and Inventory control using Reactor Core Isolation Cooling (RCIC). All 4.16 kVAC and 480 VAC ESS buses are energized within 10 seconds.

One hour later, the Control Room Operators are investigating a slow rise in Drywell Pressure on SSES Unit 1. Conditions rapidly deteriorate and the following conditions develop:

- Emergency Service Water (ESW) pumps 0P504 B, C, D are running.

On SSES Unit 1:
- Drywell Pressure is 2.1 psig.
- Reactor Pressure Vessel pressure is 395 psig.
- Residual Heat Removal (RHR) pumps 1P202 B, C, D are running.
- Core Spray (CS) pumps 1P206 B, C, D are running.

On SSES Unit 2:
- Control Rod Drive (CRD) pump 2P132A is running.
- Reactor Building Chiller 2K206A is running.

Which ONE of the following describes the cause of these conditions and the required actions?

A Emergency Diesel Generator (EDG) Supply Breaker (1A20104) OPENED and RECLOSED for LOAD SEQUENCING.
Perform ON-104-201, LOSS OF 4KV BUS 1A (1A201) or ON-204-201, LOSS OF 4KV BUS 2A (2A201) to energize either buss.

B Emergency Diesel Generator (EDG) "A" Output Breaker tripped open.
Perform ON-104-201, LOSS OF 4KV BUS 1A (1A201) and ON-204-201, LOSS OF 4KV BUS 2A (2A201) to energize both busses.

C Emergency Diesel Generator (EDG) "A" tripped.
Perform ON-024-001, DIESEL GENERATOR TRIP.

D Emergency Diesel Generator (EDG) Supply Breaker (1A20104) tripped OPEN.
Perform ON-104-201, LOSS OF 4KV BUS 1A (1A201).

Question Number: 88

Answers: A ☐ B ☐ C ☐ D ☑ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: 2A201 is ENERGIZED because Unit 2 CRD and RB Chillers are running.
VALID DISTRACTOR: Failure to start would cause 1A201 loss

CHOICE (B) - No
WRONG: 2A201 is ENERGIZED because Unit 2 CRD and RB Chillers are running.
VALID DISTRACTOR: Buss lockout can prevent buss reenergization.

CHOICE (C) - No
WRONG: 2A201 is ENERGIZED because Unit 2 CRD and RB Chillers are running.
VALID DISTRACTOR: Similar to (A) - loss of EDG would dEenergize 1A201.

CHOICE (A) - YES
Plausible that the EDG feeder tripped when RHR or CS pumps started in response to the SSES Unit 1 LOCA.

References

INPO Bank: Fermi July 2003 exam (Question ID)
TM-OP-004

Comments and Question Modification History

☑ GXJ ☐ THF ☐ RJC ☐ SSES

Gil 09/26/05 - Distracter "D" is shortest (problem?). Also change 2A2014 to 1A2014.
R: change 2A2014 to 1A2014. Not sure how to remedy potential psychometric flaw without reducing plausibility of the distracters. lengthened A and C by changing "and" to "or" and adding reason. May better hide the psychometric clue.

Gil & Harry phone discussion: run it past Todd. Possible remedy, delete second procedure in "A".

Todd 09/30/05 - deleted " due to a bus lockout." from distracter "B".

10/05/05 - substitute this for SRO Tier 2 / Group 1 because UPS was sampled in the RO portion of the exam.

Gil 10/16/05 - ...buses are energized within 10 seconds A. "A" ran out of fuel (implausible as written if all buses were, originally, energized
R - changed "A" and "B" to better conceal the error of "A".

Gil 10/17/05 - added ". . . within 10 seconds" to stem. Changed "A" to "ran out of fuel"

NRC K/A System/E/A

System 26200 A.C. Electrical Distribution 1
Number A2.03 **RO** 3.9 **SRO** 4.3 **CFR Link** (CFR 41.5 / 45.6)

Ability to (a) predict the impacts of Loss of off-site power on the A.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 89

89 | ☐ RO ☑ SRO Question ID: 29678 Origin: New ☑ Memory Level

Both units are at full power with an Equalizing Battery charge in progress on 1D610. The feeder breaker to 1D614 trips open and 1D614 is deenergized. Choose from the list of procedures below, the ORDER in which these procedures will be implemented.

a. AR-106-001, 125V DC PANEL 1L610 SYSTEM TROUBLE (A12).
b. ON-102-610, LOSS OF 125V DC BUS 1D610.
c. LA-1L610-001, 125 VDC Panel 1L610.
d. EO-100-102, RPV CONTROL.

A b - d - a - d

B a - c - b - d

C c - a - b - d

D d - b - a - c

Question Number: 89

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
VALID DISTRACTOR: Applicant may recognize entry conditions for the ON, then go to the EO.

CHOICE (B) - No
VALID DISTRACTOR: Applicant may select the AR because it is the first indication.

CHOICE (C) - No
VALID DISTRACTOR: Exact opposite of correct answer.

CHOICE (D) - YES
On loss of 1D610, both RRPs trip because the closed indication for RPT breakers is lost. ON-164-002 requires the user to scram the Rx if both RRPs trip. Per SSES, a scram from high power will cause RPV level to go below +13 inches - an entry condition for EO-100-102.

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(5)

Gil 10/16/05 - OK.

Todd/Rich 10/31/05 - changed "should" to "will" in stem.

NRC K/A System/E/A

System 26300
0

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.4 Emergency Procedures /Plan

Number 2.4.5 **RO** 2.9 **SRO** 3.6 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)
"Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions."

Question Number: 90

 # 90 ☐ **RO** ☑ **SRO** **Question ID: 29676 Origin: Mod** ☐ **Memory Level**

During the Monthly Diesel Generator Operability Test of EDG "B" per SO-024-001, a minor oil leak from the Woodward Governor was discovered. The plan to repair this leak is to run EDG "B" unloaded per OP-024-001 while Maintenance evaluates and repairs the leaky fitting under a minor maintenance activity. According to Engineering, the leak rate is independent of generator load. After two hours and ten minutes, the repair is successful.

Which ONE of the following describes the actions, if any, required before stopping and returning EDG "B" to standby status?

A Immediately shutdown EDG "B". Loading is NOT required because the EDG ran unloaded for less than 6 hours.

B Immediately shutdown EDG "B" to minimize causes of accelerated component wear.

C Load EDG "B" to greater than 3,000 KW for 30 minutes as post maintenance testing.

D Load EDG "B" to greater than 3,000 KW for 30 minutes to minimize causes of accelerated component wear.

Question Number: 90

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☑

Justification

CHOICE (A) - No
WRONG: Loading to >75% is required for 15 minutes per hour of unloaded run time.
VALID DISTRACTOR: The TSS requires loaded operation for 30 mins if unloaded for 6 hours. Applicant will choose incorrectly if applying the wrong procedure.

CHOICE (B) - No
WRONG: Loaded operation is required.
VALID DISTRACTOR: correct reason.

CHOICE (C) - No
WRONG: PMT not required because Engineering stated the leak rate is independent of generator load.
VALID DISTRACTOR: correct load and time.

CHOICE (D) - YES

References

Perry 1 Exam of March 2002
OP-024-001
SO-024-001

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(5)

QUESTION FOR SSES - why are the SO and OP requirements different?

Gil 10/16/05 - OK.

Todd/Rich 10/31/05 - keep as is but give Applicants copies of both procedures.

NRC K/A System/E/A

System 26400
0

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.1 Conduct of Operations

Number 2.1.32 **RO** 3.4 **SRO** 3.8 **CFR Link** (CFR: 41.10 / 43.2 / 45.12)

Ability to explain and apply all system limits and precautions

Question Number: 91

 # 91 ☐ **RO** ☑ **SRO** **Question ID: 29677 Origin: New** ☐ **Memory Level**

SSES Unit 2 is at full rated power with Average Power Range Monitor (APRM) "E" bypassed. APRM "D" fails DOWNSCALE.

Which ONE of the following is the LEAST limiting response with respect to Limiting Conditions for Operation (LCO) and permissible under Technical Specifications?

A Bypass APRM "D" to restore Rod Block Monitoring (RBM) OPERABILITY.

B Bypass Rod Block Monitoring (RBM) "B" and enter a 5 day time clock per LCO 3.3.2.1.A

C Operators should direct I&C to place Rod Block Monitoring (RBM) "B" in TRIP within 48 hours per LCO 3.3.2.1.B

D Operator action is not required because the failed APRM automatically bypasses the associated Rod Block Monitor (RBM).

Question Number: 91

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES

CHOICE (B) - No
WRONG: Bypassing the RBM and entering a 5 day LCO is acceptable but bypassing the APRM restores full OPERABILITY
VALID DISTRACTOR: This works.

CHOICE (C) - No
WRONG: Not necessary to trip the RBM
VALID DISTRACTOR: Correct LCO action if 3.3.2.1.A not complied with.

CHOICE (D) - No
WRONG: Violated TS requirements.
VALID DISTRACTOR: the failed APRM does bypass the associated RBM channel.

References

AR-103-C06
TM-OP-078K

Comments and Question Modification History

☐ GXJ ☐ TMF ☐ RJC ☐ SSES

10 CFR 55.23 (b)(2)

Gil 10/16/05 - Does the TS require two RBMs operable? If NOT, then answer may be wrong.
R - uncertain of interpretation but MY interpretation of TS Table 3.3.2-1 is that 2 channels of RBM are REQUIRED.

Todd/Rich 10/31/05 - improve call of the question.
R - will ask SSES for assistance.

Todd 10/31/05 - TS provided for question 92 may assist with this question.
R - correct but not a problem. Applicant must understand the APRM-RBM association and RBM response to failure or bypassing of associated APRM.

NRC K/A System/E/A

System 21500 Rod Block Monitor System 2
Number A2.03 **RO** 3.1 **SRO** 3.3 **CFR Link** (CFR 41.5 / 45.5)

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: Loss of associated reference APRM channel: BWR-3,4,5.

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 92

 # 92 ☐ **RO** ☑ **SRO** **Question ID: 29688** **Origin: Bank** ☐ **Memory Level**

SSES Unit 1 is at 30% of rated power. Instrumentation and Controls (I&C) reports that Reactor Pressure Vessel (RPV) water level detector LIS-B21-1N025A failed a sensor calibration and must be replaced.

As Unit Supervisor, you must declare the associated channel INOPERABLE and . . .

A . . . place the channel in trip or place the associated trip system in trip within 12 hours.

B . . . declare RCIC inoperable within 1 hour and place the channel in trip within 24 hours.

C . . . isolate RWCU AND be in Mode 3 within 12 hours & be in Mode 4 within 36 hours.

D . . . restore the channel to OPERABLE status or place the channel in trip within 14 days.

Question Number: 92

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☑

Justification

CHOICE (A) - No
WRONG: This is the RPS LCO (3.3.1.1)
VALID DISTRACTOR: correct for LIS-B21-1N024A

CHOICE (B) - No
WRONG: This is the RCIC Low Water Level Initiation LCO (3.3.5.2)
VALID DISTRACTOR: correct for LIS-B21-1N031A.

CHOICE (C) - No
WRONG: This is the Primary CTMT Instrumentation LCO (3.3.6.1)
VALID DISTRACTOR: correct for LITS-B21-1N026A

CHOICE (D) - YES
TS 3.3.4.2.A

References

TS 3.3
TM-OP-080
Dwg M1-B31-275

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

10 CFR 55.43.(b)(2)

****

N O T E:
Applicant will need Drawings and Technical Specification section 3.3 to determine the answer.
Consider full set of ECCS, RPS prints.

****

Gil 10/16/05 - OK.

Todd/Rich 10/31/05 - OK

NRC K/A System/E/A

System 21600
0

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.22 **RO** 3.4 **SRO** 4.1 **CFR Link** (CFR: 43.2 / 45.2)

Knowledge of limiting conditions for operations and safety limits

Question Number: 93

 # 93 ☐ **RO** ☑ **SRO** **Question ID: 29680 Origin: Bank** ☑ **Memory Level**

Which ONE of the following correctly describes a HOIST TUBE HANG UP?

A The PLC compares speed to the required zone speed; if a slow down does NOT occur in a Transition Zone, a HOIST TUBE HANG UP occurs.

B The PLC monitors J-Hook position and load; if the hoist is LOADED with J-Hooks OPEN, a HOIST TUBE HANG UP occurs.

C The PLC compares the weight when entering a transition zone through and to the next transition zone; if weight exceeds the set point, a HOIST TUBE HANG UP occurs.

D The PLC counts the number of sections that are extended; if too may sections are extended for a known location, a HOIST TUBE HANG UP occurs.

Question Number: 93

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: Not an accurate description
VALID DISTRACTOR: technically feasible and there are speed interlocks.

CHOICE (B) - No
WRONG: Not an accurate description.
VALID DISTRACTOR: this is an OPEN GRAPPLE INTERLOCK.

CHOICE (C) - YES

CHOICE (D) - No
WRONG: Not an accurate description
VALID DISTRACTOR:

References

TM-OP-081A
OP-181-001

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(7)

Gil 10/16/05 - I believe you need to specify the system is in "Automatic Mode"
R - uncertain. Does not appear in the procedure definition. Also - question merely asks for a definition.

!!!!!! Ask SSES if AUTO mode makes a difference or not !!!!!!!

Todd/Rich 10/31/05 - OK

NRC K/A System/E/A

System 23400 Fuel Handling Equipment
0

Number A3.01 **RO** 2.6 **SRO** 3.6 **CFR Link** (CFR 41.7 / 45.7)

Ability to monitor automatic operations of the FUEL HANDLING EQUIPMENT including Crane/refuel bridge movement (Plant-Specific)

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 94

 # 94 ☐ **RO** ☑ **SRO** **Question ID: 29681 Origin: Bank** ☐ **Memory Level**

SSES Unit 2 is performing a Control Rod Sequence swap. The PCO reselects and confirms the previous FOUR rod moves. Rod 14-27, the second of the last four rods moved, is at Position 02 instead of its required Position 00.

