2008 SRO NRC Retake Examination

OUESTION 1

| QuestionBank # | KA_system | KA_number | |
|----------------|------------------|----------------------------|--|
| 1701 | EPE007 | 2.4.50 | |
| KA_desc | | | |
| EPE007 GENERIC | C Ability to ver | ify system alarm setpoints | and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / |
| 45.3) | | - | |

Unit 1 is operating at 75% power and increasing following a refueling outage. The following are noted at 1015:

- 1AD-1, E/8 "TURB GEN HI VIBRATION" is LIT .
- Turbine bearing vibration readings on the OAC indicate: •
 - Bearing #9 at 11 mils
 - Bearing #10 at 13 mils

What response is required for these conditions?

- Monitor bearing vibrations and if vibration is unchanged at 1017, Α. manually trip the turbine only.
- Β. Monitor bearing vibrations and if vibration is unchanged at 1017, manually trip the reactor and verify the turbine automatically trips.
- C. Vibration limits have been exceeded for the current plant conditions, manually trip the turbine only.
- D. Vibration limits have been exceeded for the current plant conditions, manually trip the reactor and verify the turbine trips automatically.

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 1



General Discussion

Bearing vibration >12 mils is immediate trip criteria for this plant condition, the reactor is tripped first because reactor power is >69% (P9). A 2 minute wait is plausible because if vibration is >10 mils for 2 minutes, the turbine is also tripped. However that is for increasing speed between 800 and 1400 RPM only prior to syncronizing.

Answer A Discussion

Plausible: A 2 minute wait is plausible because if vibration is >10 mils for 2 minutes, the turbine is also tripped. However that is for increasing speed between 800 and 1400 RPM only prior to syncronizing.

Answer B Discussion

Plausible: A 2 minute wait is plausible because if vibration is >10 mils for 2 minutes, the turbine is also tripped. However that is for increasing speed between 800 and 1400 RPM only prior to syncronizing. The Rx would be tripped first (>P-9)

Answer C Discussion

Plausible: The turbine vibration limits have been exceeded, and turbine trip is required, but the reactor would be tripped first (> P9)

Answer D Discussion

Correct: IF all of the following conditions are met, manually trip the reactor: Reactor power greater than or equal to 69% (P-9). Any bearing vibration exceeds 12 mils.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | Databook figure 24 | |
| OPT Approved | 1AD-1, E8 annunc resp | |
| OPS Approved | mt3 lesson | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1701 | EPE007 | 2.4.50 |

KA_desc

EPE007 GENERIC Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / 45.3)

401-9 Comments:

2008 SRO NRC Retake Examination

QuestionBank #KA_systemKA_number1702APE008AK1.02

KA_desc

Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: (CFR 41.8 / 41.10 / 45.3) Change in leak rate with change in pressure

Unit 1 is operating at 100% power. Given the following conditions and sequence of events:

Initial Conditions

- 1NV-294 (NV Pmps A&B Disch Flow Ctrl) is in manual
- PRT pressure is 6 psig
- PRT level is 67%
- The PRT has a small external leak (0.05 gpm)
- Pressurizer pressure is 2235 psig

Final Conditions 10 minutes later

- The crew notes pressurizer pressure is 2197 psig and slowly decreasing
- PRT pressure is 15 psig
- PRT level is 68%

Based on the conditions stated above, and assuming no operator action:

- 1. How (if at all) is charging flow affected?
- 2. How (if at all) is the external leakage rate from the PRT affected?
- A. Charging flow is stable PRT external leakage rate will increase
- B. Charging flow is stable PRT external leakage rate is stable
- C. Charging flow is increasing PRT external leakage rate is stable
- D. Charging flow is increasing PRT external leakage rate will increase



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QUESTION 2



General Discussion

As pressure decreases, charging flow will increase due to the larger DP bewteen charging pump discharge and NC pressure. As PRT pressure increases the leak leak should increase due to the higher DP. With 1NV-294 in manual, charging would stay stable if pressure was stable

MODIFIED PER FRANK E. COMMENTS 9/14/09

Answer A Discussion

Plausible: With 1NV-294 in manual, student may believe flow will not change. Second part is correct.

Answer B Discussion

Plausible: With 1NV-294 in manual, student may believe flow will not change. Candidate may believe PRT leakage would be stable since leak is very small and DP increase is < 10 psig

Answer C Discussion

Plausible: First part is correct. Student may believe PRT leakage would be stable since leak is very small and DP increase is < 10 psig

Answer D Discussion

Correct: Charging flow will increase as NC pressure decreases and PRT external leakage will increase as PRT pressure increases

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | BNT -FF | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

| | | _ |
|------|--------|--------|
| 1702 | APE008 | AK1.02 |

KA_desc

Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: (CFR 41.8 / 41.10 / 45.3) Change in leak rate with change in pressure

401-9 Comments:

2008 SRO NRC Retake Examination

A

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1703 | EPE009 | EA2.34 |
| KA daga | | |

KA_desc

Ability to determine or interpret the following as they apply to a small break LOCA: (CFR 43.5 / 45.13) Conditions for throttling or stopping HPI

QUESTION 3

A LOCA has occurred on Unit 1. Given the following conditions:

- The crew is in EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant) evaluating safety injection termination criteria
- NC pressure is 1200 psig and stable
- Containment pressure peaked at 2.8 psig and is slowly decreasing
- NC subcooling is 2°F
- Pressurizer level is 18% and slowly increasing
- Total CA flow is 400 gpm
- All S/G NR levels are approximately 21% and slowly increasing

Can safety injection be terminated at this time and why or why not?

- A. Yes, safety injection termination criteria are met
- B. No, a secondary heat sink must be established and then safety injection can be terminated
- C. No, NC subcooling must be increased and then safety injection can be terminated
- D. No, Pressurizer level must be increased and then safety injection can be terminated

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QUESTION 3



General Discussion

Original KA was replaced. SI termination critera are: Subcooling >0 one S/G >11% (29% ACC) or total feed flow >450 gpm NC pressure stable or increasing PZR level > 11% (20% ACC)

For the conditions specified, ACC numbers are NOT used in this case therefore S/I can be terminated.

Answer A Discussion

Correct: SI termination criteria are met as stated above

Answer B Discussion

Plausible: If containment pressure was > 3psig (ACC conditions) heat sink parameters would not be met for SI termination. Flow is < 450 gpm and S/G levels are < 29%

Answer C Discussion

Plausible: Some procedures require greater than this subcooling to perform certain steps. But only >0 is required

Answer D Discussion

Plausible: If containment pressure was > 3psig (ACC conditions) PZR level parameter would not be met, (<20%)

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|----------------------------|
| RO | Comprehension | BANK | 2009 MNS AUDIT (Bank 1033) |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | E1 | |
| | | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1703 | EPE009 | EA2.34 |
| | | |

KA_desc

Ability to determine or interpret the following as they apply to a small break LOCA: (CFR 43.5 / 45.13) Conditions for throttling or stopping HPI

401-9 Comments:

2008 SRO NRC Retake Examination **QUESTION** 4

| EPE011 | 2.4.35 |
|--------|--------|
| | |
| | EPE011 |

EPE011 GENERIC Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects. (CFR: 41.10 / 43.5 (45.13)

Unit 1 was operating at 100% when a large break LOCA occurred. Given the following:

- The control room crew is in EP/1/A/5000/ES-1.3 (Transfer to Cold Leg • Recirculation)
- Step 13.b verifies the ND & NS ROOMS sump pump "RESET" lights DARK •
- The crew notes the lights are currently LIT and dispatches an operator to • perform a local action

The dispatched operator will place the affected ND & NS ROOMS Sump Pumps in:

- "AUTO" to ensure they start on "high" sump level to protect the ND and NS Α. pump rooms from flooding
- "AUTO" to ensure they start on a "high-high" sump level to protect the ND and Β. NS pump rooms from flooding
- "STDBY" to ensure contaminated water is contained within the sump due to C. potential ND and/or NS pump seal leakage
- "STDBY" to ensure a "high-high" annunciator alarm is received on increasing D. level to indicate possible ND and/or NS pump seal leakage

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination OUESTION 4



General Discussion

The sump pump reset lights should extinguish on an SI signal causing the pumps to only start on a high-high level. If the reset lights are lit, the sump pumps are placed in standby. This prevents the start of the pumps unless they reach the high-high level which also alarms on the control room annunciator panel to alert the operator of possible seal leakage. If the pumps started at the high level, the alarm would never be received unless the leakage was gross enough to exceed the sump pumps capacity.

Answer A Discussion

Plausible: Placing the pumps in AUTO will cause them to start at the high level but this would prevent receiving the HI-HI level annunciator. The operational effect is to alert the operators of possible ND/NS seal leakage

Answer B Discussion

Plausible: Placing the pumps in AUTO will cause them to start at a high level but this would prevent receiving the HI-HI level annunciator (the desired operational effect)

Answer C Discussion

Plausible: Although this is the correct action, it does not ensure that the contaminated water will be contained within the sump if leakage is greater than the pumps capacity.

Answer D Discussion

Correct: Placing the sump pumps in standby will ensure a HI-HI level annunciator is received in the control room, indicating possible seal leakage

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | ES1-3 and basis WL | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1704 | EPE011 | 2.4.35 |

KA_desc

EPE011 GENERIC Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects. (CFR: 41.10 / 43.5 / 45.13)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 5



| QuestionBank # | KA_system | KA_number | |
|----------------|------------|-----------|--|
| 1705 | APE015/017 | AK2.10 | |
| KA desc | | | |

Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: (CFR 41.7 / 45.7) RCP indicators and controls

Unit 1 was operating in Mode 3 at full temperature and pressure. Given the following trends on the 1A NCP:

| Time | 0200 | 0205 | 0210 | 0215 |
|--------------------------------|------|------|------|------|
| Motor bearing temp (°F) | 180 | 184 | 186 | 195 |
| Lower pump bearing temp (°F) | 221 | 225 | 228 | 231 |
| #1 seal outlet temp (°F) | 205 | 227 | 235 | 251 |
| Motor stator winding temp (°F) | 312 | 314 | 316 | 323 |

What is the earliest time at which the 1A NCP must be secured?

- A. 0200
- B. 0205
- C. 0210
- D. 0215

2008 SRO NRC Retake Examination

QUESTION 5



General Discussion

Bank Question: 870 NCP Trip criteria: Any motor bearing temperature >/= 195°F Seal Outlet temperature >/= 235°F Motor winding temperature >/= 311°F Any pump bearing water exit temperature >/= 225°F

Answer A Discussion

Correct: 0200 is the earliest time the NCP must be stopped since motor winding temperature reaches 311 degrees

Answer B Discussion

Plausible: If the student doesn't know the trip setpoint for securing the NCP on motor winding temperature, but knows the lower bearing temperature trip setpoint.

Answer C Discussion

Plausible: If the student doesn't know the trip setpoints for securing the NCP on motor winding or pump bearing temperatures, but knows the #1 seal outlet temperature setpoint

Answer D Discussion

Plausible: If the student doesn't know the trip setpoints for securing the NCP on motor winding, pump bearing, and #1 seal outlet temperatures, but knows the motor bearing trip setpoint

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Memory | BANK | 2003 NRC Q45 (Bank 245) |

| | Development References | Student References Provided |
|----------------------------------|------------------------|-----------------------------|
| OPT Approved | OP-CN-PS-NCP | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|------------|-----------|
| 1705 | APE015/017 | AK2.10 |
| KA_desc | | |

Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: (CFR 41.7 / 45.7) RCP indicators and controls

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 6

| uestionBank # | KA_system | KA_number |
|---------------|-----------|-----------|
| 1706 | APE025 | AK1.01 |

Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: (CFR 41.8 / 41.10 / 45.3) Loss of RHRS during all modes of operation

Unit 1 was shutdown in Mode 6, in mid loop operations when a loss of ND cooling occurred. Given the following events and conditions:

- The operators implemented CASE IV (Loss of ND in Mid Loop) of AP/1/A/5500/019 (Loss of Residual Heat Removal System) and have reached step 22.
- The ND system has been refilled and properly vented
- Step 22 requires restart of one ND pump to restore cooling.
- A caution wams the operator that restarting an ND pump can cause NC system level to decrease rapidly.

What is the reason for the NC system level decrease?

- A. Due to the contraction of the water from the cooldown
- B. Due to the suction of water from the NC system into the ND pump
- C. Due to the collapse of system voids
- D. Due to increased system pressure

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 6

General Discussion

AP/1/A/5500/019 (Loss of Residual Heat Removal System), Case IV (Loss of ND in Mid Loop) caution prior to step 22 states " NC System level may decrease rapidly when an ND pump is started due to the collapse of system voids. Additional makeup flow may be required."

Answer A Discussion

Plausible: Sufficient cooldown will cause volumetric contraction and level drop, Cooldown is insufficient to cause a level drop at representative temperatures

Answer B Discussion

Plausible: The suction surge is accompanied by discharge back into the system so the mass balance remains the same.

Answer C Discussion

Correct: Per AP/1/A/5500/019 (Loss of Residual Heat Removal System), Case IV (Loss of ND in Mid Loop) caution prior to step 22

Answer D Discussion

Plausible: System pressure will not increase. Mid loop operations require an open vent path to atmosphere

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Memory | BANK | 2003 NRC Q60 (Bank 260) |

| ✓ Developed | Development References | Student References Provided |
|----------------------------------|---|-----------------------------|
| OPT Approved | Lesson Plan Objective: none 1. AP-19 Case IV | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1706 | APE025 | AK1.01 |

KA_desc

Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: (CFR 41.8 / 41.10 / 45.3) Loss of RHRS during all modes of operation

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 7

С

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1707 | APE027 | AK3.03 |
| KA desc | d | |

Knowledge of the reasons for the following responses as they apply to the Pressurizer Pressure Control Malfunctions: (CFR 41.5,41.10/45.6/ 45.13) Actions contained in EOP for PZR PCS malfunction

Unit 2 is operating at 100% power. Given the following:

- "PZR PRESS CTRL SELECT" switch is in the 1-2 position
- Pressurizer pressure channel 1 has failed low
- The crew enters AP/2/A/5500/011 (Pressurizer Pressure Anomalies), Case II (Pressurizer Pressure Increasing).

Step 1 states:

"Verify all Pzr pressure channels – INDICATING THE SAME"

With channel 1 failed low, why does the RNO for this step require the "PZR PRESS MASTER" to be placed in manual and output adjusted to 70% demand prior to selecting an alternate operable channel on the "PZR PRESS CTRL SELECT" switch?

- A. To ensure the backup heaters remain on to stabilize NC pressure
- B. To ensure the spray valves open to deal with the increasing NC pressure
- C. To prevent 1NC-34A (PZR PORV) from lifting and causing a decrease in NC pressure
- D. To prevent 1NC-32B (PZR PORV) and 1NC-36B (PZR PORV) from lifting and causing a decrease in NC pressure

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination OUESTION 7

General Discussion

Without placing the master controller in manual and adjusting it (70% is \sim nominal value for 2235 psig), the sprays could open and the PORV could open as well due to windup in the controller. Placing the master controller in manual and adjusting it to 70% (nominal value for 2235 psig) does prevent a possible PORV actuation (1NC-34A) from the controlling channel.

Answer A Discussion

Plausible: The student may believe placing the master controller in manual and adjusting it to 70% will ensure backup heaters remain on, but this will secure the backup heaters and have "C" heater modulating.

Answer B Discussion

Plausible: The student may believe placing the master controller in manual and adjusting it to 70% will ensure sprays are open but at 70%, the spray valves will be closed.

Answer C Discussion

Correct: Placing the PZR pressure master controller in manual and adjusting it to 70% (nominal value for 2235 psig) will prevent a possible PORV actuation on 1NC -34A from the controller integral "wind up" when swapping controlling channels.

Answer D Discussion

Plausible: The student may believe 1NC-32B and 1NC-36B are controlled from the controlling channel, but these are controlled from the backup channel and would not lift due to controller "wind up" when selecting an alternate operable channel

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | AP/11 IPE lesson | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1707 APE027 AK3.03

KA_desc

Knowledge of the reasons for the following responses as they apply to the Pressurizer Pressure Control Malfunctions: (CFR 41.5,41.10 / 45.6 / 45.13) Actions contained in EOP for PZR PCS malfunction

401-9 Comments:

401-9 Comments RESPONSE DCS DCS DCS

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1708 | EPE029 | EK3.10 |
| KA desc | | |

Knowledge of the reasons for the following responses as the apply to the ATWS: (CFR 41.5 / 41.10 / 45.6 / 45.13) Manual rod insertion

QUESTION 8

The basis for manually inserting control rods during an ATWS event is to reduce reactor power to:

- A. prevent total core flux from exceeding core thermal power limits
- B. prevent rapid heatup of the NC system and potential overfill of the pressurizer
- C. ensure the only heat transferred to the NC system is from core decay heat and NC pump heat
- D. ensure there is sufficient steam dump capacity to prevent opening the steam line code safeties

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 8

General Discussion

MODIFIED PER FRANK E. COMMENTS 9/14/09

From E-0 Basis for ensuring Rx trip: Reactor trip must be verified to ensure that only heat being added to the NC Ssytem is from decay heat and reactor coolant pump heat. The safeguards systems that protect the plant during accidents are designed assuming that only decay heat and NC pump heat are being added to the NC system. Preventing rapid heatup to prevent Pzr overfill is why steam is dumped in S.1

Answer A Discussion

Plausible: The student may think that since the reactor is not tripped, that inserting negative reactivity with the rods is necessary to prevent core overheating and may confuse this with core thermal power. Core thermal power will actually decrease.

Answer B Discussion

Plausible: The reactor coolant system will heatup when the turbine is tripped, but this is the basis for dumping steam in the ATWS procedure.

Answer C Discussion

Correct: Per FR-S.1 basis document

Answer D Discussion

Plausible: The student may think rods need to be inserted during an ATWS to remove enough heat to allow the steam dumps to operate within their capacity.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | FR-S1 and basis | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1708 | EPE029 | EK3.10 |

KA_desc

Knowledge of the reasons for the following responses as the apply to the ATWS: (CFR 41.5 / 41.10 / 45.6 / 45.13) Manual rod insertion

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 9



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|--------------|
| 1709 | APE054 | AK3.04 |
| KA_desc | | l p // RA ge |

Knowledge of the reasons for the following responses as they apply to the Loss of Main Feedwater (MFW): (CFR 41.5,41.10/45.6/ 45.13) Actions contained in EOPs for loss of MFW

1A CF pump was out of service for maintenance when 1B CF pump tripped on low lube oil pressure. The crew has entered AP/1/A/5500/006 (Loss of S/G Feedwater), Case I (Loss of CF Supply To S/Gs).

What is the <u>minimum</u> power level which would <u>require</u> a manual reactor trip and what is the basis for manually tripping the reactor above that power level when in this procedure?

- A. 5%; to ensure CA can maintain adequate S/G levels
- B. 10%; to ensure CA can maintain adequate S/G levels
- C. 5%; to minimize the pressure and temperature transient on the reactor
- D. 10%; to minimize the pressure and temperature transient on the reactor

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General Discussion

The basis document for AP/06, Case I, states that CA can power operation up to 5%. 10% power is when the turbine is placed on line and also P-10 and P13 setpoints. To minimize the pressure and temperature transient on the reactor is the basis for tripping the reactor on a turbine trip >P9.

Answer A Discussion

Correct: CA can only supply S/G's when <5 % power. The Rx is tripped to ensure CA can maintain adequate S/G levels

Answer B Discussion

Plausible: Student may believe that CA can be used up to 10% power. Second part is correct

Answer C Discussion

Plausible: First part is correct. Student may believe this is the basis for tripping the reactor in this situation (actually basis for Rx trip on a turbine trip > P9)

Answer D Discussion

Plausible: Student may believe that CA can be used up to 10% power and that this is the basis for tripping the reactor in this situation (actually basis for Rx trip on a turbine trip >P9)

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO Memory | | NEW | |

| \checkmark | Developed | Development References | Student References Provided |
|--------------|--------------|-------------------------------|-----------------------------|
| | OPT Approved | AP/06 AP/06 background doc | |
| | OPS Approved | | |
| | NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1709 | APE054 | AK3.04 |
| | | |

KA_desc

Knowledge of the reasons for the following responses as they apply to the Loss of Main Feedwater (MFW): (CFR 41.5,41.10/45.6/45.13) Actions contained in EOPs for loss of MFW

401-9 Comments:

2008 SRO NRC Retake Examination

KA_number

EK3.02

QUESTION 10

| | 1710 | EPE055 |
|----|------|--|
| KA | desc | d. · • • • • • • • • • • • • • • • • • • |

QuestionBank # KA_system

Knowledge of the reasons for the following responses as the apply to the Station Blackout : (CFR 41.5 / 41.10 / 45.6 / 45.13) Actions contained in EOP for loss of offsite and onsite power

Regarding the actions of EP/1/A/5000/ECA 0.0 (Loss of All AC Power):

- 1. Why are intact S/Gs depressurized to 165 psig?
- 2. What is the basis for stopping the depressurization at 165 psig?
- A. 1. To enhance natural circulation until forced cooling can be restored2. To prevent injecting N2 from the CLAs
- B. 1. To enhance natural circulation until forced cooling can be restored2. To prevent voiding in the reactor vessel upper head
- C. 1. To minimize NC inventory loss out of the NC pump seals2. To prevent injecting N2 from the CLAs
- D. 1. To minimize NC inventory loss out of the NC pump seals2. To prevent voiding in the reactor vessel upper head

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General Discussion

The S/Gs are depressurized to reduce NC temperature and pressure thereby minimizing the loss of inventory out the NC pump seals. Although Natural Circulation might be enhanced, this is not the reason it is done in this procedure. Stopping the depressurization at 165 psig prevents injecting N2 from the CLAs. A bubble is actually assumed to form in the head.

Answer A Discussion

Plausible: Dumping steam will enhance natural circ but this is not the reason for depressurizing the intact S/G's. Second part is correct

Answer B Discussion

Plausible: Dumping steam will enhance natural circ but this is not the reason for depressurizing the intact S/G's. A bubble is actually assumed to form in the head, it is reasonable that this may be prevented by stopping the depressurization.

Answer C Discussion

Correct: The S/Gs are depressurized to reduce NC temperature and pressure thereby minimizing the loss of inventory out the NC pump seals. Stopping the depressurization at 165 psig prevents injecting N2 from the CLAs

Answer D Discussion

Plausible: The S/Gs are depressurized to reduce NC temperature and pressure thereby minimizing the loss of inventory out the NC pump seals. A bubble is actually assumed to form in the head, it is reasonable that this may be prevented by stopping

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------------------------|
| RO | Memory | NEW | Modified from 126? Or NEW ask NRC |

| Developed | Development References | Student References Provided |
|--------------|-----------------------------------|-----------------------------|
| OPT Approved | eca 0.0 step 23 and basis Step 23 | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1710 | EPE055 | EK3.02 |
| | | |

KA_desc

Knowledge of the reasons for the following responses as the apply to the Station Blackout : (CFR 41.5 / 41.10 / 45.6 / 45.13) Actions contained in EOP for loss of offsite and onsite power

401-9 Comments:

2008 SRO NRC Retake Examination

F

QUESTION 11

| QuestionBank # | KA_s | ys | tem | n KA | _number | |
|----------------|--------|----|-----|------|----------|--|
| 1711 | APE056 | | | | 2.1.28 | |
| KA_desc | | | | l | | |
| DEAL OF DEAL | ** | - | - | 0.1 | 1.0 | |

APE056 GENERIC Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)

Unit 1 is operating at 75% power and Unit 2 is at 100% power when the following switchyard PCBs open:

- PCB 17
- PCB 18
- PCB 19

Which one of the following statements correctly describes the effect on Units 1 and 2?

- A. Unit 1 will remain at 75% power and Unit 2 will run back to 48% at 18% /min
- B. Unit 1 will run back to 48% at 18% / min and Unit 2 will remain at 100%
- C. Unit 1 will remain at 75% power and Unit 2 will run back to 23% at 25% /min
- D. Unit 1 will run back to 23% at 25% / min and Unit 2 will remain at 100%

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QUESTION 11



General Discussion

Question tests the switchyard PCB (loss of load) turbine runback circuit. With PCB's 17 and 18 open and > 48% power, Unit 1 runback to \sim 48% at 18%/min will occur due to loss of 1A main buss line. Unit 2 is unaffected. The runback to 23% at 25%/min is for a loss of KG (generator stator cooling) Believe this is high cog versus memory because changing one stem condition will make another choice correct.

Answer A Discussion

Plausible: Unit 1 will runback. The student may believe Unit 2 is affected, this would be the correct runback rate and target

Answer B Discussion

Correct: Unit 1 will runback at 18% /min on loss of load with PCBs 17 and 18 open

Answer C Discussion

Plausible: Unit 1 will runback. The student may believe Unit 2 is affected, runback target and rate are for the loss of generator stator cooling.

Answer D Discussion

Plausible: Unit 1 will runback, but runback target and rate are for the loss of generator stator cooling.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Comprehension | BANK | 2003 NRC Q42 (Bank 242) |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | EPA | |
| OPS Approved | Ene | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

| 1/1 | I APE056 | 2.1.28 | | | |
|---------------|----------------|--------------------------|---------------------------|--------------------------|-----|
| KA_desc | | | | | |
| APE056 GENERI | C Knowledge of | the purpose and function | of major system component | s and controls. (CFR: 41 | .7) |

401-9 Comments:

2008 SRO NRC Retake Examination

OUESTION 12

| QuestionBank # | KA_system | KA_number | |
|----------------|-----------|---------------------------------------|---|
| 1712 | APE057 | AA1.06 | |
| | | · · · · · · · · · · · · · · · · · · · | - |

KA desc

Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: (CFR 41.7 / 45.5 / 45.6) Manual control of components for which automatic control is lost

Unit 2 is operating at 85% power. Given the following events and conditions:

- Control rods are in manual for an engineering test
- 120VAC panel 2ERPA is de-energized •
- Turbine Impulse Pressure Channel 1 fails low

Assuming no operator action, which of the following describes the current status of the condenser steam dumps?

- Α. Condenser dump valves are open and will remain open until they are closed by the P-12 interlock or both trains are placed in "OFF"
- Β. Condenser dump valves will automatically control at approximately 576.5°F following a feed pump trip and automatically control for 557°F on a reactor trip
- C. Condenser dump valves will automatically control at approximately 576.5°F following a feed pump trip, but manual control will be required to maintain 557°F on a reactor trip
- D. Condenser dump valves will automatically control for 557°F on a reactor trip but manual control will be required to control NC temperature at approximately 576.5°F following a feed pump trip

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 12



General Discussion

With Ch 1 impulse failed, Tref fails to 557F. Since control rods are in manual, there is no automatic inward rod motion. This large temperature mismatch would cause the dumps to open except there is no arming signal (C-7A or C-7B). On a trip, the target temperature is a fixed 557 T-no load and there should be no difference in normal response. However, on a feedwater pump trip runback, the dumps will not control automatically at the target temperature (576.5 at 65% power plus a 3 degree deadband if in Tave mode)) because they still see a temperature mismatch of actual Tavg to the failed Tref of 557.

Answer A Discussion

Plausible: This would be true if the student believes that the dumps are armed in addition to the large delta T from the Ch 1 impulse pressure failure.

Answer B Discussion

Plausible: The condenser dumps WILL NOT automatically control on the runback from the feedwater pump trip due to the Ch 1 impulse pressure failure. The condenser dumps WILL automatically control using T-no load setpoint plus 3 degrees (560) on a Rx trip

Answer C Discussion

Plausible: If the student gets this backward, the answer is opposite to actual conditions.

