27

☑ RO ☑ SRO Question ID: 5000025 Origin: New ☑ Memory Level

The plant is at full power. CEA partial movement testing is in progress per ST-2620A when Reg Group 7 CEA #65 drops to 162 steps. In accordance with Technical Specification 3.1.3.1, reactor power is lowered to less than _______ within 1 hour primarily to reduce the effects on ______________.

A 70%, long term power distributions from xenon redistribution ☑

B 85%, long term power distributions from xenon redistribution ☐

C 70%, available shutdown margin used in accident analyses ☐

D 85%, available shutdown margin used in accident analyses ☐

Justification

CHOICE (A) - YES
Basis for Tech Spec 3.1.3.1 explains that power is lowered to 70% to reduce the xenon redistribution effects on long term power distributions

CHOICE (B) - NO
WRONG: The basis explains that for small misalignments (<20 steps) there is a negligible effect on the available SHUTDOWN MARGIN.
VALID DISTRACTOR: TS 3.10.2, "SPECIAL TEST EXCEPTIONS - GROUP HEIGHT AND INSERTION LIMITS" limits power level to 85%.

CHOICE (C) - NO
WRONG: The basis explains that for small misalignments (<20 steps) there is a negligible effect on the available SHUTDOWN MARGIN.
VALID DISTRACTOR: TS 3.1.3.1 limits power level to 70%. The basis states that the specifications of section 3.1.3.1 ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of a CEA ejection accident are limited to acceptable levels.

CHOICE (D) - NO
WRONG: The basis explains that for small misalignments (<20 steps) there is a negligible effect on the available SHUTDOWN MARGIN.
VALID DISTRACTOR: TS 3.10.2, "SPECIAL TEST EXCEPTIONS - GROUP HEIGHT AND INSERTION LIMITS" limits power level to 85%.

References

1. T.S. 3.1.3.1 "MOVABLE CONTROL ASSEMBLIES - CEA POSITION", Amendment 280 (Pg 3/4 1-20)
2. T.S. 3.1.3.1 Basis (Page B 3/4 1-3a, B 3/4 1-4)

NRC K/A System/E/A

System 005 Inoperable/Stuck Control Rod

Number AK3.05 **RO** 3.4 **SRO** 4.2 **CFR Link** (CFR 41.5,41.10 / 45.6 / 45.13)

Knowledge of the reasons for the following responses as they apply to the Inoperable / Stuck Control Rod: Power limits on rod misalignment

NRC K/A Generic

System

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

28 ☑ RO ☑ SRO Question ID: 5000026 Origin: New ☐ Memory Level

The plant is in MODE 6 with refueling operations in progress.

One Wide Range Excore Nuclear Instrument has failed; repairs are in progress.

An I&C supervisor calls the control room and reports that, based on an audit of completed surveillances, it has been determined two of the remaining channels were improperly calibrated by an inexperienced technician and should be considered inoperable. The remaining channel was properly calibrated.

What impact does this have on fuel handling activities and why?

A All fuel movement in containment and the spent fuel pool must be suspended due to inadequate remaining instrumentation for monitoring the state of the core. ☐

B All fuel movement in to and out of the reactor core must be suspended due to inadequate remaining instrumentation for monitoring the state of the core. ☑

C Fuel movement may continue since the operability of the remaining channel is adequate for monitoring the state of the core. ☐

D Fuel offload activities may proceed; fuel reload must be suspended due to inadequate remaining instrumentation for monitoring positive reactivity additions. ☐

Justification

CHOICE (A) - NO
WRONG: CORE ALTERATIONS must be suspended without two operable channels, activities in the spent fuel pool are not CORE ALTERATIONS.
VALID DISTRACTOR: Plausible that all fuel handling would be stopped.

CHOICE (B) - YES
CORE ALTERATIONS must be immediately suspended; fuel movement in the core is a subset.

CHOICE (C) - NO
WRONG: Minimum channels operable requirement is TWO source range channels.
VALID DISTRACTOR: Plausible that one channel sufficient for core alterations.

CHOICE (D) - NO
WRONG: All CORE ALTERATIONS must be suspended, not just those involving positive reactivity additions.
VALID DISTRACTOR: Plausible that only concerned about addition of positive from new fuel loading.

Note: This question, on both the RO and SRO exams, samples CFR 55.43(6), "Procedures and limitations involved in initial core loading, alterations in core configuration, control rod programming, and determination of various internal and external effects on core reactivity."

References

1. T.S. 3.9.2 /4.9.2, "REFUELING OPERATIONS - INSTRUMENTATION", Amendment 263 (Pg 3/4 9-2, B 3/4 9-1)

NRC K/A System/E/A

System 032 Loss of Source Range Nuclear Instrumentation

Number AK3.02 **RO** 3.7* **SRO** 4.1 **CFR Link** (CFR 41.5,41.10 / 45.6 / 45.13)

Knowledge of the reasons for the following responses as they apply to the Loss of Source Range Nuclear Instrumentation: Guidance contained in EOP for loss of source-range nuclear instrumentation

NRC K/A Generic

System

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

29 ☑ RO ☑ SRO Question ID: 5000027 Origin: New ☐ Memory Level

Unit 2 is operating at 100% power. Facility 1 equipment is being worked this week. 22 Charging Pump is running. Bus 24E is aligned to Bus 24C. The following activities are in progress:
- 21 Charging Pump is OOS for plunger repair
- Surveillance Test SP-2604T, "Actuation Test of Various ESF Component" is being performed on Facility 1 ESAS
- Facility 1 ESAS TEST PERMISSIVE SWITCH S-501 is in the TEST SIAS position

A loss of Bus VA-20 occurs. The plant trips. Two CEAs remain fully withdrawn. Pressurizer PORV RC-402 opens and sticks open on the trip. Pressurizer pressure is 1655 psia and decreasing.

Choose the action required to establish emergency boration flow to the reactor coolant system.

A Place S-501, TEST PERMISSIVE SWITCH in OPERATE. ☐

B Place P-19A BORIC ACID PUMP 'A' handswitch in START. ☐

C Place CH-514, BORIC ACID ISOLATION handswitch in OPEN. ☑

D Place CH-501, VCT OUTLET ISOLATION handswitch in CLOSE. ☐

Justification

CHOICE (A) - NO
WRONG: Test mode is automatically overriden when multiple sensor channels actuate. Facility 1 SIAS will actuate without repositioning S-501.
VALID DISTRACTOR: Test in progress. Switch is in test position.

CHOICE (B) - NO
WRONG: Facility 1 BA Pump will auto start on the Z1 SIAS. No need to manually start.
VALID DISTRACTOR: BA pump operation is directed by emergency boration procedure.

CHOICE (C) - YES
CH-514 is Facility 2 component, receives SIAS open from Z2 ESAS, which will not actuate due to loss of VA-20. Must manually open the isolation.

CHOICE (D) - NO
WRONG: CH-501 closed by Facility 1 SIAS. No need to manually close.
VALID DISTRACTOR: Closing CH-501 is directed by emergency boration procedure.

References

1. AOP-2558, "Emergency Boration", Revision 5 (6/24/04) (Pg 7 of 23)
2. SP-2604T, "Actuation Tests of Various ESF Components", Revision 2 (5/11/04) (Pg 4 of 25)
3. ESA-01-C, "Engineered Safety Features Actuation System" Lesson, Revision 3 (8/6/01) (Table 2 and Table 3)

NRC K/A System/E/A

System 004 Chemical and Volume Control System

Number A4.18 **RO** 4.3 **SRO** 4.1 **CFR Link** (CFR: 41/7 / 45.5 to 45.8)

Ability to manually operate and/or monitor in the control room: Emergency borate valve

NRC K/A Generic

System

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

 # 30 ☑ RO ☑ SRO Question ID: 5000028 Origin: New ☑ Memory Level

The technical specification allowed outage time for one train of containment spray reflects the dual function of containment spray for _____________.

A heat removal and iodine removal ☑

B heat removal and sump pH control ☐

C hydrogen reduction and iodine removal ☐

D hydrogen reduction and sump pH control ☐

Justification

CHOICE (A) - YES
Per TS Basis: The containment spray is more effective than the containment cooling system in reducing the temperature of superheated steam inside containment following a main steam line break. In addition, the containment spray system provides a mechanism for removing iodine from the containment atmosphere. Therefore, at least one train of containment spray is required to be OPERABLE when pressurizer pressure is >1750 psia, and the allowed outage time for one train of containment spray reflects the dual function of containment spray for heat removal and iodine removal.

CHOICE (B) - NO
WRONG: Sump pH control is provided by trisodium phosphate (TSP) dodecahydrate stored in dissolving baskets located in the containment basement. It functions to minimize the possibility of corrosion cracking of certain metal components during operation of the ECCS following a LOCA. The TSP will get into solution during a LOCA even if containment spray is unavailable. Sump pH control is not a function of containment spray.
VALID DISTRACTOR: Control of pH is provided by TSP.

CHOICE (C) - NO
WRONG: Per lesson material: The introduction of highly acidic borated water in a fine mist to the containment will result in the liberation of hydrogen gas in containment. This is produced as a result of the metal-water reaction with aluminum and zinc components. Corrosion of these components is minimal and therefore the brief exposure to containment spray will result in negligible loss of structural integrity of these components. The generation of hydrogen by this mechanism is minimized by controlling the inventory of susceptible metals and by neutralizing the acidity of the water with Trisodium Phosphate.
VALID DISTRACTOR: Amount of hydrogen generation is minimized, but hydrogen concentration is not reduced, by sump pH control.