What is the status of Control Rod 14-27 and what action is required?

A Control Rod 14-27 is NOT mispositioned. Enter ON-255-001, CONTROL ROD PROBLEMS, for guidance on repositioning the control rod to 00.

B Control Rod 14-27 is NOT mispositioned. Shift Supervision will direct the control rod be moved to 00 and an AR written.

C Control Rod 14-27 IS mispositioned. Enter ON-255-001, CONTROL ROD PROBLEMS, for guidance on repositioning the control rod to 00.

D Control Rod 14-27 IS mispositioned. Shift Supervision will direct the control rod be moved to 00 and an AR written.

Question Number: 94

Answers: A ☐ B ☑ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: ON-255-001 is NOT required.
VALID DISTRACTOR: Rod is not in its required position and is NOT mis-positioned.

CHOICE (B) - YES

CHOICE (C) - No
WRONG: Per NDAP-QA-0338, Section 5.5, this is not mis-positioned because it was discovered during required checks.
VALID DISTRACTOR: Rod is not where it belongs. Therefore, the ON becomes enticing.

CHOICE (D) - No
WRONG: Per NDAP-QA-0338, Section 5.5, this is not mis-positioned because it was discovered during required checks.
VALID DISTRACTOR: Rod is not where it should be. However, movement can be made without the ON.

References

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(5)

Gil 10/16/05 - OK

Todd/Rich 10/31/05 - OK

NRC K/A System/E/A

System Number | **RO** | **SRO** | **CFR Link**

NRC K/A Generic

System 2.1 Conduct of Operations

Number 2.1.7 **RO** 3.7 **SRO** 4.4 **CFR Link** (CFR: 43.5 / 45.12 / 45.13)

"Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation."

Question Number: 95

 # 95 ☐ **RO** ☑ **SRO** **Question ID: 29682 Origin: Mod** ☐ **Memory Level**

The time is 19:00.

SSES Unit 1 is operating at FULL rated power.

SSES Unit 2 was required to shutdown pursuant to Technical Specification 3.0.3. SSES Unit 2 entered MODE 3 earlier this same day at 06:00 and is continuing to cool down. The current RPV pressure is 85 psig.

The Outside NPO reports that Spray Pond level is 678 feet.

If Spray Pond level remains at 678 feet, how much time does each unit have to reach mode 4?

A SSES Unit 1: 48 hours.
SSES Unit 2: 24 hours.

B SSES Unit 1: 24 hours.
SSES Unit 2: 24 hours.

C SSES Unit 1: 36 hours.
SSES Unit 2: 36 hours.

D SSES Unit 1: 36 hours.
SSES Unit 2: 24 hours.

Question Number: 95

Answers: A ☐ B ☑ C ☐ D ☐ **References Provided to Applicant:** ☑

Justification

SSES Unit 1:
TS 3.4.8.A3 - 24 hours to Mode 4.
TS 3.7.1.C - 36 hours to Mode 4.

SSES Unit 2:
TS 3.0.3 - 24 hours {06:00 to 19:00 is 13 hours. TS 3.0.3 allows 37 hrs to 4 from 3 (37 less 13 is 24)}
TS 3.4.8.A3 - 24 hours again.
TS 3.7.1.C - 36 hours.

NOTE: Applicant could misapply 3.7.1.C and add 12 hours to reach mode 3 to the 36 hours to reach mode 4 and reach 48 hours.

References

Tech Specs.
SSES Bank Question.

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(2)

Gil 10/16/05 - delete "can NOT be raised" replace with "remains at 678 feet"
R - done.

Todd/Rich 10/31/05 - OK

NRC K/A System/E/A

System Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.1 Conduct of Operations

Number 2.1.12 **RO** 2.9 **SRO** 4.0 **CFR Link** (CFR: 43.2 / 43.5 / 45.3)
Ability to apply technical specifications for a system.

Question Number: 96

 # 96 ☐ **RO** ☑ **SRO** **Question ID:** **29709** **Origin:** **Bank** ☐ **Memory Level**

SSES Unit 1 is at full rated power.

During performance of SO-151-B02, QUARTERLY CORE SPRAY FLOW VERIFICATION DIVISION II, a System Engineer has asked that Core Spray Pump 1P206B be started with its discharge (CORE SPRAY LOOP B TEST TO SUPP POOL HV-152-F015B) path Manually throttled to 75% open instead of full closed. This is not described in any approved procedure.

What approval is required to perform this test?

Operators may perform the test . . .

A . . . with an approved Safety Evaluation only.

B . . . with approval from ISI/IST Engineering only.

C . . . with approval of the Manager - Nuclear Operations only.

D . . . with approval of the Vice President - Nuclear Operations only.

Question Number: 96

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES

CHOICE (B) - No
WRONG: a Safety Evaluation is required.
VALID DISTRACTOR: SSES' screening process includes a break out for ISI/IST stuff.

CHOICE (C) - No
WRONG: not true
VALID DISTRACTOR: some stations permit pen and ink changes or "n/a" with concurrence of two SROs.

CHOICE (D) - No
WRONG: not true
VALID DISTRACTOR: Shift Manager does have authority to direct activities outside the scope of existing procedures if necessary to protect the PH&S.

References

10 CFR 55.43 (b)(3)
NDAP-QA-0726
LaSalle exam of November 2000 (Question ID 19300)

Comments and Question Modification History

☐ GXJ ☐ TMF ☐ RJC ☐ SSES

10 CFR 55.43 (b)(3)

Gil 10/16/05 - Add "With the plant at 100% power..." ...path Manually throttled...Delete after described in and replace with "any approved procedure" (too many "buzz" words that cue the applicant) Is there a manual valve that can be throttled? Would make a better case for outside UFSAR without cuing excessively
R - all done except Manual valve because there is no manual valve (no Pp discharge isolation).

Gil 10/17/05 - deleted " nor in SSES's Safety Analysis Report" from end of stem to eliminate another cue.
R - done.

Todd/Rich 10/31/05 - get SSES to beef up "C" and "D".

SSES - can you make "C" and "D" more plausible?

NRC K/A System/E/A

System Number	RO	SRO	CFR Link

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.7 **RO** 2.0 **SRO** 3.2 **CFR Link** (CFR: 43.3 / 45.13)
Knowledge of the process for conducting tests or experiments not described in the safety analysis report.

Question Number: 97

 # 97 ☐ **RO** ☑ **SRO** **Question ID: 29684** **Origin: New** ☐ **Memory Level**

A failure of transmitter TT-11305 has forced the Control Room to take manual control of Service Water Temperature Control Valve TV11028 at Temperature Controller TIC-11028 on panel 1C668. With this configuration, Operators are able to maintain RBCCW Heat Exchanger outlet temperature at the normal value of 90 degrees Fahrenheit. Adjustments are generally infrequent and predictable. Auxiliary Operators report RBCCW heat exchanger outlet temperature hourly from local indicators TI-11307A/B because the failed transmitter also causes the Control Room to lose RBCCW HX DISCH TEMP TI-11305 indication and disables RBCCW HEADER HI TEMP alarm (AR-123-E05).

As Unit Supervisor, you are reviewing the AR to repair TT-11305. What is the CLASSIFICATION and PRIORITY of this work?

A Classification is Corrective Maintenance (A)
Priority is 1, work that should be scheduled and started within 24 hours.

B Classification is Corrective Maintenance (A)
Priority is 2, schedule at earliest opportunity within four weeks (short cycle)

C Classification is Elective Maintenance (B)
Priority is 3, schedule at next available system window.

D Classification is Elective Maintenance (B)
Priority is 4, schedule as resources allow within the normal 13-week schedule process.

Question Number: 97

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☑

Justification

Provide Applicants with NDAP-QA-1901 and M-113

CHOICE (A) - No
WRONG: Priority 1 - not TS, Safety Related, Reactivity Mgmt, Risk Significant or risk to generation. No inop system.
VALID DISTRACTOR: correct Classification.

CHOICE (B) - YES
Component is unavailable but the system is available. It is a work around and Significant Control Room deficiency. Transmitter is removed from service and adversely affects controls or processes in a manner that impairs Operator ability to perform.

CHOICE (C) - No
WRONG: Not EM
VALID DISTRACTOR: Pri 3 is an EM priority
NOTE: stayed away from CM-3 because it c/b arguable a second correct answer per Attachment B of NDAP-QA-1901 (Operator Burden, Minor CR Deficiency).

CHOICE (D) - No
WRONG: Not EM
VALID DISTRACTOR: Pri 4 is an EM priority.

References

NDAP-QA-1901 and M-113
TM-OP-014

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(5)

Gil 10/16/05 - Probably need procedure to answer (Minutia) If the stem condition impacts a TS LCO, then it would be "Level 1" and "A" would be correct
R - Agreed. Procedure is to be supplied. No TS LCO impacted.

!!!!!! Confirm with SSES that RBCCW is NOT TS system !!!!!!!!

NRC K/A System/E/A

System Number		RO	SRO	CFR Link

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.19 **RO** 2.1 **SRO** 3.1 **CFR Link** (CFR: 43.5 / 45.13)
Knowledge of maintenance work order requirements.

Question Number: 98

98 | ☐ RO ☑ SRO Question ID: 29685 Origin: Mod ☐ Memory Level

While conducting a radioactive liquid release, SSES Unit 2 receives a RADWASTE EFFLUENT MON DNSCALE/INOP (AR-107-F06) alarm. Investigation finds that RITS-06433, LIQUID RADWASTE RADIATION, is malfunctioning and can NOT be repaired quickly.

Regarding the radioactive liquid release, which ONE of the following is correct?

A The release must be MANUALLY terminated and may recommence with a new release permit with Plant Effluent Radiation Monitor Inoperable requirements satisfied.

B The release must be MANUALLY terminated and may recommence at one-half the original release rate under the original release permit.

C The release is AUTOMATICALLY terminated and may recommence at one-half the original release rate under the original release permit.

D The release is AUTOMATICALLY terminated and may recommence with a new release permit with Plant Effluent Radiation Monitor Inoperable requirements satisfied.

Question Number: 98

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: automatically terminates.
VALID DISTRACTOR: correct permit requirements

CHOICE (B) - No
WRONG: automatically terminates.
VALID DISTRACTOR: half the release rate c/b reasonable.

CHOICE (C) - No
WRONG: half the release rate is not the answer.
VALID DISTRACTOR: correct in that it is an auto termination.

CHOICE (D) - YES.

References

ON-069-001
SSES Exam Bank

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(4)

Gil 10/16/05 - OK

Todd/Rich 10/31/05 - OK

NRC K/A System/E/A

System Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.3 Radiation Control

Number 2.3.6 **RO** 2.1 **SRO** 3.1 **CFR Link** (CFR: 43.4 / 45.10)

Knowledge of the requirements for reviewing and approving release permits.

Question Number: 99

 # 99 ☐ **RO** ☑ **SRO** **Question ID: 29687 Origin: New** ☐ **Memory Level**

SSES Unit 1 is at 28% and shutting down for a planned refueling outage. De-inerting and purging of the Suppression Chamber is in progress per OP-173-001, CONTAINMENT ATMOSPHERE CONTROL SYSTEM. Standby Gas Treatment System (SGTS) Train "A" is operating. While at 100% power, SSES Unit 2 develops a steam leak and Drywell pressure begins slowly rising.

Which ONE of the following is the correct course of action?

A Secure the Suppression Chamber purge on Unit 1, Enter EO-100-103 and vent the Unit 2 Drywell per OP-173-003, PRIMARY CONTAINMENT NITROGEN MAKEUP AND VENTING.

B Enter EO-100-103 and vent the Unit 2 Drywell per OP-173-003, PRIMARY CONTAINMENT NITROGEN MAKEUP AND VENTING. It is NOT necessary to stop purging the Unit 1 Suppression Chamber while venting the Unit 2 Drywell.

C Enter EO-100-103 and initiate Suppression Chamber spray per OP-149-004, RHR CONTAINMENT COOLING. It is NOT necessary to stop purging the Unit 1 Suppression Chamber.

D Enter EO-100-103, start SGTS Train "B" per OP-070-001, STANDBY GAS TREATMENT SYSTEM, and vent the Unit 2 Drywell per OP-173-003, PRIMARY CONTAINMENT NITROGEN MAKEUP AND VENTING.

Question Number: 99

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES

CHOICE (B) - No
WRONG: OP-173-001 prohibits cross-connecting Unit 1 and Unit 2 containments through SGTS. NDAP-QA-0309 prohibits cross-connecting the Drywell with the Suppression Chamber.
VALID DISTRACTOR: physically possible.

CHOICE (C) - No
WRONG: The EOP has higher priority. Must use SGTS if possible. SPS is required if unable to maintain CTMT pressure <1.72.
VALID DISTRACTOR: Applicant could assume SGTS is not available for venting.

CHOICE (D) - No
WRONG: OP-173-001 prohibits cross-connecting Unit 1 and Unit 2 containments through SGTS. NDAP-QA-0309 prohibits cross-connecting the Drywell with the Suppression Chamber.
VALID DISTRACTOR: physically possible.

References

OP-173-001, 003
NDAP-QA-0309

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

10 CFR 55.43 (b)(2), (4), (5).

Gil 10/16/05 - While at 100 % power SSES Unit 2... Delete second sentence of Distractor "B" (cues)
R - added SSES Unit 2 power level. Did NOT delete 2nd sentence of "B" becaue it would then become arguably correct.

Todd/Rich 10/31/05 - OK

NRC K/A System/E/A

System Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.3 Radiation Control

Number 2.3.9 **RO** 2.5 **SRO** 3.4 **CFR Link** (CFR: 43.4 / 45.10)
Knowledge of the process for performing a containment purge.