Answer D Discussion

Correct: Condenser dumps will control automatically on T-no load (557 F)

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | AP-29 IDE | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1712 | APE057 | AA1.06 |

KA_desc

Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: (CFR 41.7 / 45.5 / 45.6) Manual control of components for which automatic control is lost

401-9 Comments:

401-9 Comments RESPONSE DCS DCS DCS

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number | |
|----------------|-----------|-----------|---|
| 1713 | APE058 | AK1.01 | |
| | | | - |

KA_desc

Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: (CFR 41.8 / 41.10 / 45.3) Battery charger equipment and instrumentation

OUESTION 13

Given the following:

- Vital charger 1ECC fails
- 1EMXA is unavailable to the spare charger (1ECS)
- The CRS directs an NLO to align the alternate supply to 1ECS so that 1ECS can be tied to bus 1EDC before the battery is depleted
- 1. What other MCC can be aligned to provide an alternate supply to 1ECS?
- 2. Per OP/1/A/6350/008 (125VDC/120VAC Vital Instrument and Control Power System), what plant mode(s) allow this alignment?
- A. 1. 1EMXC
 - 2. No Mode only
- B. 1. 1EMXC2. Modes 5, 6 and No Mode
- C. <u>1. 1EMXJ</u> 2. No Mode only
- D. 1. 1EMXJ 2. Modes 5, 6 and No Mode

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 13

General Discussion

The spare charger can be supplied form 1EMXA and 1EMXJ. Cross train power supply can only be aligned in NO MODE per procedure. Normally (modes 1-6), when 1ECC is removed from service, the space charger (1ECS) is aligned and is powered from 1EMXA. 1EMXC seems logical since 1EMXA powers 1ECA, but 1EMXI supplies 1ECC and neither can supply the spare charger

Answer A Discussion

Plausible: Student may believe 1EMXC supplies charger 1ECC, and can be used to power the spare charger (1ECS). No mode is correct

Answer B Discussion

Plausible: Student may believe 1EMXC supplies charger 1ECC, and can be used to power the spare charger (1ECS). Student may think cross train power supply to spare is available in shutdown modes

Answer C Discussion

Correct: 1EMXJ is the only available power supply to the spare charger (1ECS) with 1EMXA unavailable. This alignment can only be performed in No Mode

Answer D Discussion

Plausible: 1EMXJ is the correct available power supply to the spare charger (1ECS). Student may think cross train power supply to spare is available in shutdown modes

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| \checkmark | Developed | Development References | Student References Provided |
|--------------|--------------|------------------------|-----------------------------|
| \checkmark | OPT Approved | EPL OP/1/A/6350/008 | |
| | OPS Approved | | |
| | NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1713 | APE058 | AK1.01 |
| · | | |

KA_desc

Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: (CFR 41.8/41.10/45.3) Battery charger equipment and instrumentation

401-9 Comments:

2008 SRO NRC Retake Examination

QuestionBank # KA_systemKA_number1714APE062AA1.02

A

KA_desc

Ability to operate and / or monitor the following as they apply to the Loss of Nuclear Service Water (SWS): (CFR 41.7 / 45.5 / 45.6) Loads on the SWS in the control room

QUESTION 14

Units 1 and 2 are operating at 100% power with RN pump 2A running. Given the following conditions and indications:

- RN pumps 1A, 1B and 2B start
- An Emergency Lo Pit Level actuation occurs
- 1. What is the expected position of 1RN-53B (Station RN Disch Hdr X-Over) and RN-54A (Station RN Disch Hdr X-Over) based on these conditions?
- 2. Where is RN discharge flow from the D/Gs directed based on the above conditions?
- A. Closed Standby Nuclear Service Water Pond
- B. Closed RL discharge piping to Lake Wylie
- C. Open Standby Nuclear Service Water Pond
- D. Open RL discharge piping to Lake Wylie

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination OUESTION 14



General Discussion

The RN discharge header crossover valves (1RN-53B and 1RN-54A) close on an emergency low pit level (2/3 logic) and on an Ss or Sp signal they remain open. All pumps start in either case.

RN discharge from the D/Gs swaps to the Standby Nuclear Service Water Pond (SNSWP) on Emergency low pit level, but remains aligned to the lake on an Sp signal. The main RN discharges from the Esssentianl Headers are aligned to both the SNSWP and the RL discharge on a Sp signal therefore aligned to both is plausible.

Answer A Discussion

Correct: 1RN-53B and 1RN-54A close and RN discharge flowpath from the D/Gs aligns to the SNSWP on emergency low pit level, 2/3 ch coincidence

Answer B Discussion

Plausible: 1RN-53B and 1RN-54A close on emergency low pit level. The RN discharge flowpath to the D/Gs will align to the SNSWP but stay aligned to the lake for other signals.

Answer C Discussion

Plausible: Student may believe that valves stay open which is true for Ss and/or Sp signal. The RN discharge flowpath to the D/Gs will align to the SNSWP

Answer D Discussion

Plausible: Student may believe that valves stay open which is true for Ss and/or Sp signal. The RN discharge flowpath to the D/Gs will align to the SNSWP but stay aligned to the lake for other signals.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Devel | loped | Development References | Student References Provided |
|-------|----------|------------------------|-----------------------------|
| | Approved | RN lesson plan | |
| OPS / | Approved | | |
| | Approved | | |

| QuestionBank # KA_system | KA_number | | |
|--------------------------|-----------|---|--|
| 1714 APE062 | AA1.02 | | |
| | | J | |

KA_desc

Ability to operate and / or monitor the following as they apply to the Loss of Nuclear Service Water (SWS): (CFR 41.7 / 45.5 / 45.6) Loads on the SWS in the control room

401-9 Comments:

2008 SRO NRC Retake Examination

QuestionBank #KA_systemKA_number1715APE065AA1.03KA_desc

Ability to operate and / or monitor the following as they apply to the Loss of Instrument Air: (CFR 41.7 / 45.5 / 45.6) Restoration of systems served by instrument air when pressure is regained

Unit 1 is in Mode 3 and Unit 2 is in No Mode. During outage work on Unit 2, the instrument air (VI) supply to Unit 2 is severed and the entire VI header depressurizes. An NLO in the area notes the problem and manually closes the VI supply isolation valve to Unit 2 and the VI header quickly repressurizes. Given the following valves and positions (prior to the loss of VI):

| VA | LVE |
|----|-----|
| | |

POSITION

QUESTION 15

| 1NV-1A (NC Letdn to Regen Hx Isol) | Open |
|--------------------------------------|------------------------|
| 1CA-149 (S/G 1A CF Byp To CA Nozzle) | Open |
| 1NV-153A (Letdn Hx Otlt 3-Way Viv) | "DEMIN" |
| 1RN-291 (1A KC HX Outlet Throttle) | "MINIFLOW" / Throttled |

Which one of the valves will automatically return to the position indicated in the table above after VI pressure is restored?

- A. 1NV-1A
- B. 1CA-149
- C. 1NV-153A
- D. 1RN-291

2008 SRO NRC Retake Examination

QUESTION 15



General Discussion

On loss of VI the valves will fail as indicated below. Once air is restored 1RN-291 will go back to throttled position to control miniflow. The other valves will require operator actions to be returned to their position prior to the loss of VI.

Answer A Discussion

Plausible: 1NV-1A fails closes and will not reopen without operator action. Student may believe the valve will return to its previous position on a short term loss of VI

Answer B Discussion

Plausible: 1CA-149 will fail closed and will not reopen without operator action. Student may believe the valve will return to its previous position on a short term loss of VI

Answer C Discussion

Plausible: 1NV-153A will swap to the VCT position and must be manually returned to the "Demin" position. Student may believe the valve will return to its previous position on a short term loss of VI

Answer D Discussion

Correct: This valve will fail open and will throttle automatically once air is restored.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | AP/22 | |
| OPS Approved | | |
| NRC Approved | | |
| | | |

QuestionBank # KA_systemKA_number1715 APE065AA1.03

KA_desc

Ability to operate and / or monitor the following as they apply to the Loss of Instrument Air: (CFR 41.7 / 45.5 / 45.6) Restoration of systems served by instrument air when pressure is regained

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 16



| EA2.2 |
|-------|
| |

Ability to determine and interpret the following as they apply to the (LOCA Outside Containment) (CFR: 43.5 / 45.13) Adherence to appropriate procedures and operation within the limitations in the facility*s license and amendments.

A loss of coolant accident outside containment has occurred on the residual heat removal system injection header.

The crew is performing Step 3 of EP/1/A/5000/ECA-1.2, LOCA Outside Containment, which states:

"Verify leak path is isolated as follows:"

Which one of the following indications is used by this procedure to identify that the leak has been successfully isolated?

- A. ND Pump discharge pressure increasing
- B. Pressurizer level increasing
- C. ND/NS room sump levels decreasing
- D. Reactor coolant pressure increasing

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination **QUESTION 16**

D

General Discussion

ECA-1.2 looks for the pressure increase as the crews isolate each train of ND. It is the only "symptom" that can be used to verify successful leak isolation.

Answer A Discussion

Plausible: ND disharge pressure would increase but that is not the indication used by ECA-1.2.

Answer B Discussion

Plausible: Pressurizer level increasing is a later issue for SI termination. It is not reasonable to assume that level would already be on scale and is not the indication used by ECA-1.2.

Answer C Discussion

Plausible: This might be true if the leak is contained and the sumps are pumped down but is not the indication used by ECA-1.2

Answer D Discussion

Correct: ECA-1.2 specifically uses NC pressure increasing as the parameter for leak isolation determination

| 2005 NRC Q16 (Bank 420) |
|-------------------------|
| |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | P/1/A/5000/ECA-1.2 | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1716 | WE04 | EA2.2 |
| | | |

KA_desc

Ability to determine and interpret the following as they apply to the (LOCA Outside Containment)

(CFR: 43.5 / 45.13) Adherence to appropriate procedures and operation within the limitations in the facility*s license and amendments.

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1717 | WE05 | EK2.1 |
| | | 1 aux a |

KA_desc

Knowledge of the interrelations between the (Loss of Secondary Heat Sink) and the following: (CFR: 41.7 / 45.7) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

OUESTION 17

Unit 1 was operating at 100% when a total loss of instrument air occurred. Given the following events and conditions:

- When the instrument air header depressurized, a total loss of feedwater occurred
- The operators tripped the reactor and completed EP/1/A/5000/E-0 (Reactor Trip or Safety Injection)
- The operators transitioned to EP/1/A/5000/FR-H.1 (Respond to a Loss of Secondary Heat Sink)
- Step 22 of EP/1/A/5000/FR-H.1 requires opening PZR PORVs

Which one of the following statements describes:

- 1. The motive force to open the PZR PORVs, and
- 2. The correct EOP bases for step 22 of EP/1/A/5000/FR-H.1?
- A. 1. Air pressure comes from dedicated accumulator tanks2. PORVs are required to provide a bleed path
- B. 1. Air pressure comes from dedicated accumulator tanks
 2. PORVs are required to depressurize the NC system to protect the S/G tubes from creep failure
- C. 1. N2 pressure comes from the cold leg accumulators A and B 2. PORVs are required to provide a bleed path
- D. 1. N2 pressure comes from the cold leg accumulators A and B
 2. PORVs are required to depressurize the NC system to protect the S/G tubes from creep failure

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination **QUESTION 17**

General Discussion

With a loss of VI, CLAs A& B are aligned to supply N2 to the PZR PORVs. Per H.1 step 22, two PZR PORVs are opened to establish an NC system bleed path.

Tube failure may become a risk with Hi DP if the S/G is required to be depressurized to introduce a low pressure water source, but this is not the basis for step 22.

Answer A Discussion

Plausible: N2 pressure comes from the CLAs not dedicated air accumulators, although some plants have these. PZR PORVs are required bleed path for heat removal

Answer B Discussion

Plausible: N2 pressure comes from the CLAs not dedicated air accumulators, although some plants have these. Tube failure may become a risk with hi DP if the S/G is required to be depressurized to introduce a low pressure water source, not step 22 basis

Answer C Discussion

Correct: N2 pressure does comes from the CLAs A & B. PZR PORVs are required bleed path for heat removal

Answer D Discussion

Plausible: N2 pressure does comes from the CLAs A & B. Tube failure may become a risk with hi DP if the S/G is required to be depressurized to introduce a low pressure water source, but this is not the basis for step 22.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|-----------------------|-----------------------------|
| RO | Memory | BANK | 2004 NRC Q30 (Bank 1230) |
| | D | evelopment References | Student References Provided |
| OPT Appro | oved V | R-H.1 and basis I | |
| OPS Appro | oved | | |

NRC Approved

| | QuestionBank # | # KA_system KA_number |
|-----------------|----------------|-----------------------|
| 1717 WE05 EK2.1 | 1717 | 17 WE05 EK2.1 |

KA_desc

Knowledge of the interrelations between the (Loss of Secondary Heat Sink) and the following:

(CFR: 41.7 / 45.7) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

401-9 Comments:

QUESTION 18

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number | |
|----------------|-----------|-----------|-------|
| 1718 | WE11 | EA2.1 | |
| | | | 564d= |

KA_desc

Ability to determine and interpret the following as they apply to the (Loss of Emergency Coolant Recirculation) (CFR: 43.5/45.13) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Unit 1 is responding to a LOCA into the Auxiliary Building in EP/1/A/5000/ECA-1.2 (LOCA Outside of Containment). At the transition point from EP/1/A/5000/ECA-1.2, the leak has <u>not</u> been isolated.

Which procedure will EP/1/A/5000/ECA-1.2 direct the crew to enter?

- A. EP/1/A/5000/FR-C.2 (Response to Degraded Core Cooling)
- B. EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant)
- C. EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation)
- D. EP/1/A/5000/ES-1.2 (Post LOCA Cooldown and Depressurization)

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 18

General Discussion

This question does not require the student to memorize procedure transitions. Instead, the student is expected to logically assess conditions (LOCA into the AUX BLD that cannot be isolated and pressure continues to decrease after completion of ECA-1.2) and deduce that the containment sump inventory is still being lost. The only correct procedure would be ECA-1.1 to address this problem. All other procedure transitions do not work.

Answer A Discussion

Plausible: Transition to FR-C.2 is plausible since it is possible that an unisolated LOCA would result in degraded core cooling.

Answer B Discussion

Plausible: Not the correct procedural transition if the NC system pressure continues to decrease (leak path not isolated). This would be the correct procedure if the NC system pressure was stable or increasing.

Answer C Discussion

Correct: Continuing loss of inventory means that there may be insufficient water in containment for recirculation cooling

Answer D Discussion

Plausible: Transition to ES-1.2 not allowed, as the leak is not isolated.

The name of the procedure is appropriate for the situation.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Comprehension | BANK | 2003 NRC Q21 (Bank 221) |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | EP2 lesson | |
| OPT Approved | ECA-1.2 | |
| OPS Approved | ECA-1.1 FR-C.2 | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1718 | WE11 | EA2.1 |
| | ····· | |

KA_desc

Ability to determine and interpret the following as they apply to the (Loss of Emergency Coolant Recirculation) (CFR: 43.5 / 45.13) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

401-9 Comments:
2008 SRO NRC Retake Examination

QUESTION 19



| QuestionBank # | KA_system | KA_number | |
|----------------|-----------|-----------|--|
| 1719 | APE005 | AK2.02 | |
| KA_desc | | | |

Knowledge of the interrelations between the Inoperable / Stuck Control Rod and the following: (CFR 41.7 / 45.7) Breakers, relays, disconnects, and control room switches

Unit 1 is operating at 100% power. Given the following:

- While performing the RCCA movement test, control rod H-8 slipped into the core to 200 steps withdrawn
- All other Bank D control rods are at 216 steps withdrawn as indicated on DRPI and step demand counters
- The crew is in AP/1/A/5500/014 (Control Rod Misalignment) and currently referring to OP/1/A/6150/008 (Rod Control).
- 1. What is the <u>maximum</u> time allowed to restore rod H-8 to within limits per Technical Specification 3.1.4 (Rod Group Alignment Limits)?
- 2. During rod retrieval per OP/1/A/6150/008 (Rod Control), for which rod(s) will the crew utilize the lift coil disconnect switch(es)?
- A. 1. 30 minutes
 - 2. Rod H-8
- B. 1. 30 minutes2. All rods in the affected bank <u>except</u> H-8
- C. 1. 1 hour
 - 2. Rod H-8
- D. 1. 1 hour2. All rods in the affected bank except H-8

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 19



General Discussion

The unaffected rods will have their lift coils disconnected per OP/1/A/6150/008, enclosure 4.6, step 2.11. Per TS 3.1.4, one hour is allowed to realign to within group limits. 30 minutes is the AFD spec which is often utilized with misaligned rods.

Answer A Discussion

Plausible: AFD TS 3.2.3 action is 30 minutes. The student may be confused as whether all rods except H-8 or only rod H-8 needs to be disconnected

Answer B Discussion

Plausible: AFD TS 3.2.3 action is 30 minutes. The unaffected rods will have their lift coils disconnected.

Answer C Discussion

Plausible: TS 3.1.4 action time is correct. The student may be confused as whether all rods except H-8 or only rod H-8 needs to be disconnected

Answer D Discussion

Correct: TS 3.1.4 action time is correct. The unaffected rods will have their lift coils disconnected.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| ✓ Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | AP/14 | |
| OPT Approved | OP/1/A/6150/008 | |
| | TS 3.1.4 | |
| | TS 3.2.3 | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1719 APE005 AK2.02

KA_desc

Knowledge of the interrelations between the Inoperable / Stuck Control Rod and the following: (CFR 41.7 / 45.7) Breakers, relays, disconnects, and control room switches

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 20



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1720 | APE033 | 2.1.19 |
| KA_desc | | |

APE033 GENERIC Ability to use plant computers to evaluate system or component status. (CFR: 41.10 / 45.12)

Unit 1 was conducting a plant startup preparing to swap main feed nozzles. Given the following:

- The control board meter for N-35 has failed and is being replaced
- OAC point C1A0766 (N-35 Intermediate Range Level) is reading 3.1 X 10⁻⁵ amps
- Other Intermediate Range and Power Range NI channel indications are:
 N-36 = 2.7 x 10⁻⁶ amps
 - N-41 = 11.2%
 - N-42 = 11.2%
 - N-43 = 11.3%
 - N-44 = 10.8%
- Thermal Power Best Estimate = 11.1%
- The C-1 interlock has not been manually blocked
- 1. Which intermediate range instrument is reading incorrectly?
- 2. Assuming no operator actions are taken to block C-1 or address the incorrectly reading I/R channel, alarm 1AD-02, C/3 (I/R Hi Flux Level Rod Stop) will occur ________ it would have if both I/R NIs were operating correctly.
- A. 1. N-35 is reading too high for existing conditions2. sooner than
- B. 1. N-35 is reading too high for existing conditions2. at the same time
- C. 1. N-36 is reading too low for existing conditions2. later than
- D. 1. N-36 is reading too low for existing conditions2. at the same time

2008 SRO NRC Retake Examination

D

General Discussion

N-36 is reading low and N-35 is reading correctly based on power range indications. Only the meter for N-35 is failed, the OAC indication is correct.

The C-1 interlock is 1/2 logic at 20% amps equivalent. Since N-35 is reading correctly and is higher than N-36 the alarm will come in at the proper time based on the N-35 indication

Answer A Discussion

Plausible: Student may believe N-35 is failed and is reading incorrectly, only the N-35 meter is failed. If the student believes N-35 is reading high, the second part would be correct also.

Answer B Discussion

Plausible: Student may believe N-35 is failed and is reading incorrectly, only the N-35 meter is failed. If it was reading higher and the logic was 2/2, then the second part would be correct also.

Answer C Discussion

Plausible: N-36 is reading too low. If it was reading lower and the logic was 2/2, then the second part would be correct also.

Answer D Discussion

Correct: N-36 is reading too low. Since C-1 is not blocked, the alarm will occur at the same time it would have if all instrumentation was indicating correctly

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|--------------------------|
| RO | Comprehension | MODIFIED | 2004 NRC Q78 (Bank 1278) |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | ENB | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1720 APE033 2.1.19

KA_desc

APE033 GENERIC Ability to use plant computers to evaluate system or component status. (CFR: 41.10 / 45.12)

401-9 Comments:

401-9 Comments RESPONSE

QUESTION 20

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1721 | APE037 | AK1.01 |
| KA_desc | | |

Knowledge of the operational implications of the following concepts as they apply to Steam Generator Tube Leak: CFR 41.8 / 41.10 / 45.3) Use of steam tables

OUESTION 21

Unit 1 was operating at 50% power when a steam generator tube leak occurred on 1A S/G and was isolated per AP/1/A/5500/010 (Reactor Coolant Leak), Case I (Steam Generator Tube Leak).

Assuming uniform conditions in 1A S/G, at what <u>minimum</u> bulk fluid temperature in S/G 1A would an unmonitored offsite release occur?

Reference provided

- A. 557.0 °F
- B. 560.7 °F
- C. 566.1 °F
- D. 567.7 °F

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 21



General Discussion

1A S/G is isolated per AP/1/A/5500/010, Case I. The S/G PORV is verified closed, but not isolated. An unmonitored release would occur if the 1A S/G PORV should lift. The S/G PORV lift setpoint is 1125 psig. Using steam tables, the saturation temperature for 1140 psia = 560.712 degrees

Answer A Discussion

Plausible: 557 is the temperatrue steam dumps control at. This would be correct except 1A S/G is isolated and this would be a monitored release (air ejectors thru Unit Vent.)

Answer B Discussion

Correct:Tsat for 1125 psig (1140 psia) = 560.712 degrees F

Answer C Discussion

Plausible: If the student believes the S/G PORV is isolated. This is saturation temperature for the first safety relief, 1175 psig (1190 psia). Tsat for 1190 psia = 566.116 degrees F

Answer D Discussion

Plausible: If the student believes the S/G PORV is isolated and confuses the first and second safety lift setpoints. This is saturation temperature for the second safety relief, 1190 psig (1205 psia) Tsat for 1205 psia = 567.709 degrees F

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| ✓ Deve | eloped | Development References | Student References Provided |
|----------|----------|------------------------|-----------------------------|
| <u> </u> | | Steam tables | Steam Tables |
| 🖌 ОРТ | Approved | SM lesson | |
| OPS | Approved | AP/10 | |
| NRC | Approved | | |

| 1721 APE037 AK1.01 | |
|--------------------|--|

KA_desc

Knowledge of the operational implications of the following concepts as they apply to Steam Generator Tube Leak: CFR 41.8 / 41.10 / 45.3) Use of steam tables

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1722 | APE067 | AK1.01 |
| | 1 | adamaan |

KA_desc

Knowledge of the operational implications of the following concepts as they apply to Plant Fire on Site: (CFR 41.8 / 41.10 / 45.3) Fire classifications, by type

QUESTION 22

A trash bin near the Spent Fuel Pool truck bay doors caught fire and smoke was drawn into the Spent Fuel Pool Ventilation (VF) system supply ductwork.

- 1. What affect will this condition have on the operation of the VF system?
- 2. How is this fire classified?
- A. 1. The VF Supply fan will trip only
 - 2. Class A Fire
- B. 1. The VF Supply fan will trip only2. Class B Fire
- C. 1. The VF Supply fan and the VF Filtered Exhaust fans will swap to filter mode2. Class A Fire
- D. 1. The VF Supply fan and the VF Filtered Exhaust fans will swap to filter mode2. Class B Fire

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 22



General Discussion

Per discussion with Frank on 8/12/09 this means A,B,C,D fire types. He suggested making a question of what type of fire and how is it extinguished.

The VF supply fans will trip and an alarm will sound in the control room, but the exhaust fans will continue to run unless manually secured by the operating crew.

Answer A Discussion

Correct: Only the VF supply fan will trip. Trash bin would contain ordinary combustibles (wood, paper, etc.) and would be classified as Class A

Answer B Discussion

Plausible: Only VF supply fan would trip. Student may believe ordinary combustibles are included in Class B fire

Answer C Discussion

Plausible: Student may believe VF fans supply fan will trip and align to filter mode on fire protection. Class A fire is correct

Answer D Discussion

Plausible: Student may believe VF fans supply fan will trip and align to filter mode on fire protection. Student may believe ordinary combustibles are included in Class B fire

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | VF | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

| 1700 4 0 0 4 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 | - |
|--|---|
| | |
| 1/22 APEU0/ AKI.UI | |

KA_desc

Knowledge of the operational implications of the following concepts as they apply to Plant Fire on Site: (CFR 41.8 / 41.10 / 45.3) Fire classifications, by type

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 23



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1723 | WE03 | EK2.2 |

KA_desc

Knowledge of the interrelations between the (LOCA Cooldown and Depressurization) and the following:

(CFR: 41.7 / 45.7) Facility*s heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Unit 2 is responding to a small break LOCA in EP/2/A/5000/ES-1.2, (Post LOCA Cooldown and Depressurization). Step 16 requires the operators to depressurize the NC system.

Which one of the following statements describes the priority and reasons for using the prescribed methods of depressurizing the NC system?

- A. 1. Auxiliary spray preferred method does not degrade containment
 - 2. PORV alternate method faster depressurization than normal spray
 - 3. Pressurizer spray alternative method will not work if NC pump is not running
- B. 1. Pressurizer spray preferred method to be used if NC pump is running
 - 2. PORV alternate method better than auxiliary spray
 - 3. Auxiliary Spray method of last resort too slow and may thermal shock the spray nozzles and degrade regenerative heat exchanger
- C. 1. PORV preferred method rapid depressurization rate
 - 2. Pressurizer spray alternative method next most rapid depressurization rate
 - 3. Auxiliary spray method of last resort too slow and may thermal shock the spray nozzles
- D. 1. Auxiliary spray preferred method does not degrade containment
 - 2. Pressurizer spray alternative method will not work if NC pump is not running
 - 3. PORV method of last resort will rupture PRT and degrade containment environment

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 23

General Discussion

Step 16 of ES-1.2 uses normal pressurizer spray, if available. If spray is unavailable, a PZR PORV is used. If no PORVs are available, then NV aux spray is used.

Answer A Discussion

Plausible: Student may believe aux spray is preferred to PZR PORV due to possible reseating problems and pressurizer spray is too slow. PZR PORV is the alternative method

Answer B Discussion

Correct: Per ES-1.2 step 16

Answer C Discussion

Plausible: Student may believe PZR PORV preferred for rapid pressure reduction. Pressurizer spray preferred over aux spray

Answer D Discussion

Plausible: Student may believe aux spray is preferred to pressurizer spray because of a more rapid depressurization and pressurizer spray preferred over PORV due to possible reseating problems

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Memory | BANK | 2003 NRC Q28 (Bank 228) |

| Developed | Development References | Student References Provided |
|--------------|--|-----------------------------|
| OPT Approved | ES1.2 and ERG Background Document ES-1.2 step 14 page 17 | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1723 | WE03 | EK2.2 |
| KA dosc | | |

KA_desc

Knowledge of the interrelations between the (LOCA Cooldown and

Depressurization) and the following:

(CFR: 41.7 / 45.7) Facility*s heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|-----------------------------|---|---------------|
| 1724 | WE08 | EK3.1 |
| 16 Tor IV . VMIRA TRABATION | 1.000 000000000000000000000000000000000 | 20140 XM 200. |

A

KA_desc

Knowledge of the reasons for the following responses as they apply to the (Pressurized Thermal Shock) (CFR: 41.5/41.10, 45.6, 45.13) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

QUESTION 24

A large steam line break occurred on Unit 1 and due to a failure of all MSIVs to close, the crew entered EP/1/A/5000/FR-P.1 (Response to Imminent Pressurized Thermal Shock).