CHOICE (D) - NO
WRONG: Per lesson material: The introduction of highly acidic borated water in a fine mist to the containment will result in the liberation of hydrogen gas in containment. This is produced as a result of the metal-water reaction with aluminum and zinc components. Corrosion of these components is minimal and therefore the brief exposure to containment spray will result in negligible loss of structural integrity of these components. The generation of hydrogen by this mechanism is minimized by controlling the inventory of susceptible metals and by neutralizing the acidity of the water with Trisodium Phosphate.
VALID DISTRACTOR: Amount of hydrogen generation is minimized, but hydrogen concentration is not reduced, by sump pH control.

References

1. TS 3/4 6.2.1 Basis, "CONTAINMENT SYSTEMS - DEPRESSURIZATION AND COOLING SYSTEMS - CONTAINMENT SPRAY AND COOLING SYSTEMS", Amendment 236 (Pg B 3/4 6-3)
2. CSS-00-C, "Containment Spray System" Lesson, Revision 4 (1/16/01), Section D.2.a. (Pg 23 of 54)

NRC K/A System/E/A

System 026 Containment Spray System (CSS)

Number K4.06 **RO** 2.8 **SRO** 3.2* **CFR Link** (CFR: 41.7)

Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following: Iodine scavenging via the CSS

NRC K/A Generic

System

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

31 ☑ RO ☑ SRO Question ID: 0053994 Origin: Bank ☑ Memory Level

The plant is operating at 100% power with bus 24E aligned to bus 24D. The "A" RBCCW Pump breaker trips and the first attempt to remotely reclose the breaker are not successful. A PEO is dispatched to determine why the breaker cannot be closed remotely.

With regard to the RBCCW system, which of the following actions must be performed?

A Align and start the 'B' RBCCW pump to supply Facility 1 RBCCW Header. ☑

B Immediately trip the reactor, then trip the affected RCPs due to the loss of RBCCW. ☐

C Realign Bus 24E to Bus 24C and start the 'B' RBCCW Pump on Facility 1 RBCCW Header. ☐

D Coordinate with PEO for a second attempt to reclose the motor breaker. If RCP seals exceed 250 degrees F, then trip reactor and affected RCPs. ☐

Justification

CHOICE (A) - YES
The 'B' RBCCW pump is available to supply Facility 1 within 5 minutes. The guidance provided in AOP allows utilizing the 'B' pump to supply Facility 1 even though it is electrically aligned to Facility 2.

CHOICE (B) - NO
WRONG: AOP directs compensatory actions. A reactor trip would not be required unless unable to restore flow in a timely fashion.
VALID DISTRACTOR: A sustained loss of one header will require a reactor trip.

CHOICE (C) - NO
WRONG: Insufficient time available to realign the bus power source in accordance with procedure. Realignment of power source is not required by AOP.
VALID DISTRACTOR: When performing routine realignments, Bus 24E would be shifted to Bus 24C

CHOICE (D) - NO
WRONG: AOP specifically allows for only one attempt to restart. Focusing all effort on restart of the affected pump could result in a required reactor trip if unsuccessful. Given that breaker has tripped and cannot be immediately reclosed it is likely there may be a problem with the component.
VALID DISTRACTOR: Applicant may think this is the appropriate action.

References

1. AOP-2564, "Loss of RBCCW", Revision 4 (12/6/02) (Pg 6,10 of 46)

NRC K/A System/E/A

System 008

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

NRC K/A Generic

System 2.1 Conduct of Operations

Number 2.1.23 **RO** 3.9 **SRO** 4.0 **CFR Link** (CFR: 45.2 / 45.6)

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

 # 32 ☑ RO ☑ SRO Question ID: 5000029 Origin: New ☐ Memory Level

The plant is operating at full power with 'B' HPSI Pump OOS for maintenance. A sustained loss of Bus 24D occurs. Coincident with the event, a large break LOCA occurs due to a guillotine shear of #1 hot leg. Assuming Bus 24D cannot be reenergized, select the choice which correctly completes the following regarding the impact of the loss of ECCS pumps.

Shortly after SRAS, a loss of the only available ___________ adversely affect long term core cooling because the remaining ______________.

A LPSI pump would not, HPSI pump could be realigned for boron precipitation control via hot leg injection ☐

B LPSI pump would not, HPSI pump could provide sufficient injection flow ☑

C HPSI pump would, LPSI pump could not be realigned for boron precipitation control via hot leg injection ☐

D HPSI pump would, LPSI pump could not provide sufficient injection flow ☐

Justification

CHOICE (A) - NO
WRONG: Boron precipitation control not following a hot leg break because ECCS water flushes through the core and out the break..
VALID DISTRACTOR: HPSI can be aligned for hot leg injection.

CHOICE (B) - YES
A single HPSI pump will provide sufficient flow for long term cooling.

CHOICE (C) - NO
WRONG: LPSI can provide long term cooling.
VALID DISTRACTOR: Realignment of LPSI would cause an undesirable interruption in injection flow.

CHOICE (D) - NO
WRONG: LPSI can provide long term cooling.
VALID DISTRACTOR: Realignment of LPSI interrupt injection flow.

References

1. ECC-01-C, "Emergency Core Cooling System", Revision 3 (6/28/01) (Pg 11,13 of 25)

NRC K/A System/E/A

System 006 Emergency Core Cooling System (ECCS)

Number K6.13 **RO** 2.8 **SRO** 3.1 **CFR Link** (CFR: 41.7 / 45.7)

Knowledge of the effect of a loss or malfunction on the following will have on the ECCS: Pumps

NRC K/A Generic

System

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

33 ☑ RO ☑ SRO Question ID: 5000030 Origin: Bank ☑ Memory Level

The following Quench Tank parameters are noted:

- Temperature is 125°F
- Level is 52%
- Pressure is 3 psig
- Oxygen concentration is 3.2%

What action is required to restore conditions to normal?

A Lower pressure to less than 1 psig. ☐

B Lower level to less than 45%. ☐

C Lower O2 concentration to less than 3%. ☐

D Lower temperature to less than 120°F. ☑

Justification

CHOICE (A) - NO
WRONG: Pressure is normally maintained between 1 and 5 psig.
VALID DISTRACTOR: Applicant may think pressure is too high.

CHOICE (B) - NO
WRONG: Level is maintained at 50% and must be maintained above 45%.
VALID DISTRACTOR: 45% is the low limit.

CHOICE (C) - NO
WRONG: Concentration is maintained less than 4% oxygen.
VALID DISTRACTOR: Applicant may think concentration must be reduced below 3%.

CHOICE (D) - YES
Temperature is maintained below 120°F.

References

1. OP-2301A, "PDT and Quench Tank Operation", Revision 10 (7/26/04) (Pg 4,6,8,16 of 37)
2. ARP-2590B-207, "QUENCH TANK TEMP HI", Revision 0 (3/4/04)
3. Source: INPO Bank - Q# 19360 - Used at Kewaunee 1, 12/11/2000

NRC K/A System/E/A

System 007 Pressurizer Relief Tank/Quench Tank System (PRTS)

Number A1.03 **RO** 2.6 **SRO** 2.7 **CFR Link** (CFR: 41.5/45.5)

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Monitoring quench tank temperature

NRC K/A Generic

System

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

34 ☑ RO ☑ SRO Question ID: 5000031 Origin: New ☐ Memory Level

Unit 2 was in the process of raising power to 100%. Given the following events and conditions:

Reactor power
- NI "A" = 76.0%
- NI "B" = 73.0%
- NI "C" = 72.0%
- NI "D" = 75.0%

Thermal power = 72.5%
VHP Trip set points were last reset at Q=66.5%

Which one of the following statements correctly describes the effect of these conditions?

A The reactor has tripped. ☐

B The pretrip has actuated on only channel "D" and CEA withdrawal motion is inhibited. ☐

C The pretrips have actuated on channels "A" and "D" and CEA withdrawal motion is inhibited. ☑

D The VHPT reset pushbuttons are lit on channel "A" but no pretrips have actuated in any channel. ☐

Justification

CHOICE (A) - NO
WRONG: AB, AC and AD logic ladders have tripped from the signal in Channel "A" but all other channels remain below the VHP trip setpoint. The reactor will not trip unless another channel exceeds 8.8%.
VALID DISTRACTOR: Applicant may think logic is met for a reactor trip.

CHOICE (B) - NO
WRONG: Channels "A" and "D" have exceeded their pretrip setpoint. 2 of 4 pretrips cuase a CEA withdrawal inhibit and control rods will not move out.
VALID DISTRACTOR: If the applicant thinks that CH "A" is no longer in pretrip because it has already tripped then this could be a plausible answer.

CHOICE (C) - YES
Channels "A" and "D" have exceeded their pretrip setpoint. 2 of 4 pretrips cuase a CEA withdrawal inhibit and control rods will not move out.

CHOICE (D) - NO
WRONG: Channels "A" and "D" have exceeded their pretrip setpoint. 2 of 4 pretrips cuase a CEA withdrawal inhibit and control rods will not move out.
VALID DISTRACTOR: If the applicant does not recall the VHP trip setpoint or thinks that they are continually reset during apower ascension (as they are during a power decrease) and compares channel power to thermal power, this distractor could be selected.