Question Number: 100

 # 100 ☐ RO ☑ SRO **Question ID: 29686 Origin: Bank** ☑ **Memory Level**

A reactor startup is in progress on SSES Unit 2 when the following conditions develop:

- Reactor Pressure Vessel (RPV) is 45 psig.
- CRD PUMP A TRIP (AR-107-001, D01) annunciates.
- CRD ACCUMULATOR TROUBLE (AR-107-001, H06) annunciates.
- CRD 32-21 Accumulator Trouble Light on the Full Core Display illuminates.
- An Auxiliary Operator reports that Accumulator 32-21 pressure is 930 psig and slowly lowering.
- CRD 32-21 is at notch position 32.

The required action to IMMEDIATELY __(1)__ is based on inadequate pressure available to ensure __(2)__.

A (1) Start CRD pump 1P132B; then fully insert control rod 32-21 and declare it INOPERABLE
(2) that the control rod would insert following a scram.

B (1) Start CRD pump 1P132B; then fully insert control rod 32-21 and declare it INOPERABLE
(2) that the control rod can be driven.

C (1) Scram the Reactor per ON-155-007, LOSS OF CRD SYSTEM FLOW and ON-100-101, SCRAM, SCRAM IMMINENT.
(2) that the control rod would insert following a scram.

D (1) Scram the Reactor per ON-155-007, LOSS OF CRD SYSTEM FLOW and ON-100-101, SCRAM, SCRAM IMMINENT.
(2) that the control rod can be driven.

Question Number: 100

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG: must scram
VALID DISTRACTOR: these are the TS required actions.

CHOICE (B) - No
WRONG: must scram and wrong reason
VALID DISTRACTOR: mirror image

CHOICE (C) - YES

CHOICE (D) - No
WRONG: wrong reason
VALID DISTRACTOR: correct response.

References

Clinton Exam of August 2002 (Question ID 21762)
ON-155-007
TM-OP-055
TS Basis for 3.1.5

Comments and Question Modification History

☑ GXJ ☐ THF ☐ RJC ☐ SSES

10 CFR 55.43 (b)(2), (5), (6)

Gil 10/16/05 - "A" implausible with rod fully inserted
R - yes but that is the REASON for inserting the rod to begin with.

Gil 10/17/05 - o.k. possibly misread.

NRC K/A System/E/A

System Number		RO	SRO	CFR Link

NRC K/A Generic

System 2.4 Emergency Procedures /Plan

Number 2.4.11 **RO** 3.4 **SRO** 3.6 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)
Knowledge of abnormal condition procedures.

Question Number: 1

Answers: A ☐ B ☐ C ☐ D ☑ References Provided to Applicant: ☐

Justification

CHOICE (A) - No
WRONG:
VALID DISTRACTOR: Plausible if the Applicant does not understand that the operating loop system characteristic changes when in single RRP operation. The operating RRP will have a lower flow resistance because it can now discharge into the ten idle jet pumps in addition to the core inlet plenum.

CHOICE (B) - NO
WRONG:
VALID DISTRACTOR: Plausible if the Applicant does not fully understand how the core flow signal is developed. The individual jet pump flow transmitters produce signals before they are summed to determine total core flow. FY-1K607 is substituted for FY-1K606 if a RRP generator exciter breaker is open or discharge valve is less than 90% open. FY-1K607 subtracts the idle loop jet pump flow from operating loop jet pump flow to determine actual core flow (operating loop flow less backflow through the idle loop).

CHOICE (C) - NO
WRONG:
VALID DISTRACTOR: Plausible if the Applicant does not understand that the idle loop jet pumps have no method of backflow prevention or if the Applicant misunderstands signal development.

CHOICE (D) - Yes

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

1. (HB 09/08/05) Mod from INPO Bank QuestionID 20448 (Quad Cities exam in August 2001)

2. (THF 09/08/05) - no comment

3. Gil 09/09/05 - no comment.

4. Gil 09/26/05 - Should be HCL
R: o.k. - classified Higher Cognitive Level.

5. Todd 09/30/05 - OK.

6. SSES 10/14/05 - MINOR FIX
shortened stem and moved "Flow indications . . ." to stem.

NRC K/A System/E/A

System 29500 Partial or Complete Loss of Forced Core Flow Circ
1

Number AK2.07 **RO** 3.4 **SRO** 3.4 **CFR Link** (CFR: 41.7 / 45.8)

AK2. Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION and the following:
AK2.07 Core flow indication

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 2

 # 2 ☑ **RO** ☑ **SRO** **Question ID: 29693 Origin: Bank** ☑ **Memory Level**

Given the following conditions:

- SSES Unit 1 recently entered Mode 4 to start a refueling outage following a 500 day run.
- SSES Unit 2 is in mode 1 at full power and flow.
- The station experiences a loss of Startup Transformer T-20.

Which ONE of the following actions must be accomplished on Unit 2, in a short amount of time to prevent damage to major plant equipment?

A Restore Power to RPS Buss "A"

B Restore Power to RPS Buss "B"

C Restore the CRD System to service

D Start the ESW system

Question Number: 2

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - NO
WRONG: does not de-energize

CHOICE (B) - YES
T-20 causes loss of RPS "B".

CHOICE (C) - NO
Will not cause major damage in short amount of time.

CHOICE (D) - NO
WRONG: EDGs should NOT have started. ESW required to cool EDGs.

References

SSES Bank

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

1. (HB 09/08/05) Modified from SSES Bank.

24 month 700 days or 18 month 500 days for SQ to answer

2. THF 09/08/05 - clarified stem.

3. Gil 09/09/05 - concerned about K/A match.

4. Gil 09/26/05 - K/A mismatch. Relationship between containment isolation and EAL?
R: on a loss of T-20, RPS buss "B" is deenergized. This causes Primary CTMT isolation including isolation of RHR in SDC mode. The successful Applicant must recognize the reason PCIS isolated is the loss of RPS buss "B" and that the isolation interrupted SDC which must be restored to prevent entry into an EAL. If SDC not restored, the threshold for an EAL will be crossed.

5. Todd 09/30/05 - OK.

6. Rich 10/03/05 - odd way to ask response question?
R: change to "why did the SM declare the event". Saved original question as number 21.

7. SQ 10/14/05 - TOSS
a - Not RO level
b - K/A miss (reason for isolation under loss of AC)
c - Technically not correct.

8. SQ 10/17/05 - rejected attempt to modify and used original BANK question. Changed T-10 to T-20 and RPS "A" to "B" to make it less recognizable. But essentially still the same question.

9. SQ 11/04/05 - questioned SSES directly about K/A match. SSES states that this is an adequate fit to the K/A because the Applicant must understand the reasoning for power restoration is to clear the CTMT ISO. SSES concedes that the K/A match is indirect but still considers it adequate.

NRC K/A System/E/A

System 29500 Partial or Complete Loss of A.C. Power
3

Number AK3.06 **RO** 3.7 **SRO** **CFR Link**

AK3. Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER :
AK3.06 Containment isolation

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 3

 # 3 ☑ **RO** ☑ **SRO** **Question ID:** **28347** **Origin:** **Bank** ☑ **Memory Level**

While operating at full power on Unit 2, control power to the operating control rod drive (CRD) pump is lost. What effect will this have on the CRD pump?

The operating CRD pump will . . .

A . . . continue to run. Automatic protective trips for the pump are functional.

B . . . trip. Automatic protective trips for the pump are disabled.

C . . . continue to run. Automatic protective trips for the pump are disabled.

D . . . trip. Automatic protective trips for the pump are functional.

Question Number: 3

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - NO
WRONG: Automatic protective trips are disabled
VALID DISTRACTOR: Plausible because the pump will continue to run.

CHOICE (B) - NO
WRONG: the operating pump will not trip
VALID DISTRACTOR: Plausible because RRPs will automatically trip on loss of 125 VDC control power, not CRDs. Auto trips are disabled.

CHOICE (C) - YES

CHOICE (D) - NO
WRONG: Operating CRD Pump will not trip and auto trips are not functional.
VALID DISTRACTOR: Plausible if Applicant considers this a fail safe mechanism.

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

1. (HB 09/08/05) Modified from INPO Bank 23832 which was used on SSES August 2002 exam.

2. THF 09/08/05 - changed format to T-T / T-F / F-T / F-F with reasons.

3. Gil 09/09/05 - question ok but - in ATWS and directed to start both CRD pumps. Concurrent loss of DC power. Now what?

4. Gil 09/26/05 - could not validate with enclosed references.
R: need SSES to validate answer and distracters. Low risk of error because this is a bank question. Gil thinks it's reasonable from memory.

5. Todd 09/30/05 - OK.

6. SQ 10/14/05 - Move "The operating CRD pump will . . . " to the stem and delete from each answer choice. Stick to one pump
R: done

NRC K/A System/E/A

System 29500 Partial or Complete Loss of D.C. Power
4

Number AK1.05 **RO** 3.4 **SRO** 3.3 **CFR Link** (CFR: 41.8 to 41.10)

Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Loss of breaker protection

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 4

 # 4 ☑ **RO** ☑ **SRO** **Question ID: 28348** **Origin: New** ☐ **Memory Level**

SSES Unit 1 is refueling. Fuel shuffles are in progress and a bundle is ready to be lowered into the reactor vessel when the Control Room receives the following indications:

- IRM CHAN B/D/F/H UPSCALE TRIP OR INOP (AR-104-001/A06)
- SRM UPSCALE OR INOP (AR-104-001/B06)
- 24V DC PANEL 1L680 SYSTEM TROUBLE (AR-106-001/B13)
- REMOTE SHUTDOWN PANEL 1C201 INSTR PWR FAILURE (AR-106-001/H16)
- Source Range Monitors "B" and "D" fail DOWNSCALE.

Which of the following is the correct response for the Control Room operating crew?

A Stop all fuel movement after placing any suspended bundle in a safe location and enter ON-175-001, LOSS OF 24 VDC BUS.

B Continue fuel movement and enter ON-175-001, LOSS OF 24 VDC BUS.

C Stop all fuel movement after placing any suspended bundle in a safe location and enter ON-081-002, REFUELING PLATFORM OPERATION ANOMALY.

D Continue fuel movement and enter ON-081-002, REFUELING PLATFORM OPERATION ANOMALY.

Question Number: 4

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES
TS 3.3.1.2 refers to Table 3.3.1.2-1 for minimum SRM operability. Two SRMs are required when in mode 5. However, the loss of Division II 24 VDC power disables both SRM channels "B" and "C". Given that SRM channel "A" is already inoperable, the TS requirement can not be met because three out of four SRMs are now disabled. Note that this is NOT a spiral offload or reload because the stem specifies that a core "shuffle" is in progress and because SSES Training Dept indicates that spiral off/on-loads are not typical for SSES.

CHOICE (B) - NO
WRONG:
VALID DISTRACTOR: Plausible if the Applicant fails to recognize that TS 3.3.1.2 can not be met following loss of one Division of 24 VDC power because the affected SRMs are in opposite quadrants.

CHOICE (C) - NO
WRONG:
VALID DISTRACTOR: Plausible if the applicant believes that stopping fuel movement is an entry condition for the Off-Normal procedure.

CHOICE (D) - NO
WRONG:
VALID DISTRACTOR: Plausible if the applicant believes that stopping fuel movement is an entry condition for the Off-Normal procedure and fails to recognize that TS 3.3.1.2 can not be met following loss of one Division of 24 VDC power because the affected SRMs are in opposite quadrants.

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

1. (HB 09/08/05) New question. Question for SSES: will SRM UPSCALE OR INOP (AR-104-001/B06) reflash? Can we delete that initial condition? Should others be added?

2. THF 09/08/05 - changes to stem and answers to simplify and clarify

3. Gil 09/09/05 - no comment

4. Gil 09/26/05 - could not validate with enclosed references. Shortest answer is correct. Should balance with other distracters.
R: Revised distracters "B" and "D" to address length of choices.

5. Todd 09/30/05 - OK.

6. SQ 10/14/05 - MAJOR
a - look at 0P020 for replacement
b - replace ON-175-001 in answer choices with "place in safe location"
c - move conditions in stem from Intro to bullets.
d - add conditions describing SRM and IRM response.

7. SQ 10/17/05 - added condition that deenergized SRMs failed DNSCL to stem and requmt to safely stow suspended fuel to choices "A" and "C".

NRC K/A System/E/A

System 29500
4

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.30 **RO** 3.5 **SRO** 3.3 **CFR Link** (CFR: 45.12)

"Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation."

Question Number: 5

 # 5 ☑ **RO** ☑ **SRO** **Question ID: 29694** **Origin: New** ☑ **Memory Level**

SSES Unit 2 is at full rated power when Stator Coolant begins leaking into the Main Generator. This causes a Generator Neutral Overvoltage (59GN) fault.

Which ONE of the following correctly describes the expected sequence of plant events?

A 1. Concurrent trip of both Stator Cooling Water pumps and the Main Turbine,
2. Generator Lockout Relays trip,
3. Reactor Scram.

B 1. Concurrent trip of both Stator Cooling Water pumps and Generator Lockout Relays,
2. Reactor Scram,
3. Main Turbine trip.

C 1. Concurrent trip of both Stator Cooling Water pumps and the Main Turbine,
2. Generator Lockout Relays trip,
3. Reactor Scram.

D 1. Concurrent trip of both Stator Cooling Water pumps and Generator Lockout Relays,
2. Main Turbine trip,
3. Reactor Scram.

Question Number: 5

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - NO
WRONG: Turbine does not trip with Stator Coolant Pumps.
VALID DISTRACTOR: combination of correct events ending in scram.

CHOICE (B) - NO
WRONG: The scram does NOT precede the Turbine Trip.
VALID DISTRACTOR: Correct start and reasonable to believe logic would force scram (Heat Source) before trip (Heat Sink).

CHOICE (C) - NO
WRONG: Pumps and Turbine are NOT the initiator (s/b Pumps and Generator).
VALID DISTRACTOR: tests knowledge of whether the trip causes a GENERATOR or TURBINE trip.