Which part of the reactor vessel is most susceptible to failure for this accident sequence and what is the reason that it is most susceptible?

- A. Inner reactor vessel wall; because the temperature gradient across the reactor vessel wall and the pressure stress is additive and highest at the inner wall during the cooldown
- B. Inner reactor vessel wall; because the temperature gradient across the reactor vessel wall and the pressure stress is additive and highest at the inner wall during a subsequent heatup after the S/Gs fully depressurize
- C. Outer reactor vessel wall; because the temperature gradient across the reactor vessel wall and the pressure stress is additive and highest at the outer wall during the cooldown
- D. Outer reactor vessel wall; because the temperature gradient across the reactor vessel wall and the pressure stress is additive and highest at the outer wall during a subsequent heatup after the S/Gs fully depressurize

2008 SRO NRC Retake Examination

QUESTION 24



General Discussion

Stress Profiles

Heatup

- a) Pressure stress is higher on inner wall than outer wall.
- b) Thermal gradient during heatup causes tensile stress on outer wall (cooler), compressive stress on inner wall.
- C) The compressive stress on the inner wall effectively cancels portion of the pressure stress. Causes a lower total tensile stress on the inner wall. Vessel inner wall is further from allowable stress values.

2) Cooldown

a) Pressure stress profile is the same as for heatup.

b) Thermal gradient during cooldown causes tensile stress on inner wall, compressive stress on outer wall.

C) The tensile stress on the inner wall due to Delta T reinforces the tensile stress due to pressure. This causes higher total tensile stress on inner wall. The Vessel is closer to allowable stress values.

3. Since total stress is higher on the vessel inner wall on cooldown than heatup, cooldown is more limiting

Summary: Stresses are highest at the inner wall during the cooldown due to the pressure stress being additive to the temperature gradient stress.

Answer A Discussion

Correct: Per discussion above

Answer B Discussion

Plausible: Student may be confused on heatup and cooldown. The inner vessel wall is correct but during cooldown, not subsequent heatup

Answer C Discussion

Plausible: Student may be confused on vessel inner wall or outer wall. Correct reasons, outer vessel wall is incorrect

Answer D Discussion

Plausible: Student may be confused on which vessel wall and whether during cooldown or subsequent heatup

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | PTS | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1724 WE08 EK3.1

KA_desc

Knowledge of the reasons for the following responses as they apply to the (Pressurized Thermal Shock) (CFR: 41.5/41.10, 45.6, 45.13) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|--------------------------|-----------|-----------|
| 1725 | WE13 | EK3.1 |
| CONTRACTOR OF CONTRACTOR | | |

KA_desc

Knowledge of the reasons for the following responses as they apply to the (Steam Generator Overpressure) (CFR: 41.5 / 41.10, 45.6, 45.13) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

OUESTION 25

Given the following:

- 1A S/G pressure is 1212 psig and increasing
- The crew has implemented EP/1/A/5000/FR-H.4 (Response to Loss of Normal Steam Release Capabilities)
- 1A S/G level is approximately 18% N/R level
- Operators have been dispatched to manually operate the 1A S/G PORV
- 1. How will 1A S/G indicated level initially respond when the PORV is opened?
- 2. What is the reason for this response?
- A. 1. Indicated level will initially decrease
 - 2. Increased voiding in the S/G downcomer region will cause a "shrink" phenomenon
- B. 1. Indicated level will initially increase
 - 2. Increased voiding in the S/G downcomer region will cause a "swell" phenomenon
- C. 1. Indicated level will initially decrease
 - 2. Increased voiding in the S/G tube bundle area will cause a "shrink" phenomenon
- D. 1. Indicated level will initially increase
 - 2. Increased voiding in the S/G tube bundle area will cause a "swell" phenomenon

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 25



General Discussion

During normal power operation, steam voids are formed in the tube bundle region of the Steam Generator. The amount of voiding present is dependent on steam pressure, power level, and feedwater temperature. As these voids form or collapse, water is displaced into or out of the downcomer region where level is sensed.

SHRINK occurs when a transient occurs that results in a DECREASE in steam voiding. This appears as a rapid DECREASE in N/R S/G level. SWELL occurs when any transient occurs that results in an INCREASE in steam voiding. It appears as a rapid INCREASE in indicated N/R S/G level.

At 1175 psig FR-H.4 is entered. When the S/G PORV is opened the indicated S/G level will swell due to increased voiding in the tube bundle region.

Answer A Discussion

Plausible: The student may be confused on shrink and swell as well as the tube bundle area and the downcomer region

Answer B Discussion

Plausible: Swell will occur but not due to increased voiding in the downcomer region

Answer C Discussion

Plausible: Although voiding in the tube bundle region will increase, this will not result in swell, not shrink

Answer D Discussion

Correct: When the S/G PORV is opened the indicated S/G level will swell due to increased voiding in the tube bundle region and water is displacement into the downcomer region.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | IFE | |
| OPT Approved | FR-H.4 | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_s | ystem | KA_number | , |
|----------------|------|-------|-----------|---|
| 1725 | WE13 | | EK3.1 | |
| | | | | |

KA_desc

Knowledge of the reasons for the following responses as they apply to the (Steam Generator Overpressure) (CFR: 41.5 / 41.10, 45.6, 45.13) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 26



| QuestionBank # | KA_system | KA_number |
|----------------|---|-----------|
| 1726 | WE14 | EA2.1 |
| KA dosc | AND | |

Ability to determine and interpret the following as they apply to the (High Containment Pressure) (CFR: 43.5 / 45.13) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Which one of the following specifies the <u>minimum</u> condition(s) that would <u>require</u> a RED path entry into EP/1/A/5000/FR-Z.1 (Response to High Containment Pressure)?

- A. 3 psig containment pressure alone
- B. 15 psig containment pressure alone
- C. 3 psig containment pressure combined with no NS trains indicating flow
- D. 15 psig containment pressure combined with no NS trains indicating flow

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination OUESTION 26



General Discussion

15 psig red path is entered regardless of NS status

Answer A Discussion

Plausible: NS initiation setpoint for high containment pressure. Student may believe high containment pressure requires entering FR-Z.1 due to procedure title

Answer B Discussion

Correct: 15 psig is the entry requirement for FR-Z.1

Answer C Discussion

Plausible: NS initiation setpoint for high containment pressure. Student may believe high containment pressure without NS in service requires entering FR-Z.1 due to procedure title and no containment spray available

Answer D Discussion

Plausible: 15 psig is the entry requirement, this is independent of NS status. Student may believe NS being unavailable is part of entry conditions for FR-Z.1

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| 🔽 De | eveloped | Development References | Student References Provided |
|------|-------------|------------------------|-----------------------------|
| 121 | | F-0 | |
| V OF | PT Approved | | |
| OF | PS Approved | | |
| NF | RC Approved | | |
| □ NF | RC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1726 | WE14 | EA2.1 |
| | | |

KA_desc

Ability to determine and interpret the following as they apply to the (High Containment Pressure) (CFR: 43.5 / 45.13) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

401-9 Comments:

2008 SRO NRC Retake Examination

QuestionBank # KA_system KA_number

QUESTION 27



KA_desc

Ability to operate and / or monitor the following as they apply to the (Containment Flooding) (CFR: 41.7 / 45.5 / 45.6) Operating behavior characteristics of the facility.

A large break LOCA has occurred on Unit 1. The S/G sample valves must to be opened to verify a S/G tube leak does <u>not</u> exist.

Which of the following does <u>not</u> need to be RESET to allow the S/G sample valves to be opened?

- A. Phase A
- B. Phase B
- C. KC NC NI NM St
- D. CA SYS VLV CTRL

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 27



General Discussion

The KC,NC,NI,NM St RESETs are specifically designed to prevent spurious valve repositioning due to containment flooding. The steam generator sample valves have a separate reset. A separate reset is required because a containment Phase A signal disables the open circuits for these valves to prevent them from spuriously repositioning due to containment flooding. Phase B is not required, but the student may think this is a Phase B signal to close the NM valves.

To allow these valves to be operated, Phase A, CA SYS VLV CTRL, and KC,NC,NI,NM St signals must be reset

Answer A Discussion

Plausible: Phase A signals ARE required to be reset

Answer B Discussion

Correct: Phase B is NOT required to be reset

Answer C Discussion

Plausible: KC,NC,NI,NM St signals ARE required be reset

Answer D Discussion

Plausible: CA SYS VLV CTRL IS required to be reset

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| ~ | Developed | Development References | Student References Provided |
|----------|--------------|------------------------|-----------------------------|
| | | E-1 | |
| | | | |
| | UPS Approved | | |
| | NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1727 | WE15 | EA1.2 |

KA_desc

Ability to operate and / or monitor the following as they apply to the (Containment Flooding) (CFR: 41.7 / 45.5 / 45.6) Operating behavior characteristics of the facility.

401-9 Comments:

2008 SRO NRC Retake Examination

A

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1728 | SYS003 | K4.04 |
| | |) |

KA_desc

Knowledge of RCPS design feature(s) and/or interlock(s) which provide for the following : (CFR: 41.7) Adequate cooling of RCP motor and seals _______

QUESTION 28

What of the following states the system that provides cooling water to the reactor coolant pump motor bearings and a signal that will isolate that cooling water from the pump?

- A. KC provides cooling water and isolates on a Phase B signal
- B. KC provides cooling water and isolates on a Safety Injection signal
- C. YV provides cooling water and isolates on a Phase B signal
- D. YV provides cooling water and isolates on a Safety Injection signal

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination **QUESTION 28**



General Discussion

KC provides the cooling to the motor bearings but YV provides cooling to the NCP motor stator. Phase B acuation on Hi-Hi containment pressure (3psig) isolates KC to NCP supply and return valves

Answer A Discussion

Correct: KC provides the cooling to the motor bearings and Phase B acuation on Hi-Hi containment pressure (3psig) isolates KC to NCP supply and return valves

Answer B Discussion

Plausible: KC does provide cooling. Some containment components KC cooling are isolated on a Phase A signal (NCDT and excess letdown) **Answer C Discussion**

Plausible: YV does not supply the NCP motor bearings, but does isolate on a Phase B signal

Answer D Discussion

Plausible: YV provides cooling to the NCP motor stator. Student may believe cooling is isolated on an SI signal

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| | Development References | Student References Provided |
|----------------|------------------------|-----------------------------|
| | NCP lesson | |
| OPS Approved | | |
| □ NRC Approved | | |

QuestionBank # KA_system KA_number

1728 SYS003 K4.04

KA_desc

Knowledge of RCPS design feature(s) and/or interlock(s) which provide for the following : (CFR: 41.7) Adequate cooling of RCP motor and seals

401-9 Comments:

QUESTION 29

2008 SRO NRC Retake Examination

 QuestionBank #
 KA_system
 KA_number

 1729
 SYS004
 A4.08

KA_desc

Ability to manually operate and/or monitor in the control room: (CFR: 41/7/45.5 to 45.8) Charging

Unit 2 was operating at 100%. Given the following:

- 2AD-7, C/4 "NCP Seal Water Lo Flow" is LIT
- 2AD-7, E/1 "Charging Line Hi/Lo Flow" is LIT
- 2AD-7, E/2 "Regen Hx Letdn Hi Temp" is LIT
- Charging flow meter indicates 0 gpm

Which single failure would cause all the symptoms noted above?

- A. NC loop A cold leg temperature has failed low
- B. Charging flow input signal to 2NV-294 has failed high
- C. The pressurizer level master has failed low
- D. The pressurizer level master has failed high



FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination OUESTION 29



General Discussion

Charging Flow failing high will cause 2NV-294 to "see" that 1) it meets the minimum required flow (47 gpm) and 2) charging flow is greater than required by the PZR Level Master. End result of this will be 2NV-294 will be fully closed in AUTO. This will result in the given symptoms.

Answer A Discussion

Plausible: The student may have a misconception concerning input to Pzr reference level. Toold failing low and subsequent decrease in charging due to decrease in reference level

Answer B Discussion

Correct: Charging flow input failing high with 2NV-294 in "auto" will result in the given symptoms

Answer C Discussion

Plausible: The pzr level master failing low would result in low charging flow (47 gpm) and high letdown temperature alarms

Answer D Discussion

Plausible: The pzr level master failing high would result in maximum charging output, possible misconception concerning the effects of the level master failure high or low

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Comprehension | MODIFIED | 2007 NRC Q31 (Bank 831) |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | AD-7 ILE | |
| OPS Approved | NV | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

| | | _ |
|------|--------|-------|
| 1729 | SYS004 | A4.08 |

KA_desc

Ability to manually operate and/or monitor in the control room: (CFR: 41/7 / 45.5 to 45.8) Charging

401-9 Comments:

401-9 Comments RESPONSE DCS DCS DCS

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number | |
|----------------|-----------|-----------|---|
| 1730 | SYS005 | A4.05 | |
| | | | - |

QUESTION 30



| KA_desc |
|---|
| Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) Position of RWST recirculation valve (locked |
| when not in use, continuously monitored when in use) |

Unit 1 is at 100% power.

For current conditions, what is the normal position of 1ND-33 (ND Sys Rtn To FWST) and how is this position administratively controlled?

- A. Closed; white tagged in position
- B. Closed; locked in position
- C. Open; white tagged in position
- D. Open; locked in position

2008 SRO NRC Retake Examination

QUESTION 30



General Discussion

Originally asked to be replaced because this is a manual valve. Frank said that pump miniflow could be considered as recirc to meet this K/A and to re-evaluate. Later stated that we should try to meet it with ND33.

This value is normally closed and locked in position (refer to PT/0/B/4700/30).

Answer A Discussion

Plausible: Correct position. White tags are commonly used for configuration control in some plant modes

Answer B Discussion

Correct: This valve is normally closed and locked in position (refer to PT/0/B/4700/30).

Answer C Discussion

Plausible: Student may believe this is normal recirc flowpath and this valve is open at times during shutdown ops. White tags are commonly used for configuration control in some plant

Answer D Discussion

Plausible: Student may believe this is normal recirc flowpath and this valve is open at times during shutdown ops. Locked is correct

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|--|-----------------------------|
| OPT Approved | ND OP (Page 70 of pdf) PT/0/B/4700/40 | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

| 1730 | SYS005 | A4.05 |
|------|--------|-------|

KA_desc

Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) Position of RWST recirculation valve (locked when not in use, continuously monitored when in use).

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 31



| QuestionBank | # KA_system | KA_number |
|------------------|------------------|-----------------------------|
| 1731 | SYS005 | K1.13 |
| KA_desc | | |
| Knowledge of the | physical connect | tions and/or cause-effect r |

Knowledge of the physical connections and/or cause-effect relationships between the RHRS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) SIS

Unit 1 was operating at 100% power when a large break LOCA occurred. Given the following:

- FWST level is 35%
- All automatic actions have occurred
- No operator actions have occurred
- 1. Which ECCS pump(s) are taking suction from the containment sump?
- 2. Which NC cold legs are the ND pumps currently injecting into?
- A. 1. ND pumps only
 - 2. B and C NC cold legs
- B. 1. ND pumps only2. All 4 cold legs
- C. 1. NV pumps, NI pumps, ND pumps 2. B and C NC cold legs
- D. 1. NV pumps, NI pumps, ND pumps2. All 4 cold legs

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 31



General Discussion

On the auto swap, only the ND pump suction aligns to the containment sump from the FWST. The NI and NV pumps remain on the FWST and additional operator action is required to swap them to the cont sump (via the ND pump discharge). ND injects to all four cold legs on CLR, however during HLR, ND only injects into B and C hot legs.

Answer A Discussion

Plausible: ND pumps are correct with auto actions complete and no operator action. B and hot legs are used for ND hot leg recirc

Answer B Discussion

Correct: ND pumps are correct with auto actions complete and no operator action and will be injecting into all 4 cold legs

Answer C Discussion

Plausible: This would be correct if operator actions had occurred (NV and NI indirectly from the ND pumps). B and hot legs are used for ND hot leg recirc

Answer D Discussion

Plausible: This would be correct if operator actions had occurred (NV and NI indirectly from the ND pumps). All pumps will be injecting into to all 4 cold legs

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| ✓ Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | NI lesson | |
| OPT Approved | E-0 | |
| OPS Approved | ES-1.3 | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1731 SYS005 K1.13

KA_desc

Knowledge of the physical connections and/or cause-effect relationships between the RHRS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) SIS

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 32



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1732 | SYS006 | A1.07 |

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: (CFR: 41.5 / 45.5) Pressure, high and low

Unit 1 has experienced a steam line break accident. Given the following conditions and sequence of events:

- The operating crew has completed EP/1/A/5000/E-2 (Faulted Steam Generator Isolation)
- NC pressure initially decreases to 1400 psig
- Safety injection termination criteria has been met and the crew is preparing to transition to EP/1/A/5000/ES-1.1 (Safety Injection Termination)
- NC pressure is 2200 psig and increasing

Per Enclosure 1 of EP/1/A/5000/E-2, at what NC pressure will 1NV-202B and 1NV-203A (NV Pumps A&B Recirc Isol) be closed as NC pressure initially decreases and at what NC pressure will they be reopened as NC pressure subsequently increases to provide protection to the NV pumps?

- A. Closed at <1500 psig decreasing and re-opened at >2000 psig increasing
- B. Closed at <1500 psig decreasing and re-opened at >1955 psig increasing
- C. Closed at <1620 psig decreasing and re-opened at >2000 psig increasing
- D. Closed at <1620 psig decreasing and re-opened at >1955 psig increasing

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General Discussion

Per enclosure 1 the valves are closed if NC pressure is <1500 psig and NV SI flowpath is aligned and are reopened at NC pressure > 2000 psig .

Answer A Discussion

Correct: Per E-2, enclosure 1, the recirc values are closed if NC pressure is <1500 psig and NV SI flowpath is aligned and are reopened at NC pressure > 2000 psig.

Answer B Discussion

Plausible: Valves are closed if NC pressure is <1500 psig and NV SI flowpath is aligned. 1955 psig is the setpoint for permissive P-11 and is close to the required >2000 psig

Answer C Discussion

Plausible: 1620 psig is procedurally (~100 psig conservatism) the shutoff head for the NI pumps and is close to the required <1500 psig. Reopening at >2000 psig is correct

Answer D Discussion

Plausible: 1620 psig is procedurally (~100 psig conservatism) the shutoff head for the NI pumps and is close to the required <1500 psig. 1955 psig is the setpoint for permissive P-11 and is close to the required >2000 psig

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | E-2 | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1732 SYS006 A1.07

KA_desc

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: (CFR: 41.5 / 45.5) Pressure, high and low

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number | |
|----------------|------------|-----------|--|
| 1733 | SYS006 | K5.06 | |
| KA_desc | - HE CHING | | |

Knowledge of the operational implications of the following concepts as they apply to ECCS: (CFR: 41.5 / 45.7) Relationship between ECCS flow and RCS pressure

QUESTION 33

Unit 2 was operating at 100% power when a LOCA occurred at Time 0. Given the NC System pressure trend shown below:



Which of the following describes when each of the ECCS pumps listed <u>begins</u> to inject flow into the NC system?

| | <u>NI Pumps</u> | ND Pumps |
|----|-------------------------|--------------------------|
| A. | Between 0 and 1 minute | Between 8 and 9 minutes |
| B. | Between 1 and 2 minutes | Between 8 and 9 minutes |
| C. | Between 0 and 1 minute | Between 9 and 10 minutes |
| D. | Between 1 and 2 minutes | Between 9 and 10 minutes |

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 33

General Discussion

NI shutoff head is 1536, ND shutoff head is 195.

MODIFIED PER FRANK E. COMMENTS 9/14/09

Answer A Discussion

Plausible: Student may believe shutoff head of NI and ND are higher or misinterpret the graph

Answer B Discussion

Plausible: NI will begin injecting at ~ 1.5 minutes. Student may believe shutoff head of ND is higher or misinterpret the graph

Answer C Discussion

Plausible: Student may believe shutoff head of NI is higher or misinterpret the graph. ND will begin to inject at ~ 9.7 minutes

Answer D Discussion

Correct: NI will begin injecting at ~ 1.5 minutes and ND will begin to inject at ~ 9.7 minutes

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | ND | |
| OP1 Approved | NI | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1733 SYS006 K5.06

KA_desc

Knowledge of the operational implications of the following concepts as they apply to ECCS: (CFR: 41.5 / 45.7) Relationship between ECCS flow and RCS pressure

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 34



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1734 | SYS007 | K5.02 |
| | J a | |

KA_desc

Knowledge of the operational implications of the following concepts as they apply to PRTS: (CFR: 41.5 / 45.7) Method of forming a steam bubble in the PZR

Unit 1 has completed NC fill and vent activities following a forced outage. Given the following:

- A nitrogen blanket was placed on the pressurizer during the outage
- NC level is 85% in preparation for drawing a bubble in the pressurizer
- 1. What is the limit on pressurizer heat up rate per Selected Licensee Commitment 16.5-4 (Pressurizer)?
- 2. What indication verifies nitrogen venting is complete while drawing a bubble in the pressurizer?
- A. 1. 100°F per hour
 - 2. PRT temperature equalizes with Pzr steam space temperature
- B. 1. 100°F per hour
 - 2. PRT level increases without a corresponding PRT pressure increase
- C. 1. 200°F per hour2. PRT temperature equalizes with Pzr steam space temperature
- D. 1. 200°F per hour
 - 2. PRT level increases without a corresponding PRT pressure increase

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 34



General Discussion

PZR heatup rate per SLC 16.5-4 is 100 degrees F/hour. PRT pressure and level indications are used to determine when all N2 has been vented from the pressurizer during bubble formation. N2 venting is considered complete when PRT pressure does not increase with a corresponding PRT level increase

Answer A Discussion

Plausible: 100 F/hr is correct Pzr heatup rate. PRT temperature equal to Pzr steam space temperature may be logical to the student based on steaming the PZR to the PRT

Answer B Discussion

Correct: PZR heatup rate per SLC 16.5-4 is 100 degrees F/hour. N2 venting is considered complete when PRT pressure does not increase with a corresponding PRT level increase

Answer C Discussion

Plausible: 200 F/hr is the Pzr cooldown rate per SLC 16.5-4. PRT temperature equal to Pzr steam space temperature may be logical to the student based on steaming the PZR to the PRT

Answer D Discussion

Plausible: 200 F/hr is the Pzr cooldown rate per SLC 16.5-4. N2 venting is considered complete when PRT pressure does not increase with a corresponding PRT level increase

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| | Development References | Student References Provided |
|----------------|--|-----------------------------|
| ✓ OPT Approved | OP/1/A/6100/001, enclosure 4.1. NOTE prior to step | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1734 SYS007 K5.02

KA_desc

Knowledge of the operational implications of the following concepts as they apply to PRTS: (CFR: 41.5 / 45.7) Method of forming a steam bubble in the PZR

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|---------------------|---------------------------------------|
| 1735 | SYS008 | A1.03 |
| KA desc | dorena - Grandan In | · · · · · · · · · · · · · · · · · · · |

Ability to predict and/or monitor changes in parameters to prevent exceeding design limits) associated with operating the CCWS controls including : (CFR: 41.5 / 45.5) CCW pressure

QUESTION 35

Unit 1 is in Mode 3. Given the following:

- 1AD-6, E/1 (NCP A Thermal Barrier KC Outlet Hi/Lo Flow) is LIT
- The flow trend below:



- 1. At what time on the above graph should 1KC-394A (NC Pump 1A Therm Bar Otlt) have automatically closed?
- 2. If the NCP 1A thermal barrier can <u>not</u> be isolated from the KC System by any means, how is over pressurization of the KC surge tanks prevented?
 - A. 1. 100 seconds
 - 2. The KC surge tanks vent line is large enough to prevent over pressurization
 - B. 1. 130 seconds
 - 2. The KC surge tanks vent line is large enough to prevent over pressurization
 - C. 1. 100 seconds
 - 2. The KC surge tanks relief valve to the KC drain sump is large enough to prevent over pressurization
 - D. 1. 130 seconds
 - 2. The KC surge tanks relief valve to the KC drain sump is large enough to prevent over pressurization

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General Discussion

Thermal barrier tube rupture Thermal barrier KC outlet valve will auto close at >/= 60 gpm for 30 seconds (time delay) Overpressurization of surge tanks is prevented by vent piping design size Correct flow and time delay required

Relief valves are typically used to prevent tank overpressurization

Answer A Discussion

Plausible: The correct flow has been reached but not for 30 seconds. Overpressurization of surge tanks is prevented by vent piping design size is correct

Answer B Discussion

Correct: Thermal barrier KC outlet valve will auto close at >/= 60 gpm for 30 seconds (time delay). Overpressurization of surge tanks is prevented by vent piping design size

Answer C Discussion

Plausible: The correct flow has been reached but not for 30 seconds. Relief values are typically used to prevent tank overpressurization, this not true for the KC surge tank

Answer D Discussion

Plausible: Thermal barrier KC outlet valve will auto close at >/= 60 gpm for 30 seconds (time delay). Relief valves are typically used to prevent tank overpressurization, this not true for the KC surge tank

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------------|-----------------------------|
| OPT Approved | KC lesson plan and 1AD-6 ARP | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # KA_ | system KA_r | number |
|--------------------|-------------|--------|
| 1735 SYS | 008 A1.03 | |

KA_desc

Ability to predict and/or monitor changes in parameters to prevent exceeding design limits) associated with operating the CCWS controls including : (CFR: 41.5 / 45.5) CCW pressure

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 36



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1736 | SYS010 | K6.01 |

KA_desc

Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: (CFR: 41.7/45.7) Pressure detection systems

Unit 2 was operating at 100%. Given the following:

- Pressurizer pressure select switch is in the 3-2 position
- Channel 3 pressurizer pressure fails low
- Pressurizer heaters energize

Assuming no operator action, what is the response of the pressurizer pressure control system as pressure increases?

- A. No pressurizer PORVs will open and the reactor will trip on pressurizer high pressure
- B. 2NC-34A (NC PORV) will open when needed and pressurizer pressure will oscillate between 2315 psig and 2335 psig
- C. 2NC-32B and 2NC-36B (NC PORVs) will open when needed and pressurizer pressure will oscillate between 2315 psig and 2335 psig
- D. Pressurizer sprays open and pressure oscillates between 2260 psig and 2310 psig, PORVs will <u>not</u> be required to control pressure

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 36



General Discussion

For this failure, channel 3 is controlling channel and will cause PORV 34A to remain closed on actual high pressure. Also Ch 3 blocks NC32 and NC36. Therefore no PORVs are available to respond to high pressure. The heaters will pressurize the NC system until the Rx trip setpoint is reached.