References

1. RPS-01-C, "Reactor Protection System" Lesson, Revision 6 (9/15/00), (Pg 19 of 80 and Figures 7, 20, and 33)

NRC K/A System/E/A

System 012 Reactor Protection System

Number K3.01 **RO** 3.9 **SRO** 4.0 **CFR Link** (CFR: 41.7 / 45.6)

Knowledge of the effect that a loss or malfunction of the RPS will have on the following: CRDS

NRC K/A Generic

System

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

 # 35 ☑ RO ☑ SRO Question ID: 0053886 Origin: Mod ☐ Memory Level

Given the following conditions:
- 100% reactor power
- Inverter 2 has been isolated in preparation for repairs

The DC input breaker on Inverter 6 is inadvertently opened while hanging the clearance on Inverter 2 .

If a large break LOCA were to occur inside containment with the plant in this configuration which of the following would be an expected condition two minutes after the event? Assume no operator action

A 'A' LPSI Pump will be stopped. ☐

B 'B' LPSI Pump will be stopped. ☑

C 'C' CAR Cooler Fan will be running in fast speed. ☐

D 'D' CAR Cooler Fan will be running in slow speed. ☐

Justification

CHOICE (A) - NO
WRONG: The LBLOCA will actuate SIAS. Facility 1 ESAS equipment will operate as designed.
VALID DISTRACTOR: 'A' LPSI Pump will be started.

CHOICE (B) - YES
Opening DC input breaker on Inverter 6 with Inverter 2 out will deenergize Vital AC Bus VA20, which will deenergize Facility 2 ESAS Actuation Cabinet. All Facility 2 ESAS associated equipment will be prevented from responding to conditions which would normally result in an actuation. 'B' LPSI will remain stopped until manually started by the operator.

CHOICE (C) - NO
WRONG: The LBLOCA will actuate SIAS. Facility 1 ESAS equipment will operate as designed.
VALID DISTRACTOR: 'A' CAR Fan will shift to slow speed.

CHOICE (D) - NO
WRONG: The LBLOCA will actuate SIAS. Facility 2 ESAS equipment will not receive actuation signals.
VALID DISTRACTOR: 'B' CAR Fan will remain in fast speed.

References

1. LVD-00-C, "125 VDC/120 VAC" Lesson, Revision 5 (Pg 9 of 81)

NRC K/A System/E/A

System 013 Engineered Safety Features Actuation System (ESFAS)

Number A2.04 **RO** 3.6 **SRO** 4.2 **CFR Link** (CFR: 41.5 / 43.5 / 45.3 / 45.13)

Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations;
Loss of instrument bus

NRC K/A Generic

System

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

 # 36 ☑ RO ☑ SRO Question ID: 5000033 Origin: New ☐ Memory Level

The plant is operating at 75% power when Main Steam Line Pressure Transmitter PT-4224 fails high.

Which of the following describes the response of 'B' SG level to this instrument failure?

A Level will not change, the feedwater control system will maintain level constant. ☐

B Level will initially increase, then recover to maintain a level equal to the level prior to the failure. ☑

C Level will initially decrease, then recover to maintain a level equal to the level prior to the failure. ☐

D Level will initially increase, then recover to maintain a level higher than the level prior to the failure. ☐

Justification

CHOICE (A) - NO
WRONG: Level will swell when the ADV on #2 MSL opens. The feedwater control system will restore level to setpoint.
VALID DISTRACTOR: Applicant may not recognize the effect of the instrument failure on the ADV.

CHOICE (B) - YES
Level will swell when the ADV on #2 MSL opens. The feedwater control system will restore level to setpoint.

CHOICE (C) - NO
WRONG: Level will swell when the ADV on #2 MSL opens. The feedwater control system will restore level to setpoint.
VALID DISTRACTOR: Applicant may think that the predominant level effect will be shrink due to additional feedwater when FRV opens in response to steam-feed mismatch.

CHOICE (D) - NO
WRONG: Level will swell when the ADV on #2 MSL opens. The feedwater control system will restore level to setpoint.
VALID DISTRACTOR: Applicant may think the controller will maintain level higher than setpoint.

References

1. MSS-00-C, "Main Steam System" Lesson, Revsion 6 (7/11/01), Page 16, 25 of 69)
2. Millstone Unit 2 FSAR, Revision 21, Section 7.4.7 (Pg 7.4-19)

NRC K/A System/E/A

System 039 Main and Reheat Steam System (MRSS)

Number K1.01 **RO** 3.1 **SRO** 3.2 **CFR Link** (CFR: 41.2 to 41.9 / 45.7 to 45.8)

Knowledge of the physical connections and/or cause-effect relationships between the MRSS and the following systems: S/G

NRC K/A Generic

System

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

37

☑ RO ☑ SRO Question ID: 0070216 Origin: Mod ☐ Memory Level

The Main Steam Isolation Valves will automatically close in response to which one of the following sets of conditions?

A PT-1013A, SG 1 CHANNEL A PRESSURE = 575 psia
PT-1013B, SG 1 CHANNEL B PRESSURE = 570 psia ☐

B PT-1013A, SG 1 CHANNEL A PRESSURE = 564 psia
PT-1023B, SG 2 CHANNEL B PRESSURE = 566 psia ☑

C PT-1023A, SG 2 CHANNEL A PRESSURE = 567 psia
PT-1023B, SG 2 CHANNEL B PRESSURE = 574 psia ☐

D PT-1013B, SG 1 CHANNEL B PRESSURE = 552 psia
PT-1023B, SG 2 CHANNEL B PRESSURE = 555 psia ☐

Justification

CHOICE (A) - NO
WRONG: Only CH B is < 572 psia.
VALID DISTRACTOR: Both channels are on same SG.

CHOICE (B) - YES
Both pressures <572 psia, one is CH A, the other CH B. MSI is generated by 2/4 SG pressure <572 psia on any 2 channels, provided they are not the same letter designation. For example: SG1 CH A and SG2 CH B (one A and one B) is an acceptable combination, whereas SG1 CH A and SG2 CH A (both A's) is not an acceptable combination.

CHOICE (C) - NO
WRONG: Only CH A is < 572 psia.
VALID DISTRACTOR: Different channels on the same SG.

CHOICE (D) - NO
WRONG: Both transmitters have same designation (CH B).
VALID DISTRACTOR: Both pressures are < 572 psia.

References

1. ESA-01-C, "Engineered Safety Features Actuation System" Lesson, Revision 3 (8/6/01), Table H and Figure 5 (Pg 52, 53)

NRC K/A System/E/A

System 039 Main and Reheat Steam System (MRSS)

Number A3.02 **RO** 3.1 **SRO** 3.5 **CFR Link** (CFR: 41.5 / 45.5)

Ability to monitor automatic operation of the MRSS, including: Isolation of the MRSS

NRC K/A Generic

System

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

38 ☑ RO ☑ SRO Question ID: 5000034 Origin: Mod ☐ Memory Level

Given the following plant conditions:

- 100% power
- SG levels at setpoint
- Steam flow and feed flow matched
- SG2 Feed Flow Transmitter FT-5269A output fails high

With no operator actions, which of the following describes the expected plant response?

A SG level lowers to the low level reactor trip. ☑

B SG level lowers, but stabilizes above the low level reactor trip. ☐

C SG level rises to the high level turbine trip. ☐

D SG level rises, but stabilizes below the high level turbine trip. ☐

Justification

CHOICE (A) - YES
Output from feed flow transmitters FT-5269A and FT-5269B on the SG2 feed line are averaged for input to the three-element level control. Failing one transmitter high drives the average high. The control system will respond by closing the FRV. The level signal will slowly act on the steam flow signal to moderate the response. However, the relatively rapid response to the feed flow signal will dominate the level input. Without operator action, level will decrease to the low SG level reactor trip setpoint.

CHOICE (B) - NO
WRONG: Output from feed flow transmitters FT-5269A and FT-5269B on the SG2 feed line are averaged for input to the three-element level control. Failing one transmitter high drives the average high. The control system will respond by closing the FRV. The level signal will slowly act on the steam flow signal to moderate the response. However, the relatively rapid response to the feed flow signal will dominate the level input. Without operator action, level will decrease to the low SG level reactor trip setpoint.
VALID DISTRACTOR: Applicant may think that level signal will prevent level from dropping to the low level trip.

CHOICE (C) - NO
WRONG: SG will lower to the low level trip setpoint.
VALID DISTRACTOR: Applicant may think the higher indicated feed flow will cause SG level to rise to the turbine trip.

CHOICE (D) - NO
WRONG: SG will lower to the low level trip setpoint.
VALID DISTRACTOR: Applicant may think the higher indicated feed flow will cause SG level to rise but stabilize below the high level trip based on input to the control system from the level signal.

References

1. FWC-01-C, "Feedwater Control System", Revision 2 (3/22/04) (Pg 7,8 of 46)
2. Source: INPO Bank - Q# 1942 - Used at Palisades 1, 6/14/1999

NRC K/A System/E/A

System 059 Main Feedwater (MFW) System

Number K4.08 **RO** 2.5 **SRO** 2.7 **CFR Link** (CFR: 41.7)

Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Feedwater regulatory valve operation (on basis of steam flow, feed flow mismatch)

NRC K/A Generic

System

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

39 ☑ RO ☑ SRO Question ID: 5000035 Origin: New ☐ Memory Level

The plant is at 100% power. I&C is performing troubleshooting in the Facility 1 ESAS Actuation Cabinet. A spurious Facility 1 AFAS is generated.