CHOICE (D) - YES

References

AR-106-A04
AR-106-C04
ON-193-002
TM-OP-098

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

1. (HB 09/08/05) Question for SSES: how to describe Pp 1B status?

2. Gil 09/09/05 - no comments

3. Gil 09/26/05 - OK

4. Todd 09/30/05 - OK.

5. Rich 10/03/05 - Backward logic at memory level. Can we increase cognitive level?
R: revised question and answer choice to be forward looking. Saved original question as number 51. Still considered on the high side of memory level.

6. SQ 10/14/05 - MAJOR
a - recommend giving condition that a Gen Neut OV occurred and asking for sequence of events.

7. SQ 10/17/05 - per phone conversation, question restated. Original saved as number 52.

NRC K/A System/E/A

System 29500 Main Turbine Generator Trip 5

Number AK2.04 **RO** 3.3 **SRO** 3.3 **CFR Link** (CFR: 41.7 / 45.8)

Knowledge of the interrelations between MAIN TURBINE GENERATOR TRIP and the following: Main generator protection

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 6

 # 6 ☑ **RO** ☑ **SRO** **Question ID: 29587 Origin: New** ☐ **Memory Level**

Ten minutes after a reactor scram late in core life the steady state Reactor Pressure has risen from about 955 psig to almost 960 psig.

Which of the following caused this?

A A Reactor Feed Pump (RFP) tripped.

B EHC Steam Pressure Regulator "A" (PT10101A) failed low.

C Both Reactor Feed Pumps (RFP) tripped.

D EHC Steam Pressure Regulator "A" (PT10101A) failed high.

Question Number: 6

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (C) - NO
WRONG:
VALID DISTRACTOR: Plausible because a high failure will cause a plant depressurization because the HVG will pass the full OPEN signal to the TBVs.

CHOICE (B) - YES
This failure will cause EHC to maintain a new steady state pressure 3 psig GREATER THAN the pre-failure steady state pressure.

CHOICE (A) - NO
WRONG:
VALID DISTRACTOR: Plausible if the Applicant believes that reactor coolant throughput is reduced; thereby causing a slight pressure drop. Alternatively, the Applicant may conclude that the tripped RFP reduces steam flow such that pressure goes down. In fact, should a RFP trip, the EHC system will respond to maintain steady state pressure per program.

CHOICE (D) - NO
WRONG:
VALID DISTRACTOR: Plausible because this is redundant to PT10101A and an Applicant may incorrectly conclude that the signal will bias the output of the HVG somehow. However, this failure will cause a plant depressurization because the HVG will pass the full OPEN signal to the TBVs.

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

1. (HB 09/08/05) New.

Need reasonable pressure drop from SQ

2. THF 09/08/05 - changes to stem and answer.

3. Gil 09/08/05 - not realistic. Suggests scram condition but Rx Press stays at full power value - then ask what procedure to enter.

4. Gil 09/26/05 - Distracter "A" not plausible with electric feed pumps.
R: SSES has steam driven feed pumps. This is the result of comments to date. We need to reconsider "A" in light of making it mirror image of B-C-D.

5. Todd 09/30/05 - OK.

6. SQ 10/14/05 - MINOR
a - stem may describe actual plant response
b - delete STA reference in stem
c - need better description of the PTs

7. SQ 10/17/05 - per phone conversation with SSES, refer to PTs as EHC Regulators.
R - accepted. Also changed distractor "C" to both RFPs to better align the question to the K/A.

NRC K/A System/E/A

System 29500 SCRAM
6

Number AA2.04 **RO** 4.1 **SRO** 4.1 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)

Ability to determine and/or interpret the following as they apply to SCRAM : Reactor Pressure

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 7

 # 7 ☑ **RO** ☑ **SRO** **Question ID: 28352** **Origin: Bank** ☑ **Memory Level**

What is the DESIGN BASIS for disabling control room controls when control is transferred from the Control Room to the Remote Shutdown Panel per ON-100-009, PLANT SHUTDOWN FROM OUTSIDE THE CONTROL ROOM?

A To prevent unauthorized component operation from the Control Room.

B To prevent spurious component operation caused by hot shorts.

C To simplify design and construction of the Remote Shutdown system.

D To minimize time to evacuate the Control Room once deciding to evacuate.

Question Number: 7

Answers: A ☐ B ☑ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (B) - YES

CHOICE (A) - NO
WRONG:
VALID DISTRACTOR: Plausible because it does fulfill the purpose proposed by this distracter. However, the design reason is to prevent spurious hot short operation.

CHOICE (C) - NO
WRONG:
VALID DISTRACTOR: Plausible because it may simplify design and construction of the RSD system. However, the design reason is to prevent hot short operation.

CHOICE (D) - NO
WRONG:
VALID DISTRACTOR: Plausible because it may minimize evacuation time. However, the design reason is to prevent hot short operation.

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

1. (HB 09/08/05) Bank - minor revisions

2. THF 09/08/05 - editorial and deleted window dressing in stem.

3. PAP 9/9/05 - too easy, consider asking what the CR indication would be when the instrument were swapped to RSD.

4. Gil 09/26/05 - Revise first sentence of stem: "What is design basis for disabling control room controls . . ."
R: done.

5. Todd 09/30/05 - OK.

6. SQ 10/14/05 - distractor "C" may be implausible.
R - SSES personnel disagreed on this. Left question unchanged.

NRC K/A System/E/A

System 29501 Control Room Abandonment
6

Number AK3.03 **RO** 3.5 **SRO** 3.7 **CFR Link** (CFR: 41.5 / 45.6)

Knowledge of the reasons for the following responses
as they apply to CONTROL ROOM ABANDONMENT : Disabling control room controls

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 8

 # 8 ☑ **RO** ☑ **SRO** **Question ID: 29586 Origin: Bank** ☑ **Memory Level**

The plant is at 100% power when a loss of Reactor Building Closed Cooling Water (RBCCW) occurs.

With NO Operator action, which of ONE of the following will occur and why?

A Inboard MSIVs will close because Containment Instrument Gas is lost when RBCCW is lost.

B Outboard MSIVs will close because Instrument Air is lost when RBCCW is lost.

C Inboard MSIVs will close due to Main Steam Tunnel High Temperature when RBCCW is lost.

D Outboard MSIVs will close due to Main Steam Tunnel High Differential Temperature when RBCCW is lost.

Question Number: 8

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - YES
CTMT Inst Gas compressors cooled by RBCCW.

CHOICE (B) - NO
WRONG: IA compressors are cooled by TBCCW.
VALID DISTRACTOR:

CHOICE (C) - NO
WRONG: Tunnel coolers cooled by SW (Secondary CTMT). Moreover, Hi Tunn Temp closes ALL MSIVs.
VALID DISTRACTOR:

CHOICE (D) - NO
WRONG: Tunnel coolers cooled by SW (Secondary CTMT). Moreover, Hi Tunn Diff Temp closes ALL MSIVs.
VALID DISTRACTOR:

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

1. (HB 09/06/05) Bank question.

2. THF 09/08/05 - editorial changes. changed choices to just INBD/OUTBD

3. Gil 09/09/05 - added stem conditions to improve operational orientation.

4. Gil 09/26/05 - could not validate with enclosed references.
R: Risk of error is low because this is a BANK question. Also noted that RBCCW cools the steam tunnel HVAC during exam development.

5. Rich 10/03/05 - Backward logic at memory level. Can we increase cognitive level?
R: revised wording to forward looking. Still lower level cause BANK and it is memory.

6. SQ 10/14/05 - OK.

NRC K/A System/E/A

System 29501 Partial or Complete Loss of Component Cooling Wtr
8

Number AK1.01 **RO** 3.5 **SRO** 3.6 **CFR Link** (CFR: 41.8 to 41.10)

Knowledge of the operational implications of the
following concepts as they apply to PARTIAL OR
COMPLETE LOSS OF COMPONENT COOLING WATER : Effects on component/system operations

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 9

 # 9 ☑ **RO** ☑ **SRO** **Question ID: 28355 Origin: New** ☑ **Memory Level**

SSES Unit 2 is at full power with the following conditions:

- "A" Containment Instrument Gas compressor (2K205A) is in LEAD
- "B" Containment Instrument Gas compressor (2K205B) is in STANDBY
- "A" Instrument Air compressor (2K107A) is in LEAD
- "B" Instrument Air compressor (2K107B) is in STANDBY
- "A" Service Air compressor (2K108A) is in LEAD
- "B" Service Air compressor (2K108B) is in STANDBY

The plant suffers a loss of Bus 2A201. Which of the following correctly describes the plant response:

A PCV-22560 will open, allowing the Service Air system to supply Instrument Air system loads.

B Service Air compressor 2K108B will start and cycle between 118 psig and 127 psig.

C Instrument Air compressor 2K107B will start and cycle between 87 psig and 102 psig.

D Containment Instrument Gas compressor 2K205B will start and cycle between 152 psig and 170 psig.

Question Number: 9

Answers: A ☐ B ☐ C ☐ D ☑ References Provided to Applicant: ☐

Justification

CHOICE (D) - YES

CHOICE (C) - NO
WRONG:
VALID DISTRACTOR: Plausible because a unit 2 bus was lost and the STBY IA compressor does cycle between 87 and 102. Incorrect because the power supply to lead IA compressor 2K107A (2A204) remains energized.

CHOICE (B) - NO
WRONG:
VALID DISTRACTOR: Plausible because a unit 2 bus was lost and the STBY SA compressor does cycle between 118 and 127. Incorrect because the power supply to lead SA compressor 2K108A (1B130) remains energized.

CHOICE (A) - NO
WRONG:
VALID DISTRACTOR: Plausible because PCV-12560 will open as described on a loss of IA. However, no loss of IA occurred as described in Distracter 1.

References

TM-OP-025

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

1. (HB 09/08/05) New. Check cycle pressures with SSES.

2. THF 09/08/05 - formatting

3. Gil 09/09/05 - no comment

4. Gil 09/26/05 - could not validate with enclosed references.
R: will re-verify if time permits. Did re-verify once during development of subsequent question and am confident in question.

5. Todd 09/30/05 - OK.

6. Rich 10/03/05 - are we sure it is Memory Level?
R: yes - really only need to know the power supplies for each of the compressors. Once loss of power to 2K205A is recognized, the question is straightforward memory.

7. SQ 10/14/05 - Power supply from memory is minutia. 2Y216 Trips Control Power. Stick with one unit or the other. Delete references to cycle pressures in the answer choices.
R - deleted all references to Unit 1. Agree that it is a simple power supply question. However, the K/A was randomly selected and has an importance rating of 3.0. Moreover, SSES has a Learning Objective to know the power supplies to these compressors. The cycle pressures are not necessary to determine the answer and correctly state what the associated compressor will do IF ITS POWER IS LOST. Therefore, this additional information does not complicate the question and is left in place.

NRC K/A System/E/A

System 29501 *Partial or Complete Loss of Instrument Air*
9

Number AA1.03 **RO** 3.0 **SRO** 3.0 **CFR Link** (CFR: 41.7 / 45.6)

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

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 10

 # 10 ☑ **RO** ☑ **SRO** **Question ID: 29689** **Origin: New** ☑ **Memory Level**

SSES Unit 2 is in Mode 3 with Shutdown Cooling in service. Shutdown Cooling is lost due to low RPV water level isolation.

What is the minimum required RPV Water Level and the basis for this level?

A 45 inches to ensure natural circulation flow for core cooling and to prevent thermal stratification if Shutdown Cooling is lost.

B 80 inches to ensure natural circulation flow for core cooling and to provide adequate NPSH to the Fuel Pool Cooling (FPC) pumps.

C 45 inches to prevent thermal stratification and to provide adequate NPSH to the Fuel Pool Cooling (FPC) pumps.

D 80 inches to prevent thermal stratification and to provide adequate NPSH to the RHR pumps.

Question Number: 10

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES

CHOICE (B) - NO
WRONG: NPSH to FPC pumps is NOT the reason.
VALID DISTRACTOR: Plausible because 90 inches is the administrative limit per OP-149-002 and because NC flow is partially correct. Static head is a common issue wrt NPSH.

CHOICE (C) - NO
WRONG: NPSH to FPC pumps is NOT the reason.
VALID DISTRACTOR: Plausible because 45 inches is correct and thermal stratification is part of the reason. Static head is a common issue wrt NPSH.

CHOICE (D) - NO
WRONG: NPSH to pumps is NOT the reason.
VALID DISTRACTOR: Plausible because 90 inches is the administrative limit per OP-149-002. Static head is a common issue wrt NPSH.

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

1. (HB 09/08/05) New.
2. Gil 09/09/05 - no changes.
3. PAP 9/9/05 comment - Applicant could argue that "C" is a second correct answer. Changed RFR to Fuel Pool Cleanup pumps.

!!! ASK SSES IF "C" IS POTENTIALLY CORRECT !!!!

4. Gil 09/26/05 - K/A mismatch.
R: possibly but on a loss of SDC, unlikely to see any recirc flow changes.

5. Todd - unable to agree. SSES input seems to support my view but I asked for further clarification.

6. SQ 10/14/05 - As written, two correct answers. Rejected entirely for MAJOR rewrite. Original saved as 101.

09/28/05 Phone Conversation with SSES - they agree that the original question as written did not appear to match the K/A. However, they recommended changes to the entire question to better align it to the K/A. These changes were incorporated into the question.

Todd 09/30/05 - OK.

7. SQ 10/14/05 - as written, 90 inches is correct. Also, distractor "D" refers to NPSH for BOTH reasons.
R - significant rewrite to make only one correct answer and changed distractor "D".

NRC K/A System/E/A

System 29502 Loss of Shutdown Cooling
1
Number AA2.07 **RO** 2.9 **SRO** 3.1 **CFR Link** (CFR: 41.10 / 43.5 / 45.13)
Ability to determine and/or interpret the following as
they apply to LOSS OF SHUTDOWN COOLING : Reactor recirculation flow

NRC K/A Generic

System
Number **RO** **SRO** **CFR Link**

Question Number: 11

 # 11 ☑ **RO** ☑ **SRO** **Question ID:** **29585** **Origin:** **Bank** ☑ **Memory Level**

Which one of the following is the Safety Related Basis for maintaining Fuel Pool level 22 feet above the top of fuel?