Answer A Discussion

Correct: With channel 3 as the controlling channel, PORV 34A will remain closed on actual high pressure. Also Ch 3 blocks NC32 and NC36. Therefore no PORVs are available to respond to high pressure resulting in hi press Rx trip

Answer B Discussion

Plausible: If NC34 opened, then the effect noted would be correct. Ch 3 failed low prevents NC34 from opening

Answer C Discussion

Plausible: If NC32 and NC 36 opened then the effect noted would be correct. Ch 3 blocks NC32 and NC36

Answer D Discussion

Plausible: Sprays would normally open, do not open because they are controlled by Ch 3. Normally Ch 1 is the controlling channel.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | IPE | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1736 SYS010 K6.01

KA_desc

Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: (CFR: 41.7/45.7) Pressure detection systems

401-9 Comments:

401-9 Comments RESPONSE DCS DCS DCS
2008 SRO NRC Retake Examination

QUESTION 37



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1737 | SYS012 | K6.10 |
| KA_desc | | |

Knowledge of the effect of a loss or malfunction of the following will have on the RPS: (CFR: 41.7/45/7) Permissive circuits

Unit 1 is increasing power at 55%. Given the following conditions:

- 1A NC pump spuriously tripped
- Both reactor trip breakers are closed
- 1. Which permissive enables a reactor trip on the loss of one NC pump?
- 2. For the conditions above, should a reactor trip have automatically occurred?
- A. 1. P-7
 2. Yes
 B. 1. P-8
 2. Yes
 C. 1. P-7
 2. No
- D. 1. P-8 2. No

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 37



General Discussion

On increasing power, P-8 (2/4 PR >/= 48%) enables the 1 out of 4 loop loss of flow (2/3 flow ch.) Rx trip. Also on increasing power, P-7 (2/4 PR >/= 10%) unblocks the 2 out of 4 loop loss of flow (2/3) Rx trip. With reactor power at 55% the Rx should automatically trip. Per TS 3.3.1 bases:

In MODE 1 above the P-8 setpoint, a loss of flow in one RCS loop could result in DNB conditions in the core. In MODE 1 below the P-8 setpoint, a loss of flow in two or more loops is required to actuate a reactor trip because of the lower power level and the greater margin to the design limit DNBR.

Answer A Discussion

Plausible:Student may believe P-7 unblocks 1 loop loss of flow. The Rx should trip automatically

Answer B Discussion

Correct: P-8 is the correct permissive and the Rx should trip automatically

Answer C Discussion

Plausible: Student may believe P-7 setpoint is higher and Rx trip is not required

Answer D Discussion

Plausible: P-8 is the correct permissive. Student may believe P-8 setpoint is higher and Rx trip is not required

| Job Level | Cognitive Level | QuestionType | Question Source |
|---|----------------------------------|-----------------------------------|-----------------------------|
| RO | Memory | NEW | |
| Develope OPT App OPS App NRC App | roved roved roved roved | evelopment References X lesson | Student References Provided |
| r | | | |

QuestionBank # KA_system KA_number

1737 SYS012 K6.10

KA_desc

Knowledge of the effect of a loss or malfunction of the following will have on the RPS: (CFR: 41.7/45/7) Permissive circuits

401-9 Comments:

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QuestionBank #KA_systemKA_number1738SYS013K5.02

QUESTION 38



| KA_desc |
|--|
| Knowledge of the operational implications of the following concepts as they apply to the ESFAS: (CFR: 41.5 / 45.7) Safety system logic and |
| reliability |

Unit 1 is in Mode 3 and reducing NC pressure and temperature for a refueling outage. Given the following:

- Pressurizer pressure channels indicate at follows:
 - o Channel 1 is 1972 psig
 - o Channel 2 is 1985 psig
 - Channel 3 is 1965 psig
 - o Channel 4 is 1951 psig
- Assuming pressurizer pressure channel 2 fails "as-is" at 1985 psig while the other channels of pressurizer pressure continue to track NC pressure as it decreases

How many of the <u>remaining</u> operable pressurizer pressure channels are <u>required</u> to be below the P-11 setpoint before "ECCS TRN A/B PZR PRESS" can be blocked?

- A. 1 of the other 2 remaining channels that input P-11
- B. 2 of the other 2 remaining channels that input P-11
- C. 1 of the other 3 remaining channels that input P-11
- D. 2 of the other 3 remaining channels that input P-11

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General Discussion

There are 4 channels of pzr pressure for trip logic. CH 4 does NOT input P-11 logic, only channels 1, 2 and 3. 2/3 channels less than P-11 (1955 psig) cause the P-11 light on SI/19 to light (block permissive). Since there are only 2 channels left (1 and 3) that input P-11, both must be less than P-11 to allow the permissive. Possible misconception of requiring 2/4 logic

Answer A Discussion

Plausible : If the student thinks that Ch 4 inputs P-11, then this would be correct.

Answer B Discussion

Correct: Channels 1, 2 and 3 input P-11. 2/3 channels less than 1955 psig cause the P-11 light on SI/19 to light (block permissive). Since there are only 2 channels left (1 and 3) that input P-11, both must be less than P-11 to allow the permissive.

Answer C Discussion

Plausible: There are only 2 remaining channels that input P-11, but almost all other permissive signals have 4 channels

Answer D Discussion

Plausible: There are only 2 remaining channels that input P-11, but almost all other permissive signals have 4 channels. This would be correct if Ch 4 were the failed channel.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| ✓ Developed | Development References | Student References Provided |
|-----------------|------------------------|-----------------------------|
| | TS 3.3.2 | |
| V OF I Approved | | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1738 SYS013 K5.02

KA_desc

Knowledge of the operational implications of the following concepts as they apply to the ESFAS: (CFR: 41.5 / 45.7) Safety system logic and reliability

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 39



| QuestionBank # | KA_system | KA_number |
|--|-----------|-----------------|
| 1739 | SYS022 | A2.01 |
| And and a second s | | l _{en} |

KA_desc Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5/43.5/45.3/45.13) Fan motor over-current

......

Unit 1 was operating at 100% power. Given the following events and conditions:

- 1A,1B, and 1C Lower Containment Ventilation Units (LCVU's) are in service
- LCVU 1B fan trips on over-current
- Lower containment average temperature is 117°F and slowly increasing

Based on the conditions above, what is the <u>first</u> action OP/1/A/6450/001 (Containment Ventilation (VV) Systems) specifies to provide additional cooling to lower containment?

- A. Start 1D LCVU in LOW speed
- B. Place 1A and 1C LCVUs in "MAX" cooling only
- C. Place 1A and 1C LCVUs in "MAX" cooling and HIGH speed
- D. Start 1D LCVU in HIGH speed and place 1A and 1C LCVUs in HIGH speed

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QUESTION 39



General Discussion

Per Enclosure 4.11, when additional units are available, they should be placed on in LOW speed. If no additional units are available, then the available units should be placed in HIGH speed. System operation has changed within the last 2 years to operate in MAX cooling mode all the time.

Answer A Discussion

Correct: Per OP/1/A/6450/001 Enclosure 4.11, when idle LCVUs are available, they should be placed on in LOW speed.

Answer B Discussion

Plausible: This is the normal alignment (MAX), but selecting "Max Cool" was a correct action in the past.

Answer C Discussion

Plausible: This would be the first action if these were the only available LCVUs.

Answer D Discussion

Plausible: If an idle LCVU is not available, 2 of the operating LCVUs are placed in HIGH SPEED per enclosure 4.11. Since 1D LCVU is available, no units would be started in high speed as a first action

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|---|-----------------------------|
| OPT Approved | References: OP/1/A/6450/001/ Encl 4.11 | |
| OPS Approved | VV lesson plan | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

| | / | _ |
|------|--------|-------|
| 1739 | SYS022 | A2.01 |

KA_desc

Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Fan motor over-current

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 40



| QuestionBank # | KA_system | KA_number |
|----------------|-------------------------|-----------|
| 1740 | SYS022 | K3.02 |
| | 1 nov 10 nov | |

KA_desc

Knowledge of the effect that a loss or malfunction of the CCS will have on the following: (CFR: 41.7/45.6) Containment instrumentation readings

Unit 1 is operating at 100% power. Given the following conditions and sequence of events:

- Initial lower containment average temperature was 103°F
- All YV flow to containment was lost
- Current lower containment average temperature is 116°F and increasing
- 1. What are the Technical Specification temperature range limits for lower containment temperature based on <u>current</u> plant status?
- 2. What affect does a higher containment temperature have on indicated pressurizer level?
- A. 1. 60°F 120°F
 - 2. indicated level will be lower than actual level
- B. 1. 60°F 120°F
 2. indicated level will be higher than actual level
- C. 1. 100°F 120°F
 2. indicated level will be lower than actual level
- D. 1. 100°F 120°F
 2. indicated level will be higher than actual level

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination **QUESTION 40**



General Discussion

This KA is met because it appears to be asking about containment conditions deteriorating and affects on instruments based on that. Pzr level is affected by containment temperature since its reference leg is in containment.

Containment temperature limits are 100-120 in Mode 1 and 60-120 in modes 2, 3, 4. Actual level will be lower than indicated level because as the reference leg heats up and becomes less dense, it will have the effect on the DP cell similar to increasing pzr level.

Answer A Discussion

Plausible: If student thinks Mode 2,3 and 4 limits apply. If student thinks level effect is reverse

Answer B Discussion

Plausible: If student thinks Mode 2,3 and 4 limits apply. Indicated level will be higher than actual level because as the reference leg heats up and becomes less dense, indicated level will increase

Answer C Discussion

Plausible: Mode 1 Containment temperature limits. If student thinks level effect is reverse

Answer D Discussion

Correct: Containment temperature limits are 100-120 in Mode 1. indicated level will be higher than actual level because as the reference leg heats up and becomes less dense, indicated level will increase

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| ✓ Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | TS 3.6.5 | |
| OPS Approved | | |
| | | |

QuestionBank # KA_system KA_number 1740 SYS022 K3.02

1740 ST S022 K3.0

KA_desc

Knowledge of the effect that a loss or malfunction of the CCS will have on the following: (CFR: 41.7/45.6) Containment instrumentation readings

401-9 Comments:

401-9 Comments RESPONSE

Monday, October 19, 2009

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| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1741 | SYS025 | A3.02 |
| KA dose | | |

KA_desc

Ability to monitor automatic operation of the ice condenser system, including: (CFR: 41.7/45.5) Isolation valves

Which one of the following parameters provides an input to the automatic close signal for 1NF-228A (NF Supply Containment Isolation Valve)?

QUESTION 41

- Α. glycol flow
- Β. refrigerant compressor oil pressure
- C. glycol expansion tank level
- D. refrigerant compressor suction pressure

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General Discussion

The NF supply containment isolation (1NF-228A) is located outside containment and closes on:

1) A loss of air or power

2) An St signal.

3) A Low-Low expansion tank level.

1NF-228A is controlled from the control room. A key switch is provided on the local NF control panel to allow the Low-Low Expansion Tank Level interlock to be bypassed. Meets the KA because these are parameters that could be monitored to determine when NF228A closes or why it closed.

Answer A Discussion

Plausible: This condition will trip the refrigerant compressor. Student may believe 1NF-228A closes on high or low flow

Answer B Discussion

Plausible: Student may believe 1NF-228A closes for chiller protection. This condition will trip the refrigerant compressor.

Answer C Discussion

Correct - 1NF-228A closes on glycol expansion tank lo-lo level.

Answer D Discussion

Plausible: Student may believe 1NF-228A closes to prevent system perturbation. This condition will trip the refrigerant compressor.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|--------------------------|
| RO | Memory | BANK | 2004 NRC Q22 (Bank 1222) |

| | Development References | Student References Provided |
|--------------|-------------------------------------|-----------------------------|
| OPT Approved | Lesson Plan Objective: CNT-NF SEQ 3 | |
| OPS Approved | 1. OP-CN-CNT-NF pages 12-13 | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

A3.02

1741 SYS025

 KA_desc

 Ability to monitor automatic operation of the ice condenser system, including: (CFR: 41.7/45.5) Isolation valves

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 42



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1742 | SYS026 | A2.02 |
| KA daga | | |

KA desc

Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5/43.5/45.3/45.13) Failure of automatic recirculation transfer

Unit 1 was at 100% power when a LOCA occurred. The automatic and manual swap to CLR failed and the crew implemented EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation). The following conditions were noted:

- The reactor trip and safety injection occurred 1 hour ago ٠
- Containment pressure was 11.2 psig ٠
- FWST level has decreased to 4.9% ٠

In addition to securing ND pumps, what additional pumps (if any) are required to be secured per EP/1/A/5000/ECA-1.1?

- All NI pumps, all NV pumps and all NS pumps Α.
- Β. All NI pumps, all NV pumps and all but one NS pump
- C. All NI pumps, all but one NV pump and all NS pumps
- D. No additional pumps are required to be secured

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination **OUESTION 42**



General Discussion

On the swap to CLR at 37% FWST level, the crew would enter EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation). At step 2 they would enter the RNO and take action to secure the ND pumps and get the containment sump suctions aligned. When step 5 is reached they would dispatch operators to manually align the containment sump suctions to ND and go to EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation). In step 3 d RNO they are sent to step 4 and at step 6 RNO they determine the FWST is less than 5% and are sent to step 33 where they secure all ECCS Pumps, remove Sequencer Control Power and remove NS Pump Control Power Fuses.

11.2 psig containment pressure would require 1 NS pump in service per ECA-1.1 step 7, but all pumps are secured when FWST level is < 5% **Answer A Discussion**

Correct: Since ND pumps have been secured, NI,NV, and NS are still operating aligned to the FWST and are required to be secured also

Answer B Discussion

Plausible: NI and NV pumps will be secured. Student may believe 1 NS pump is required to be in service due to the 11.2 psig containment pressure

Answer C Discussion

Plausible: Student may believe one NV pump is left on to minimize flow until other sources can be used, but at 5% FWST level all pumps must be secured.

Answer D Discussion

Plausible: Student may believe remaining pumps need to be in service. 5% FWST level= ~20,000 gallons

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Comprehension | MODIFIED | 2006 NRC Q43 (Bank 649) |

| Developed | Development References | Student References Provided |
|--------------|---|-----------------------------|
| OPT Approved | 1. EP/1/A/5000/ES-1.3 (Transfer to Cold Leg | |
| OPS Approved | Recirculation) 2. EP/1/A/5000/ECA-1.1 (Loss of Emergen | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1742 | SYS026 | A2.02 |
| KA desc | 1 | |

Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Failure of automatic recirculation transfer

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 43



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1743 | SYS039 | A1.09 |

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MRSS controls including: (CFR: 41.5 / 45.5) Main steam line radiation monitors

Unit 1 is in Mode 3 preparing for a startup when 1EMF-27 (Steamline 1B) comes into Trip 2 alarm.

Assuming a large tube leak had occurred on 1B S/G, what <u>additional</u> EMF(s) would also be expected to be in a Trip 1 or Trip 2 alarm at this time?

- A. 1EMF-33 (Condenser Air Ejector Exhaust) only
- B. 1EMF-33 (Condenser Air Ejector Exhaust) and 1EMF-28 (Steamline 1C) only
- C. 1EMF-33 (Condenser Air Ejector Exhaust) and 1EMF-72 (S/G B Leakage) only
- D. 1EMF-33 (Condenser Air Ejector Exhaust), 1EMF-72 (S/G B Leakage), and 1EMF-73 (S/G C Leakage)

2008 SRO NRC Retake Examination

QUESTION 43



General Discussion

In Mode 3 the N16 monitors 71, 72, 73, 74 do not register.

Answer A Discussion

Correct: In Mode 3 only 1EMF-33 and 1EMF-27 (given) would be available for detection of a tube leak

Answer B Discussion

Plausible: If the student believes that there is shine associated with the Steamline monitors (26,27,28,29) but this applies to the N16 monitors only.

Answer C Discussion

Plausible: If N-16 monitors were active this would be correct but 1EMF-73 would likely also be in alarm.

Answer D Discussion

Plausible: N-16 monitors do not alarm in Mode 3 but at power this would be correct.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|-------------------------|-----------------------------|
| | E-3 | |
| OPT Approved | E-3 background document | |
| OPS Approved | SM | |
| NRC Approved | PC | |

QuestionBank # KA_system KA_number

1743 SYS039 A1.09

KA_desc

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MRSS controls including: (CFR: 41.5 / 45.5) Main steam line radiation monitors

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 44

| QuestionBank # | KA_system | KA_number |
|----------------|--|-----------|
| 1744 | SYS039 | 2.2.37 |
| KA desc | Server the server of the serve | 1 |

SYS039 GENERIC Ability to determine operability and/or availability of safety related equipment. (CFR: 41.7 / 43.5 / 45.12)

Unit 2 is in Mode 3 at full temperature and pressure. Given the following status of 2SV-19 (S/G 2A PORV) nitrogen bottle pressures:

- Bottle #1 1970 psig
- Bottle #2 2165 psig

What action (if any) is required for 2SV-19 per Selected Licensee Commitment 16.10-1 (Steam Vent to Atmosphere)?

- A. No action is required as long as Bottle #2 remains greater than 2100 psig
- B. Immediately take action to restore the nitrogen supply to operable status only
- C. Immediately enter the applicable conditions of Technical Specification 3.7.4 (S/G PORVs) only
- D. Immediately take action to restore the nitrogen supply to operable status and immediately enter the applicable conditions of Technical Specification 3.7.4 (S/G PORVs)

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 44

B

General Discussion

Per SLC 16.10-1, N2 pressure lower limit per bottle is 2100 psig. If BOTH bottles are less tha 2100, the PORV is inoperable per TS. If only one is below 2100 then SLC 16.10-1 Condition A is the only commitment action applicable.

Answer A Discussion

Plausible: The student may believe no action is necessary for 1 bottle < 2100 psig

Answer B Discussion

Correct: With 1 bottle < 2100 psig, condition A of SLC 16.10-1 applies

Answer C Discussion

Plausible: This is the one correct action for Condition B of SLC 16.10-1 for both bottles < 2100 psig, but Condition A would also apply concurrently

Answer D Discussion

Plausible: These are the correct actions to take for both bottles < 2100 psig, Conditions A and B per SLC 16.10-1

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| | Development References | Student References Provided |
|--------------|-------------------------|-----------------------------|
| OPT Approved | SLC 16.10-1 TS 3 7 4 | |
| OPS Approved | 10 5774 | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

| 1744 | SYS039 | 2.2.37 |
|------|--------|--------|
| | | |

KA_desc

SYS039 GENERIC Ability to determine operability and/or availability of safety related equipment. (CFR: 41.7 / 43.5 / 45.12)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 45

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1745 | SYS059 | A4.08 |
| KA dees | | |

KA_desc

Ability to manually operate and monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) Feed regulating valve controller

Given the following conditions:

- Unit 2 is at 95% power
- The crew is performing steps per AP/2/A/5500/006 (Loss of S/G Feedwater) Case III, DFCS Not In Auto
- 2CF-37 (S/G 2B CF Ctrl) feedwater regulating valve is in automatic
- 2CF-39 (S/G 2B CF Byp Ctrl) feedwater regulating bypass valve is in manual
- 2B steam generator level is 69% and slowly decreasing

Which of the following actions will be performed to return 2B steam generator level control to automatic and results in a bumpless transfer?

- A. Decrease 2CF-39 by 5% and ensure 2CF-37 moves in the open direction Depress manual for 2CF-37 and 2CF-39 Depress automatic for 2CF-37 and 2CF-39
- B. Ensure 2CF-39 demand is 100% and S/G level is stabilized within 2% of setpoint Depress automatic for 2CF-39 only
- C. Ensure 2CF-39 demand is 100% and S/G level is stabilized within 2% of setpoint Depress manual for 2CF-37 and 2CF-39 Depress automatic for 2CF-37 and 2CF-39
- D. Increase 2CF-39 by 5% and ensure 2CF-37 moves in the closed direction Depress automatic for 2CF-39 only

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 45

General Discussion

Based on ensuring that there is no transient when the valves are returned to automatic. It is required that levels be within 2% and that the bypass be fully open (normal position at this power level). Both valves must have manual depressed and then auto depressed for proper operation. 2B S/G level is slowly decreasing because level is slightly high and it is decreasing to the narrow range level setpoint

AP-06 step 9

a. Verify 1CF-37 (S/G 1B CF Ctrl) IN AUTOMATIC.

AP-06 step 10

10. Ensure feed reg bypass valves in automatic and DFCS tracking logic reset as follows:

IF 1CF-39 (S/G 1B CF Byp Ctrl) has been in manual at any time during this

event, THEN perform the following for S/G 1B:

a. IF reactor power greater than 90%,

THEN ensure 1CF-39 (S/G 1B CF Byp Ctrl) demand - AT 100%.

B. IF reactor power less than or equal to 90%, THEN ensure 1CF-39 (S/G 1B CF Byp Ctrl) demand AT SETPOINT DETERMINED BY PLANT ENGINEERING.

C. Ensure S/G 1B N/R level WITHIN 2% OF S/G N/R LEVEL SETPOINT.

D. Ensure S/G 1B N/R level - STABLE.

E. Place 1CF-37 (S/G 1B CF Ctrl) in manual.

F. Momentarily depress 1CF-39 (S/G 1B CF Byp Ctrl) "MAN" pushbutton.

G. Place 1CF-39 in automatic.

H. Place 1CF-37 in automatic.

Answer A Discussion

Plausible: Decreasing 2CF-39 by 5% would verify the reg valve is operating properly. Returning the valves to auto in this fashion would be a bumpless transfer if level was stable and within 2% of setpoint

Answer B Discussion

Plausible: Ensuring 2CF-39 demand is 100% and level is stable within 2% correct. Student may believe depressing 2CF-39 only is all that is required, but both valves must have manual depressed and then auto depressed for proper operation

Answer C Discussion

Correct: Per AP/06 procedure steps

Answer D Discussion

Plausible: Decreasing 2CF-39 by 5% would verify the reg valve is operating properly. Student may believe depressing 2CF-39 only is all that is required, but both valves must have manual depressed and then auto depressed for proper operation

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Comprehension | BANK | 2005 NRC Q41 (Bank 445) |

| \checkmark | Developed | Development References | Student References Provided |
|--------------|--------------|--------------------------------------|-----------------------------|
| | OPT Approved | IFE AP/2/A/5500/006 Case 3 Encl 4 | |
| | OPS Approved | | |
| | NRC Approved | | |

| 1745 SYS059 A4.08 |
|-------------------|
| |
| desc |

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2008 SRO NRC Retake Examination

401-9 Comments:

QUESTION 45

401-9 Comments RESPONSE DCS DCS DCS

2008 SRO NRC Retake Examination

QUESTION 46



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1746 | SYS061 | 2.4.20 |
| KA desc | <u> </u> | |

SYS061 GENERIC Knowledge of the operational implications of EOP warnings, cautions, and notes. (CFR: 41.10 / 43.5 / 45.13)

Unit 2 was operating at 100% power when a loss of offsite power occurred and the transient resulted in a reactor trip. Given the following conditions and sequence of events related to the CA system 30 minutes after the initial event:

- Train "A" CA has been RESET
- Train "B" CA could not be RESET and a maintenance crew is investigating
- The CA common suction piping from condensate grade sources ruptures
- 2AD-5, E/1 "CA Pumps Train A Loss of Norm Suct" is LIT
- 2AD-5, E/2 "CA Pumps Train B Loss of Norm Suct" is LIT

How will the CA system respond after 5 seconds?

- A. 2A CA pump trips CAPT #2 trips
 2B CA pump suction shifts to the RN system
- B. 2A CA pump suction shifts to the RN system
 CAPT #2 suction shifts to the RN system
 2B CA pump trips
- C. 2A CA pump suction shifts to the RN system CAPT #2 trips 2B CA pump trips
- D. 2A CA pump trips
 CAPT #2 suction shifts to the RN system
 2B CA pump suction shifts to the RN system

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 46



General Discussion

This is testing the NOTE prior to step 1 of Case II of AP/06 When RESET, CA behaves as a manual trip. On low suction pressure >5 seconds the CA trains that have been reset will trip and the CA trains that have not been reset will swap suction source. CAPT needs BOTH trains reset to be considered "reset".

Answer A Discussion

Plausible: If the student believes A train reset only is required for CAPT. 2A pump will trip and 2B will swap to RN

Answer B Discussion

Plausible: If the candidate believes reset allows suction swap

Answer C Discussion

Plausible: If the candidate reverses the logic

Answer D Discussion

Correct: With train B not reset, 2B and CAPT#2 will shift on low suction pressurer >5 sec and with train A reset and low suction pressurer >5 sec, 2A will trip.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|------------------------|
| RO | Comprehension | BANK | 2003 NRC Q5 (Bank 205) |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | CA AP/06 | |
| OPS Approved | AD-5 ANNUNC RESP | |
| NRC Approved | | |

QuestionBank #KA_systemKA_number1746SYS0612.4.20

KA_desc

SYS061 GENERIC Knowledge of the operational implications of EOP warnings, cautions, and notes. (CFR: 41.10/43.5/45.13)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 47



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1747 | SYS062 | A3.01 |
| | 1 · · · · | |

KA_desc

Ability to monitor automatic operation of the ac distribution system, including: (CFR: 41.7/45.5) Vital ac bus amperage

Given the following:

- 2B D/G automatically started due to the incoming breaker to 2ETB spuriously opening
- While monitoring D/G operating parameters, the crew notes that D/G 2B "VOLTS" is 4000 V
- Voltage is adjusted to normal

How will 2B D/G output "AMPS" and "P/F" indications respond to this adjustment?

| | AMPS | <u>P/F</u> |
|----|----------|---------------|
| A. | increase | less lagging |
| В. | increase | stay the same |
| C. | decrease | less lagging |
| D. | decrease | stay the same |

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination **QUESTION 47**



General Discussion

Students must understand that the D/G is not in parallel and that voltage must be adjusted UP. When voltage is increased, D/G /ETA amps decrease. This has no effect on Power Factor. This is OE from an NLO who was attempting to control power factor while operating in isochronous mode.

Answer A Discussion

Plausible: Voltage needs to be increased. Student may unsure of direction for adjustment to normal voltage and of voltage and current relationship. Power factor is unaffected

Answer B Discussion

Plausible: Voltage needs to be increased. Student may unsure of direction for adjustment to normal voltage and of voltage and current relationship. Power factor will be unaffected

Answer C Discussion

Plausible: Amps will decrease as voltage is increased, but power factor is unaffected

Answer D Discussion

Correct: Amps will decrease as voltage is increased and power factor will be unaffected

| Job Level | Cognitive I | Level | QuestionType | Question Source |
|-------------------------------|-------------|---------|--------------------|-----------------------------|
| RO Comprehens | | nsion | MODIFIED | 2008 NRC Q47 (Bank 553) |
| | | Devel | lopment References | Student References Provided |
| OPT Appro | oved | DG3 le | esson | |
| | oved | | | |
| NRC Appr | oved | | | |
| QuestionBank | # KA_system | KA_numl | ber | |
| 174 | 7 SYS062 | A3.01 | - | |

1747 SYS062

KA_desc

Ability to monitor automatic operation of the ac distribution system, including: (CFR: 41.7/45.5) Vital ac bus amperage

401-9 Comments:

QUESTION 48

2008 SRO NRC Retake Examination

| QuestionBank | # KA_system | KA_number | | | |
|-----------------|------------------|-------------------------|----------------------------|---------|--|
| 1748 | SYS062 | K2.01 | | | |
| KA_desc | | | | | |
| Knowledge of bu | s power supplies | to the following : (CFR | : 41.7) Major system loads | ••••••• | |

Unit 1 is operating at 100% power. Given the following:

- All systems are properly aligned and in service for current plant conditions
- A fault on transformer 1T1B caused the 1TB and 1TD short side incoming breakers to open

Which one of the following describes the status of the 1B and 1D NC Pumps (NCP) and how power to 1TB and 1TD is restored to normal alignment?