As a result of automatic actions associated with this event, plant efficiency will ________ and action will be taken to reduce ________.

A decrease, reactor power by inserting CEAs ☐

B increase, reactor power by inserting CEAs ☐

C decrease, turbine load by adjusting load limit ☑

D increase, turbine load by adjusting load limit ☐

Justification

CHOICE (A) - NO
WRONG: Inserting CEAs will reduce RCS temperature. However, power will remain >100% until turbine load is reduced.
VALID DISTRACTOR: Insertion of CEAs does add negative reactivity and would reduce power in a reactor below the POAH.

CHOICE (B) - NO
WRONG: Additional heat required to raise temperature of AFW entering SGs, resulting in a decrease in plant efficiency.
VALID DISTRACTOR: Main feedwater will be automatically throttled to compensate for the AFW flow. Applicant may think efficiency is improved by the reduction of main feedwater.

CHOICE (C) - YES
Additional heat required to raise temperature of AFW entering SGs, resulting in a decrease in plant efficiency. OP-2204, "Load Changes", requires power to be maintained less than 100%

CHOICE (D) - NO
WRONG: Additional heat required to raise temperature of AFW entering SGs, resulting in a decrease in plant efficiency.
VALID DISTRACTOR: Main feedwater will be automatically throttled to compensate for the AFW flow. Applicant may think efficiency is improved by the reduction of main feedwater.

References

1. OP-2204, "Load Changes", Revision 19 (6/29/04) (Pg 17 of 46)

NRC K/A System/E/A

System 059 Main Feedwater (MFW) System

Number A2.01 **RO** 3.4* **SRO** 3.6* **CFR Link** (CFR: 41.5 / 43.5 / 45.3 / 45.13)

Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Feedwater actuation of AFW system

NRC K/A Generic

System

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

40

☑ RO ☑ SRO Question ID: 5000036 Origin: Bank ☑ Memory Level

How is power supplied to 120 VAC Instrument Bus VR21 when the LOAD CONNECTED TO NORMAL (amber) lamp is lit on Transfer Switch RS-2?

A 480 VAC from MCC B41A, rectified, and then inverted to 120 VAC ☐

B 125 VDC from battery, supplied to Bus 201D, then to inverted to 120 VAC ☐

C 480 VAC from MCC B61, then through step-down transformer to 120 VAC ☑

D 480 VAC from MCC B62, inverted to 120 VAC then isolating transformer to 120 VAC ☐

Justification

CHOICE (A) - NO
WRONG: MCC B61 provides normal power to VR21
VALID DISTRACTOR: MCC B41A provides alternate power to VR21

CHOICE (B) - NO
WRONG: MCC B61 provides normal power to VR21
VALID DISTRACTOR: Bus 201D provides power to VA20 through INV 6

CHOICE (C) - YES
MCC B61 provides normal power to VR21

CHOICE (D) - NO
WRONG: MCC B61 provides normal power to VR21
VALID DISTRACTOR: MCC B62 provides emergency power to VR21

References

1. LVD-00-C, "125 VDC/120 VAC", Revision 5 (Pg 10, 33 of 77 and Figure 3)
2. In House Single Line Diagrams 25203-30001 and 25203-30024
3. Source: INPO Bank - Q# 20751 - Used at Braidwood 1, 10/29/2001

NRC K/A System/E/A

System 062 A.C. Electrical Distribution

Number K2.01 **RO** 3.3 **SRO** 3.4 **CFR Link** (CFR: 41.7)

Knowledge of bus power supplies to the following: Major system loads

NRC K/A Generic

System

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

41 ☑ RO ☑ SRO Question ID: 5000037 Origin: New ☑ Memory Level

A steam line break in containment during power operation results in an automatic safety injection actuation signal, generating an emergency diesel generator start signal.

Which of the following describes the reason for the rapid acceleration of the engine to rated speed?

A Crankshaft rotation positions the fuel racks to maximum speed/maximum fuel position. ☐

B Starting air provides the motive force to position the fuel racks to the full fuel position. ☑

C Fuel racks are shifted to the fully extended position at 250 rpm. ☐

D Fuel racks are shifted to the 1/8 to 1/4 position at 250 rpm. ☐

Justification

CHOICE (A) - NO
WRONG: The governor oil boost to initially position the fuel racks is provided by the air start system.
VALID DISTRACTOR: Crankshaft rotation develops governor oil pressure for normal governor operation when engine is running.

CHOICE (B) - YES
The governor oil boost to initially position the fuel racks is provided by the air start system, the fuel racks are positioned by the governor boost oil to the full fuel position.

CHOICE (C) - NO
WRONG: The governor oil boost shifts the fuel racks to the full fuel position upon admission of starting air.
VALID DISTRACTOR: Fuel racks are fully extended on engine start. The 250 rpm switch initiates generator field flash.

CHOICE (D) - NO
WRONG: The governor oil boost to initially position the fuel racks is provided by the air start system.
VALID DISTRACTOR: The governor positions fuel racks to the 1/8 to 1/4 position to maintain the engine at rated speed while unloaded. A 250 rpm switch initiates generator field flash.

References

1. EDG-00-C, "Emergency Diesel Generator System" Lesson, Revision 7 (8/27/02) (Pg 75,107,142 of 143)
2. OP-2346A, "Emergency Diesel Generators", Revision 25 (6/15/04) (Pg 17 of 99)

NRC K/A System/E/A

System 064 Emergency Diesel Generators (ED/G)

Number K4.03 **RO** 2.5 **SRO** 3.0 **CFR Link** (CFR: 41.7)

Knowledge of ED/G system design feature(s) and/or inter- lock(s) which provide for the following: Governor valve operation

NRC K/A Generic

System

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

 # 42 ☑ RO ☑ SRO Question ID: 5000032 Origin: Mod ☐ Memory Level

Given the following conditions on Unit 2:

- SBLOCA resulted in a Manual SIAS
- A loss of offsite power occurred coincident with the Manual SIAS
- 4160 Volt Bus 24E de-energized on 86-2 lockout
- 'A' and 'B' EDGs have energized their respective buses

How many CAR fans will be operating?

A 1 ☐

B 2 ☐

C 3 ☐

D 4 ☑

Justification

CHOICE (A) - NO
WRONG: CAR Fans are powered off of 480 Volt Buses B05 and B06. These buses will re-energize from the EDGs.
VALID DISTRACTOR: May assume Bus 24E fault will keep Bus 24C or 24D from re-energizing. May assume only 1 fan will automatically restart on loss of offsite.

CHOICE (B) - NO
WRONG: CAR Fans are powered off of 480 Volt Buses B05 and B06. These buses will re-energize from the EDGs.
VALID DISTRACTOR: May assume Bus 24E fault will keep Bus 24C or 24D from re-energizing. May assume 2 fans will automatically restart on loss of offsite.

CHOICE (C) - NO
WRONG: CAR Fans are powered off of 480 Volt Buses B05 and B06. These buses will re-energize from the EDGs.
VALID DISTRACTOR: May assume Bus 24E fault will keep Bus 24C or 24D from re-energizing. May assume Bus 24E fault will keep Bus 24C or 24D from re-energizing.

CHOICE (D) - YES
Buses B05 and B06 will reenergize from the EDGs. CAR fans will restart in slow speed on sequencer.

References

1. CCS-00-C, "Containment and Containment Systems" Lesson, Revision 8 (11/20/00) (Pg 33 of 83)

NRC K/A System/E/A

System 022 Containment Cooling System (CCS)

Number K2.01 **RO** 3.0* **SRO** 3.1 **CFR Link** (CFR:41.7)

Knowledge of power supplies to the following: Containment cooling fans

NRC K/A Generic

System

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

43 ☑ RO ☑ SRO Question ID: 0053401 Origin: Bank ☑ Memory Level

The plant is in Mode 4, on the RSST, with bus 24E powered from bus 24D, when the "A" Service Water (SW) Pump breaker shorts internally causing a fault on Bus 24C and tripping the 24C-24G tie breaker.

If the appropriate equipment actuates on the Loss of Normal Power to Bus 24C, which one of the following operator actions is required to prevent further equipment damage?

A Perform a normal shutdown of the "A" EDG. ☐

B Start the "B" SW and RBCCW pumps on the Facility to which they are aligned. ☐

C Align the "A" EDG to the Facility 2 SW header. ☐

D Shutdown the "A" EDG using the Emergency Shutdown push buttons. ☑

Justification

The "A" EDG is running without any cooling water, it should be immmediately tripped to prevent damaging the machine. The fault on Bus 24C will prevent the A EDG breaker from closing as well as no SW pump available to the facility.

CHOICE (A) - NO
WRONG: EOP-2525 requires trip of the EDG.
VALID DISTRACTOR: Procedures and lesson material stress that normal shutdown generally preferable because less stressful to engine.

CHOICE (B) - NO
WRONG: The "B" pumps are aligned to Facility 2.
VALID DISTRACTOR: Start of a standby pump is a logical choice.