A To provide a floodable volume for RHR/FPC following a postulated seismic event.

B To limit Iodine release during a fuel handling accident to 25% or less of 10 CFR 100 limits.

C To minimize localized boiling within individual fuel assemblies following a loss of fuel pool cooling.

D To properly seat the Fuel Pool Gate Inflatable Seals with a static head of water in the fuel pool.

Question Number: 11

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (B) - YES

CHOICE (A) - NO
WRONG:
VALID DISTRACTOR: SQ has committed to providing RHRFPC to maintain temperatures below 125 degrees Fahrenheit following a seismic event. However, this is not the safety related basis.

CHOICE (C) - NO
WRONG:
VALID DISTRACTOR: This is the basis for maintaining fuel pool temperature below 125 degrees Fahrenheit. However, it is not the safety related basis for maintaining 22 feet of water above the fuel.

CHOICE (D) - NO
WRONG: This is not the stated reason.
VALID DISTRACTOR: Higher head of water could be expected to better seat the gates..

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

1. (HB 09/08/05) Bank - INPO 24493 (River Bend ILO in 2003)

Need to verify BASIS against SQ TS

2. THF 09/08/05

3. Gil 09/09/05: added operational orientation and raised LOD by adding conditions to the stem.

4. Gil 09/26/05: Distracter "D" not plausible if FPC pumps are non-safety related.
R: Replaced "To ensure net positive suction head to the Fuel Pool Cooling Cleanup Pumps during routine operation." with new distracter.

5. Todd 09/30/05 - deleted "Refueling operations are about to start. There are no known fuel failures in the core. The Shift Manager directs you to ensure the level in the Fuel Pool and Reactor Cavity are greater than 22 feet." from the stem.

6. SQ 10/14/05 - insert a "?" between RHR and FPC in distractor "A".

NRC K/A System/E/A

System 29502 Refueling Accidents
3

Number AK1.01 **RO** 3.6 **SRO** 4.1 **CFR Link** (CFR: 41.8 to 41.10)

Knowledge of the operational implications of the following concepts as they apply to REFUELING ACCIDENTS : Radiation exposure hazards

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 12

 # 12 ☑ **RO** ☑ **SRO** **Question ID: 29690** **Origin: New** ☑ **Memory Level**

SSES Unit 2 Operators are responding to a High Drywell Pressure condition by venting the drywell per OP-273-003, Primary Containment Nitrogen Makeup and Venting. There is no failed fuel and the Containment atmosphere is below minimum detectable activity (MDA). How does the method of Drywell venting per Section 2.3 of OP-273-003, Venting Drywell, prevent an UNMONITORED and UNCONTROLLED release to assure radiation exposures remain as low as reasonably achievable (ALARA)?

The Drywell is vented . . .

A . . . to the Standby Gas Treatment Exhaust Vent via the Standby Gas Treatment system.

B . . . to the Zone 3 Filtered Exhaust via the Recirculation Plenum.

C . . . to the SSES Unit 2 Filtered Exhaust via the Recirculation Plenum.

D . . . to the SSES Unit 2 Turbine Building Filtered Exhaust via the Ambient Offgas Charcoal system.

Question Number: 12

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - YES

CHOICE (B) - NO
WRONG: This is not the vent path
VALID DISTRACTOR: From the Training diagram, this appears to be a possible flow path.

CHOICE (C) - NO
WRONG:
VALID DISTRACTOR: Plausible to believe that the Nitrogen gas could be compressed and reused. However, it's not done this way.

CHOICE (D) - NO
WRONG:
VALID DISTRACTOR: Plausible method of venting the Drywell. However, it's not done this way.

References

TM-OP-70 (46) and 73 (10)

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

1. (HB 09/08/05) New by Gil. Check TRM 3.6.1.

2. THF 09/08/05 - no comment

3. Gil 09/09/05 - no comment

4. Gil 09/26/05 - Is the flow path in distracter "B" possible?
R: No. none of the distracter flow paths are possible. Replaced "The Drywell is vented to the Offgas Recombiner via the Main Condenser." with new distracter.

5. SQ 10/14/05 - editorial change to stem and complete rewrite of the distractors. Saved original version as 121.

NRC K/A System/E/A

System 29502
4

Number | **RO** | **SRO** | **CFR Link**

NRC K/A Generic

System 2.3 Radiation Control

Number 2.3.2 **RO** 2.5 **SRO** 2.9 **CFR Link** (CFR: 41.12 / 43.4. 45.9 / 45.10)

Knowledge of facility ALARA program.

Question Number: 13

 # 13 ☑ **RO** ☑ **SRO** **Question ID: 29695 Origin: Bank** ☐ **Memory Level**

The following conditions exist on SSES Unit 1:

- A successful automatic reactor scram occurred on high reactor pressure.
- MSIVs are closed but the Main Condenser is available.
- The PCO is attempting to stablize RPV pressure between 950 and 1,000 psig using SRVs.
- Suppression Pool Temperature is 92 degrees Farenheit and slowly rising.

Re-establishing the Main Condenser as a heat sink is . . .

A . . . PERMITTED if NO valid MSIV isolation signal exists.

B . . . NEVER permitted UNLESS primary containment integrity is in jeopardy.

C . . . REQUIRED immediately after bypassing and resetting any valid MSIV isolation signal.

D . . . PERMITTED if NO SRV is available.

Question Number: 13

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES

CHOICE (B) - NO
WRONG: is permitted if signal determined and cleared.
VALID DISTRACTOR: CTMT Integrity issues come from ON-184-001 note.

CHOICE (C) - NO
WRONG: not required action - nonsensical to bypass valid signals
VALID DISTRACTOR: Applicant may consider heat sink restoration more important that CTMT.

CHOICE (D) - NO
WRONG: would not be permitted if SRVs were unavailable.
VALID DISTRACTOR: Applicant may see extremis - reality is that HPCI and RCIC are available and total SRV loss is unlikely.

References

Hope Creek August 1998 Exam
ON-184-001

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Question generated after original K/A rejected IRT SQ comments and concerns about first question. Original saved as 131.

1. SQ 11/04/05 - discussed K/A match with SSES. Agreed to add SPT to initial conditions to improve K/A match and considered the original match adequate, albeit indirect. SSES noted that it was a difficult K/A.

NRC K/A System/E/A

System 29502 High Reactor Pressure
5

Number EA2.03 **RO** 3.9 **SRO** 4.1 **CFR Link** (CFR 41.10, 43.5, 45.13)

Ability to determine and/or interpret the Suppression pool temperature as it applies to HIGH REACTOR PRESSURE

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 14

 # 14 ☑ RO ☑ SRO **Question ID:** 29696 **Origin:** Mod ☐ Memory Level

A Main Generator trip and an Auxiliary Buss load shed occurred while SSES Unit 2 was operating at 100% power. The following conditions exist:

- A failure to scram occurred.
- Initial Reactor power was 4%.
- SRVs are cycling to maintain Reactor Pressure.
- Drywell pressure is 18 psig.
- Drywell Temperature is 149 degrees Farenheit.
- Suppression Pool water level is 31 feet.
- Suppression Pool Temperature is 135 degrees Farenheit.

Which ONE of the following states the required Operator action and the basis of that action?

A Perform an emergency cooldown using the Main Turbine Bypass Valves to prevent the impulse load on the Supression Pool from exceeding design loads.

B Perform a rapid depressurization using the SRVs to ensure Primary Containment vent valve opening pressure will not be exceeded following RPV depressurization.

C Transfer HPCI suction from the Condensate Storage Tank to the Suppression Pool to prevent further Suppression Pool water level increase.

D Reduce Reactor pressure using SRVs and stop HPCI and RCIC to prevent operation with water in the turbine exhaust lines.

Question Number: 14

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - NO
WRONG: TBVs unavailable due to load shed & loss of Circ Water.
VALID DISTRACTOR: may want to remove energy via normal means.

CHOICE (B) - NO
WRONG: HCTL NOT exceeded. This is a key mod to the original question.
VALID DISTRACTOR: Applicant may recognize past question or misread HCTL curves.

CHOICE (C) - YES per SP/L-12.

CHOICE (D) - NO
WRONG: SP/L-11 prefers running HPCI and RCIC to prevent auto start with water in Turbine Exhaust.
VALID DISTRACTOR: play on actual requirements.

References

SSES ILO Exam of August 2004.
EO-000-103.

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

New question after SSES review determined that original had little or no plant relevance.

NRC K/A System/E/A

System 29502 Suppression Pool High Water Temperature
6

Number EK1.02 **RO** 3.5 **SRO** 3.8 **CFR Link** (CFR 41.8 to 41.10)

Knowledge of the operational implications of the Steam condensation as it applies to SUPPRESSION POOL HIGH WATER TEMPERATURE

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 15

 # 15 ☑ **RO** ☑ **SRO** **Question ID: 29576 Origin: Bank** ☐ **Memory Level**

SSES Unit 1 has a Loss of Coolant Accident (LOCA) and the following plant conditions exist:

- RPV Pressure . . . . . 25 psig
- RPV Level . . . . . +40 inches and rising slowly
- Suppression Pool Level . . . . . 23.5 feet
- Suppression Pool Temperature . . . . . 102 degrees Fahrenheit
- Drywell Pressure . . . . . 21 psig
- Drywell Temperature . . . . . 296 degrees Fahrenheit
- Division I RHR . . . . . Injecting into the RPV
- Division II RHR . . . . . Operating in Suppression Pool Cooling/Spray mode
- Both Divisions of Core Spray . . . . . Injecting into the RPV
- Instrument Run Temperature (UR 25701A&B) . . 276 degrees Fahrenheit

Given the above conditions, which of the following actions is required by the operating crew per EO-200-103, PC CONTROL?

A Go To EO-100-112, Rapid Depressurization.

B Initiate Drywell Spray.

C Go To EO-100-114, RPV Flooding.

D Shutdown All Drywell Coolers and Fans.

Question Number: 15

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☑

Justification

Bank - Fermi 2 2 exam of March 2003 (Question ID = 23721)

Applicants may want the EOPs to refer to Figure 1 of EO-100-103, PC Control. However, they should be able to determine that RPV level instruments are unreliable due to reference leg flashing by using ordinary steam tables. The given RPV Pressure of 25 psig or 40 psia yields a saturation Temperature of 267.25 deg F. The given Instrument Run Temperature is almost 9 deg F above saturation.

DISTRACTOR (A):
Plausible because the Drywell Temperature Control procedure requires Rapid Depressurization if DW temps can not be restored/maintained below 340 deg F at step DW/T-6. However, in this question, the operator should have gone to RPV flooding earlier at step DW/T-3.

DISTRACTOR (B):
Plausible because Drywell Spray is required when Drywell Temps exceed 340 deg F.

DISTRACTOR (D):
Shutdown All Drywell Coolers and Fans per OP-273-001, Containment Atmosphere Control System.

References

Standard Steam Tables.

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/09/05 - editorial change to stem

Gil 09/26/05 - OK

SQ 10/14/05 - changed Torus to Suppression Pool and revised +1.5 inches to 23.5 feet.
delete procedure references and changed to unit 1
Applicants will have EOPs without entry conditions.

NRC K/A System/E/A

System 29502 High Drywell Temperature
8

Number EK3.02 **RO** 3.5 **SRO** 3.8 **CFR Link** (CFR 41.5, 45.6)

Knowledge of the reasons for the RPV flooding as it applies to HIGH DRYWELL TEMPERATURE

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 16

 # 16 ☑ **RO** ☑ **SRO** **Question ID: 29577** **Origin: New** ☑ **Memory Level**

Which of the following describes the method that provides the highest flow rate of makeup to the Suppression Pool per OP-159-001, Suppression Pool Cleanup System?

A Pump the Condensate Storage Tank with the Core Spray Line Fill Pump to the CORE SPRAY CONDENSATE TRANSFER ISOLATION TO LOOP "B" MINIMUM FLOW LINE 152028.

B Gravity drain the Condensate Storage Tank through the Reactor Core Isolation Cooling (RCIC) Pump Casing to the RCIC MIN FLOW TEST LINE 149F019.

C Pump the Condensate Storage Tank with the High Pressure Coolant Injection (HPCI) Pump to the HPCI MIN FLOW LINE 155F012.

D Gravity drain the Condensate Storage Tank through CORE SPRAY CST SUPPLY ISOLATION 152021 and CORE SPRAY PUMP B&D CST SUCTION SUPPLY 152F002B to the Core Spray suction strainers.

Question Number: 16

Answers: A ☐ B ☐ C ☐ D ☑ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - NO
WRONG: lower flow rate than the correct response.
VALID DISTRACTOR: normal method of makeup.

CHOICE (B) - NO
WRONG: Not procedurally authorized.
VALID DISTRACTOR: would work.

CHOICE (C) - NO
WRONG: Not procedurally authorized.
VALID DISTRACTOR: Would work

CHOICE (D) - YES

References

Section 3.4 of OP-159 and SP/L-1 specify use of the Suppression Pool Cleanup system.

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

Inspired by Peach Bottom 2 September 2002 exam (Question ID 24782)

Gil 09/09/05 - editorial change to stem

CONSIDER CHANGING ALL DISTRACTORS TO: Gravity drain CST through RHR, HPCI, RCIC suction strainers.
?????????

Gil 09/26/05 - Correct answer is longest. Should balance with other distracters.
R: added full noun name descriptions to "B" and "C" for HPCI and RCIC. However, unable to perfect length of selections without degrading operational validity of the distracters or creating new psychometric clues.