- A. NCPs 1B and 1D are tripped; buses 1TB and 1TD are automatically transferred back once the fault is cleared
- B. NCPs 1B and 1D are running; buses 1TB and 1TD are manually transferred back once the fault is cleared
- C. NCPs 1B and 1D are tripped; buses 1TB and 1TD are manually transferred back once the fault is cleared
- D. NCPs 1B and 1D are running; buses 1TB and 1TD are automatically transferred back once the fault is cleared

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General Discussion

Transformer 1T1B supplies the short side of 1TB and 1TD. The short side of 1TB and 1TD supply ""B"" and ""D"" reactor coolant pumps respectively. The short side incoming breakers in this situation are tripped by a Zone B lockout. This would cause the tie breakers to rapidly close on all four 6.9KV switchgear (1TA, 1TB, 1TC, and 1TD), preventing a Rx trip on NCP undervoltage or NCP underfrequency. This requires manual transfer back to the normal breaker after the fault condition is cleared and the lockout is reset.

Answer A Discussion

Plausible: Student may believe busses are deenergized and the bus will transfer back to normal automatically once the fault is cleared

Answer B Discussion

Correct: Tie breakers will rapidly close on all four 6.9KV switchgear (1TA, 1TB, 1TC, and 1TD) and busses will remain energized. Restoration to normal alignment is performed manually

Answer C Discussion

Plausible: Student may believe busses are deenergized. Restoration to normal alignment is performed manually

Answer D Discussion

Plausible: Tie breakers will rapidly close on all four 6.9KV switchgear (1TA, 1TB, 1TC, and 1TD) and busses will remain energized. The student may believe the bus will transfer back to normal automatically once the fault is cleared.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|------------------------|
| RO | Comprehension | BANK | 2006 NRC Q22 (Bank 99) |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | EPA EPB | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1748 SYS062

KA_desc

Knowledge of bus power supplies to the following : (CFR: 41.7) Major system loads

K2.01

401-9 Comments:

2008 SRO NRC Retake Examination

| 2008 SH | RO NRC | Retake Exai | nination QUESTION 49 |
|------------------|------------------|-------------------------|---------------------------------------|
| QuestionBank # | KA_system | KA_number | |
| 1749 | SYS063 | K2.01 | |
| KA_desc | <u>_}</u> | | |
| Knowledge of bus | power supplies t | to the following: (CFR: | 41.7) Major DC loads |
| | | | ··· ····· · · · · · · · · · · · · · · |

What is the power supply for the main turbine emergency bearing oil pump (EBOP)?

- 120V AC Α.
- 125V DC Β.
- C. 208V AC
- 250V DC D.

2008 SRO NRC Retake Examination QUESTION 49

| General Discussion | |
|---|--|
| This comes from DPD(250vdc) | |
| Answer A Discussion | |
| Plausible: This is approximate voltage but AC | |
| Answer B Discussion | |
| Plausible:1A D/G DC fuel oil booster pump uses this supply | |
| Answer C Discussion | |
| Plausible: This is switchyard aux power voltage, approximate voltage but AC | |
| Answer D Discussion | |
| Correct: - comes from DPD DC bus | |

| Job Level | Cognitive | Level | QuestionType | Question Source |
|-----------------|------------------|---------------|---------------------------------|-----------------------------|
| RO | Memor | У | NEW | |
| ✓ Develope | d | Devel | opment References | Student References Provided |
| OPT Appr | oved | Erj | | |
| 📄 OPS Appr | roved | | | |
| 🔲 NRC Appi | roved | | | |
| QuestionBank | # KA_system | KA_num | ber | |
| 17- | 49 SYS063 | K2.01 | | |
| KA_desc | | | | |
| Knowledge of bu | s power supplies | to the follow | ring: (CFR: 41.7) Major DC load | ls |

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 50



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1750 | SYS063 | K3.01 |
| KA_desc | doorge. | |

Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: (CFR: 41.7/45.6) ED/G

Unit 1 is operating at 100% power. Given the following:

- 1AD-11, A/8 "125VDC Diesel Gen A Control Pwr Sys Trbl" is LIT
- 1AD-11, B/7 "D/G 1A Panel Trouble" is LIT
- The reflash module indicates "1DGCA supply to DG Control Panel 1A open"
- 1A D/G Panel alarm E/5 "Loss of DC Control Power" is LIT

What affect (if any) will this condition have on the start capability of the 1A D/G?

- A. None, 1/A D/G will start on an automatic start signal or manually as designed
- B. 1A D/G will start on an automatic start signal but can <u>not</u> be started manually
- C. 1A D/G can be started manually but will <u>not</u> start on an automatic start signal
- D. 1A D/G will <u>not</u> start manually or on an automatic start signal

2008 SRO NRC Retake Examination

QUESTION 50

General Discussion

1A D/G has a loss of DC control power. If the Diesel Generator is shutdown, there is no DC power available to the starting solenoids. The diesel generator will not start.

Answer A Discussion

Plausible: Student may believe the 1A D/G is unaffected

Answer B Discussion

Plausible: Student may believe 1A D/G will start on an automatic signal, 1A D/G cannot be started manually

Answer C Discussion

Plausible: Student may believe 1A D/G can be started manually, 1A D/G will not start on an automatic signal

Answer D Discussion

Correct: With a loss of DC control power, if the Diesel Generator is shutdown, there is no DC power available to the starting solenoids. The diesel generator will not start.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| | Development References | Student References Provided |
|--------------|-------------------------|-----------------------------|
| | EPL | |
| OPT Approved | DG1 | |
| | DG1A ann resp E/5 | |
| | EQB | |
| NRC Approved | 1AD-11 annunciator resp | |

QuestionBank # KA_system KA_number 1750 SYS063 K3.01

KA_desc

Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: (CFR: 41.7/45.6) ED/G

401-9 Comments:

2008 SRO NRC Retake Examination

 QuestionBank # KA_system
 KA_number

 1751
 SYS064
 K4.01

KA_desc Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) Trips while loading the ED/G (frequency, voltage, speed)

QUESTION 51

Unit 1 was in Mode 3 when 1ETA experienced a blackout. Given the following:

- The 1A D/G started and was sequencing on loads per the accelerated sequence
- Half way through the accelerated sequence, the fuel racks stuck in an open position causing D/G speed to exceed the overspeed trip setpoint
- 1. What is the setpoint for the D/G overspeed trip?
- 2. For the conditions stated above will the D/G trip?
- A. 1. 495 rpm
 - 2. No
- B. 1. 495 rpm2. Yes
- C. 1. 517.5 rpm 2. No
- D. 1. 517.5 rpm 2. Yes

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General Discussion

The D/G overspeed trip is at 115% (517.5 rpm) of normal speed (450 rpm). The main turbine trips at 110% of normal speed) 450*1.1= 495rpm. Overspeed is an emergency trips. On an auto start, ONLY emergency trips will trip the D/G, for manual starts emergency or nonemergency trips will trip it.

Answer A Discussion

Plausible: The student may believe overspeed is 110% of normal (450) and overspeed is not an emergency trip

Answer B Discussion

Plausible: The student may believe overspeed is 110% of normal (450). The 1A D/G will trip on overspeed (emergency trip)

Answer C Discussion

Plausible: This is the correct overspeed setpoint. The student may believe overspeed is not an emergency trip

Answer D Discussion

Correct: The D/G overspeed trip is at 115% (517.5 rpm) of normal speed (450 rpm). The 1A D/G will trip on overspeed (emergency trip)

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| T | DG3 | |
| OPT Approved | | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1751 SYS064 K4.01

KA desc

Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) Trips while loading the ED/G (frequency, voltage, speed)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 52



| 1752 SVS073 A2 | |
|----------------|-----|
| 1752 515073 A2 | .01 |

KA_desc Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use

procedures to cor- rect, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Erratic or failed power supply

Unit 1 was operating at 50% power when a power spike causes a 1EMF-33 (CSAE EXHAUST) Trip 2 alarm.

What manual operator actions (if any) are required to place systems affected by this EMF alarm in their post alarm condition per OP/1/B/6100/010X (Annunciator Response to Radiation Monitoring Panel 1RAD-1)

- A. Swap "Unit 1 CSAE EXH" discharge from "UNIT VENT" to "AUTO"
- B. Close 1BB-48 (BB Pumps Disch to TB Sump)
- C. Close S/G Sample valves
- D. No manual actions are required

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 52



General Discussion

On trip 2, the BB valves close and the NM valves close. The ZJ must be swapped manually to AUTO. We are associating "predict" with what will and will not position automatically.

Answer A Discussion

Correct: On trip 2, the BB values close and the NM values close. ZJ must be swapped to VA (aux building ventilation) manually to placing the switch in AUTO (normal position is "Unit Vent").

Answer B Discussion

Plausible: This valve automatically closes

Answer C Discussion

Plausible: NM sample valves auto close.

Answer D Discussion

Plausible: If the student believes ZJ automatically swaps to VA (aux building ventilation)

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | 1RAD-1 ARP | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1752 | SYS073 | A2.01 |
| | | |

KA_desc

Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to cor- rect, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Erratic or failed power supply

401-9 Comments:

QUESTION 53

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number | |
|----------------|-----------|--------------------|--|
| 1753 | SYS076 | K2.01 | |
| KA_desc | | analosange · · · · | |

2B RN pump is normally powered from:

- A. 6900V bus 2TB long side
- B. 6900V bus 2TD long side
- C. 4160V bus 2ETB
- D. 4160V bus 2FTB

2008 SRO NRC Retake Examination

QUESTION 53

General Discussion

These are all possible loads for "B" train large motors.

Answer A Discussion

Plausible: Student may believe this large motor is supplied from this buss. Condensate and RC pumps come off the long side of both 2TD and 2TB

Answer B Discussion

Plausible: Student may believe this large motor is supplied from this buss. Condensate and RC pumps come off the long side of both 2TD and 2TB

Answer C Discussion

Correct: 2B RN pump power supply is 2ETB

Answer D Discussion

Plausible: Student may believe this large motor is supplied from this buss. 2 of 3 Main fire pumps come off the 4160 V blackout buss.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Memory | MODIFIED | 2008 NRC Q53 (Bank 559) |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | EPC lesson | |
| OPT Approved | | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

| ۲A_desc | |
|---|---------------|
| Knowledge of bus power supplies to the following: (CFR: 41.7) | Service water |

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-------------------------|
| 1754 | SYS078 | K3.02 |
| | | i po analito Anoi Seren |

KA_desc Knowledge of the effect that a loss or malfunction of the IAS will have on the following: (CFR: 41.7/45.6) Systems having pneumatic valves and controls

OUESTION 54

Unit 2 automatically tripped from 100% power and the crew entered EP/2/A/5000/E-0 (Reactor Trip or Safety Injection). Given the following:

- Both trains of CA SYS VLV RESET have been "RESET" and CA flow has been throttled to maintain proper S/G levels
- 20 minutes after the reactor trip, a complete loss of VI pressure occurs

How long (if at all) can CA flow continue to be controlled using the CA flow control valves, and when control is lost, how will CA flow be affected?

- A. CA flow control is lost immediately and then CA flow will decrease
- B. CA flow control is lost immediately and then CA flow will increase
- C. CA flow control will be maintained for 1 hour and then CA flow will decrease
- D. CA flow control will be maintained for 1 hour and then CA flow will increase
FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 54



General Discussion

CA flow control valves fail open on a loss of air pressure. These valves have their own air accumulators that allow control to be maintained for 1 hour when VI is lost. Once accumulators deplete, the valves will fail open and from the throttled position per the stem, flow will increase. Decreasing is plausible because other feedwater sources to the S/Gs fail closed (CF).

Answer A Discussion

Plausible: Student may not take into account the VI air accumulators that will last for an hour. Control is not immediately lost. Once the air accumulators deplete, the valves will fail open and from the throttled position per the stem, flow will increase

Answer B Discussion

Plausible: Student may not take into account the VI air accumulators that will last for an hour. Control is not immediately lost. Once the air accumulators deplete, the valves will fail open and from the throttled position per the stem, flow will increase

Answer C Discussion

Plausible: The air accumulators have depleted after an hour and CA flow control is lost, but the valves will fail open and from the throttled position per the stem, flow will increase

Answer D Discussion

Correct: The air accumulators have depleted after an hour and CA flow control is lost. The valves will fail open and from the throttled position per the stem, flow will increase

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|----------------------------------|------------------------|-----------------------------|
| OPT Approved | AP/22 CA | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank #KA_systemKA_number1754SYS078K3.02

KA_desc

Knowledge of the effect that a loss or malfunction of the IAS will have on the following: (CFR: 41.7/45.6) Systems having pneumatic valves and controls

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 55

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1755 | SYS103 | K1.01 |

Knowledge of the physical connections and/or cause-effect relationships between the containment system and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) CCS

At 1000, a secondary steam leak occurred in the Unit 2 containment. The crew has started a controlled shutdown using AP/2/A/5500/009 (Rapid Downpower). Containment pressure and temperature trends indicate:

| <u>Time</u> | Temperature | Pressure |
|-------------|-------------|-----------|
| 1000 | 113°F | 0.15 psig |
| 1005 | 117°F | 0.31 psig |
| 1010 | 119°F | 0.42 psig |
| 1015 | 122°F | 0.48 psig |
| 1020 | 126°F | 0.65 psig |
| 1025 | 129°F | 0.91 psig |

During which time period did the Lower Containment Ventilation Units (LCVUs) cooling water bypass valve (full flow valve) automatically open?

Assume no manual operator actions have been taken related to LCVU operation.

- A. Between 1005 and 1010
- B. Between 1010 and 1015
- C. Between 1015 and 1020
- D. Between 1020 and 1025

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 55

General Discussion

The LCVU bypass valve will be opened by an operator selecting HIGH speed on each LCVU or when containment pressure reaches 0.5 psig.

Answer A Discussion

Plausible: 0.3 psig is the old CPCS permissive signal

Answer B Discussion

Plausible: The student may believe the cooling units start on high temperature (120F is the TS cont hi temp)

Answer C Discussion

Correct: The LCVU bypass valve will be opened by an operator selecting HIGH speed on each LCVU or when containment pressure reaches 0.5 psig.

Answer D Discussion

Plausible:0.9 psig is the current CPCS permissive signal

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | NS | |
| OPT Approved | VV | |
| | AP/009 | |
| | AP/28 | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1755 SYS103 K1.01

KA_desc

Knowledge of the physical connections and/or cause-effect relationships between the containment system and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) CCS

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 56



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1756 | SYS001 | K2.01 |
| KA_desc | <u> </u> | |

Knowledge of bus power supplies to the following: (CFR: 41.7) One-line diagram of power supply to M/G sets.

Unit 1 was in Mode 3 with shutdown banks withdrawn in preparation for startup. Given the following conditions and sequence of events:

- The 1TXS is isolated for transmissions inspection
- A fault on the short side of 1TC occurs

Which MG set(s) has/have a power supply available and what is the current status of the shutdown banks?

- A. Only 1B MG set; shutdown banks are inserted
- B. Only 1B MG set; shutdown banks are withdrawn
- C. 1A and 1B MG sets; shutdown banks are inserted
- D. 1A and 1B MG sets; shutdown banks are withdrawn

2008 SRO NRC Retake Examination

QUESTION 56



General Discussion

MG sets are powered from LXC (1A) and LXD (1B). In this case 1TC short faults and the alternate power supply from 1TXS is isolated. Therefore all power to 1A MG set is lost as well as power to 1C NCP. There is no reactor trip required either manually or automatically due to an NCP loss in this condition (<P-7). 1B MG set will continue to be powered from 1LXD. Therefore the shutdown banks would still be withdrawn.

Answer A Discussion

Plausible: Student may believe that 1B MG set is energized but 1C NCP trip causes a Rx trip

Answer B Discussion

Correct: 1B MG set continues to be powered from 1LXD, but MG set 1A loses power. There is no reactor trip required either manually or auotmatically due to an NCP loss in this condition (<P-7).

Answer C Discussion

Plausible: Student may believe that power is available to both MG sets and 1C NCP trip causes a Rx trip.

Answer D Discussion

Plausible: Student may believe that power is available to both MG sets and shutdown banks will still be withdrawn

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Comprehension | MODIFIED | 2008 NRC Q56 (Bank 562) |

| Developed | Development References EPA | Student References Provided |
|--|-------------------------------|-----------------------------|
| OPT Approved OPS Approved | IRE | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1756 | SYS001 | K2.01 |
| | <u> </u> | |

KA_desc

Knowledge of bus power supplies to the following: (CFR: 41.7) One-line diagram of power supply to M/G sets.

401-9 Comments:

2008 SRO NRC Retake Examination

B

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1757 | SYS002 | K1.07 |
| KA_desc | | |

Knowledge of the physical connections and/or cause-effect relationships between the RCS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) Reactor vessel level indication system

QUESTION 57

What is the RVLIS LR level that corresponds to the top of the core?

- A. 41%
- B. 54%
- C. 61%
- D. 70%

2008 SRO NRC Retake Examination

QUESTION 57



General Discussion

Original K/A replaced. The core is shown to be from 23 to 54% on the lower-range meter. 41% and 61% are used in the core cooling CSF procedure as key levels. 70% is the top of scale for the lower range but the upper range goes from 60% to 120% so an operator may think that 70% is top of core. Answer A Discussion

Plausible: <41% is used in F-0 for determination of FR-C procedures

Answer B Discussion

Correct: 54% corresponds to the top of the core on RVLIS

Answer C Discussion

Plausible: 61% is used in FR-C.1 to verify adequate core cooling

Answer D Discussion

Plausible: This is the top of scale for RVLIS LR level

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | ССМ | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1757 SYS002 K1.07

KA_desc

Knowledge of the physical connections and/or cause-effect relationships between the RCS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) Reactor vessel level indication system

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1758 | SYS011 | A2.11 |
| KA desc | l | <u></u> |

QUESTION 58

Ability to (a) predict the impacts of the following malfunctions or operations on the PZR LCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5/43.5/45.3/45.13) Failure of PZR level instrument - low

Unit 2 is operating at 100% power. Given the following indications:

- PZR level control in the 1-2 position
- PZR level channel 1 fails low
- 1. What affect does this failure have on the NV system?
- 2. What is one of the actions AP/2/A/5500/012 (Loss of Charging or Letdown) will direct in response to this failure?
- A. 1. Charging flow decreases to 0 gpm
 - 2. Swap PZR level control to the 3-2 position
- B. 1. Charging flow decreases to 47 gpm2. Manually control 2NV-309 (Seal Water Inj Flow) for 32 gpm seal flow
- C. 1. Charging flow increases to maximum2. Swap PZR level control to the 3-2 position
- D. 1. Charging flow increases to maximum2. Manually control 2NV-309 (Seal Water Inj Flow) for 32 gpm seal flow

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 58

General Discussion

Ch.1 is the controlling channel and channel 2 is the backup channel. Channel 1 failing low causes a letdown isolation and Pzr level master seeing 0% level. This results in charging flow demand to maximum.

Procedure AP/12 is used because letdown isolates. Charging flow will be reduced to 32 gpm per AP/12, and 2NV-309 will control automatically to achieve 32 gpm seal flow.

Answer A Discussion

Plausible: Student may think with letdown isolation and level increasing level master will take charging flow to 0. AP/12/, Case II will direct swapping to alternate operable channel (3-2)

Answer B Discussion

Plausible: Student may think with letdown isolation and level increasing level master will take charging flow to the lowest flow the level master will call for (i.e. 47 gpm). 2NV-309 is will be controlled in auto

Answer C Discussion

Correct: Channel 1 failing low causes a letdown isolation and Pzr level master seeing 0% level. This results in charging flow demand to maximum. AP/12/, Case II will direct swapping to alternate operable channel (3-2)

Answer D Discussion

Plausible: Channel 1 failing low causes a letdown isolation and Pzr level master seeing 0% level. This results in charging flow demand to maximum. 2NV-309 will be controlled in auto

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| ✓ Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | ILE | |
| OPT Approved | 1ad-6 ann resp | |
| | AP/11 | |
| | ap/12 | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1758 | SYS011 | A2.11 |
| KA daga | | |

KA_desc

Ability to (a) predict the impacts of the following malfunctions or operations on the PZR LCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Failure of PZR level instrument - low

401-9 Comments:

401-9 Comments RESPONSE DCS DCS DCS

2008 SRO NRC Retake Examination

QUESTION 59



| QuestionBank # | KA_system | KA_number | |
|----------------|-----------|-----------|--|
| 1759 | SYS016 | K3.04 | |
| KA_desc | | | |

Knowledge of the effect that a loss or malfunction of the NNIS will have on the following: (CFR: 41.7 / 45.6) MFW system

Unit 2 was operating at 65% power when IAE work caused two Feedwater Header Pressure signals to fail low.

How is the following equipment affected by this failure?

- CF Main Reg valves
- CF Bypass Reg valves
- CFPT Master Controller
- CFPT Slave Controllers
- A. CF Main Reg valves and CF Bypass Reg valves fail to manual, CFPT Master controller and CFPT Slave Controllers remain in automatic
- B. CF Main Reg valves and CF Bypass Reg valves remain in automatic, CFPT Master controller and CFPT Slave Controllers fail to manual
- C. CF Main Reg valves, CF Bypass Reg valves and CFPT Master controller fail to manual, CFPT Slave Controllers remain in automatic
- D. CF Main Reg valves, CF Bypass Reg valves, CFPT Master controller and CFPT Slave Controllers fail to manual

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 59

General Discussion

Feedwater header pressure is one of the unit parameters that if a sufficient number of input signals fail, it will place all the controllers it affects in manual. Feedwater header pressure affects CF main Reg valves and bypasses, because it inputs S/G D/P, which is used to adjust valve position. Feedwater header pressure also affects feed pump speed, because actual S/G D/P is compared with program D/P to adjust CFPT speed. Therefore on failure of 2 feedwater header pressure instruments low, all reg valves/bypasses and feed pump speed controllers will swap to manual.

Answer A Discussion

Plausible: Reg valves do fail to manual, but feed pumps do not remain in automatic. Student may believe CFPTs are unaffected

Answer B Discussion

Plausible: Reg valves fail to manual, and feed pumps fail to manual. Student may believe reg valves/bypasses are unaffected

Answer C Discussion

Plausible: Reg valves fail to manual, and feed pumps fail to manual. Student may believe CFPT slave controllers are unaffected

Answer D Discussion

Correct: With 2 feedwater header pressure instruments failed low, all reg valves/bypasses and feed pump speed controllers will swap to manual.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | IFE | |
| | | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

| 1759 | SYS016 | K3.04 |
|------|--------|-------|

KA_desc

Knowledge of the effect that a loss or malfunction of the NNIS will have on the following: (CFR: 41.7/45.6) MFW system

401-9 Comments:

401-9 Comments RESPONSE DCS DCS DCS

2008 SRO NRC Retake Examination

QUESTION 60

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1760 | SYS028 | K6.01 |
| KA_desc | | |

Knowledge of the effect of a loss or malfunction on the following will have on the HRPS: (CFR: 41.7/45.7) Hydrogen recombiners

A large LOCA occurred on Unit 1. Given the following conditions and sequence of events:

CONDITIONS at 1100

- Containment hydrogen concentration of 6.2%
- Containment pressure is 5.3 psig
- 1A Hydrogen Recombiner was placed in service per OP/1/A/6450/010 (Containment Hydrogen Control Systems)

CONDITIONS at 2100

- During the previous hourly temperature check, an NLO discovered the 1A Hydrogen Recombiner breaker had tripped
- Containment hydrogen is 3.2%
- Containment pressure is 3.5 psig
- 1B Hydrogen Recombiner pre-heating is complete and an NLO has called the control room for guidance on adjusting power output
- 1. What <u>minimum</u> approval was required to place 1A Hydrogen Recombiner in service at 1100?
- 2. To what approximate power output should 1B Hydrogen Recombiner be adjusted at 2100?

Reference provided

- A. 1. OSM approval 2. 53 KW
- B. 1. OSM approval2. 59 KW
- C. 1. TSC approval 2. 53 KW
- D. 1. TSC approval 2. 59 KW

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 60

General Discussion

TSC approval is required prior to placing a hydrogen recombiner in service with H2 conc > 6%. The output is adjusted per Data Book Figure 10 and with 3.5 psig in containment, the value read off the chart is 53 KW. If the A recombiner line is used, power will be adjusted too high (59 KW).

Answer A Discussion

Plausible: The student may believe only OSM approval is necessary. 53 Kw is correct

Answer B Discussion

Plausible: The student may believe only OSM approval is necessary. 59 Kw is obtained if the student uses the 1A recombiner that tripped

Answer C Discussion

Correct: Requires TSC approval, 53 Kw is correct using B recombiner

Answer D Discussion

Plausible: Requires TSC approval. 59 Kw is obtained if the student uses the 1A recombiner that tripped

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|---|-----------------------------|
| OPT Approved | OP/1/A/6450/010 encl 4.10 Databook Figure 10 | Databook Figure 10 |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1760 SYS028 K6.01

KA_desc

Knowledge of the effect of a loss or malfunction on the following will have on the HRPS: (CFR: 41.7/45.7) Hydrogen recombiners

401-9 Comments:

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2008 SRO NRC Retake Examination

QUESTION 61



| QuestionBank | # KA_system | KA_number | |
|-----------------|---------------------|---------------------------|---|
| 1761 | SYS033 | K4.04 | |
| KA_desc | | | |
| Knowledge of de | esign feature(s) an | d/or interlock(s) which p | provide for the following: (CFR: 41.7) Maintenance of spent fuel pool radiation |

Workers are shuffling fuel assemblies in the Spent Fuel Pool in preparation for placing some new fuel into the pool for an upcoming outage.

- 1. What is the <u>minimum required</u> spent fuel pool water level over the top of the fuel assemblies specified by Technical Specifications to meet the assumptions for iodine decontamination factors following a fuel handling accident?
- 2. By design, what system provides the assured source of makeup to the Spent Fuel Pool?
- A. 1. 23 feet

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- 2. RN
- B. 1. 23 feet 2. RF
- C. 1. 39 feet 2. RN
- D. 1. 39 feet 2. RF

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 61



General Discussion

TS 3.7.14 requires 23 feet of water above the top of the spent fuel assemblies. 39 feet is the spent fuel pool (SFP) low level alarm setpoint. The RN system is the assured makeup source, however for B5b purposes, a fire pump has been purchased and the RF system is capable of using either the portable HALE pump or an RF pump to supply RF water to the SPF. However, it is not the designed assured source.

Answer A Discussion

Correct: TS 3.7.14 requires 23 feet of water above the top of the spent fuel assemblies. The RN system is the assured makeup source to the SFP

Answer B Discussion

Plausible: 23 feet is correct. RF can be used for B.5.B purposes, but is not the designed assured makeup

Answer C Discussion

Plausible: Student may confuse 23 feet with 39 feet (SFP lo level alarm setpoint). RN is assured makeup

Answer D Discussion

Plausible: Student may confuse 23 feet with 39 feet (SFP lo level alarm setpoint). RF can be used for B.5.B purposes, but is not the designed assured makeup

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | KF TS 3.7.14 | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1761 SYS033 K4.04

KA_desc

Knowledge of design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) Maintenance of spent fuel pool radiation

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 62



| QuestionBank | # KA_system | KA_number | |
|--------------------|------------------|----------------------------|---|
| 1762 | SYS035 | A1.02 | |
| KA_desc | | | |
| Ability to predict | and/or monitor c | hanges in parameters (to p | revent exceeding design limits) associated with operating the S/GS controls |
| including: (CFR: | 41.5 / 45.5) S/(| j pressure | |

Unit 1 is in Mode 3 at 2235 psig and 557°F with shutdown banks withdrawn. Given the following conditions and sequence of events:

- Steam pressure and NC Loop temperature are noted to be decreasing rapidly
- The reactor is manually tripped
- Main Steam Isolation does <u>not</u> actuate automatically and manual actuation has failed

Which of the following is a complete list of the valve groups that are ensured to be closed to compensate for the lack of an automatic or manual Main Steam Isolation?