CHOICE (C) - NO
WRONG: No procedural guidance provided to allow cross-tie of Facility 2 RBCCW with Facility 1 EDG.
VALID DISTRACTOR: Cross tie physically possible.

CHOICE (D) - YES
EOP directs trip of running EDG on loss of service water.

References

1. EOP-2525, "Standard Post Trip Actions", Revision 20 (2/22/01) (Pg 6 of 26)
2. EOP-2525 Standard Post Trip Actions Technical Guide, Revision 20 (Pg 6 of 38)

NRC K/A System/E/A

System 076 Service Water System (SWS)

Number A2.02 **RO** 2.7 **SRO** 3.1 **CFR Link** (CFR: 41.5 / 43.5 / 45/3 / 45/13)

Ability to (a) predict the impacts of the following malfunctions or operations on the SWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Service water header pressure

NRC K/A Generic

System

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

44

☑ RO ☑ SRO Question ID: 5000038 Origin: New ☐ Memory Level

The unit is operating at full power when a SGTR occurs. Operators manually trip the plant and initiate SIAS. EOP-2525, "Standard Post-Trip Actions" are performed. While performing Step 2 of EOP-2534, "Steam Generator Tube Rupture", a report is received that a large air leak has been discovered on the Service Air header upstream of Containment Header Isolation 2-SA-42 in the 14 foot Aux Bldg General Area. Instrument air pressure is 91 psig and decreasing.

Under these conditions what design feature will enable the Instrument Air header to remain pressurized?

A Opening of 2-SAS-6, Station Air Cross Tie to Unit 3 ☐

B Closing of 2-SA-137, Containment Air Excess Flow Check Valve ☐

C Auto opening of 2-SA-10.1, Cross Tie from Station Air to Instrument Air ☑

D Auto closing of 2-SA-23.1, Cross Tie from Station Air to Containment Air ☐

Justification

CHOICE (A) - NO
WRONG: Given the location of the line rupture, the Unit 3 cross-tie would supply the leak. The leak cannot be isolated from the Unit 3 air when cross-tied.
VALID DISTRACTOR: Step 32 of EOP-2534 directs alignment of Unit 3 to the Unit 2 Service Air System.

CHOICE (B) - NO
WRONG: Excess flow check valves for the containment service air are are located at service air connections in containment.
VALID DISTRACTOR: Major service and instrument air headers are designed with excess flow check valves which isolate in the event of excessive air flow.

CHOICE (C) - YES
Valve 2-SA-10.1 automatically opens when instrument air pressure drops below 85 psig to supply instrument air from station air. Valve 2-SA-11.1 is interlocked to close when 2-SA-10.1 is open to stop flow from the station air compressor to the station air system. All station air compressor flow is re-directed into the instrument air header. In the given situation the station air system leak will be isolated from the instrument air system.

CHOICE (D) - NO
WRONG: Valve SA-23.1 is located within containment and will not isolate the leak.
VALID DISTRACTOR: Valve SA-23.1 is on the service air to containment line and fails closed.

References

1. ISA-00-C, "Station Air & Instrument Air Systems" Lesson, Revision 6 (Pg 12, 13 of 78)
2. OP-2332A-001, "Station Air System Valve Alignment", Revision 8 (Pg 4 of 7)
3. Piping Diagram 25203-26009, "Instrument and Station Air System", Sheet 8 of 10, Revision 32 (9/27/01)

NRC K/A System/E/A

System 078 Instrument Air System (IAS)

Number K4.02 **RO** 3.2 **SRO** 3.5 **CFR Link** (CFR: 41.7)

Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: Cross-over to other air systems

NRC K/A Generic

System

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

45 ☑ RO ☑ SRO Question ID: 0073948 Origin: Bank ☑ Memory Level

The 'A' Instrument Air Compressor F3A is properly tagged for electrical troubleshooting. Electrical Maintenance has determined that the MANUAL / OFF / AUTO Control Switch requires replacement. The yellow tag on the control switch must be ____________.

A cleared prior to removal of the switch from the panel ☐

B lifted under a "temporary lift" until the new switch is installed ☐

C removed from the switch and attached beside the switch mounting location ☑

D maintained with the switch that is removed until transferred to the new switch ☐

Justification

CHOICE (A) - NO
WRONG: Yellow tag is not required to be cleared prior to removing switch.
VALID DISTRACTOR: Generally tags must be cleared before manipulating or working on boundary components.

CHOICE (B) - NO
WRONG: Yellow tag is not required to be cleared prior to removing switch.
VALID DISTRACTOR: Plausible that tag would be temporary lifted to allow switch to be replaced since tag is for information purposes only.

CHOICE (C) - YES
The tagging procedure states that "If tagged panel switch must be removed, remove tag from switch and attach near panel hole (yellow only)."

CHOICE (D) - NO
WRONG: Yellow tag is not required to be cleared prior to removing switch.
VALID DISTRACTOR: Plausible that, since tag is for information only, it might be kept with the original switch until new switch installed as a way of maintaining control over the tag.

References

1. WC-2, "Tagging", Revision 6 (5/1/03), Attachment 4, "Tagging Practices" (Pg 55 of 85)

NRC K/A System/E/A

System 078

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

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.13 **RO** 3.6 **SRO** 3.8 **CFR Link** (CFR: 41.10 / 45.13)

Knowledge of tagging and clearance procedures.

46 ☑ RO ☑ SRO Question ID: 5000040 Origin: New ☐ Memory Level

Plant is operating at in MODE 1 when operators see indications of a rapid rise in containment pressure coincident with lowering SG pressure. The reactor is manually tripped. The crew enters EOP-2525, "Standard Post Trip Actions". While scanning the control boards, the SPO observes the following:

- CIAS ACTUATION SIG CH 1 TRIP alarm actuated
- CIAS ACTUATION SIG CH 2 TRIP alarm actuated
- Containment Sump Pump P-33A stopped
- Containment Sump Pump P-33B running
- 2-SSP-16.1 Containment Drain Sump Isolation Valve open
- 2-SSP-16.2 Containment Drain Sump Isolation Valve closed
- 2-CH-505, RCP Bleedoff Isolation Valve closed
- 2-CH-506, RCP Bleedoff Isolation Valve closed

These conditions indicate ____________________________.

A ESAS Block Relay 24VDC power has failed ☐

B SPO has overriden the ESAS signal to SSP-16.1 ☐

C CTMT PRESS HI coincidence has not been met ☐

D CIAS Actuation Module AM-607 has failed to actuate ☑

Justification

CHOICE (A) - NO
WRONG: Loss of 24VDC block relay power would affect all Facility 2 CIAS components in same manner. Would not have RCP Bleedoff Isolation 2-CH-506 closed with SSP-16.1 open.
VALID DISTRACTOR: 24VDC block power is associated with the Facility 2 CIAS actuation modules.

CHOICE (B) - NO
WRONG: ESAS signal to SSP-16.1 cannot be overriden.
VALID DISTRACTOR: Many ESAS actuation signals can be overriden from switches on the main control boards.

CHOICE (C) - NO
WRONG: CIAS ACTUATION SIG CH 2 TRIP alarm would not be in if coincidence not made up.
VALID DISTRACTOR: Some of the indications provided are consistent with no CIAS

CHOICE (D) - YES
Abnormal ESF response caused by a failure of ESAS Actuation Module AM-607. The module actuates the following components on a Facility 2 CIAS:
- 2-RC-001, RC Hot Leg Sampling==Close
- 2-LRR-43.1 PDT Pump Discharge Valve==Close
- 2-GR-11.l Waste Gas Surge Tank Inlet Valve==Close
- 2-SSP-16.1 Containment Drain Sump Isolation Valve==Close
- P-33B Containment Drain Sump Pump==Stop
- 2-SI-312 N2 to SI Tanks Shutoff Valve

References

1. ESA-01-C, "Engineered Safety Features Actuation System" Lesson, Revision 3 (8/6/01) (Pg 44 of 73 and Tables 4 and 5)
2, CCS-00-C, "Containment and Containment Systems" Lesson, Revision 8 (11/20/00) (Pg 15 of 83)
3. ARP-2590A-138, "CIAS ACTUATION SIG CH 2 TRIP", Revision 0

NRC K/A System/E/A

System 103 Containment System

Number A4.03 **RO** 2.7* **SRO** 2.7* **CFR Link** (CFR: 41.7 / 45.5 to 45.8)

Ability to manually operate and/or monitor in the control room: ESF slave relays

NRC K/A Generic

System

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

47 ☑ RO ☑ SRO Question ID: 0053544 Origin: Bank ☐ Memory Level

An estimated critical position calculation is being performed to startup the reactor 29 hours after a plant trip from 100%. Boron concentration is 955 ppm.

Reference Data:
- Power = 100%
- Xenon = 2.41% delta rho
- Samarium = 0.78% delta rho
- Tavg = 572F
- Burnup = 7,500 MWD/MTU
- Boron = 692 ppm

The moderator temperature coefficient is ___________ and if moderator temperature is maintained during the startup at 2°F below the temperature assumed by the ECP, then the critical rod height will be _______________ than the calculated estimated critical position.

A negative, lower ☑

B positive, lower ☐

C negative, higher ☐

D positive, higher ☐

Justification

CHOICE (A) - YES
MTC is negative at 532°F when boron concentration is below 1400 ppm.