Todd 09/30/05 - deleted "SSES Unit 1 is operating at full power. A failure of PSV152-F032B, the "B" Core Spray loop pump suction relief valve has lowered Suppression Pool water level. PSV152-F032B has been gagged shut. However, Suppression Pool water level has been below 22 feet for one hour. Per Emergency Operating Procedure EO-100-103, step SP/L-1, the Unit Supervisor has directed you to raise Suppression Pool water level to 23 feet." from stem.

SQ 10/14/05 - OK

NRC K/A System/E/A

System 29503 Low Suppression Pool Water Level
0

Number EA1.06 **RO** 3.4 **SRO** 3.4 **CFR Link** (CFR 41.7, 45.6)

Ability to operate and/or monitor the Condensate storage and transfer (make up to the suppression pool) (Plant-Specific) as it applies to LOW SUPPRESSION POOL WATER LEVEL

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 17

 # 17 ☑ RO ☑ SRO **Question ID:** 29578 **Origin:** New ☐ Memory Level

SSES Unit 1 was operating at full rated power when all Feedwater flow was lost. Reactor Pressure Vessel level quickly lowered to approximately -40 inches at which point all control rods inserted and both Reactor Recirculation Pumps (RRP) tripped. What FSAR described event initiated the transient and what caused the plant response?

A Feedwater Line Break - Outside Containment
Backup Scram Valve (SV 147110 A & B) actuation

B Feedwater Controller Failure - Maximum Demand
ARI and ATWS-RPT actuation

C Feedwater Line Break - Outside Containment
ARI and ATWS-RPT actuation

D Feedwater Controller Failure - Maximum Demand
Backup Scram Valve (SV 147110 A & B) actuation

Question Number: 17

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

New

Note: The ATWS-ARI and ATWS-RPT use the same circuitry per TM-OP-058, page 46. RPS should have scrammed the plant at L3 (+13 inches). In this case, the rods inserted and RPT occurred just below L2 (-38 inches).

DISTRACTOR (A):
Plausible because FW Line Break is correct and the Backup Scram Valves are a redundant means of inserting control rods. However, per OP-TM-058, page 35, the Backup Scram Valves will not actuate unless both RPS A and B Trip Systems trip (de-energize) to energize the Backup Scram Valve Solenoid on each valve. In this case, the RPS system failed to operate at L3.

DISTRACTOR (B):
Plausible because the FW failure to max demand would eventually cause a loss of both FW-Ps on high RPV level. However, the question stem does not support this conclusion because there is no statement indicating a rise in RPV level and the RPV level decrease to below L2 requires the main turbine to be in operation.

DISTRACTOR (D):
Plausible because Backup Scram valves are a redundant means of inserting control rods. However, per OP-TM-058, page 35, the Backup Scram Valves will not actuate unless both RPS A and B Trip Systems trip (de-energize) to energize the Backup Scram Valve Solenoid on each valve. In this case, the RPS system failed to operate at L3.

References

FSAR

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/09/05 - No comment

Gil 09/26/05 - OK

Todd 09/30/05 - change insert and trip to inserted and tripped.

SQ 10/14/05 - editorial changes to stem and added "ARI and" to "B" and "C".

NRC K/A System/E/A

System 29503 Reactor Low Water Level 1

Number EK2.13 **RO** 4.1 **SRO** 4.2 **CFR Link** (CFR 41.7, 45.8)

Knowledge of the interrelations between REACTOR LOW WATER LEVEL and ARI/RPT/ATWS (Plant-Specific)

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 18

 # 18 ☑ **RO** ☑ **SRO** **Question ID: 29660 Origin: New** ☐ **Memory Level**

SSES Unit 1 has an Anticipated Transient Without Scram (ATWS). The control room operating crew initiate Standby Liquid Control (SBLC) per LQ/Q-3. You observe the following:

- "A" SBLC Pump RED indicating light ILLUMINATES,
- "B" SBLC Pump RED indicating light does NOT illuminate,
- ONE SBLC SQUIB READY A-B White indicating light extinguishes,
- ONE SBLC SQUIB READY A-B White indicating light remains energized,
- SBLC SQUIB VALVES LOSS OF CKT CONTINUITY (A03) Energizes.

What actions, if any, are necessary to establish REQUIRED flow (86 gpm)?

A OPEN the second SBLC SQUIB Valve to establish sufficient flow path for full flow.

B START the "B" SBLC Pump to establish full pumping capacity.

C INJECT Boron with HPCI IAW ES-150-002 to establish full flow.

D No action is necessary because a single pump and valve will provide rated flow.

Question Number: 18

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

New - inspired by Browns Ferry 2 exam of September 2001 (Question ID 21039)

SSES requires both SBLC pumps to start to ensure reactor safety following an ATWS. The expected flow rate is approximately 86 gpm. In this case, the flow rate is one-half of expected (43 gpm) because one SBLC pump failed to start. The alarm will energize when 4742 less 4587 (155) gallons have been injected. This will occur in 155 divided by 43 or 3.6 minutes.

The failure of one SQUIB Valve to fire has no effect on the solution because the pumps discharge to a common header. The common header then flows through two parallel SQUIB valves.

A - Only one valve opened. Plausible if the Applicant believes that the failed SQUIB valve blocks SBLC flow to the RPV and that opening the valve will restore full flow.

C - LQ/Q-4 requires this if Boron can NOT be injected with SBLC. Here, SBLC is injecting, albeit at half the required rate.

D - SSES requires both SBLC pumps to start to ensure reactor safety following an ATWS

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☑ SSES

Gil 09/09/05 - editorial change to stem
Gil 09/26/05 - Distracter "A" not plausible with one pump running and one squibb fired; should have some flow.
R: revised "Never" to "16 minutes". Applicant may misapply pump laws.

Todd 09/30/05 - why give set point?
R: w/o set point, it may become LOD=5 because not expected to know this.

Rich 10/03/05 - K/A mismatch. CE view?
R: agreed. Changed stem and distracters to require Applicant to demonstrate ability to manipulate controls. Saved original question as 181.

* * * Ask SSES to evaluate distracter "C" as a potentially second correct answer.

SQ 10/14/05 - editorial changes to stem and answer.

SQ 11/04/05 - SSES considered distracter "C" to be second correct answer. Changed "RCIC" to "HPCI" to make it absolutely incorrect.

NRC K/A System/E/A

System 29503
7

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.2 **RO** 4.0 **SRO** 3.5 **CFR Link** (CFR: 45.2)

Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.

Question Number: 19

 # 19 ☑ **RO** ☑ **SRO** **Question ID: 29580** **Origin: New** ☑ **Memory Level**

A truck carrying Chlorine is involved in an accident on Route 11 outside the Main Access Road to the site. How will the Control Structure HVAC system protect control room operators from toxic gas?

A The system will automatically shift to the RECIRULATION MODE. Correct configuration and operation is then verified per ON-159-001 (ON-259-002), Containment Isolation.

B The system can be manually started in the RECIRCULATION MODE per OP-030-002, Control Structure HVAC, by placing Control Structure Manual Isolation switches HS-07802A1 and HS-07802B1 to "ISO" and then starting CREOASS Fan OV101A or OV101B.

C The system can be manually started in the PRESSURIZATION/FILTRATION MODE per OP-030-002, Control Structure HVAC, by placing Emergency Outside Air Intake Radiation Monitor mode switches RISHH-D12-0K618A and RISHH-D12-0K618B to "TRIP TEST".

D The system will automatically shift to the PRESSURIZATION/FILTRATION MODE. Correct configuration and operation is then verified per ON-159-001 (ON-259-002), Containment Isolation.

Question Number: 19

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

New

Per TM-OP-079E, the system originally built to automatically do this on high Chlorine.

DISTRACTOR (A):
Plausible because ON-1/2 59-002 does verify configuration and operation in response to a CTMT ISO. Automatic initiation of RECIRCULATION was part of the original design basis.

DISTRACTOR (C):
Plausible because this is one of three distinct operating modes for the system. However, per the TM-OP-079E, the correct response is RECIRC mode.

DISTRACTOR (D):
Plausible because this is one of three distinct operating modes for the system. However, the system will not automatically align itself to this mode and ON-1/2 59-002 does not address this mode.

References

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/09/05 - No comment

Gil 09/26/05 - K/A mismatch. Suggests throwing the K/A out.
R: disagree. While the question does not directly ask what happens on a RADIOACTIVE release, the successful Applicant must understand operation of the Control Structure ventilation system to answer this question. The applicant must know the difference between the two suggested operating modes (Recirc and Press/Filt) and what situations cause automatic reconfigurations. Therefore, the question does discriminate between Applicants who understand the Control Structure HVAC from those who do not.

Gil: suggests new stem: "Following a significant release of Chlorine from the Chlorine building". Accepted.

SQ 10/14/05 - SSES no longer has Chlorine on site. Therefore, changed stem to read truck accident.

NRC K/A System/E/A

System 29503 High Off Site Release Rate
8

Number EA1.07 **RO** 3.6 **SRO** 3.8 **CFR Link** (CFR 41.7, 45.6)

Ability to operate and/or monitor the Control room ventilation (Plant-Specific) as it applies to HIGH OFF SITE RELEASE RATE

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 20

 # 20 ☑ **RO** ☑ **SRO** **Question ID: 29697 Origin: Bank** ☐ **Memory Level**

The following Simplex Alarm is received.

FIRE SUP X222_Z3 ALM
TIME: 0300 DATE: 08/14/04
02-656 WPS111 CNDNSR

Which of the following would be the plant response for the given Simplex Alarm?

A High flow from FSH12201A (FSH FOR WPS-111 UNIT 1 TB CDSR AREA) and WPS-111 OS&Y SUPPLY VALVE via ZS-12201A NOT Full open, and Input to Radwaste Collection Tanks will increase.

B AR-036-B01, "PUMP (Fire) IS OPERATING", alarm will be received, and AR-036-B05, "ENGINE RUNNING", alarm will be received, and Input to Radwaste Collection Tanks will increase.

C AR-036-B01, "PUMP (Fire) IS OPERATING", alarm will be received, and AR-036-B05, "ENGINE RUNNING", alarm will be received, and HV16150 Condenser Area Transfer Sump Isolation Valve closes.

D High flow from FSH12201A (FSH FOR WPS-111 UNIT 1 TB CDSR AREA) and WPS-111 OS&Y SUPPLY VALVE via ZS-12201A NOT Full open, and HV16150 Condenser Area Transfer Sump Isolation Valve closes.

Question Number: 20

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - NO
VALID DISTRACTOR: The candidate may believe that there will be an increase in flow to the radwaste, but the sump isolates as part of the fire response. Thus there will be no sudden inrush of fire protection water to radwaste.

CHOICE (B) - NO
VALID DISTRACTOR:The candidate may believe that there will be an increase in flow to the radwaste, but the sump isolates as part of the fire response. Thus there will be no sudden inrush of fire protection water to radwaste.

CHOICE (C): YES

CHOICE (D): NO
VALID DISTRACTOR: The high flow from the flow switch is expected on fire suppression initiation in the area. The supply valve is normally open. A trouble alarm will result if the valve is not full open. The valve is a manual valve and will be open. The candidate may believe the valve operates on an initiation signal.

References

SSES Exam of August 2004
Direct K/A match.
AR-036-B01, B05
OP-TM-013Z

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Second stab at same K/A

****

* THIS IS THE FIRST BANK TAKEN DIRECTLY FROM PREVIOUS EXAM *

****

SQ 11/04/05 - SSES advised NRC that this question was also on the "Cert Exam" for the current class of Applicants. It is permissible to reuse the question because the exams were developed independently (See, ES-401-6, Item 5). Nevertheless, we will explore MODifying the question during the formal validation week.

NRC K/A System/E/A

System 60000 Plant fire on site
0

Number AA1.06 **RO** 3.0 **SRO** 3.0 **CFR Link**

Ability to operate and / or monitor the following as they apply to the Plant Fire on Site: Fire alarm

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 21

 # 21 | ☑ **RO** ☑ **SRO** **Question ID:** **29698** **Origin:** **New** ☐ **Memory Level**

SSES Unit 2 is at full rated power. Reactor Pressure Vessel (RPV) water level is steady at 35 inches. You observe the following steady state conditions:

- Reactor Feed Pump "A"
  - running at 4,000 rpm and
  - pumping 3.7E6 lbm/hour (3,700,000 lbm per hour).
- Reactor Feed Pump "B"
  - running at 5,000 rpm and
  - pumping 4.6E6 lbm/hour (4,600,000 lbm per hour).
- Reactor Feed Pump "C"
  - running at 4,000 rpm and
  - pumping 3.7E6 lbm/hour (3,700,000 lbm per hour).

As PCO, you take RFP B SPD CTL/DEMAND SIGNAL SIC-C32-2R601B to MANUAL and attempt to reduce the speed of the "B" Reactor Feed Pump. There is no response.

What MUST your next action be per ON-145-001, RPV LEVEL CONTROL SYSTEM MALFUNCTION?

A Lower RFPT B MTR SPD CHANGER using HS-22730B1 SLOW pushbutton until the Reactor Feed Pump slows down.

B Place FW LEVEL CTL/DEMAND SIGNAL LIC-C32-2R600 in MANUAL and attempt to reduce Reactor Feed Pump speed.

C Place FWLCS in Single Element Control by pressing the Green 1 ELEM pushbutton for 1 OR 3 ELEMENT LEVEL CONTROL HS-206102.

D Swap the controlling level channel by depressing available channel pushbutton for SELECT LVL A OR B HS-C32-2S01.

Question Number: 21

Answers: A ☑ B ☐ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - YES, per 3.4.3

CHOICE (B) - NO
WRONG: Master Controller will affect all three pumps. Need to match speeds/flows
VALID DISTRACTOR: this is directed for a Master Controller failure

CHOICE (C) - NO
WRONG: Would have no affect on speed control because level is steady at 35.
VALID DISTRACTOR: this is directed for level controller failure.

CHOICE (D) - NO
WRONG: Would have no affect on speed control because level is steady at 35.
VALID DISTRACTOR: this is directed for level controller failure.