- A. MSIVs and MSIV bypass valves
- B. MSIVs, MSIV bypass valves and S/G PORVs
- C. MSIVs, MSIV bypass valves, S/G PORVs and CAPT steam supplies
- D. MSIVs, MSIV bypass valves, S/G PORVs and S/G PORV block valves

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 62



General Discussion

SM isolation setpoint is 2/3 steam pressures on 1/4 S/Gs < 775 psig. The operator is expected to take manual action for failed auto action. Since the S/G depressurization was not automatically terminated and manual initiation of main steam isolation was unsuccessful, the operator must manually operate and/or ensure the required valves that normally close on main steam isolation are in the closed position. The required valves are the main steam isolations, main steam isolation bypasses and PORVs.

Answer A Discussion

Plausible: The student may not think the PORV is required to isolate the steam line

Answer B Discussion

Correct: The required valves are the main steam isolations, main steam isolation bypasses and PORVs.

Answer C Discussion

Plausible: The student may believe all the correct valves and the CAPT steam supplies need to be isolated. The CAPT steam supplies are isolated in E-2 if faulted and E-3 if ruptured

Answer D Discussion

Plausible: The student may believe all the correct valves and the PORV blocks need to be isolated. PORV blocks are closed to isolate failed or inadvertent operation of PORVs

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|--------------------------|
| RO | Comprehension | BANK | 2004 NRC Q73 (Bank 1273) |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | SM | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1762 | SYS035 | A1.02 |

KA_desc

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the S/GS controls including: (CFR: 41.5 / 45.5) S/G pressure

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 63



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1763 | SYS041 | A4.07 |
| KA_desc | <u> </u> | |

Ability to manually operate and/or monitor in the control room: (CFR: 41.7/45.5 to 45.8) Remote gagging of stuck open-relief valves

Unit 1 was operating at 75.0% power with turbine at 900 MW. Given the following conditions and sequence of events:

- The turbine was placed in "MW IN" for an engineering test
- 1SB-27 (SM Byp Cond Ctrl #27) failed to approximately 75% open
- Attempts to close 1SB-27 from the control room failed and operators were dispatched to close the local manual isolation valve
- Steady state conditions were reached with 1SB-27 not yet isolated
- The engineering test was aborted and the turbine was placed in "MW OUT"
- Operators slowly closed the manual isolation valve for 1SB-27

What are the approximate values of reactor and turbine power when steady state conditions are reached after 1SB-27 is isolated?

Assume:

- Steam flow thru 1SB-27 is approximately linear and proportional with % open
- Steady state is a combined temperature error signal of approximately 0°F

| | Reactor Power | <u>Turbine Power</u> |
|----|---------------|----------------------|
| A. | 72.0% | 865 MW |
| В. | 73.1% | 882 MW |
| C. | 76.9% | 918 MW |
| D. | 78.0% | 935 MW |
| | | |

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination OUESTION 63



General Discussion

Requested K/A change. Discussed with Frank E and he said that we could use "isolate" as gagging to meet the K/A. This was run on the sim and the values were about 932 MW and 77.9% power.

Must know that a condenser dump is worth 4% total steam flow and a PORV is only worth 2.5 (distractor). Also with MW IN - turbine will maintain MW (i.e. 900 MW until MW OUT is selected, at which point when the steam dump is isolated, the turbine load will get the 3% steam flow which was going through the steam dump, increasing turbine load to ~935 MW) and cause reactor power to go up an additional 3% to compensate for the 3% steam flow (i.e. reactor power will increase 6% until the steam dump is isolated, and then the reactor power will decrease 3%, for a final value of 78%}. The reactor and turbine power of ~ +/- 1.9% is if they assume a PORV 75% open rather than a condenser dump. The lower final values are if they reverse the effects of MW IN /OUT and how reactor responds.

Answer A Discussion

Plausible: If student reverses the effects of MW IN /OUT and how reactor responds for a 75% open dump.

Answer B Discussion

Plausible: If student reverses the effects of MW IN /OUT and how reactor responds for a 75% stuck open S/G PORV

Answer C Discussion

Plausible: If the student uses PORV steam worth for dump worth. These would be correct values for a 75% stuck open S/G PORV

Answer D Discussion

Correct: After turbine is in MW OUT and dump has been isolated, Rx power and MW should have increased by \sim 3 %, \sim 78% power and \sim 735 MW from original 75% and 900 MW

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | ide EHC | |
| OPS Approved | SM | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1763 | SYS041 | A4.07 |

KA_desc

Ability to manually operate and/or monitor in the control room: (CFR: 41.7/45.5 to 45.8) Remote gagging of stuck open-relief valves

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 64



| quoodom | same π in r | <_system | KA_number |
|---------|-------------------|----------|-----------|
| 1764 | 1 | SYS045 | K5.01 |

Knowledge of the operational implications of the following concepts as the apply to the MT/B System: (CFR: 41.5 / 45.7) Possible presence of explosive mixture in generator if hydrogen purity deteriorates

What gas is <u>first</u> used to purge the main generator casing when the generator is shutdown for outage maintenance and what is the purpose of the purge?

- A. N2 gas; to prevent condensation in the hot generator windings
- B. CO2 gas; to prevent condensation in the hot generator windings
- C. N2 gas; to prevent an explosive mixture
- D. CO2 gas; to prevent an explosive mixture

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General Discussion

CO2 is used to purge the casing, however N2 is an available gas that is also inert. If the student thinks that H2 and the O2 in the air will combine and condense on the hot windings of the generator when it is shut down for an outage

Answer A Discussion

Plausible: Student may believe that combining H2 and O2 in high temperature environment (e.g. as in H2 recombiner) will result in water in the generator.

Answer B Discussion

Plausible: CO2 is correct. Student may believe that combining H2 and O2 in high temperature environment (e.g. as in H2 recombiner) will result in condensation of water in the generator

Answer C Discussion

Plausible: N2 is not used. Preventing an explosive mixture is correct

Answer D Discussion

Correct: CO2 is used to prevent an explosive mixture

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | EGB | |
| | | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1764 SYS045 K5.01

KA_desc

Knowledge of the operational implications of the following concepts as the apply to the MT/B System: (CFR: 41.5/45.7) Possible presence of explosive mixture in generator if hydrogen purity deteriorates

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 65



| QuestionBank # | KA_system | KA_number | |
|----------------|-----------|-----------|------|
| 1765 | SYS015 | A3.03 | |
| KA_desc | | | |

Ability to monitor automatic operation of the NIS, including: (CFR: 41.7 / 45.5) Verification of proper functioning/operability

Given the following conditions:

- An inadvertent reactor trip has occurred on Unit 1
- The Control Room is performing actions in EP/1/A/5000/ES-0.1 (Reactor Trip Response) when the following indications are noted:
 - Intermediate Range Channel N-35 is reading 5x10E-11 amps and decreasing
 - Intermediate Range Channel N-36 is reading 1x10E-9 amps and stable

Based on current conditions:

- 1. What is the status of source range instruments N-31 and N-32?
- 2. What operator action (if any) is required to ensure both source range instruments are energized?
- A. 1. Both N-31 and N-32 are energized2. No action is required
- B. 1. N-31 is energized; N-32 is <u>not</u> energized
 2. Reset "TRN B SR SELECT" only
- C. 1. N-31 is energized; N-32 is <u>not</u> energized
 2. Reset "TRN A SR SELECT" and "TRN B SR SELECT"
- D. 1. Both N-31 and N-32 are <u>not</u> energized
 2. Reset "TRN A SR SELECT" and "TRN B SR SELECT"

2008 SRO NRC Retake Examination

QUESTION 65



General Discussion

Source range instruments energize automatically at P-6.(10E-10 amps) For the case given, one of the IR instruments is hung up (presumably due to a compensation issue). In this case neither source range instrument will indicate until both trains of SR are reset. Resetting one or the other is plausible because there are some systems (i.e. CA) where resetting a single train provide partial system control.

Answer A Discussion

Plausible: Student may think only 1 IR channel below P-6 will energize the SRs.

Answer B Discussion

Plausible: Student may think P-6 is NI related (N-35 energizes N-31, etc) and only B train SR would require reset

Answer C Discussion

Plausible: Student may think P-6 is NI related (N-35 energizes N-31, etc) and both trains of SR require reset

Answer D Discussion

Correct: Both IR channels must be < P-6 to auto energize the SR. N-36 is undercompensated, which will require both trains of SR to be reset

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Comprehension | BANK | 2006 NRC Q59 (Bank 136) |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | ENB | |
| OPT Approved | | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # KA_system | n KA_number | | |
|----------------------------------|---------------------------|--|--|
| 1765 SYS015 | A3.03 | | |
| KA_desc | | | |
| Ability to monitor automatic ope | ration of the NIS, includ | ing: (CFR: 41.7 / 45.5) Verification of proper functioning/operability | |

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 66

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1766 | GEN2.1 | 2.1.3 |
| KA desc | | 1 |

Conduct of Operations Knowledge of shift or short-term relief turnover practices. (CFR: 41.10/45.13)

Given the following conditions and sequence of events:

- Unit 1 is at 100% power
- Unit 2 is in Mode 5
- No reactivity changes are planned
- Initially there are 2 ROs assigned to each unit
- The Unit 1 BOP is preparing to leave the site but plans to return within an hour
- An RO recently assigned to the procedure group with an active license has reported to the control room to fill-in during the BOP's absence
- 1. Does this situation meet the requirements for "short term relief" as specified in OMP 2-22 (Shift Turnover)?
- 2. Based on these conditions, how many ROs are <u>required</u> to meet the <u>minimum</u> administrative shift manning requirements of OMP 1-10 (Shift Manning and Overtime Requirements)?
- A. 1. No 2. 3
- B. 1. Yes 2. 3
- C. 1. No 2. 4
- D. 1. Yes 2. 4

2008 SRO NRC Retake Examination

QUESTION 66

General Discussion

Because the replacement RO has not been part of the shift activities on this day, he cannot get an abbreviated turnover which is permitted by OMP 2-22. With both units in modes 5, 6, or no mode only 3 RO's would be required. If either unit was in mode 4 or above, then 4 would be needed. In this case 4 are needed.

Answer A Discussion

Plausible: The first part is correct. The requirements for short term relief turnover are not met. The student may believe the 4th RO is unnecessary

Answer B Discussion

Plausible: The requirements for short term relief turnover are not met, and the 4th RO IS required to meet shift manning for these plant conditions. The student may believe the reverse of the correct answer is true.

Answer C Discussion

Correct: The replacement RO has not been part of the shift activities and therefore he cannot meet the requirements for short term relief. With Unit 1 in Mode 1 and Unit 2 in Mode 5, 4 RO's are required

Answer D Discussion

Plausible: The student may believe the short term relief is OK for this situation. The 4th RO IS required to meet shift manning for these plant conditions the second part is correct.

| Job Level | Cognitive | Level | QuestionType | Question Source |
|------------------|----------------|------------------|------------------------------------|-----------------------------|
| RO | Memor | ry 🛛 | NEW | |
| Developed | ł | Develo | opment References | Student References Provided |
| ✓ OPT Approved | | OMP 1 OMP 2 | OMP 1-10 OMP 2-22 | |
| OPS Appr | oved | | | |
| NRC Appr | oved | | | |
| QuestionBank | # KA_system | KA_numb | er | |
| 176 | 56 GEN2.1 | 2.1.3 | | |
| KA_desc | | | | |
| Conduct of Opera | tions Knowledg | ge of shift or s | short-term relief turnover practic | ces. (CFR: 41.10 / 45.13) |

401-9 Comments:

2008 SRO NRC Retake Examination

B

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1767 | GEN2.1 | 2.1.5 |
| KA dose | | |

Conduct of Operations Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. (CFR: 41.10 / 43.5 / 45.12)

QUESTION 67

Per OMP 1-10 (Shift Manning and Overtime Requirements), what is the <u>minimum</u> total number of Fire Brigade members assigned for a given shift and how many of the Fire Brigade members are designated as "first responders"?

- A. 8 total with 3 being designated as first responders
- B. 8 total with 5 being designated as first responders
- C. 10 total with 3 being designated as first responders
- D. 10 total with 5 being designated as first responders

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 67



General Discussion

10 is the minimum ops crew compliment per TS (NLO +RO+SRO). Also ONS uses 5 suppemental members which would be 10/5 as designated first responders. 3 is the number of supplemental (non-first responders) (NSD112)

Answer A Discussion

Plausible: Student may believe only 3 of the 8 minimum assigned are designated first responders, confusing with supplemental members

Answer B Discussion

Correct: Per NSD 112 a total of 8 members are required and per OMP 1-10, 5 of those members must be designated as first responders

Answer C Discussion

Plausible: The student might confuse the total number with the total crew compliment and that only 3 of the assigned are designated first responders,

Answer D Discussion

Plausible: The student might confuse the total number with the total crew compliment, 5 first responders is correct

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | OMP 1-10 NSD112 | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1767 GEN2.1 2.1.5

KA_desc

Conduct of Operations Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. (CFR: 41.10 / 43.5 / 45.12)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 68



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1768 | GEN2.1 | 2.1.7 |
| | | 1 0 .º 1 |

KA_desc

Conduct of Operations Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (CFR: 41.5 / 43.5 / 45.12 / 45.13)

Unit 2 is at 100% Power when an event occurred. The following parameters were noted:

- NC Tavg is 585° F and slowly decreasing
- NC pressure is 2229 psig and slowly decreasing
- Turbine load is 1195 MW and slowly decreasing
- Containment humidity is 14% and stable
- Steam header pressure is 965 psig and slowly decreasing
- S/G levels are all at 67% NR and stable
- PZR level is 54% and slowly decreasing
- Power Range NIs are all at 100.1% and slowly increasing

Which one of the following is the cause of these indications?

- A. Main Turbine Control Valve #4 is failing closed
- B. Feed leak has occurred outside containment
- C. Steam leak has occurred outside containment
- D. NC leak has occurred inside containment

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination **OUESTION 68**

General Discussion

Meets the KA because you are evaluating plant performance data and determining that a problem exists and what that problem is. Indications point to a steam leak outside containment

Answer A Discussion

Plausible: Student may believe this would account for some of the indications, but several would be the opposite of what is in stem.

Answer B Discussion

Plausible: Student may believe this would account for some of the indications, but a feed leak outside would not cause Tavg or MW to drop.

Answer C Discussion

Correct: These are all indications of a steam leak outside containment

Answer D Discussion

Plausible: Student may believe this would account for some of the indications. The NC Leak does not directly affect MW or NC Temp and would increase containment humidity.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Comprehension | BANK | 2006 NRC Q67 (Bank 673) |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | AP/10 AP/28 | |
| OPS Approved | 11/20 | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1768 GEN2.1 2.1.7

KA_desc

Conduct of Operations Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (CFR: 41.5 / 43.5 / 45.12 / 45.13)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 69



| QuestionBank # | KA_system | KA_number |
|----------------|------------------|-----------|
| 1769 | GEN2.2 | 2.2.1 |
| | · · ··· /. · · · | |

KA_desc

Equipment Control Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity. (CFR: 41.5 / 41.10 / 43.5 / 43.6 / 45.1)

The following conditions exist on Unit 1:

- MODE 3 at normal operating temperature and pressure, preparing for a reactor startup
- The reactor coolant system (NC) has been diluted to the estimated critical boron concentration
- 1KC-132 (Letdn Hx Otlt Temp Ctrl) control is in MANUAL
- All other controls are in AUTOMATIC and functioning normally
- Letdown flow is decreased from 100 gpm to 50 gpm

Assuming NO other manipulations, over the next hour, Source Range counts will ______?

- A. INCREASE due to warmer water exiting the letdown heat exchanger
- B. INCREASE due to cooler water exiting the letdown heat exchanger
- C. DECREASE due to warmer water exiting the letdown heat exchanger
- D. DECREASE due to cooler water exiting the letdown heat exchanger

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General Discussion

A decrease in letdown temperature will result in a reduction in boron concentration at the demineralizer outlet due to increased boron ion exchange by the anion resin at lower temperatures. Positive reactivity would be added due to reduced RCS boron concentration. In November of 1996 at Turnkey Point, reactor power increased .3% over a 30 minute period as a result of lowering non-regenerative heat exchanger outlet temperature. Ran on Simulator. Letdown temperature decreased by approximately 15 degrees. Students may think that because letdown is reduced (which will reduce charging (in auto)) that the regen HX will not cool L/D as much going into the L/D hx and offset any additional cooling by KC. This is what would make warmer plausible.

Answer A Discussion

Plausible: Student may think heat exchanger outlet temperature and ion exchange are reverse.

Answer B Discussion

Correct: With KC flow maintained and letdown flow decreased, letdown heat exchanger outlet temperature will decrease, thus removing boron and increasing SR counts

Answer C Discussion

Plausible:Student may think heat exchanger outlet temperature is reverse

Answer D Discussion

Plausible: Student may think ion exchange is reverse.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Comprehension | BANK | 2005 NRC Q70 (Bank 474) |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | OP-CN-PS-NV lesson | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1769 | GEN2 2 | 221 |

KA_desc

Equipment Control Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity. (CFR: 41.5 / 41.10 / 43.5 / 43.6 / 45.1)

401-9 Comments:

2008 SRO NRC Retake Examination

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| | _ |

| QuestionBank # | KA_system | KA_number |
|-------------------|---------------|--------------------------|
| 1770 | GEN2.2 | 2.2.25 |
| KA_desc | dinana i sere | |
| Equipment Control | Knowledge o | f the bases in Technical |

Equipment Control Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. (CFR: 41.5 / 41.7 / 43.2)

QUESTION 70

Per Technical Specification 2.1.2 (RCS Pressure SL):

- 1. What NC System valves are credited to maintain the reactor coolant system below the safety limits?
- 2. What are the modes of applicability of this Technical Specification?
- A. 1. Pzr safety valves only
 - 2. Modes 1, 2, 3 and 4
- B. 1. Pzr safety valves only2. Modes 1, 2, 3, 4 and 5
- C. 1. Pzr safety valves and Pzr PORVs2. Modes 1, 2, 3 and 4
- D. 1. Pzr safety valves and Pzr PORVs2. Modes 1, 2, 3, 4 and 5

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B

General Discussion

Discussed this with Frank since Basis is SRO, but he pointed out that basis of safety limits is NOT SRO only, therefore it IS RO.

Only the safetys are credited on the NC system. Mode 1-5 is the applicability.

Answer A Discussion

Plausible: Student may believe RCS safety limit applies in Modes 1-4

Answer B Discussion

Correct: The pressurizer safety valves are the credited NC system valves per TS 2.1.2 basis and RCS pressure safety limit applies in Modes 1-5 per TS 2.12

Answer C Discussion

Plausible: Student may believe safeties and PORVs are the required NC system valves and that the RCS safety limit applies in Modes 1-4

Answer D Discussion

Plausible: Student may believe safeties and PORVs are the required NC system valves. Modes 1-5 applicability is correct

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| ✓ Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | TS 2.1.2 and basis | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1770 GEN2.2 2.2.25

KA_desc

Equipment Control Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. (CFR: 41.5 / 41.7 / 43.2)

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|--|-----------|
| 1771 | GEN2.3 | 2.3.14 |
| | Constant of a state of the stat | |

QUESTION 71

| 1//1 | GENZ.5 | 2.5.14 | | | |
|-------------------|-----------------|---------------------|-----------------------|--|--|
| KA_desc | | | | | |
| Radiation Control | Knowledge of ra | diation or contamin | ation hazards that ma | | |

Radiation Control Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (CFR: 41.12 / 43.4 / 45.10)

Unit 1 was operating at 77% power. Given the following sequence of events and conditions:

- CA pump 1A was tagged out for work
- A tube rupture occurs in the 1B S/G
- The crew is isolating the 1B S/G in EP/1/A/5000/E-3 (Steam Generator Tube Rupture)
- 1SV-13 (S/G 1B PORV Manual Ctrl) is open and the isolation valve will not close
- RP reports significant contamination and radiation in the Unit 1 interior doghouse
- At Step 4.b of EP/1/A/5000/E-3, the steam supply to the CAPT from 1B S/G must be isolated

Which valve will be used to isolate the CAPT steam supply under the conditions stated above?

- A. 1SA-1 (Main Steam 1B to CAPT Maint Isol)
- B. 1SA-2 (S/G 1B SM to CAPT)
- C. 1SA-3 (S/G 1B SM to CAPT Stop Check)
- D. CAPT #1 trip and throttle valve

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General Discussion

With the 1B S/G ruptured and the 1B S/G PORV intermediate and unable to be isolated, the inside doghouse area would have elevated radiation and contamination levels and would be inaccessible. The CAPT#1 steam supply would normally be isolated using the T&T valve if both motor driven CA pumps were available (1A is not) until 1SA-1 is closed by dispatched operators, at which time the T&T valve would be reopened to make the CAPT#1 available from the 1C S/G supply. Since the doghouse would be inaccessible due to rad and contamination levels, 1SA-3 (aux bldg) would be used to isolate the 1B S/G supply to the CAPT#1.

Answer A Discussion

Plausible: This valve would normally be used for isolation of the CAPT but would be inaccessible in this situation

Answer B Discussion

Plausible: This is an air operated valve and although it is in the steam supply flowpath, it is not used for CAPT isolation purposes

Answer C Discussion

Correct: This valve would be used for the CAPT isolation in this situation

Answer D Discussion

Plausible: The T&T valve is normally closed first, but only if both motor driven pumps are available (1A is not) and then 1SA-1 would be closed (if accessible) to allow the CAPT to be supplied from 1C S/G

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Comprehension | BANK | 2004 NRC Q3 (Bank 1203) |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | E-3 | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_systemKA_number1771 GEN2.32.3.14

KA_desc

Radiation Control Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (CFR: 41.12 / 43.4 / 45.10)

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1772 | GEN2.3 | 2.3.13 |
| | | |

KA_desc

Radiation Control Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (CFR: 41.12 / 43.4 / 45.9 / 45.10)

OUESTION 72

Unit 1 is operating at 75% power. An engineer needs to enter the Reactor Building pipechase area to perform some scoping work for a future modification.

Per Site Directive 3.1.2 (Access to Reactor Building and Areas Having High Pressure Steam Relief Devices):

- 1. What permission is required to allow entry into this area?
- 2. What operational modes <u>require</u> use of the "buddy system" for entry into the Reactor Building?
- A. 1. Radiation Protection and the WCC SRO
 - 2. Modes 1 and 2 only
- B. 1. Radiation Protection and the WCC SRO2. Modes 1, 2, 3 and 4
- C. 1. WCC SRO only 2. Modes 1 and 2 only
- D. 1. WCC SRO only 2. Modes 1, 2, 3 and 4


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General Discussion

Per the SD, a buddy is required in modes 1-4. RP and the WCCSRO permission is required.

Answer A Discussion

Plausible: RP and WCC SRO is correct. Student may believe a buddy is only required in Modes 1 & 2

Answer B Discussion

Correct: RP and WCC SRO permission is required. Buddy system applies in Modes 1-4

Answer C Discussion

Plausible: Student may believe only the WCC SRO permission is required and that the buddy system only applies in Modes 1 & 2.

Answer D Discussion

Plausible: Student may believe only the WCC SRO permission is required. Modes 1-4 is correct

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|----------------|------------------------|-----------------------------|
| ✓ OPT Approved | SD 3.1.2 | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1772 | GEN2.3 | 2.3.13 |
| | | |

KA_desc

Radiation Control Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (CFR: 41.12 / 43.4 / 45.9 / 45.10)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 73



| G | QuestionBank # | KA_system | KA_number |
|---|----------------|-------------------|-------------------------------|
| | 1773 | GEN2.3 | 2.3.7 |
| K | A desc | ditati manatana a | I HANDON IS HIDDELENGI CONTRA |

Radiation Control Ability to comply with radiation work permit requirements during normal orabnormal conditions. (CFR: 41.12 / 45.10)

An RWP that you are preparing to work under states that the highest dose rate in a particular area (at 30 cm) is 325 mR/hr. When you arrive in the area, a flashing yellow light is in the entry path to the area.

- 1. How would an area with a dose rate of 325 mR/hr be posted?
- 2. What is the significance of the flashing yellow light?
- A. 1. Radiation Area
 - 2. Radiography is in progress and no entry is permitted
- B. 1. High Radiation Area2. Radiography is in progress and no entry is permitted
- C. 1. Radiation Area
 - 2. The area is a "Locked" High Radiation Area and the RWP you have <u>cannot</u> be used to enter the area
- D. 1. High Radiation Area
 - 2. The area is a "Locked" High Radiation Area and the RWP you have <u>cannot</u> be used to enter the area

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 73

General Discussion

Dose rates from 100-1000 mR/hr require a posting of HIGH radiation area. A flashing yellow light signifies that an area is a LOCKED high rad area A flashing yellow light is used for "locked high rad areas" (>1 R/hr) where locking is not practical.

Answer A Discussion

Plausible: The student may believe this area should be posted as a radiation area and the flashing yellow light signifies radiography in progress

Answer B Discussion

Plausible: The area should be posted high radiation area. The student may believe the flashing yellow light signifies radiography in progress

Answer C Discussion

Plausible: The student may believe this area should be posted as a radiation area. It is true that the RWP could no longer be used

Answer D Discussion

Correct: Dose rates from 100-1000 mR/hr require a posting of HIGH radiation area. The RWP could no longer be used since area dose rates have increased

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Memory | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Annroved | NSD 507 | |
| | | |
| | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| | | |
| | | |

| 1773 | GEN2.3 | 2.3. | 7 |
|------|--------|------|---|
| | | | |

KA_desc

Radiation Control Ability to comply with radiation work permit requirements during normal orabnormal conditions. (CFR: 41.12 / 45.10)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 74



| QuestionBank # | KA_system | KA_number |
|----------------|----------------------|-----------|
| 1774 | GEN2.4 | 2.4.21 |
| KA_desc | 1 <u>17 5</u> . 1842 | |

Emergency Procedures / Plan Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc. (CFR: 41.7 / 43.5 / 45.12)

Unit 1 was operating at 100% power when a complete loss of offsite power occurred. A LOCA occurred on the transient. Given the following conditions:

- 1A D/G did not start and manual start attempts have failed
- Containment pressure is 3.4 psig
- NC subcooling is -8°F
- Core exit thermocouples are 642°F
- RVLIS level 37%
- S/G NR levels are all 25%
- CA has not been reset
- CA flow is 420 gpm
- I/R SUR is 0 DPM
- S/R SUR is 0.3 DPM

Which one of the following is the highest priority CSF at this time?

- A. SUBCRITICALITY
- B. CORE COOLING
- C. CONTAINMENT
- D. HEAT SINK

2008 SRO NRC Retake Examination

QUESTION 74

General Discussion

Based on conditions, SUBCRITICALITY is YELLOW, CORE COOLING is ORANGE, CONTAINMENT is ORANGE, and HEAT SINK is RED. The RED path for HEAT SINK is the highest priority

Answer A Discussion

Plausible: Even though this is the highest priority left to right, it is only YELLOW, so it is not highest overall.

Answer B Discussion

Plausible: Even though this is higher priority left to right, it is ORANGE and any RED takes priority.