CHOICE (B) - NO
WRONG: MTC is negative at 532°F when boron concentration is below 1400 ppm.
VALID DISTRACTOR: CEA height will be lower.

CHOICE (C) - NO
WRONG: MTC is negative at 532°F when boron concentration is below 1400 ppm.
VALID DISTRACTOR: MTC will be negative.

CHOICE (D) - NO
WRONG: MTC is negative at 532°F when boron concentration is below 1400 ppm.
VALID DISTRACTOR: If MTC was positive, then CEA height would be higher.

References

1. OP-2208-003, "MODERATOR TEMPERATURE COEFFICIENT VERSUS BORON CONCENTRATION MOC CYCLE 16", Revision 044 (4/27/04)

NRC K/A System/E/A

System 001 Control Rod Drive System

Number K5.26 **RO** 3.3 **SRO** 3.6 **CFR Link** (CFR: 41.5/45.7)

Knowledge of the following operational implications as they apply to the CRDS: Definition of moderator temperature coefficient; application to reactor control

NRC K/A Generic

System

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

48 ☑ RO ☑ SRO Question ID: 5000041 Origin: New ☑ Memory Level

A large break LOCA occurred inside containment approximately 9 hours ago. Containment hydrogen concentration is approximately 1.8% and increasing. Bus 24C is de-energized due to a fault.

Operators start the 'B' Hydrogen Recombiner and adjust its power such that it maintains a temperature of 1015°F, as indicated on TEMP IND SW, TIS 8721.

Assuming this recombiner is the only component operating to control containment hydrogen concentration, what is the expected condition inside containment at 12 hours into this event? Containment hydrogen concentration will be _____________ than it was at 9 hours into the event because ______________.

A higher, hydrogen reactions in containment will increase the free hydrogen concentration ☑

B lower, hydrogen reactions in containment will convert some of the free hydrogen back into water ☐

C higher, thermal recombination will occur after hydrogen concentration increases to greater than 2.0% by volume ☐

D lower, thermal recombination will convert more of the free hydrogen back into water than is being produced during the event ☐

Justification

CHOICE (A) - YES
Recombining does not occur until temperature is 1135°F or higher. Water reactions with zirconium, zinc and aluminum in the post-LOCA containment environment will continue to generate free hydrogen.

CHOICE (B) - NO
WRONG: Recombining does not occur until temperature is 1135°F or higher. Water reactions with zirconium, zinc and aluminum in the post-LOCA containment environment will continue to generate free hydrogen.
VALID DISTRACTOR: Radiolysis of water is a reaction that can be driven to reduce the hydrogen concentration in solution under conditions where excess free hydrogen exists in solution exposed to ionizing radiation.

CHOICE (C) - NO
WRONG: Recombination will not occur unless the kW input to the device is increased.
VALID DISTRACTOR: Recombination rate is higher for a recombiner operating in a higher concentration.

CHOICE (D) - NO
WRONG: The recombiner will not reduce hydrogen concentration.
VALID DISTRACTOR: The recombiners are intended to convert more free hydrogen to water than is being produced.

References

1. EOP-2532 Loss of Coolant Accident Technical Guide, Revision 21 (Pg 5, 6 of 18)
2. OP-2313C, "Containment Post-Incident Hydrogen Control", Revision 19 (6/19/03), Section 4.5 (Pg 17 of 30)
3. HCS-00-C, "Hydrogen Control System" Lesson, Revision 3 (6/29/01), Section E.1.b (Pg 18,41,42,43 of 48) (1135°F, 1150-1500°F)
4. Millstone Unit 2 UFSAR, Revision 21, Section 6.6.2.1, "Containment Post-Accident Hydrogen Control System"(Pg 6.6-3) (1100°F)

NRC K/A System/E/A

System 028 Hydrogen Recombiner and Purge Control System (HRPS)

Number K3.01 **RO** 3.3 **SRO** 4.0 **CFR Link** (CFR: 41.7 / 45.6)

Knowledge of the effect that a loss or malfunction of the HRPS will have on the following: Hydrogen concentration in containment

NRC K/A Generic

System

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

49 ☑ RO ☑ SRO Question ID: 5000042 Origin: Mod ☑ Memory Level

The following conditions exist on Unit 2:

- Reactor power is 80%, steady state
- All systems are in automatic control
- MS Pressure Instrument PT-4216 output drifts
- 'A' Steam Dump Valve to Condenser, 2-MS-209, strokes to approx 30% open

Assuming no immediate operator action, what is the expected response of the plant due to the steam dump valve failure AND what action can the operator take from the control room to stop the excess steam flow?

A Turbine load will decrease by approx. 5% AND reactor power will remain constant. The operator can stop dumping excess steam by taking Bypass to Condenser Controller PIC-4216 to MAN and lowering output to 0. ☐

B Turbine load will remain relatively constant AND reactor power will increase by approx. 5%. The operator can stop dumping excess steam by taking Bypass to Condenser Controller PIC-4216 to MAN and lowering output to 0. ☑

C Turbine load will decrease by approx. 5% AND reactor power will remain constant. The operator can stop dumping excess steam by taking the Quick Open Permissive Switch to OFF. ☐

D Turbine load will remain relatively constant AND reactor power will increase by approx. 5%. The operator can stop dumping excess steam by taking the Quick Open Permissive Switch to OFF. ☐

Justification

CHOICE (A) - NO
WRONG: Reactor power will increase.
VALID DISTRACTOR: Some steam flow will divert to the condenser.

CHOICE (B) - YES
Reactor power will increase because of greater steam demand. The valve can be closed by taking controller to manual and reducing output.

CHOICE (C) - NO
WRONG: Reactor power will increase.
VALID DISTRACTOR: The quick open permissive switch blocks an open signal to the dumps.

CHOICE (D) - NO
WRONG: Quick Open Permissive Switch will not close the valve.
VALID DISTRACTOR: Turbine load will remain relatively constant.

References

1. MSS-00-C, "Main Steam System" Lesson, Revision 6 (7/11/01) (Pg 34, 35 of 74)
2. RRS-01-C, "Reactor Regulating System" Lesson, Revision 3 (7/2/01)
3. ARP-2590D-024, "CONDENSER BYPASS VALVE NOT CLOSED", Revision 0 (2/12/04)
4. Piping Diagram 25203-26002, "Main Steam Turbine", Sheet 4 of 5, Revision 20 (9/17/01) (J-2)
5. Source: INPO Bank - Q# 21444 - Used at Braidwood 1, 7/17/2002

NRC K/A System/E/A

System 045 Main Turbine Generator (MT/G) System

Number A2.08 **RO** 2.8 **SRO** 3.1* **CFR Link** (CFR: 41.5/43.5/45.3/45.5)

Ability to (a) predict the impacts of the following malfunctions or operation on the MT/G system; and (b) based on those predictions, use procedures to correct, control,or mitigate the consequences of those malfunctions or operations:
Steam dumps are not cycling properly at low load, or stick open at higher load (isolate and use atmospheric reliefs when necessary)

NRC K/A Generic

System

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

50 ☑ RO ☑ SRO Question ID: 5000039 Origin: New ☐ Memory Level

The plant is at 85% power. Heater Drain Pump 'A' has been removed from service for maintenance on the pump. Given the following tagout boundaries, identify the correct component operation sequence to prevent overpressurization of piping.

1. CLOSE 'A' Heater Drains Pump Suction Valve 2-HD-7A
2. CLOSE 'A' Heater Drains Pump Minimum Flow Recirc Isolation 2-HD-45A
3. CLOSE 'A' Heater Drains Pump Discharge 2-HD-9A

A 1-3-2 ☐

B 3-1-2 ☑

C 1-2-3 ☐

D 2-1-3 ☐

Justification

CHOICE (A) - NO
WRONG: Suction valve is closed before discharge valve.
VALID DISTRACTOR: Procedure directs discharge before recirc.

CHOICE (B) - YES
Discharge valve must always be closed before suction valve to prevent overpressurization of suction piping

CHOICE (C) - NO
WRONG: Suction valve is closed before discharge valve.
VALID DISTRACTOR: Procedure directs drain after isolations.

CHOICE (D) - NO
WRONG: Suction valve is closed before discharge valve.
VALID DISTRACTOR: This sequence would isolate and depressurize piping.

References

1. OP-2320, "Feedwater Heater Drains and Vents", Revision 16 (12/23/03), Section 4.5 (Pg 21 of 46)

NRC K/A System/E/A

System

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

NRC K/A Generic

System 2.2 Equipment Control

Number 2.2.13 **RO** 3.6 **SRO** 3.8 **CFR Link** (CFR: 41.10 / 45.13)

Knowledge of tagging and clearance procedures.

80 ☐ RO ☑ SRO Question ID: 5000022 Origin: Bank ☐ Memory Level

The following conditions exist for a job performed on a system:

- The general area radiation levels are 10 mrem/hr
- The hot spot in the room is a pipe elbow that has radiation levels of 100 mrem/hr
- The job will be performed near the hot spot area

Assuming transit time is the same for each case and all shielding placement is done at 100 mrem/hr, which ONE (1) of the following results in the LEAST amount of personnel exposure?