References

ON-145-001

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Get good numbers from SSES.

SQ 11/04/05 - asked SSES to get good numbers for this question - possibly to run it on the simulator.

NRC K/A System/E/A

System 29500 8

Number **RO** **SRO** **CFR Link**

NRC K/A Generic

System 2.1 Conduct of Operations

Number 2.1.20 **RO** 4.3 **SRO** 4.2 **CFR Link** (CFR: 41.10 / 43.5 / 45.12)

Ability to execute procedure steps.

Question Number: 22

 # 22 ☑ **RO** ☑ **SRO** **Question ID: 29592** **Origin: New** ☐ **Memory Level**

Which of the following conditions will NOT actuate a Reactor Recirculation Pump (RRP) runback to prevent CAVITATION?

A RPV Water Level at +11 inches and
Reactor Feedwater Pump "A" flow of 26% and
Reactor Feedwater Pump "B" flow of 27% and
Reactor Feedwater Pump "C" flow of 27%.

B RPV Water Level at +32 inches and
Reactor Feedwater Pump "A" flow of 17% and
Reactor Feedwater Pump "B" flow of 18% and
Reactor Feedwater Pump "C" flow of 16%.

C RPV Water Level at +28 inches and
Reactor Feedwater Pump "A" flow of 24% and
Reactor Feedwater Pump "B" flow of 24% and
Reactor Feedwater Pump "C" SECURED.

D RPV Water Level at +30 inches and
Reactor Feedwater Pump "A" flow of 24% and
Reactor Feedwater Pump "B" flow of 25% and
Reactor Feedwater Pump "C" flow of 27%.

Question Number: 22

Answers: A ☐ B ☐ C ☐ D ☑ References Provided to Applicant: ☐

Justification

30% limiter if below L3 (13") or TOTAL FW less than 20% (Cavitation of RRPs)
45% limiter if below L4 (30") or CO-P disch Press < 100 psig or RFP flow <20% or CW-P trip or Hi-Hi FW Heater Lvl (reduce ST-FW mismatch and Level mismatch disparity)

CHOICE (A) - NO
WRONG: below L3 is correct
VALID DISTRACTOR:

CHOICE (B) - NO
WRONG: Total FW < 20% is correct
VALID DISTRACTOR:

CHOICE (C) - NO
WRONG: Total FW < 20% is correct
VALID DISTRACTOR: Below L4 but above L3. This combination will actuate the 45% limit (Speed Limiter #2)

CHOICE (D) - YES

References

TM-OP-064A, pp 8 to 11.

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/26/05 - No K/A statement with question. Did validate correct answer.
R: added K/A to K/A table. Gil is OK.

Todd 09/30/05 - removed references to L3, L4 and Total v. RFP flows.

SQ 10/14/05 - changed stem from "Which of the following conditions will prevent CAVITATION?" to "Which of the following conditions will actuate a Reactor Recirculation Pump (RRP) runback to prevent CAVITATION?"

SQ 11/04/05 - SSES noted that the runback occurs on ANY (or) rather than ALL (and) of the conditions. Also noted that question was missing data on THIRD RFP.
R - easiest fix is to make it a negative question by adding "NOT" to the stem and then add "C" RFP conditions.

NRC K/A System/E/A

System 29500 Low Reactor Water Level 9

Number AK1.02 **RO** 3.0 **SRO** **CFR Link**

Knowledge of the operational implications of the following concepts as they apply to LOW REACTOR WATER LEVEL: Recirculation pump net positive suction head: Plant specific.

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 23

 # 23 ☑ **RO** ☑ **SRO** **Question ID: 29593 Origin: Mod** ☐ **Memory Level**

SSES Unit 1 was at 10% reactor power when a steam line break occurred in the Primary Containment. The following conditions exist:

- Several control rods failed to insert.
- RPV Water Level is -80 inches and steady.
- RPV Pressure is 920 psig and steady.
- Drywell Pressure is 7.0 psig and steady.
- Drywell Temperature is 180 degrees Fahrenheit and steady.
- Suppression Chamber Pressure is 2.0 psig and rising slowly.
- Suppression Pool Temperature is 86 degrees Fahrenheit and rising.

According to EO-200-103, PC CONTROL, which ONE of the following Residual Heat Removal (RHR) configurations is REQUIRED?

A One loop of RHR in Suppression Pool Cooling and one loop of RHR in Suppression Chamber Spray

B Both loops of RHR in Suppression Pool Cooling.

C One loop of RHR in Drywell Spray and one loop of RHR in Suppression Chamber Spray

D One loop of RHR in Drywell Spray and one loop of RHR in Suppression Pool Cooling

Question Number: 23

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - YES
SP Cooling required per SP/T-1
SP Spray required per PC/P-4

CHOICE (B) - NO
WRONG: SP/T-2 does NOT require maximum SP cooling until SC temp can NOT be maintained below 90 deg F.
VALID DISTRACTOR: Some SP cooling will be required to maintain SP below 90 deg F

CHOICE (C) - NO
WRONG: Drywell Spray is NOT required until DW pressure exceeds 13 psig in the SC per PC/P-5
VALID DISTRACTOR: SC Spray required per PC/P-4

CHOICE (D) - NO
WRONG: Drywell Spray is NOT required until DW pressure exceeds 13 psig in the SC per PC/P-5
VALID DISTRACTOR: Some SP cooling will be required to maintain SP below 90 deg F

References

NMP2 August 2002 Exam (Question ID 22265)
EOPs.

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

1. Gil 09/26/05 - could not validate with enclosed references. Appears correct.
R: Self validated. Will ask Chief Examiner to validate.

2. SQ 10/14/05 - changed to Unit 1, added initial power of 10%, RPV level to -80 inches, changed Chamber to Pool.

3. SQ 10/18/05 - changed selections to state one loop in and the other loop in instead of specifying which loop. Changed RPV Pressure to 920. Changed SPT to rising. Capitalized REQUIRED. All per original comments illuminated by phone conversation on this date.

NRC K/A System/E/A

System 29501 High Suppression Pool Temperature
3

Number AK2.01 **RO** 3.6 **SRO** 3.7 **CFR Link** (CFR: 41.7 / 45.8)

Knowledge of the interrelations between HIGH
SUPPRESSION POOL TEMPERATURE and the following: Suppression pool cooling

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 24

 # 24 ☑ **RO** ☑ **SRO** **Question ID:** **29594** **Origin:** **New** ☐ **Memory Level**

SSES Unit 1 was operating at full power when the Main Turbine tripped. However, the Reactor did NOT scram. Control Rod 22-27 is selected and to be inserted per EO-100-113, Control Rod Insertion.

The following plant conditions exist:

- all Average Power Range Monitors (APRMs) indicate approximately 24% Reactor Power.
- the RSCS ROD INS BLK BYPASS HS-55601 is in NORMAL (WHITE light illuminated)

On the Rod Sequence Control System (RSCS) Operator Display Unit (ODU), you observe the following:

- AMBER DISPLAY UNIT pushbutton lower light (FREE ROD) illuminated.
- Control Rod 22-27 AMBER light emitting diode (LED) is illuminated.
- RED DISPLAY UNIT pushbutton lower light (BYPASS) illuminated.
- Control Rod 22-27 RED light emitting diode (LED) is illuminated.

Which one of the following describes the status of control rod 22-27?

Control Rod 22-27 can . . .

A . . . be INSERTED because power is above the Low Power Set point (LPSP).

B . . . be INSERTED because it is BYPASSED.

C . . . NOT be INSERTED because the RSCS ROD INS BLK BYPASS HS-55601 is in NORMAL.

D . . . NOT be INSERTED because power is below the Low Power Set point (LPSP).

Question Number: 24

Answers: A ☐ B ☑ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - NO
WRONG: RPS does not bypass RSCS blocks.
VALID DISTRACTOR: LPSP is 22%. APRMs > 22% may be mistaken for the actual LPSP parameter (1st stage pressure).

CHOICE (B) - YES
Turbine 1st stage pressure is the parameter measured to determine whether the plant is above or below LPSP and LPAP. The stem establishes that the Main Turbine is tripped. Therefore, 1st stage pressure is below the LPSP set point and is probably at a vacuum. In addition, the ODU conditions in the stem establish that the rod is bypassed (RED LED) and free to move (AMBER LED).

CHOICE (C) - NO
WRONG: The rod can be inserted because RSCS does not have a Rod Block on this rod
VALID DISTRACTOR: EO-100-113 directs the user to bypass RSCS. Applicant may believe the rod could be blocked if the switch is still in normal.

CHOICE (D) - NO
WRONG: The rod can be inserted because RSCS does not have a Rod Block on this rod.
VALID DISTRACTOR: Applicant may recognize that with no 1st stage pressure, RSCS receives a <LPSP signal and blocks rod motion.

References

TM-OP-56Z

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Gil 09/26/05 - OK
Todd 09/30/05 - replaced colon with question mark at end of stem.

SQ 10/14/05 - moved "Control Rod 22-27 can" from choices to stem. Conditions of RSCS panel may be trivial.

R - following Lesson Objectives support this question:

10183 Locate and describe the function of each Rod Sequence Control System control and indication.
a. Amber Display Control Pushbutton
b. Red Display Control Pushbutton

2438 Predict the Rod Sequence Control System response to manipulation of the following controls:
a. Amber Display Control Pushbutton
b. Red Display Control Pushbutton
f. Bypass Switches

2441 Predict the effect that the following will have on the Rod Sequence Control System:
d. Loss of Main Turbine First Stage Pressure Input

Verified with TM-OP-056Z that the indications do indicate that the rod is BYPASSED and Free to Move.

NRC K/A System/E/A

System 29501 Incomplete SCRAM
5

Number AK2.06 **RO** 2.6 **SRO** 2.8 **CFR Link** (CFR: 41.7 / 45.8)

Knowledge of the interrelations between INCOMPLETE SCRAM and the following: RSCS: Plant-Specific

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 25

 # 25 ☑ **RO** ☑ **SRO** **Question ID: 29663 Origin: Mod** ☑ **Memory Level**

SSES Unit 1 is in MODE 5 for a planned refueling outage and fuel movement is in progress. SSES Unit 2 is in MODE 4 to support emergent maintenance. The Control Room receives the following alarms and Indications:

- REFUEL FLOOR WALL EXH MON HI RADIATION (AR-212-001, D01)
- RR-D12-2R605 reads 19.2 millirem per hour (mR/hr)
- REFUEL FLOOR HI EXH HI RADIATION (AR-212-001, F02)
- REFUEL FLOOR HI EXHAUST HI - HI RADIATION (AR-206-001, E03)
- RR-D12-2R607 reads 19.8 millirem per hour (mR/hr)

Which ONE of the following is the correct evacuation and reason?

A Evacuate both Refuel Floor areas because the Refuel Floor areas are common to both units.

B Only evacuate Unit 1 Refuel Floor areas because fuel movement is in progress only on Unit 1.

C Evacuate both Refuel Floor areas because radiation levels in 2 areas have exceeded MAX NORMAL.

D Evacuate both Refuel Floor areas because radiation levels in 2 areas have exceeded MAX SAFE.

Question Number: 25

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - YES
Radiation levels are high enough to cause a Secondary CTMT isolation. Zone III at SSES is common to both units. Therefore, evacuation of both areas is required.

CHOICE (B) - NO
WRONG: Zone III is common to both areas. Therefore, evacuation of both areas is required.
VALID DISTRACTOR: SSES Unit 1 is the unit undergoing refueling with fuel moves in progress.

CHOICE (C) - NO
WRONG: Zone III is common to both SSES units. Therefore, evacuation of both areas is required.
VALID DISTRACTOR: The alarms given are Unit 2 alarms.

CHOICE (D) - NO
WRONG: SSES procedures support immediate evacuation.
VALID DISTRACTOR: Training Material discusses allowance for planned or expected alarms. The discussion indicates that alarms can be expected when handling irradiated materials in the vicinity of the radiation monitors.

References

TM-OP-079E
AR-101-A04, AR-112-D01, AR-112-F02, AR-106-E03
ON-070-001
ON-081-001

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

Modified from Grand Gulf 1, April 2000 (Question ID 16458)

Gil 09/26/05 - OK

Todd 09/30/05 - added ", only" after distracters "B" and "C" for grammatical correctness.

Rich 10/03/05 - does not ask for REASONS. K/A mismatch.
R: saved original as 251. Rewrite to address reasons for evacuation.

Todd 10/17/05 - additional revisions. Concerned that "C" is implausible with common refuel floor.
R - possibly but accident could have occurred on Unit 2 side and not yet spread. Nevertheless, changed to mimic "D" with MAX NORMAL

NRC K/A System/E/A

System 29503 Secondary Containment Ventilation High Radiation
4

Number EK3.03 **RO** 4.0 **SRO** 4.4 **CFR Link** (CFR 41.5, 45.6)

Knowledge of the reasons for the Personnel evacuation as it applies to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 26

 # 26 ☑ **RO** ☑ **SRO** **Question ID: 29596 Origin: Mod** ☐ **Memory Level**

Both units are at full power. SSES Unit 1 has isolated and is draining Residual Heat Removal (RHR) loop "B" for planned maintenance. SSES Unit 1 RHR loop "B" is draining to the floor drain to the Reactor Building Sump via 161121 (RHR Pump B & D Room Drain Iso Vlv.).

SSES Unit 1 Receives the following alarms and indications:

- RHR LOOP B PUMP ROOM FLOODED (AR-113-001, H08).
- SUPPRESSION POOL DIV 1 LO LEVEL (AR-111-001, E02).
- SUPP POOL LEVEL LI-25755A indicates 22.4 feet and slowly lowering.
- SUPPRESSION POOL DIV 2 LO LEVEL (AR-112-001, E02).
- SUPP POOL LEVEL LI-15755B indicates 22.3 feet and slowly lowering.
- REACTOR BLDG SUMP LEVEL HI-HI (AR-125-001, B01)

(1) How will Suppression Pool level respond?
(2) What Emergency Operating Procedure (EOP) entry conditions are CURRENTLY met?