Answer C Discussion

Plausible: This is another orange path, and student may think that this might be red due to only one train of NS

Answer D Discussion

Correct: ACC numbers for S/G levels is 29% to meet heat sink and with total CA flow less than 450 gpm, then Red Path conditions are met and this is the highest priority.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| RO | Comprehension | NEW | |

| De | veloped | Development References | Student References Provided |
|----------|-------------|------------------------|-----------------------------|
| <u>.</u> | | 1. OP-CN-EP-CSF | |
| 🖌 ОР | PT Approved | F-0 | |
| 🗌 ОР | PS Approved | | |
| | C Approved | | |

QuestionBank #KA_systemKA_number1774GEN2.42.4.21

KA_desc

Emergency Procedures / Plan Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc. (CFR: 41.7 / 43.5 / 45.12)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 75



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1775 | GEN2.4 | 2.4.29 |
| KA daga | GEN2.4 | 2.7.27 |

Emergency Procedures / Plan Knowledge of the emergency plan. (CFR: 41.10 / 43.5 / 45.11)

An offsite release is occurring due to a stuck open S/G PORV on 2C S/G which has a significant tube leak.

Which one of the following identifies:

- 1. The on-site emergency facility that assumes responsibility for communications with offsite agencies including the NRC once it is activated?
- 2. What emergency classification(s) <u>require(s)</u> an evacuation of all non-essential personnel?
- A. 1. Technical Support Center (TSC)
 - 2. Site Area Emergency or General Emergency
- B. 1. Technical Support Center (TSC)2. General Emergency only
- C. 1. Operations Support Center (OSC)2. Site Area Emergency or General Emergency
- D. 1. Operations Support Center (OSC)2. General Emergency only

2008 SRO NRC Retake Examination

QUESTION 75



General Discussion

The TSC becomes the station's central control area for emergency response and technical management. The TSC is activated at the Alert Status and will assume responsibility for communication with offsite agencies, including NRC, after activation.

Site Evacuation may occur for Site Area Emergency and ALWAYS occurs for General Emergency, must be preceded by a Site Assembly. All non-essential site personnel should proceed to one of two Evacuation Sites based on site selection criteria.

Answer A Discussion

Plausible: Correct location, but student may believe an evacuation is required at SAE. An evacuation can be done at the SAE level but is REQUIRED at the GE level.

Answer B Discussion

Correct: The TSC will assume responsibility for communication with offsite agencies, including NRC, after activation. Site Evacuation may occur for Site Area Emergency, but is REQUIRED for General Emergency

Answer C Discussion

Plausible: Student may believe the OSC is responsible for communications and an evacuation is required at SAE. An evacuation can be done at the SAE level but is REQUIRED at the GE level.

Answer D Discussion

Plausible: Student may believe the OSC is responsible for communications. An evacuation can be done at the SAE level but is REQUIRED at the GE level.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| RO | Memory | MODIFIED | 2008 NRC Q75 (Bank 581) |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | SEP lesson | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1775 GEN2.4 2.4.29

KA_desc

Emergency Procedures / Plan Knowledge of the emergency plan. (CFR: 41.10 / 43.5 / 45.11)

401-9 Comments:

2008 SRO NRC Retake Examination

QuestionBank #KA_systemKA_number1776APE008AA2.18

QUESTION 76

KA_desc

Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: (CFR: 43.5 / 45.13) Computer indications for RCS temperature and pressure

Unit 1 was operating at 100%. Given the following conditions and sequence of events:

- A pressurizer safety valve opened and did not fully reclose
- The crew manually tripped the reactor, initiated safety injection and entered EP/1/A/5000/E-0 (Reactor Trip or Safety Injection) due to the rapid decrease in NC pressure
- The following indications are noted on the OAC:
 - NC pressure is 1035 psig and stable
 - NC Tavg is 554°F and slowly decreasing
 - PRT pressure is 65 psig and increasing
 - o PRT temperature is 220°F and increasing
- 1. Based on the OAC indications what should the temperature be downstream of the safety valve?
- 2. Which overpressure relief transient was used to determine the <u>design</u> relief capacity of the safety valves?
- A. 1. 550°F
 - 2. NCP locked rotor

B. 1. 550°F

- 2. Main turbine trip
- C. 1. 320°F 2. NCP locked rotor
- D. 1. 320°F 2. Main turbine trip

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General Discussion

For the leaking safety, the tailpipe temeprature is based on the saturation temperature of the pressure downstream of the valve which is 320 degrees based on 65 psig (80 psia). Based on the upstream pressure the temperature would be 550 degrees (this is the TMI issue). Per the basis of TS 3.4.10, the PZR safeties were sized based on a locked rotor event. The safeties handle multiple high pressure scenarios, one of which is a turbine trip.

Answer A Discussion

Plausible: Student may believe this is the correct temperature based on upstream conditions. The event is correct.

Answer B Discussion

Plausible: Student may believe this is the correct temperature based on upstream conditions Even though the turbine trip is something that the safeties are designed to lift for, their capacity is not sized based on this event.

Answer C Discussion

Correct: 320 F is the correct temperature for downstream conditions. Locked rotor event is correct per TS 3.4.10 bases

Answer D Discussion

Plausible: 320 F is the correct temperature for downstream conditions. Even though the turbine trip is something that the safeties are designed to lift for, their capacity is not sized based on this event.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Memory | NEW | |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | TS 3.4.10 and Basis | Steam Tables |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1776 | APE008 | AA2.18 |
| | | |

KA_desc

Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: (CFR: 43.5 / 45.13) Computer indications for RCS temperature and pressure

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1777 | EPE011 | EA2.02 |

QUESTION 77



| KA_desc | |
|---|----------------------------|
| Ability to determine or interpret the following as they apply to a Large Break LOCA: (CFR 43.5 / 45.13) | Consequences to RHR of not |
| resetting safety injection | |

Unit 1 was operating at 100%. Given the following conditions and sequence of events:

- 1A NV pump trips
- A dispatched operator reports an overcurrent relay has actuated on the breaker
- The crew entered AP/1/A/5500/012 (Loss of Charging and Letdown)
- 1B NV pump has just been placed in service
- 1. What is the current status of NV letdown?
- 2. Which one of the following describes the <u>latest</u> time that 1A NV pump can be restored to prevent entering a shutdown action per Technical Specification 3.5.2 (ECCS-Operating)?
- A. 1. In service
 - 2. 72 hours
- B. 1. Isolated
 - 2. 72 hours
- C. 1. In service 2. 78 hours
- D. 1. Isolated 2. 78 hours

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QUESTION 77



General Discussion

Requested a new K/A, was asked to try again by Frank and he mentioned loss of recirc procedure specifically. Called again 10/8 after attempting to write a new question and was unsuccessful. He provided a new KA.

When all charging pumps are tripped, letdown automatically isolates. In this situation, Tech Spec 3.5.2, Condition A, is applied and allows 72 hours of inoperability before the shutdown action is entered with one train of ECCS inoperable. Two trains of ECCS are required operable in Modes 1-3. One train of ECCS consists of one charging pump, one safety injection pump, one RHR pump, and one RHR Hx.

Answer A Discussion

Plausible: Student may not realize letdown automatically isolates on loss of all charging pumps. 72 hours is allowed per TS 3.5.2, Condition A, before Unit 1 is requiremed to be in Mode 3 in the next 6 hours

Answer B Discussion

Correct: When all charging pumps are tripped, letdown automatically isolates. In this situation, Tech Spec 3.5.2, Condition A, is applied and allows 72 hours of inoperability before the shutdown action is entered with one train of ECCS inoperable.

Answer C Discussion

Plausible: Student may not realize letdown automatically isolates on loss of all charging pumps. Student may add the 6 hours allowed to get to Mode 3, resulting in 78 hours.

Answer D Discussion

Plausible: When all charging pumps are tripped, letdown automatically isolates. The student may add the 6 hours allowed to get to Mode 3, resulting in 78 hours.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Memory | NEW | |

| ✓ Developed | Development References | Student References Provided |
|-------------|------------------------|-----------------------------|
| OPT Approv | ed TS3.5.2 AP/12 | |
| | ed | |
| NRC Approv | ed | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1777 | EPE011 | EA2.02 |
| | | |

KA_desc

Ability to determine or interpret the following as they apply to a Large Break LOCA: (CFR 43.5 / 45.13) Consequences to RHR of not resetting safety injection

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 78

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1778 | EPE038 | 2.4.18 |
| KA_desc | | |

EPE038 GENERIC Knowledge of the specific bases for EOPs. (CFR: 41.10 / 43.1 / 45.13)

Unit 2 was operating at 100% power. Given the following conditions and sequence of events:

- Manual reactor trip and safety injection occurred due to a tube rupture on 2A S/G
- A complete loss of offsite power occurs
- All S/G pressures have been maintained stable by automatic operation of the S/G PORVs
- The crew is in EP/2/A/5000/E-3 (Steam Generator Tube Rupture) cooling down the NC system to the required core exit temperature based on 2A S/G pressure
- Current NC loop Tcolds are:
 - \circ A Loop 245°F
 - B Loop 520°F
 - C Loop 526°F
 - D Loop 518°F
- 1. What is the basis for the required core exit temperature selection?
- 2. What is the correct procedure flowpath for this situation?
- A. 1. To ensure intact S/G pressures will remain above the main steam isolation setpoint for the NC system cooldown and depressurization
 - 2. Transition to EP/2/A/5000/FR-P.1 (Response to Imminent Pressurized Thermal Shock Condition)
- B. 1. To ensure intact S/G pressures will remain above the main steam isolation setpoint for the NC system cooldown and depressurization
 - 2. Continue in EP/2/A/5000/E-3 (Steam Generator Tube Rupture)
- C. 1. To establish and maintain subcooling for the NC system cooldown and depressurization
 - 2. Transition to EP/2/A/5000/FR-P.1 (Response to Imminent Pressurized Thermal Shock Condition)
- D. 1. To establish and maintain subcooling for the NC system cooldown and depressurization
 - 2. Continue in EP/2/A/5000/E-3 (Steam Generator Tube Rupture)

2008 SRO NRC Retake Examination

QUESTION 78



General Discussion

The core exit temperature selected is based on the lowest ruptured S/G pressure in order to establish adequate subcooling margin. The pressure in the intact S/G's must be maintained less than the ruptured S/G in order to maintain subcooling.

Based on S/G pressure being controlled by the S/G PORV's, the NC system would be cooled down to 520 F based on core exit

thermocouples. The saturation pressure for 520F is ~825psig which is 50# > the SM isolation setpoint giving a plausible distractor. With NCP's off, E-3 directs disregarding the T-cold in the ruptured loop because it may cause an invalid Integrity Status Tree condition. This may be due to reverse flow during cooldown or SI flow redirection during depressurization. If an orange or red path is encountered due to the ruptured S/G T-Cold then the crew would NOT transition to P.1

Answer A Discussion

Plausible: The student may believe the temperature is selected is to prevent a main steam isolation. The student may believe transition to FR-P.1 is required, but E-3 directs disregarding the T-cold in the ruptured loop if no NCPs are on

Answer B Discussion

Plausible: The student may believe the temperature is selected is to prevent a main steam isolation. Continuing in E-3 is the correct procedure flowpath

Answer C Discussion

Plausible: The core exit temperature selected is based on the lowest ruptured S/G pressure in order to establish adequate subcooling margin. The student may believe transition to FR-P.1 is required, but E-3 directs disregarding the ruptured loop T-cold

Answer D Discussion

Correct: The core exit temperature selected is based on the lowest ruptured S/G pressure in order to establish adequate subcooling margin. Continuing in E-3 is the correct procedure flowpath

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|-----------------------------------|-----------------------------|
| OPT Approved | EP-3 and background document, P.1 | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1778 EPE038 2.4.18

1778 EPE038 2.4.18

KA_desc

EPE038 GENERIC Knowledge of the specific bases for EOPs. (CFR: 41.10 / 43.1 / 45.13)

401-9 Comments:

OUESTION 79

2008 SRO NRC Retake Examination

B

APE054 GENERIC Ability to locate and operate components, including local controls. (CFR: 41.7 / 45.7)

Unit 1 was operating at 100% power and Unit 2 was in No Mode when terrorist explosions resulted in a total loss of switchyard 2 hours ago. Given the following events and conditions:

- 1A D/G failed to start
- The terrorists have broken through the security fence and taken control of the Secondary Alarm Station (SAS)
- The OSM orders an evacuation of the control room due to the ongoing security threat per AP/1/A/5500/017 (Loss of Control Room)
- 1. Which Unit 1 CA pump(s) is/are currently available and can be controlled from the location to which the crew is evacuated?
- 2. What is the current emergency classification for this situation?

Reference provided

- A. 1. CAPT #1 only 2. Alert
- B. 1. CAPT #1 only2. Site Area Emergency
- C. 1. CAPT #1 and 1B motor driven CA Pump 2. Alert
- D. 1. CAPT #1 and 1B motor driven CA Pump 2. Site Area Emergency

2008 SRO NRC Retake Examination

QUESTION 79



General Discussion

All CF flow is lost because with the loss of offsite power, vacuum is lost and 1A CA has no power. This makes answers C 1 and D 1 plausible but not correct. The knowledge is to know WHERE to send the crew. For terrorist threats, the SSF is manned, not the ASP. The only controls available for CA from the SSF is the CAPT. The ASP has controls for all CA pumps. The classification is an SAE due to the security event. It would be an ALERT due to power loss alone. Must understand that the AP evacuates to the SSF directly on security threats.

Answer A Discussion

Plausible: The CAPT is the only CA source which can be controlled from the SSF. The student may believe this is an Alert because without a security threat or if the threat was not within a vital area, it would be an ALERT.

Answer B Discussion

Correct: The crew has evacuated to the SSF and the CAPT is the only CA source which can be controlled from the SSF. The classification is an SAE (4.6.S.1-1) due to the security event.

Answer C Discussion

Plausible: The student may believe that the evacuation is to the ASP and may believe the classification is an Alert because without a security threat or if the threat was not within a vital area, it would be an ALERT.

Answer D Discussion

Plausible: The student may believe that the evacuation is to the ASP. The classification is an SAE (4.6.S.1-1) due to the security event.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| | Development References | Student References Provided |
|----------------------------------|------------------------|--|
| OPT Approved | RP/01 AP/17 | RP/0/A/5000/001 (Classification of Emergency) Enclosure 1 |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1779 APE054 2.1.30

KA_desc

APE054 GENERIC Ability to locate and operate components, including local controls. (CFR: 41.7 / 45.7)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 80

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1780 | APE077 | 2.4.18 |
| KA_desc | | |

APE077 GENERIC Knowledge of the specific bases for EOPs. (CFR: 41.10 / 43.1 / 45.13)

Unit 1 is operating at 100% power and Unit 2 is in No Mode. Given the following:

- 1100 Catawba switchyard voltage is abnormally low due to a loss of a large section of the east coast electrical grid
- 1102 The crew enters AP/1/A/5500/037 (Generator Voltage and Electric Grid Disturbances), Case I (Abnormal Generator or Grid Voltage)
- 1110 The TCC reported that RTCA (Real Time Contingency Analysis) indicates CNS switchyard voltage would <u>not</u> be adequate if Unit 1 should trip
- 1310 The crew notified SPOC to install jumpers per AM/1/A/5100/008 (4Kv Essential Power (EPC) System Degraded Voltage Logic) per AP/1/A/5500/037.
- 1. How (if at all) does the RTCA status at 1110 affect Technical Specifications for shared systems (RN,VC,YC,VA)?
- 2. What is the basis for installing these jumpers under the current conditions?
- A. 1. Shared systems (RN,VC,YC,VA) are operable
 - 2. To initiate and seal in a blackout signal to the D/G sequencer to prevent multiple actuations due to unstable grid conditions
- B. 1. Shared systems (RN,VC,YC,VA) are operable
 - 2. To prevent the D/G sequencer from restarting the sequence on a LOCA signal after 5 seconds due to a degraded bus voltage situation
- C. 1. Shared systems (RN,VC,YC,VA) are inoperable
 - 2. To initiate and seal in a blackout signal to the D/G sequencer to prevent multiple actuations due to unstable grid conditions
- D. 1. Shared systems (RN,VC,YC,VA) are inoperable
 - 2. To prevent the D/G sequencer from restarting the sequence on a LOCA signal after 5 seconds due to a degraded bus voltage situation

2008 SRO NRC Retake Examination

QUESTION 80



General Discussion

In AP/37, the shared systems that require a normal and emergency power source are declared inoperable when the TCC reports that the RTCA indicates switchyard voltage would be inadequate on a trip. The reason jumpers are placed is to prevent the D/G from loading the loca loads and then load shedding and restarting the LOCA loads due to the degraded buss conditons 5 seconds later.

Answer A Discussion

Plausible: Student may believe shared systems are still operable until the Unit should trip. 2nd part is plausible, because the jumpers do cause a B/O to be initiated immediately if a LOCA occurs, but B/O signal does not seal in.

Answer B Discussion

Plausible: Student may believe shared systems are still operable until the Unit should trip. Jumpers are placed to prevent "double sequencing" of LOCA loads due to a B/O after 5 seconds when buss voltage is degraded

Answer C Discussion

Plausible: Shared systems are inoperable per AP/37. 2nd part is plausible because the jumpers do cause a B/O to be initiated immediately if a LOCA occurs, but B/O signal does not seal in.

Answer D Discussion

Correct: Shared systems are inoperable per AP/37. Jumpers are placed to prevent "double sequencing" of LOCA loads due to a B/O after 5 seconds when buss voltage is degraded

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | EQB | |
| OPS Approved | EN 151 | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1780 | APE077 | 2.4.18 |
| KA dasa | | |

KA_desc

APE077 GENERIC Knowledge of the specific bases for EOPs. (CFR: 41.10 / 43.1 / 45.13)

401-9 Comments:

QUESTION 81

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1781 | WE05 | EA2.1 |
| | teres | |

KA_desc

Ability to determine and interpret the following as they apply to the (Loss of Secondary Heat Sink) (CFR: 43.5/45.13) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Unit 1 was operating at 50% power. Given the following:

Initial Conditions

- 1A CA pump red tagged for PMs
- UST level is 104%
- During a board walkdown, 1CA-6 (CA Pmps Suct From CA CST) was noted to be closed

Final Conditions

- The reactor was manually tripped due to a main steam equalization header break
- All power is lost to 1ETB
- 1SM-5 (S/G 1B SM Isol) failed to close
- 1SM-3 (S/G 1C SM Isol) failed to close
- 1A S/G conditions NR level is 10%; pressure is 650 psig
- 1B S/G conditions NR level is 0%; pressure is 5 psig
- 1C S/G conditions NR level is 0% ; pressure is 7 psig
- 1D S/G conditions NR level is 8% ; pressure is 675 psig
- The crew is preparing to exit EP/1/A/5000/E-0 (Reactor Trip or Safety Injection)
- 1. Based on the <u>Initial Conditions</u>, how many CA pumps were <u>required</u> to be declared inoperable per Technical Specifications?
- 2. What procedure will be used next?
- A. 1. 1A CA Pump only
 - 2. EP/1/A/5000/E-2 (Faulted Steam Generator Isolation)
- B. 1. All three CA pumps
 2. EP/1/A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink)
- C. 1. 1A CA Pump only
 2. EP/1/A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink)
- D. 1. All three CA pumps
 2. EP/1/A/5000/E-2 (Faulted Steam Generator Isolation)

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General Discussion

Only 1 CA pump is required to be declared inoperable per the initial conditions. Closing 1CA-6 does not make any CA pumps inoperable, this would only affect TS 3.7.6. E-2 would be the correct procedure under the stated conditions if this were Unit 2, but the heat sink requirements for Unit 1 are higher (11% versus 9% for unit 2) Student must also understand that they have no CA flow since CAPT has no pressure amd 1A and 1B are not powered for various reasons and therefore FR-H.1 entry conditions are met (No S/G NR level >11% and total feedwater flow <450 gpm).

Answer A Discussion

Plausible: Only 1A CA pump is inoperable. Part 2 is plausible because E-2 would be the correct procedure for Unit 2 under the stated conditions

Answer B Discussion

Plausible:: Candidate may believe all CA pumps are inoperable because the CACST is isolated. FR-H.1 entry conditions are met

Answer C Discussion

Correct: Only 1A CA pump is inoperable and FR-H.1 entry conditions are met

Answer D Discussion

Plausible: Candidate may believe all CA pumps are inoperable because the CACST is isolated. Part 2 is plausible because E-2 would be correct for Unit 2 under the stated conditions

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| | Developed | Development References | Student References Provided |
|--------------|--------------|--|-----------------------------|
| | | EP/1/A/5000/FR-H.1 | |
| \checkmark | OPT Approved | EP/1/A/5000/FR-E-2 | |
| | OPS Approved | EP/1/A/5000/FR-E-0 TS 3.8.1 and basis | |
| | NRC Approved | | |
| | | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1781 | WE05 | EA2.1 |
| | | |

KA_desc

Ability to determine and interpret the following as they apply to the (Loss of Secondary Heat Sink)

(CFR: 43.5/45.13) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 82



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1782 | APE005 | AA2.04 |
| KA desc | | |

Ability to determine and interpret the following as they apply to the Inoperable / Stuck Control Rod: (CFR: 43.5 / 45.13) Interpretation of computer in-core TC map for inoperable/stuck rod location

Unit 1 is operating at 98% power. A surveillance test per PT/1/A/4600/001 (RCCA Movement Test) is in progress. At 0200, as Control Bank D was being moved, control rod H-8 did <u>not</u> move and another rod in Control Bank D slipped to 120 steps withdrawn and stopped. IAE has determined both rods are untrippable. A boration is in progress because SDM is <u>not</u> met. This is an incore thermocouple map one minute later.

| | R | Р | Ν | М | L | к | J | н | G | F | E | D | С | в | А |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | | | | | | 576 | | 572 | | 576 | | | | _ | |
| 2 | | | 546 | | 599 | | 611 | | 603 | | 605 | | | | |
| 3 | | | | 605 | | | | 624 | | | | BAD | | 569 | |
| 4 | | | 597 | | 602 | | | | 609 | | | | 617 | | |
| 5 | | 602 | | | | 625 | | | | 616 | | | | 614 | |
| 6 | 563 | | 611 | | | | 611 | | | | 626 | | 623 | | 568 |
| 7 | | 602 | | 606 | | | | 617 | | | | 620 | | | |
| 8 | 561 | | | | 612 | | 634 | | 572 | | | | 626 | | |
| 9 | | 619 | | | | 611 | | | | 613 | | | | 614 | |
| 10 | 548 | | 610 | | | | 606 | | | | 613 | | | | 574 |
| 11 | | | | 627 | | | | BAD | | | | 610 | | 614 | |
| 12 | | | 612 | | 599 | | | | 608 | | | | 622 | | |
| 13 | | | | 620 | | 619 | | | | 576 | | 626 | | 562 | |
| 14 | | | 540 | | 628 | | 613 | | 608 | | 614 | | | | - |
| 15 | | | | | | BAD | | 622 | | 580 | | | | • | |
| | | | | , | | | | | | | | - | | | |

Which single rod has slipped into the core to 120 steps withdrawn, and assuming SDM is still <u>not</u> met, what is the <u>earliest</u> time the crew is <u>required</u> to be \leq 75% power per Technical Specification 3.1.4 (Rod Group Alignment Limits)?

- A. Rod D-12; 0400
- B. Rod M-4; 0400
- C. Rod D-12; 0800
- D. Rod M-4; 0800

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination OUESTION 82

General Discussion

changed "DROPPED TO STUCK IN KA. Wrong KA per Frank

Based on the map provided, ROD M4 is the correct rod (temperature is depressed in this area and higher in opposite side of core. Based on one rod being outside group alignment limits (H-8 should be within 12 steps because rod withdrawl would be halted when it did not move), the crew has 2 hours to get to $\leq 75\%$ per TS 3.1.4- B.2.2. Additionally for the untrippable rods they have 6 hours to be in Mode 3 per TS 3.1.4- A.2 and therefore 0800 is plausible.

Answer A Discussion

Plausible: Student may believe rod D-12 is the affected rod (located in control bank D). 0400 is the correct time required to be </= 75% power

Answer B Discussion

Correct: Based on the map provided, ROD M4 is the indicated rod that slipped to 120 swd (temperature is depressed in this area and higher in opposite side of core). Per TS 3.1.4, Condition A and Condition B apply and must be </= 75% power by 0400.

Answer C Discussion

Plausible: Student may believe rod D-12 is the affected rod (located in control bank D). Student may believe 6 hrs to be <75% but actually Mode 3 per TS 3.1.4- A.2 and therefore 0800 is plausible.

Answer D Discussion

Plausible: Based on the map provided, ROD M4 is the indicated rod that slipped to 120 swd (temperature is depressed in this area and higher in opposite side of core). 6 hours to Mode 3 per TS 3.1.4- A.2 and therefore 0800 is plausible.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-------------------------------|-----------------|---------------------------------|-----------------------------|
| SRO | Comprehension | NEW | |
| | Dev | velopment References | Student References Provided |
| OPT Appro | TS TS | 3.1.4 and basis 1/A/4600/001 | |
| OPS Appre | oved | | |
| | oved | | |

QuestionBank # KA_system KA_number

1782 APE005 AA2.04

KA_desc

Ability to determine and interpret the following as they apply to the Inoperable / Stuck Control Rod: (CFR: 43.5 / 45.13) Interpretation of computer in-core TC map for inoperable/stuck rod location

401-9 Comments:

2008 SRO NRC Retake Examination

 QuestionBank #
 KA_system
 KA_number

 1783
 APE032
 2.4.4

 KA_desc
 Image: Constraint of the system o

APE032 GENERIC Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6)

QUESTION 83

Unit 1 was in Mode 6 performing core alterations. Given the following conditions and sequence of events:

- N-32 was removed from service 3 days ago
- 1AD-2, E/2 (TRAIN A SHUTDOWN MARGIN ALARM) is LIT
- N-31 indicates 1.1 x10² cps
- BDMS Train A train indicates "E1"
- BDMS Train B indicates 1.4 x10² cps
- 1. What procedure is entered to address the stated conditions?
- 2. Can core alterations continue based on the above conditions?
- A. 1. AP/1/A/5500/013 (Boron Dilution) 2. Yes
- B. 1. AP/1/A/5500/013 (Boron Dilution)2. No
- C. 1. AP/1/A/5500/016 (Malfunction of Nuclear Instrumentation System)2. Yes
- D. 1. AP/1/A/5500/016 (Malfunction of Nuclear Instrumentation System)2. No



2008 SRO NRC Retake Examination

QUESTION 83



General Discussion

Both APs have an entry condition S/R Hi flux at shutdown, but only AP/13 has entry conditions for the alarm given. With 2 instruments having approximately the same value, they should be determined to be operable. (N31 and BDMS B train). TS 3.9.2 (Mode 6) requires 2 neutron flux source range monitors which can be any combination of SR NIs or BDMS channels. If the student believes both BDMS channels are required, then suspension of core alterations is plausible. The basis of the TS states that the Nis or the BDMS channels can be used in any combination to meet the 2 channels required by the LCO.

Answer A Discussion

Correct: Shutdown margin alarm is addessed per AP/13.

2 required source range flux monitors (N-31

and B BDMS) are operable and core alterations may continue

Answer B Discussion

Plausible: This is the correct procedure. If the student believes both BDMS channels are required, then suspension of core alterations is plausible.

Answer C Discussion

Plausible: AP/16 is the wrong procedure and will not perform actions required to regain control after BDMS alarms, however since it is also considered source range monitoring, AP/16 seems like a logical choice. Core alterations can continue.