A The job is performed by 2 operators for 3 hours each on the job at the hot spot. ☐

B The job is performed by 2 operators for 2 hours each on the job at the hot spot and a 3rd operator reading instructions in the general room area for 2 hours. ☐

C The job is performed by 3 operators for 1 hour each on the job at the hot spot and a 4th operator reading instructions in the general room area for 1 hour. ☑

D 2 Health Physics technicians require 1.5 hours to install and remove 1 tenth thickness of lead shielding on the hot spot. The job is performed with the shielding in place by 2 operators for 3 hours each. ☐

Justification

SRO ONLY QUESTION - Samples 55.43(4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

CHOICE (A) - NO
'WRONG: Total dose for this plan equals 600 mrem. The lowest dose of any choice provided is 310 mrem.
VALID DISTRACTOR: This choice involves the fewest number of personnel.

CHOICE (B) - NO
WRONG: Total dose for this plan equals 420 mrem. The lowest dose of any choice provided is 310 mrem.
VALID DISTRACTOR: This choice requires less time to complete the job than 2 other choices.

CHOICE (C) - YES
This choice results in the lowest total dose of 310 mrem.

CHOICE (D) - NO
WRONG: Total dose for this plan equals 360 mrem. The lowest dose of any choice provided is 310 mrem.
VALID DISTRACTOR: This choice installs shielding to reduce the dose to workers.

References

1. Source: Indian Point 3 NRC Exam, 12/2003

NRC K/A System/E/A

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

NRC K/A Generic

System 2.3 Radiation Control

Number 2.3.10 **RO** 2.9 **SRO** 3.3 **CFR Link** (CFR: 43.4 / 45.10)

Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.

81 ☐ RO ☑ SRO Question ID: 5000023 Origin: New ☑ Memory Level

RPM-1.1.2, "Radiation Protection Program and ALARA Program", requires that a whole body count be performed for ______________________.

A exposure to 6.5 DAC-hours from Cs-137 in a calendar week ☑

B work known or suspected to have caused airborne radioactivity ☐

C cumulative exposure of greater than 2 Rem TEDE in a calendar year ☐

D maintenance work in an area with 17,400 dpm/100 square-cm beta-gamma removable surface contamination ☐

Justification

SRO ONLY QUESTION - Samples 55.43(4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.

CHOICE (A) - YES
Section 1.3.5.a of the procedure requires a whole body count for individuals potentially exposed to concentrations of four or more effective DAC-hours within a calendar week, (excluding alpha and tritium) (Pg 10 of 33)

CHOICE (B) - NO
WRONG: A whole body count is not required for work known or suspected to have caused airborne radioactivity.
VALID DISTRACTOR: Section 1.3.4.i of the procedure requires airborne surveys for work conditions known or suspected to cause airborne radioactivity.

CHOICE (C) - NO
'WRONG: A whole body count is not required for a cumulative exposure > 2 Rem TEDE.
VALID DISTRACTOR: Section 1.3.1.a states that increased exposure limits (in excess of admin limits) are permitted using a system of upgrades requiring progressively higher levels of management approval.

CHOICE (D) - NO
WRONG: A whole body count is not required for work in an area with 17,400 dpm/100 sq-cm removable surface contamination.
VALID DISTRACTOR: Section 1.3.4.g provides a limit of <1000 dpm/100 sq-cm removable for unconditional release.

References

1. RPM-1.1.2, "Radiation Protection Program and ALARA Program", Revision 3 (8/19/04) (Pg 5,8,9,10,11,16 of 33)

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.

82 ☐ RO ☑ SRO Question ID: 5000024 Origin: Bank ☐ Memory Level

Unit 2 is operating near beginning of cycle at a burnup of 600 MWD/MTU.

The following conditions exist AFTER a transient from 90% RTP:

- steam generator pressure is lower
- main generator megawatt output is lower
- indicated feedwater temperature is lower
- reactor coolant hot leg temperature is lower

Which one of the following events caused this plant response and what is the applicable procedure for addressing the problem? Assume no operator action.

A condenser backpressure rise (degraded vacuum), address with ARP-2590E (A-37), "COND VACUUM LO" ☐

B sensor input to throttle pressure limiter failed (0 psig), address with ARP-2590D (DA-22), "10% TURBINE LOAD DECREASE" ☐

C feedwater heater extraction steam isolation valve closed (heater 1B), address with ARP-2590D (AA-18), "HEATER 1A LEVEL HI" ☐

D atmospheric dump stuck in intermediate position (30% open), address with ARP-2590D (B-6), "ATMOSPHERIC DUMP VALVE NOT CLOSED" ☑

Justification

SRO ONLY QUESTION - Samples 55.43(5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

CHOICE (A) - NO
WRONG: Degraded vacuum with no movement of control valves or control rods will result in no observable change in steam generator pressure. Steam flow will remain constant. Efficiency of the turbine will decrease. Turbine will perform less work. The additional energy rejected to the condenser will be removed by circulating water system. Feedwater temperature will be unchanged and reactor power will be unchanged.
VALID DISTRACTOR: Increasing backpressure will cause main generator output to decrease.

CHOICE (B) - NO
WRONG: Throttle pressure limiter is maintained in OFF during power operations to prevent undesirable load transients.
VALID DISTRACTOR: If on, the throttle pressure limiter would act to reduce turbine load.

CHOICE (C) - NO
'WRONG: Main turbine output will increase slightly with the isolation of an extraction line as extraction steam is redirected through subsequent turbine stages.
VALID DISTRACTOR: Loss of extraction will result in lower feedwater temperature.

CHOICE (D) - YES
Fully open ARV passes steam flow equivalent to approximately 7.5% reactor power. Steam flow will increase. Steam pressure will drop. With lower steam pressure, the main turbine output will drop. Feed flow will increase to maintain steam generator level. Increased feed flow with same extraction heating steam flow will result in lower feedwater temperature. The increased total steam flow will reduce average coolant temperature. The moderator temperature coefficient of reactivity will raise reactor power until equilibrium conditions are re-established. Reactor power and core delta-T will be higher, but Tave, Th and Tc will be lower.

References

1. MSS-00-C, "Main Steam System" Lesson, Revision 6, Section 19.b (Pg 27)
2. OP-2204, "Load Changes", Revision 19 (6/29/04), Attachment 6, "Temperature vs. Power Program"(Pg 42 of 46)
3. Source: INPO Bank - Q# 23848 - Used at Susquehanna 1, 08/01/2002

NRC K/A System/E/A

System

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

NRC K/A Generic

System 2.4 Emergency Procedures /Plan

Number 2.4.47 **RO** 3.4 **SRO** 3.7 **CFR Link** (CFR: 41.10,43.5 / 45.12)

Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

83

☐ RO ☑ SRO Question ID: 0071509 Origin: Bank ☑ Memory Level

Given the following conditions exist after a reactor trip while implementing EOP 2526, "Reactor Trip Recovery":

- Pressurizer level 25% and lowering slowly
- RCS pressure 2230 psia and trending up slowly
- RCS Tavg 534°F and steady
- "A" SG level 41% and trending up slowly
- "B" SG level 55% and lowering slowly

Identify the procedure which will be implemented next and the step that may be performed out of its given sequence within that procedure?

A EOP-2526, "Reactor Trip Recovery", manually adjust steam generator feed flows to control SG levels ☐

B EOP-2526, "Reactor Trip Recovery", manually adjust charging and letdown to control pressurizer level ☑

C EOP-2536, "Excess Steam Demand Event", manually operate heaters and spray to control pressurizer pressure ☐

D EOP-2536, "Excess Steam Demand Event", manually operate steam dump/bypass valves to control RCS Tcold ☐

Justification

SRO ONLY QUESTION - Samples 55.43(5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

CHOICE (A) - NO
WRONG: SG levels are within band and do not require action to correct or preserve the safety function.
VALID DISTRACTOR: EOP-2526 is the correct procedure.

CHOICE (B) - YES
Step 1.10.2 of the EOP User's Guide provides the following two conditions when EOP steps may be performed out of the order listed in the procedure: 1) steps which are asterisked may be brought forward to correct or preserve a safety function, and 2) steps may be performed out of order after they have been accomplished once, if they are Continuously Applicable step as indicated by an asterisk. Pressurizer level is outside of the band given and trending in away from the band.

CHOICE (C) - NO
WRONG: EOP-2536 is not the correct procedure.
VALID DISTRACTOR: Manual control of pressurizer pressure is an asterisked step.

CHOICE (D) - NO
WRONG: RCS Tcold is within the band and does not require action to correct or preserve the safety function.
VALID DISTRACTOR: Manual control of Tcold via steam dup/bypass valves is an asterisked step.

References

1. OP-2260, "Unit 2 EOP Users Guide", Revision 8 (7/11/02), Section 1.10.2 (Pg 11 of 32)

NRC K/A System/E/A

System E02 Reactor Trip Recovery

Number EA2.2 **RO** 3.0 **SRO** 4.0 **CFR Link** (CFR: 43.5 / 45.13)

Ability to determine and interpret adherence to appropriate procedures and operation within the limitations in the facility's license and amendments as they apply to the Reactor Trip Recovery.

NRC K/A Generic

System

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

84 ☐ RO ☑ SRO Question ID: 5000043 Origin: New ☐ Memory Level

The unit is operating at 100% power, equilibrium conditions. RCS leakage has been steady (confirmed by manual calculation) over the last 2 days at 0.98 gpm, of which 0.01 gpm is known tube leakage on #1 SG.

The RO makes a 60 gallon water addition as measured by Flow Integrator F-210X to the RCS during the 4 hour period of today's PPC leakrate calculation.