A (1) The Suppression Pool will continue to drain until 161121 (RHR Pump B & D Room Drain Iso Vlv.) is closed.
(2) EO-100-104, SECONDARY CONTAINMENT CONTROL.

B (1) The Suppression Pool will continue to drain until 161121 (RHR Pump B & D Room Drain Iso Vlv.) is closed.
(2) EO-100-103, PC CONTROL.

C (1) Suppression Pool will continue to drain until draining of RHR loop "B" is stopped by closing the open vents & drains.
(2) EO-100-104, SECONDARY CONTAINMENT CONTROL.

D (1) Suppression Pool will continue to drain until draining of RHR loop "B" is stopped by closing the open vents & drains.
(2) EO-100-103, PC CONTROL.

Question Number: 26

Answers: A ☐ B ☐ C ☑ D ☐ References Provided to Applicant: ☐

Justification

CHOICE (A) - NO
WRONG: SP will not continue to drain because the Unit 1 and 2 floor drains are not cross-connected.
VALID DISTRACTOR: Correct EOP and each unit's ECCS room floor drains are cross-connected to other ECCS room of the same unit.

CHOICE (B) - NO
WRONG: PC CONTROL requires SP level below 22 feet. However, the SP will not continue to drain because the Unit 1 and 2 floor drains are not cross-connected.
VALID DISTRACTOR: The stem conditions give sufficient information to correctly conclude that the Suppression Pool will stabilize at 17 feet (Table 18 of EO-100-103). Therefore, Applicant may reasonably select this.

CHOICE (C) - YES
Table 18 of EO-100-103 tells us that SP will stabilize at 17 feet.
EO-100-104 requires entry on RB Water Level above high alarm.

CHOICE (D) - NO
WRONG: PC CONTROL requires SP level below 22 feet.
VALID DISTRACTOR: Correct SP level. The stem conditions give sufficient information to correctly conclude that the Suppression Pool will stabilize at 17 feet (Table 18 of EO-100-103). Therefore, Applicant may reasonably select this.

References

EO-100-103, 104
AR-111, 112, 113, 125
ON-169-002

Comments and Question Modification History

☑ GXJ ☑ TMF ☑ RJC ☐ SSES

NM2 August 2002 (Question ID 22279)

1. Gil 09/26/05 - could not validate the 17 feet because EO-100-103 not included in work papers
R: it is 17 feet. Ask Chief Examiner to independently validate.

2. Todd 09/30/05 - changed "(1) What level will SSES Unit 2 Suppression Pool stabilize at?" to "(1) How will Suppression Pool level respond?".
changed part (1) of distracters "C" and "D" from "(1) 17 feet" to "(1) Suppression Pool level will lower to 17 feet and stabilize."

3. SQ 10/17/05 - system will continue draining until isolated. Stick to only one unit for plausibility.
R - only unit 1 and changed "C" and "D" to correct technical error.

NRC K/A System/E/A

System 29503 Secondary Containment High Sump/Area Water Level 6

Number EA1.01 **RO** 3.2 **SRO** 3.3 **CFR Link** (CFR 41.7, 45.6)

Ability to operate and/or monitor the Secondary containment equipment and floor drain systems as it applies to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 27

 # 27 ☑ **RO** ☑ **SRO** **Question ID: 29597 Origin: New** ☐ **Memory Level**

Following a loss of coolant accident, the Primary Containment Hydrogen and Oxygen (H2O2) Analyzers are placed in service per OP-173-001, Section 2.8, H2O2 ANALYZER OPERATION DURING EMERGENCY. The following conditions exist:

- Analyzer "A" is aligned to the SUPPRESSION POOL.
- Analyzer "A" O2 reads 2%.
- Analyzer "A" H2 reads 9%

- Analyzer "B" is aligned to the DRYWELL.
- Analyzer "B" O2 reads 6%
- Analyzer "B" H2 reads less than 1%

- Sample flow to both analyzers was restored 35 minutes ago.
- Both analyzers are on the 10% range.

Which ONE of the following statements is correct?

All Hydrogen Recombiners, Drywell Fans and Drywell Coolers MUST . . .

A . . . be Operated to adequately mix the Primary Containment atmosphere.

B . . . be Operated to adequately recombine Hydrogen in the Primary Containment atmosphere.

C . . . be Shutdown because Hydrogen and Oxygen concentrations are above combustible limits.

D . . . be Shutdown because Hydrogen and Oxygen concentrations can NOT be determined.

Question Number: 27

Answers: A ☐ B ☐ C ☑ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - NO
WRONG: EO-100-103 requires that Recombiners, Fans and Coolers be secured when H2>6% AND O2>5% whether the gases are in the same CTMT section or not because migration is possible.
VALID DISTRACTOR: EO-103-113 calls for mixing and recombining for the individual CTMT sections (SP or DW) given the individual conditions.

CHOICE (B) - NO
WRONG: EO-100-103 requires that Recombiners, Fans and Coolers be secured when H2>6% AND O2>5% whether the gases are in the same CTMT section or not because migration is possible.
VALID DISTRACTOR: EO-103-113 calls for mixing and recombining for the individual CTMT sections (SP or DW) given the individual conditions.

CHOICE (C) - YES
Analyzers have been in-service for >30 minutes.
H2 and O2 conditions exceed combustible limits.

CHOICE (D) - NO
WRONG: The Analyzers require 30 minutes to stabilize. They've had 35 minutes.
VALID DISTRACTOR: Applicant may consider the Analyzers inoperable due to the disparate SP and DW readings or because Analyzers have been in service for a short time period. (Note: 1 hour at PB)

References

EO-000-103

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/26/05 - OK
Todd 09/30/05 - OK

SQ 10/14/05 - moved "All Hydrogen Recombiners, Drywell Fans and Drywell Coolers MUST" to the stem.

NRC K/A System/E/A

System 50000 High Containment Hydrogen Concentration
0

Number EA2.04 **RO** 3.3 **SRO** 3.3 **CFR Link** (CFR 41.10, 43.5, 45.13)

Ability to determine and / or interpret Combustible limits for wetwell as it applies to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 28

 # 28 ☑ **RO** ☑ **SRO** **Question ID:** **29598** **Origin:** **Bank** ☑ **Memory Level**

Given that the following conditions occur in the specified sequence:

1. All required conditions for Automatic Depressurization System (ADS) actuation were met.
2. Automatic depressurization is in progress.
3. All low pressure ECCS pumps trip.
4. A single Core Spray (CS) pump is restarted.

Which ONE of the following describes how the Automatic Depressurization System (ADS) is affected?

A Automatic depressurization STOPS when low pressure ECCS pumps trip; then AUTOMATICALLY reinitiate after the CS pump restarts.

B Automatic depressurization CONTINUES until the LOGIC TIMER RESET pushbutton is depressed.

C Automatic depressurization CONTINUES until both MANUAL INHIBIT (S34A & S34B) switches are rotated to INHIBIT.

D Automatic depressurization STOPS when low pressure ECCS pumps trip; then can be MANUALLY reinitiated after the CS pump restarts.

Question Number: 28

Answers: A ☐ B ☑ C ☐ D ☐ **References Provided to Applicant:** ☐

Justification

CHOICE (A) - No
WRONG: K4A seals in the actuation signal.
VALID DISTRACTOR: ADS will not actuate without low pressure ECCS pumps running

CHOICE (B) - YES
Signal seals in until broken by the ADS LOGIC/TIMER RESET PB

CHOICE (C) - No
WRONG: Manual Inhibit PBs are effective before ADS actuation only.
VALID DISTRACTOR: They are effective before actuation at stopping actuation.

CHOICE (D) - No
WRONG: K4A seals in the actuation signal and Manual Initiation does NOT bypass the LP ECCS Pumps relay K9A and K10A
VALID DISTRACTOR: Reasonable belief that Manual Initiation would bypass all interlocks.

References

OP-TM-83E

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Drawn from Clinton 1 June 2000 exam (Question ID 18937)

Gil 09/26/05 - Add to first sentence in stem ". . . conditions occur in sequence". Can you shorten distracter "D" a bit?
R: accepted both comments.

Todd 09/30/05 - Revised "A" and "D" to be past tense and added auto restart to "A".

SQ 10/14/05 - changed past/present tenses to read better and eliminate psychometric clues.

NRC K/A System/E/A

System 20300 RHR/LPCI: Injection Mode (Plant Specific)
0

Number K3.03 **RO** 4.2 **SRO** 4.3 **CFR Link** (CFR 41.7 / 45.4)

Knowledge of the effect that a loss or malfunction of the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) will have on Automatic depressurization logic

NRC K/A Generic

System

Number **RO** **SRO** **CFR Link**

Question Number: 29

 # 29 ☑ **RO** ☑ **SRO** **Question ID:** **29599** **Origin:** **New** ☐ **Memory Level**

Both units are at full power. 480 VAC Bus 2B226 was deenergized in response to a report of smoke coming out of the bus.. All systems were in their normal configuration when Operations de-energized 2B226.

Which ONE of the following correctly describes the status of SSES Unit 2 Residual Heat Removal (RHR) Loop "B" with NO Local/Manual component manipulation?

A Drywell Spray Mode - NOT Available
Suppression Pool Spray - NOT Available
Suppression Pool Cooling - NOT Available
RHR Pump "B" and "D" Minimum Flow Isolation - Available

B Drywell Spray Mode - Available
Suppression Pool Spray - Available
Suppression Pool Cooling - Available
RHR Pump "B" and "D" Minimum Flow Isolation - NOT Available

C Drywell Spray Mode - Available
Suppression Pool Spray - NOT Available
Suppression Pool Cooling - NOT Available
RHR Pump "B" and "D" Minimum Flow Isolation - NOT Available

D Drywell Spray Mode - NOT Available
Suppression Pool Spray - Available
Suppression Pool Cooling - Available
RHR Pump "B" and "D" Minimum Flow Isolation - Available

Question Number: 29

Answers: A ☑ B ☐ C ☐ D ☐ References Provided to Applicant: ☑

Justification

De-energizing 2B226 removes power from the following:
- HV251F016B - Drywell Spray (Normally Shut)
- HV251F017B - Injection (Normally Open)
- HV251F028B - SP Spray & Cooling (Normally Shut)
- HV251F010B - Cross-connect to "A" loop (Normally Shut)
- HV251F004B - "B" Pump suction from SP (Normally Open)
- HV251F006B - "B" Pump suction from SDC dropline (Normally Open)
- HV251F003B - "B" HX Outlet (Normally Open)
- HV251F047B - "B" HX Inlet (Normally Open)

Therefore, the following applies"
- Low Pressure Coolant Injection (LPCI) - Operable because de-energized valves in the flow path are normally open (HV251F015B is on swing buss 2B229)
- Drywell Spray Mode - NOT Available because normally closed valve F016B is de-energized
- Suppression Pool Spray - NOT Available because normally closed valve F028B is de-energized
- Suppression Pool Cooling - NOT Available because normally closed valve F028B is de-energized
- RHR Pump "B" and "D" Minimum Flow - Available because normally closed valve F007B is energized from 2B229

CHOICE (A) - YES

CHOICE (B) - No
WRONG: DW Spray NOT avail because F016B deenergized. SP Spray NOT avail because F028B deenergized.
VALID DISTRACTOR: LPCI is Operable, Min Flow is available and SP Cooling NOT Avail.

CHOICE (C) - No
WRONG: LPCI is Operable. Remainder of distracter mirrors Distracter B
VALID DISTRACTOR: Remainder of distracter mirrors Distracter B

CHOICE (D) - No
WRONG: LPCI is Operable. Remainder of distracter mirrors Distracter D
VALID DISTRACTOR: Remainder of distracter mirrors Distracter B

References

M-2151
ON-104-202

Comments and Question Modification History

☑ GXJ ☑ THF ☑ RJC ☐ SSES

Gil 09/26/05 - Suggest use "Available" (or not available) rather than "Operable". Not sure what impact the bus loss will have on Operability, however availability is assured in A.
R: accepted.

Todd 09/30/05 - deleted LPCI mode to limit variables to four. modified distracters accordingly.

SQ 10/17/05 - Memorized Load List is trivial. Operations would not de-energize 2B226.
R - change to loss due to fault and provide Applicant with Load List. Specifically, provide Applicants with copy of ON-204-202.

Note that SSES Lesson Objective supports this question: 10499 State the power supply to the following Residual Heat Removal System Components:
a. Residual Heat Removal Pumps
b. RHR motor-operated valves
c. LPCI initiation logic
d. RHR valve control logic

NRC K/A System/E/A

System 20500 Shutdown Cooling System (RHR Shutdown Cooling Mode 0

Number K2.02 **RO** 2.5 **SRO** 2.7 **CFR Link** (CFR 41.7)

Knowledge of electrical power supplies to Motor operated valves

NRC K/A Generic

Question Number: 29

System Number	RO	SRO	CFR Link

Question Number: 30

 # 30 ☑ **RO** ☑ **SRO** **Question ID: 29600 Origin: Bank** ☐ **Memory Level**

SSES Unit 1 is at full power when the Unit 1 High Pressure Coolant Injection (HPCI) inadvertently initiates and injects to the Reactor Pressure Vessel (RPV). Assuming no Operator action, which ONE of the following correctly describes the INITIAL change from steady state?

Thermal Power will RISE and . . .

A RPV Water Level will LOWER and
Total Steam Flow will LOWER and
Total Indicated Feedwater Flow will LOWER

B RPV Water Level will LOWER and
Total Steam Flow will RISE and
Total Indicated Feedwater Flow will LOWER

C RPV Water Level will RISE and
Total Steam Flow will LOWER and
Total Indicated Feedwater Flow will RISE

D RPV Water Level will RISE and
Total Steam Flow will RISE and
Total Indicated Feedwater Flow will LOWER