If Flow Integrator F-210X has inaccurately measured 5 gallons more than was actually injected, and the resulting leak rate change is attributed entirely to SG #1 tube leakage, then the new SG #1 tube leak rate based on PPC calculation will be ____________________

A 0.0308 gpm, which meets the TS LCO for primary-to-secondary leakage. ☑

B 0.218 gpm, which meets the TS LCO for primary-to-secondary leakage. ☐

C 0.0308 gpm, which exceeds the TS LCO for primary-to-secondary leakage and exceeds the pressure boundary leakage limit. ☐

D 0.218 gpm, which exceeds the TS LCO for primary-to-secondary leakage and meets the pressure boundary leakage limit. ☐

Justification

SRO ONLY QUESTION - Samples 55.43(2) Facility operating limitations in the technical specifications and their bases.

CHOICE (A) - YES
5 gallons less added to RCS than actually added. Will be calculated as an increase of leakage of 5 gallons over 4 hours. This equates to a calculated increase in leakage of 0.0208 gpm. Added to existing SG tube leakage, new calculated pri-to-sec is 0.0308 gpm. TS limit is 0.035 gpm.

CHOICE(B) - NO
WRONG: Measured leakrate is 0.0308 gpm.
VALID DISTRACTOR: Plausible value, off by factor of 10.

CHOICE (C) - NO
WRONG: Measured leakrate does not exceed the TS LCO.
VALID DISTRACTOR: Applicant may think this exceeds SG and pressure boundary limits

CHOICE (D) - NO
WRONG: Measured leakrate does not exceed the TS LCO.
VALID DISTRACTOR: Could determine leakage to be 0.218 gpm, making this choice credible.

References

1. TS 3.4.6.2, "Reactor Coolant System Leakage", Amendment 228 (Pg 3/4 4-9)
2. SP-2602A, "Reactor Coolant Leakage", Revision 5 (08/31/04) (Pg 3 of 20)

NRC K/A System/E/A

System 022

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.

85 ☐ RO ☑ SRO Question ID: 5000044 Origin: New ☑ Memory Level

In EOP-2528, "Loss of Offsite Power/Loss of Forced Circulation", a note states that a cooldown rate of 30°F/hr should be observed when RCS Tcold is below 230°F. This note is based on ___________________________.

A preventing uncoupling of the core and the loops ☐

B ensuring a margin of safety against non-ductile failure ☑

C preventing a cold water accident following RCP restart ☐

D ensuring no void formation due to upper head temperature ☐

Justification

SRO ONLY QUESTION - Samples 55.43(2) Facility operating limitations in the technical specifications and their bases.

CHOICE (A) - NO
WRONG: During natural circulation, the maximum cooldown rate at which the RCS loops can be maintained coupled is dependent on decay heat and RCS temperature . Due to this, the cooldown rate must be lowered as the cooldown progresses. A cooldown rate of 30 to 60 degrees an hour should be maintainable initially, and a rate of 10 to 25 degrees per hour should be sustainable until RCS temperature reaches 300°F. While coupling is a concern, the higher limit of 30°F/hr is a technical specification requirement related to brittle fracture concerns.
VALID DISTRACTOR: Uncoupling is a concern during a natural circulation cooldown.

CHOICE(B) - YES
Cooldown rate is maintained in accordance with Technical Specifications to ensure a margin of safety against non-ductile failure.

CHOICE (C) - NO
WRONG: Rate of cooldown does not affect RCP restart.
VALID DISTRACTOR: Plausible that stagnant legs can develop during natural circulation cooldown.

CHOICE (D) - NO
WRONG: Cooldown limit is a technical specification brittle fracture concern.
VALID DISTRACTOR: Void formation is a concern during natural circulation.

References

1. EOP-2528, "Loss of Offsite Power/Loss of Forced Circulation", Revision 15 (2/27/01), (Page 21 of 36)
2. TS Basis 3/4.4.9, "RCS Pressure and Temperature Limits", Amendment 218 (Pg B 3/4 4-5, 4-6)

NRC K/A System/E/A

System 026

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

NRC K/A Generic

System 2.4 Emergency Procedures /Plan

Number 2.4.20 **RO** 3.3 **SRO** 4.0 **CFR Link** (CFR: 41.10 / 45.13)

"Knowledge of operational implications of EOP warnings, cautions, and notes."

86

☐ RO ☑ SRO Question ID: 5000045 Origin: Mod ☑ Memory Level

The plant has been operating at 100% power. An automatic reactor trip has been initiated by RPS. RPI indicates all rods are out of the core and the reactor trip breakers are stuck shut.

Operators implement the appropriate procedure EOP. Identify the correct procedure entered and the procedurally identified criteria for verifying that the reactor is subcritical?

A EOP-2525, "Standard Post Trip Actions", power dropping and negative SUR ☑

B EOP-2525, "Standard Post Trip Actions", power dropping and emergency boration in progress ☐

C EOP-2540A, "Functional Recovery of Reactivity Control", power dropping and negative SUR ☐

D EOP-2540A, "Functional Recovery of Reactivity Control", power dropping and emergency boration in progress ☐

Justification

SRO ONLY QUESTION - Samples 55.43(5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

CHOICE (A) - YES
EOP-2525 provides contingency actions to trip the reactor from the control room by opening the MG set output breakers. EOP-2540A is not entered until all SFSC evaluated. Reactivity SF will be met before transition from EOP-2525. Criteria are power decreasing, negative SUR and all rods inserted. If any rods stick out after MG set output breakers are opened, the condition will be addressed within EOP-2525 by emergency boration.

CHOICE(B) - NO
WRONG: Emergency boration is performed in response to one or more stuck CEAs. Shutdown is confirmed by power decreasing and negative SUR.
VALID DISTRACTOR: Emergency boration is a step taken for one or more stuck CEAs.

CHOICE (C) - NO
WRONG: EOP-2525 will address the problem. EOP-2540A will not need to be implemented.
VALID DISTRACTOR: Power decreasing and negative SUR are the criteria for confirming reactor shutdown.

CHOICE (D) - NO
WRONG: EOP-2525 will address the problem with trip circuit breakers.
VALID DISTRACTOR: EOP-2540A addresses the loss of reactivity control safety function.

References

1. EOP-2525, "Standard Post Trip Actions", Revision 20 (2/27/01) (Pg 3 of 26)
2. OP-2260, "Unit 2 EOP Users Guide", Revision 8 (7/11/02)
3. Source: INPO Bank - Q# 24679 - Used at Seabrook 1, 5/30/2003

NRC K/A System/E/A

System 029 Anticipated Transient Without Scram (ATWS)

Number EA2.09 **RO** 4.4 **SRO** 4.5 **CFR Link** (CFR 43.5 / 45.13)

Ability to determine or interpret the following as they apply to a ATWS: Occurrence of a main turbine/reactor trip

NRC K/A Generic

System

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

87 ☐ RO ☑ SRO Question ID: 0053649 Origin: Bank ☑ Memory Level

A reactor trip has occurred.

During the performance of EOP 2525, "Standard Post Trip Actions", the following conditions are reported:

PPO:
- SJAE RM is alarming
- Pressurizer level is 15% and lowering
- Pressurizer pressure is 1850 psia and lowering
- No other apparent problems

SPO:
- S/G Blowdown has isolated
- #1 S/G level is 9% and rising
- #2 S/G level is 34% and rising
- #1 FRV Bypass ~ 60% open
- #2 FRV Bypass ~ 30% open
- Both S/G levels are rising at the same rate
- No other apparent problems

Per EOP-2525, what actions should be taken with regard to steam generators?

A Secure feed to #1 S/G. ☐

B Secure feed to #2 S/G. ☐

C Continue feed to SGs until both have levels of 10 to 80%. ☐

D Continue feed to SGs until both have levels of 40 to 70%. ☑

Justification

SRO ONLY QUESTION - Samples 55.43(5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

CHOICE (A) - NO
WRONG: #1 SG is the unaffected SG. Level will be controlled between 40 and 70%.
VALID DISTRACTOR: Plausible that #1 unnecessary for heat removal.

CHOICE(B) - NO
WRONG: Step 7 contingency has the affected SG controlled between 40 and 70%.
VALID DISTRACTOR: Plausible that #2 would be isolated because of the SG tube leak.

CHOICE (C) - NO
WRONG: Both SGs will be maintained between 40 and 70%.
VALID DISTRACTOR: Step 6 has the operator ensure at least one SG is between 10 and 80% as a heat sink for the reactor coolant system.

CHOICE (D) - YES
EOP 2525 step 7.b. contingency actions for SJAE radiation monitor unexplained activity requires that feed be throttled to maintain 40-70 % to the SG with the highest radiation readings. The highest radiation reading will be in the SG with the higher level/lowest feed flow. Step 6c restores level to 40 to 70%.

References

1. EOP-2525, "Standard Post Trip Actions", Revision 20 (2/27/01) (Pg 16,18 of 26)
2. "EOP-2525, Standard Post Trip Actions Technical Guide", Revision 20 (Pg 19 of 38)

NRC K/A System/E/A

System 038

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

NRC K/A Generic

System 2.1 Conduct of Operations

Number 2.1.23 **RO** 3.9 **SRO** 4.0 **CFR Link** (CFR: 45.2 / 45.6)

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