Answer D Discussion

Plausible: AP/16 is the wrong procedure and will not perform actions required to regain control after BDMS alarms, however since it is also considered source range monitoring, AP/16 seems like a logical choice. Also, core alterations can continue.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | ENC | |
| OPT Approved | AP/16 | |
| | AP/13 | |
| OPS Approved | TS 3.9.2 and basis | |
| NRC Approved | 1AD-2 Annunc resp | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1783 | APE032 | 2.4.4 |

KA_desc

APE032 GENERIC Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6)

401-9 Comments:

401-9 Comments RESPONSE

Monday, October 19, 2009

2008 SRO NRC Retake Examination

QUESTION 84



| (| QuestionBank # | KA_system | KA_number | |
|---|----------------|-----------|-----------|---|
| | 1784 | APE033 | 2.1.30 | |
| I | KA_desc | | | × |

APE033 GENERIC Ability to locate and operate components, including local controls. (CFR: 41.7 / 45.7)

Unit 2 is at 9% power performing a startup. Given the following:

- Intermediate Range channel N-35 fails low
- The crew removes N-35 from service per the applicable abnormal procedure
- IAE estimates 30 hours for repair of N-35
- 1. When removing N-35 from service per the abnormal procedure, which fuses (if any) are removed?
- 2. Which course of action can be taken to maintain compliance with Technical Specification 3.3.1 (Reactor Trip Instrumentation) until N-35 can be returned to service in 30 hours?
- A. 1. The control power fuses
 - 2. Maintain current power level until N-35 is repaired
- B. 1. The control power fuses2. Increase reactor power to 12% over the next 6 hours
- C. 1. No fuses are removed2. Maintain current power level until N-35 is repaired
- D. 1. No fuses are removed
 - 2. Increase reactor power to 12% over the next 6 hours

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination OUESTION 84



General Discussion

Discussed wanting to change this K/A since the question we have does not appear to be SRO. Frank asked us to try again 10/8/09 he was OK with assessing indications/conditions versus locating /operating.

This is assessing current plant conditions and noting that you are >P6 (10-10 amps) and < P10 (10%) and determining a course of action that complies with TS 3.3.1 which allows 24 hours to repair N35 or be in a place where the TS doesn't apply. This can be done by reducing power to < P6 or increasing power > P10. Maintaining current power level is plausible because a student may believe that power cannot be increased with only one IR channel operable. Control power fuses are not removed for the IR instruments per AP/16. This is something IAE might do. The control power fuses for the power range Nis are removed when a channel fails.

Answer A Discussion

Plausible: Control power fuses are removed for PR failures. The student may believe that power cannot be increased with only one IR channel operable.

Answer B Discussion

Plausible: Control power fuses are removed for PR failures. Increasing power > P-10 (10%) within 24 hours is a correct action

Answer C Discussion

Plausible:Control power fuses are not removed. The student may believe that power cannot be increased with only one IR channel operable.

Answer D Discussion

Correct: Control power fuses are not removed. Increasing power > P-10 (10%) within 24 hours is a correct action

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| | Development References | Student References Provided |
|--------------|--------------------------------------|-----------------------------|
| OPT Approved | AP/16, case III and T.S. 3.3.1 bases | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1784 | ADE033 | 2 1 30 |

KA_desc

APE033 GENERIC Ability to locate and operate components, including local controls. (CFR: 41.7 / 45.7)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 85

| QuestionBank | # KA_system | KA_number | |
|-------------------|---------------------|-------------------------|---|
| 1785 | APE067 | AA2.02 | |
| KA_desc | <u> </u> | A manual of the | |
| Ability to determ | ine and interpret 1 | he following as they ap | ly to the Plant Fire on Site: (CFR: 43.5 / 45.13) Damper posi |

.....

A fire on site resulted in a large amount of smoke entering the Auxiliary Building Ventilation (VA) system ductwork.

- 1. What affect will this situation have on VA system operation?
- 2. Once all automatic actions associated with the VA system have occurred based on the conditions above, is the VA system considered operable per Technical Specifications?
- 1. VA Supply fans (ABSU) will trip only Α. 2. Yes
- Β. 1. VA Supply fans (ABSU) will trip only 2. No
- C. 1. VA Supply fans (ABSU) will trip and the ABSU inlet dampers will close 2. Yes
- D. 1. VA Supply fans (ABSU) will trip and the ABSU inlet dampers will close 2. No

FOR REVIEW ONLY - DO NOT DISTRIBUTE2008 SRO NRC Retake ExaminationQUESTION 85

General Discussion

When smoke is detected in the VA ductwork, the VA supply fans will trip and the inlet dampers will close. The supply fans and unfiltered exhaust fans are not required to meet TS 3.7.12, only the filtered exhaust fans. SRO only because a determination of system operability must be made based on equipment status.

Answer A Discussion

Plausible: Student may believe only the supply fans will trip on smoke detection. VA is operable with this alignment

Answer B Discussion

Plausible: Student may believe only the supply fans will trip on smoke detection. Second part is plausible because the VC system is inoperable if its supply dampers are closed.

Answer C Discussion

Correct: VA supply fans will trip and the inlet dampers will close. VA is operable with this alignment

Answer D Discussion

Plausible: VA supply fans will trip and the inlet dampers will close. Second part is plausible because the VC system is inoperable if its supply dampers are closed.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | VA TS 3.7.12 | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1785 APE067 AA2.02

KA_desc

Ability to determine and interpret the following as they apply to the Plant Fire on Site: (CFR: 43.5 / 45.13) Damper position

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 86



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1786 | SYS003 | A2.02 |

KA_desc

Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45/13) Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP

Unit 2 was at 3% power and increasing. Given the following:

- 2AD-7 C/1 NCP #1 "SEAL LEAKOFF HI FLOW" is LIT
- 2B NCP seal leakoff is 6.5 gpm
- 2B NCP Seal Outlet temperature is 165°F and stable
- 2B NCP Lower Bearing temperature is 140°F and stable
- The crew enters AP/2/A/5500/008 (Malfunction of Reactor Coolant Pump)

What is the maximum time 2B NCP can remain in service and what procedure does AP/2/A/5500/008 direct the crew to enter <u>after</u> the pump is tripped?

- A. 5 minutes; EP/2/A/5000/E-0 (Reactor Trip or Safety Injection)
- B. 5 minutes; AP/2/A/5500/004 (Loss of Reactor Coolant Pump)
- C. 8 hours; OP/2/A/6100/002 (Controlling Procedure For Unit Shutdown)
- D. 8 hours; AP/2/A/5500/004 (Loss of Reactor Coolant Pump)

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination OUESTION 86



General Discussion

SRO ONLY because it is asking for steps within the body of the procedure and making decisions about procedure flowpath based on indications. Per AP/08 (Malfunction of Reactor Coolant Pump) with # 1 seal leakoff flow > 6 gpm but < 7.5 gpm and # 1 seal outlet or lower bearing temperatures NOT increasing, the affected NC pump must be shutdown within 8 hrs. If #1 seal outlet or lower bearing temperatures ARE increasing, then the affected NC pump must be shutdown within 5 minutes. After all actions have been taken (Unit shutdown with control banks inserted) the pump is tripped and the crew will GO TO AP/04 (Loss of reactor Coolant Pump)

Answer A Discussion

Plausible: IF temperature on the lower bearing or # 1 seal outlet was increasing, then this would be correct.

Answer B Discussion

Plausible: This would be correct if leakoff was greater than 7.5 gpm or if #1 seal outlet or lower bearing temperatures ARE increasing and control banks were inserted

Answer C Discussion

Plausible: The time is correct, but althought this procedure is plausible, its not the correct procedure.

Answer D Discussion

Correct: Per AP/08, step 13. After all actions have been taken (Unit shutdown with control banks inserted) the pump is tripped and the crew will GO TO AP/04 (Loss of reactor Coolant Pump)

| Job Level | Cognitive Level | QuestionType | Question Source | |
|---|-----------------|----------------------------------|-----------------------------|--|
| SRO | Memory | MODIFIED | 2008 NRC Q86 (Bank 592) | |
| Developed OPT Appro OPS Appro | bved | Development References AP/008 | Student References Provided | |
| | oved | | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1786 | SYS003 | A2.02 |
| | | |

KA_desc

Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45/13) Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP

401-9 Comments:

2008 SRO NRC Retake Examination

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1787 | SYS008 | 2.4.9 |
| | | |

KA_desc SYS008 GENERIC Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)

OUESTION 87

Unit 1 is at 450°F and 1860 psig heating up with shutdown banks withdrawn following a refueling outage. Given the following conditions and sequence of events:

Initial Conditions

- All KC is lost and no KC pumps can be immediately restarted per AP/1/A/5500/021 (Loss of Component Cooling)
- YD has been manually aligned to provide cooling to 1A NV pump
- Letdown is manually isolated and pressurizer level is increasing

Final Conditions

- The crew tripped the reactor and all reactor coolant pumps
- The resultant transient causes a CRDM housing leak estimated to be approximately 200 gpm
- The crew manually safety injected
- KC has not yet been restored
- 1. What procedure direction does AP/1/A/5500/021 provide for maintaining NC pump seal injection for the current situation?
- 2. What procedure will the crew "GO TO" based on the final conditions?
- A. 1. Maintain YD aligned to 1A NV pump and continuously monitor motor cooler flows, motor bearing temperatures and motor stator temperature
 - 2. EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection)
- B. 1. Maintain YD aligned to 1A NV pump and continuously monitor motor cooler flows, motor bearing temperatures and motor stator temperature
 2 AP/1/A/5500/027 (Shutdown LOCA)
 - 2. AP/1/A/5500/027 (Shutdown LOCA)
- C. 1. Realign KC to the 1A NV pump, start the Standby Makeup Pump, and after a maximum of 10 minutes secure the 1A NV pump
 - 2. EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection)
- D. 1. Realign KC to the 1A NV pump, start the Standby Makeup Pump, and after a maximum of 10 minutes secure the 1A NV pump
 - 2. AP/1/A/5500/027 (Shutdown LOCA)

FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination **QUESTION 87**

General Discussion

YD must be isolated and KC must be realigned to NV pumps if a safety injection occurs per AP/21. The standby makeup pump provides seal injection then. The crew must secure the NV pump within 10 minutes per enclosure 7 of AP21. The correct procedure to address the SI is E-0. AP/27 is not used unless in Mode 4 or in Mode 3 with the CLAs isolated (which they would not be in this situation).

Answer A Discussion

Plausible: Student may believe YD alignment can be maintained. E-0 is the correct procedure to address the SI

Answer B Discussion

Plausible: Student may believe YD alignment can be maintained. Student may believe AP/27 is appropriate procedure to address the SI

Answer C Discussion

Correct: YD must be isolated and KC must be realigned to NV pumps if a safety injection occurs. E-0 is the correct procedure to address the SI

Answer D Discussion

Plausible: YD must be isolated and KC must be realigned to NV pumps if a safety injection occurs. Student may believe AP/27 is appropriate procedure to address the SI

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | AP05 AP27 | |
| OPS Approved | AP21 | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1787 SYS008 2.4.9

KA_desc

SYS008 GENERIC Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)

401-9 Comments:

2008 SRO NRC Retake Examination

QuestionBank # KA_systemKA_number1788SYS039A2.02

KA_desc

Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5/43.5/45.3/45.13) Decrease in turbine load as it relates to steam escaping from relief values.

OUESTION 88

Given the following:

- Rod control is in MANUAL.
- Turbine power has decreased from 1227 MW to 1164 MW and stabilized.
- Security has reported significant steam escaping from the interior doghouse

What single steam relief valve passing full flow produced the conditions noted and what actions were directed by the procedure the crew <u>initially</u> implemented based on the stated conditions?

- A. A steam line safety; trip the reactor and go to EP/1/A/5000/E-0 (Reactor Trip or Safety Injection.
- B. A S/G PORV; trip the reactor and go to EP/1/A/5000/E-0 (Reactor Trip or Safety Injection.
- C. A S/G PORV; initiate a unit shutdown per AP/1/A/5500/009 (Rapid Downpower)
- D. A steam line safety; initiate a unit shutdown per AP/1/A/5500/009 (Rapid Downpower)



FOR REVIEW ONLY - DO NOT DISTRIBUTE 2008 SRO NRC Retake Examination QUESTION 88



General Discussion

A PORV is ~ 2.5% steam flow and a safety is ~ 5%. The turbine MW reduction represents one S/G safety valve full open (~60 MW). This would be ~30MW with a PORV full open. AP/28 directs tripping the reactor and entering E-0 if a steam leak is not < 5%. Otherwise a load reduction is performed per AP/09 (or the OP which is not an answer choice).

Answer A Discussion

Correct: AP/28 directs tripping the reactor and entering E-0 if a steam leak is NOT < 5%.

Answer B Discussion

Plausible: Student may believe Mw reduction is due to a S/G PORV, E-0 is the correct procedure direction

Answer C Discussion

Plausible: Student may believe Mw reduction is due to a S/G PORV and that a unit shutdown is necessary per AP/09

Answer D Discussion

Plausible: S/G safety valve full open (~60 MW) is correct. Student may believe that a unit shutdown is necessary per AP/09

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| SRO | Comprehension | MODIFIED | 2008 NRC Q88 (Bank 594) |

| | 1 | Development References | Student References Provided |
|-----------|------|------------------------|-----------------------------|
| OPT Appro | oved | AP/28 and basis SM | |
| OPS Appro | oved | | |
| | oved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1788 | SYS039 | A2.02 |
| | | <u>.</u> |

KA_desc

Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5/43.5/45.3/45.13) Decrease in turbine load as it relates to steam escaping from relief valves.

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 89



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1789 | SYS063 | 2.2.40 |
| KA_desc | | |

SYS063 GENERIC Ability to apply Technical Specifications for a system. (CFR: 41.10 / 43.2 / 43.5 / 45.3)

Unit 1 is in Mode 3 and cooling down in preparation for a refueling outage when IAE discovers a bad cell on 1DGBA during surveillance testing per Technical Specification SR 3.8.4.2.

- 1. When is the cascade to Technical Specification 3.8.1 (AC Sources Operating required to be made?
- 2. With 1DGBA already inoperable, why is an additional cascade to Technical Specification 3.8.9 (Distribution Systems Operating) required if A or D channels of DC power become inoperable?
- A. 1. Immediately
 - 2. Because A and D channels supply power to the SSPS output bays
- B. 1. Immediately
 - 2. Because A and D channels supply power to 1EDE and 1EDF
- C. 1. Within 4 hour2. Because A and D channels supply power to the SSPS output bays
- D. 1. Within 4 hour2. Because A and D channels supply power to 1EDE and 1EDF

2008 SRO NRC Retake Examination

QUESTION 89

General Discussion

With the DG DC system inoperable, 3.8.4 action directs entry into 3.8.1 immediately.

From the basis for TS 3.8.4 - Being powered from auctioneering diode circuits from either the A channel of DC or the A Train of DG DC, distribution center EDE supplies breaker control power to the 4.16 kV AC and the 600 VAC switchgear, auxiliary feedwater pump controls, and other important DC loads. The EDF center is powered from the B Train of DG DC or the D channel of DC and provides DC power to Train B loads, similar to EDE center. With the loss of the channel DC power and the associated DG DC power, the load center power for the train is inoperable and the Condition(s) and Required Action(s) for the Distribution Systems must be entered immediately. Channels A and D do supply power to the SSPS output bays, however, that is not why the actions are cascaded.

4 hours is plausible because that is the time where cascades are made FROM 3.8.1 when redundant equipment is inoperable.

Answer A Discussion

Plausible: With the DG DC system inoperable, 3.8.4 action directs entry into 3.8.1 immediately. Student may believe this is the reason for cascade to 3.8.9, (SSPS output bays powered via associated inverter)

Answer B Discussion

Correct: With the DG DC system inoperable, 3.8.4 action directs entry into 3.8.1 immediately. A & D channels of DC power supply power to 1EDE/EDF which supply 4160v control power, etc. (per discussion)

Answer C Discussion

Plausible: Student may believe 4 hrs is correct because that is the time where cascades are made FROM 3.8.1 when redundant equipment is inoperable. (SSPS output bays powered via associated inverter) A & D

Answer D Discussion

Plausible: Student may believe 4 hrs is correct because that is the time where cascades are made FROM 3.8.1 when redundant equipment is inoperable. The second part is correct.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | TS 3.8.4 and basis | |
| OPT Approved | | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

1789 SYS063 2.2.40

KA desc

SYS063 GENERIC Ability to apply Technical Specifications for a system. (CFR: 41.10/43.2/43.5/45.3)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 90



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1790 | SYS076 | A2.02 |
| KA_desc | hay m | |

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: (CFR: 41.5 / 43.5 / 45/3 / 45/13) Service water header pressure

Unit 1 and 2 were operating at 100% power with 2A RN pump in service. Given the following conditions and sequence of events:

- 1A D/G was tagged for PMs
- The following annunciators were LIT:
 - 1AD-12, A/2 "RN Essential Hdr A Pressure Lo"
 - o 2AD-12, A/2 -- "RN Essential Hdr A Pressure -- Lo"
 - o 1AD-12, A/5 "RN Essential Hdr B Pressure Lo"
 - o 2AD-12, A/5 "RN Essential Hdr B Pressure Lo"
- The 2A RN pump tripped
- The 1A RN pump was started and the above alarms cleared
- 1. Is the 2A D/G operable per Technical Specifications for the conditions stated above?
- 2. What system manipulations (if any) are <u>required</u> per OP/0/A/6400/006C (Nuclear Service Water System)?
- A. 1. No
 - 2. No manipulations are required, only verification of the RN system lineup
- B. 1. No
 - 2. The CA assured makeup valves from Train A RN on both units have power removed
- C. 1. Yes2. No manipulations are required, only verification of the RN system lineup
- D. 1. Yes
 - 2. The CA assured makeup valves from Train A RN on both units have power removed
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General Discussion

1A D/G inoperability results in 1A RN pump being inoperable. When 2A RN pump trips, the A train loop of RN becomes inoperable, resulting in the inoperability of both units A train D/Gs. Although 1A RN is functional, it is inoperable by Tech Specs due to its inoperable D/G. The RN OP, encl. 4.11, will require ensuring at least one crossover flowpath combinations is open from either unit. These valves are normally open and there is no information given that would cause contradict this status.

A common misconception is that an inoperable RN pump makes a D/G inoperable, but this is reverse logic. The exception is in the case where both RN pumps are inoperable in which case both D/G's are inoperable.

Actions for aligning an RN pump for single pump flow (typically when inoperable > 72 hrs) include deenergizing the CA assured makeup valve

Answer A Discussion

Correct: Both D/G's are inoperable. Ensuring one crossover flowpath combinations from either unit is open is verified since they are already open and are not required to be manipulated

Answer B Discussion

Plausible: Both D/G's are inoperable. Student may believe A train CA assured makeup on both units must have power removed.

Answer C Discussion

Plausible: Student may believe only the 1 A D/G is inoperable. Ensuring one crossover flowpath combinations from either unit is open is verified since they are already open and are not required to be manipulated

Answer D Discussion

Plausible: Student may believe only the 1A D/G is inoperable and that A train CA assured makeup on both units must have power removed...

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|--------------------------|-----------------------------|
| OPT Approved | ap/20 Lad-12 ann resp | |
| OPS Approved | RN OP/0/A/6400/006C | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1790 | SYS076 | A2.02 |

KA_desc

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; (CFR: 41.5/43.5/45/3/45/13) Service water header pressure

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 91



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1791 | SYS016 | A2.02 |
| , | | danaa |

KA_desc Ability to (a) predict the impacts of the following malfunctions or operations on the NNIS; and (b) based on those predictions, use or mitigate

the consequences of those malfunctions or operations: (CFR: 41.5/43.5/45.3/45.5) Loss of power supply

Unit 2 is performing a power decrease <u>required</u> by Technical Specifications. Given the following:

- At 45% power, 2SMPS5219 (Turbine Impulse Pressure / ATWS/ AMSAC Related) stopped decreasing
- The power supply to 2SMPS5218 (Turbine Impulse Pressure / ATWS/ AMSAC Related) has failed
- IAE has been notified to repair failed channels
- Current reactor power is 28.5%
- 1. What guidance does OP/2/A/6100/003 (Controlling Procedure for Unit Operation) provide for the AMSAC system for this situation?
- 2. What is the Selected Licensee Commitment (SLC) basis for the AMSAC System?
- A. 1. Stop the power decrease
 - 2. AMSAC provides an independent means of initiating a turbine trip and automatic feedwater isolation under ATWS conditions
- B. 1. Continue the power decrease
 - 2. AMSAC provides an independent means of initiating a turbine trip and auxiliary feedwater autostart under ATWS conditions
- C. 1. Stop the power decrease
 - 2. AMSAC provides an independent means of initiating a turbine trip and auxiliary feedwater autostart under ATWS conditions
- D. 1. Continue the power decrease
 - 2. AMSAC provides an independent means of initiating a turbine trip and automatic feedwater isolation under ATWS conditions

FOR REVIEW ONLY - DO NOT DISTRIBUTE **OUESTION 91 2008 SRO NRC Retake Examination**



General Discussion

AMSAC input from turbine impulse pressure is 2/2 logic at 235 psig (~40% turbine load). AMSAC will automatically reset on load increase > 40% if logic is met (2/2) and will automatically bypass on load decrease < 40% if logic is met (2/2) and 120 sec time delay.

Since 2SMPS5218 power supply is failed and 2SMP5219 is failed at 45%, the 2/2 logic cannot be met to bypass AMSAC on the power decrease. The power decrease procedure notes that if AMSAC cannot be bypassed and the power decrease is required by Tech Specs, continue with the power decrease while IAE repairs the switches.

AMSAC basis: Per 10 CFR 50.62,

Each pressurized water reactor must have equipment from sensor output to final actuation device, that is diverse from the reactor trip system, to automatically initiate the auxiliary feedwater system and initiate a turbine trip under conditions indicative of an ATWS. This equipment must be designed to perform its function in a reliable manner and be independent from the existing reactor trip system.

Answer A Discussion

Plausible: Student may believe power decrease is stopped to prevent AMSAC actuation. Student may believe AMSAC provides independent means of turbine trip and CF isolation

Answer B Discussion

Correct: Power decrease must continue due to TS shutdown. Basis is as stated

Answer C Discussion

Plausible: Student may believe power decrease is stopped to prevent AMSAC actuation. Basis is correct

Answer D Discussion

Plausible: Power decrease must continue due to TS shutdown. Student may believe AMSAC provides independent means of turbine trip and CF isolation

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Memory | NEW | |

| ✓ Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | CF SLC 16.7-1 basis | |
| OPS Approved | OP/1/A/6100/003 | |
| NRC Approved | | |

QuestionBank # KA_system KA_number A2.02

1791 SYS016

KA_desc

Ability to (a) predict the impacts of the following malfunctions or operations on the NNIS; and (b) based on those predictions, use or mitigate the consequences of those malfunctions or operations: (CFR: 41.5/43.5/45.3/45.5) Loss of power supply

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 92



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1792 | SYS029 | 2.1.28 |
| KA_desc | | |

SYS029 GENERIC Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)

Unit 1 is currently in Mode 6 preparing to unload the third fuel assembly from the core. Given the following conditions and sequence of events:

- Unit 1 entered Mode 3 five days ago
- All plant systems are in normal operation for the current conditions
- The B train Containment Purge Exhaust System (VP) duct heaters lose power
- The B train VP system fan status/ system flow is unchanged
- 1. When VP is <u>required</u> to be operable, does a loss of the duct heaters affect the operability of the VP train?
- 2. For the conditions above, is the VP system required to be operable per Technical Specification 3.9.3 (Containment Penetrations)?
- A. 1. Yes 2. Yes
- B. 1. No 2. Yes
- C. 1. Yes 2. No
- D. 1. No 2. No

2008 SRO NRC Retake Examination

QUESTION 92



General Discussion

TS 3.9.3 does not apply because the basis states that recently irradiated is part of a critical core within the last 72 hours. If they believe it is 7 days vice 3 they will choose YES.

Per the basis, the heaters do not affect the operability of the VP train, however the heaters do have an action specific to them and if they believe the spec applies this would be appealing. Because the heaters have a specifice TS action associated with them it is logiccal to assume this is "major equipment" and meets the KA.

Answer A Discussion

Plausible: Student may believe the VP system operability is affected by the heaters and may believe 3.9.3 is applicable if they think recently irradiated is within the last 7 days

Answer B Discussion

Plausible: Loss of heaters does not affect VP operability. Student may believe 3.9.3 is applicable if they think recently irradiated is within the last 7 days.

Answer C Discussion

Plausible: Student may may believe the VP system operability is affected by the heaters. TS 3.9.3 does not apply because the basis states that recently irradiated is part of a critical core within the last 72 hours.

Answer D Discussion

Correct: Loss of heaters does not affect VP operability. TS 3.9.3 does not apply because the basis states that recently irradiated is part of a critical core within the last 72 hours.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Memory | NEW | |
| ····· | | | |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | TS 3.9.3 and basis | |
| | VP | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1792 | SYS029 | 2.1.28 |
| | | |

KA_desc

SYS029 GENERIC Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)

401-9 Comments:

2008 SRO NRC Retake Examination

QuestionBank #KA_systemKA_number1793SYS033A2.03

KA desc

Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Abnormal spent fuel pool water level or loss of water level

OUESTION 93

Unit 1 is in Mode 6 with core unload in progress. Given the following:

- An RP technician in the Spent Fuel Pool (SFP) calls the control room and reports that level in the SFP is decreasing
- The fuel assembly most recently removed from the core is currently in the reactor building manipulator crane
- 1. Based on current conditions, what procedure will be used to perform the <u>mitigative</u> <u>actions</u> necessary to address the problem?
- 2. What direction will the procedure provide for the fuel assembly currently being handled?
- A. 1. AP/1/A/5500/026 (Loss of Refueling Canal Level)
 - 2. Lower the fuel assembly into the upender and place in the fully down position
- B. 1. AP/1/A/5500/026 (Loss of Refueling Canal Level)
 - 2. Lower the fuel assembly to fully down in the core or the deep end of the canal
- C. 1. AP/1/A/5500/041 (Loss of Spent Fuel Cooling or Level)
 - 2. Lower the fuel assembly into the upender and place in the fully down position
- D. 1. AP/1/A/5500/041 (Loss of Spent Fuel Cooling or Level)
 - 2. Lower the fuel assembly to fully down in the core or the deep end of the canal

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General Discussion

Based on the stem, AP/41 appears to be appropriate and may in fact be the procedure chosen. However, based on the stem, the refueling canal and the SFP are physically connected at this time (refueling in progress) and step 1 of AP/41 checks this and sends the crew to AP/26 without taking any mitigative actions. If the assembly is in the reactor building manipulator crane, the procedure directs the assembly to be placed fully down in the core or the deep end of the canal.

Answer A Discussion

Plausible: AP/26 steps will perform the required mitigative actions. This action would be taken if the assembly had been placed in the upender

Answer B Discussion

Correct: AP/26 steps will perform the required mitigative actions. Since the assembly is in the reactor building manipulator crane, the procedure directs the assembly to be placed fully down in the core or the deep end of the canal.

Answer C Discussion

Plausible: Student may believe mitigative actions will be taken in AP/41. This action would be taken if the assembly had been placed in the upender

Answer D Discussion

Plausible: Student may believe mitigative actions will be taken in AP/41. Since the assembly is in the reactor building manipulator crane, the procedure directs the assembly to be placed fully down in the core or the deep end of the canal.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | AP/26 | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1793 | SYS033 | A2.03 |
| | | |

KA_desc

Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Abnormal spent fuel pool water level or loss of water level

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 94

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1794 | GEN2.1 | 2.1.26 |
| KA desc | | |

Conduct of Operations Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen). (CFR: 41.10 / 45.12)

Unit 2 entered a forced outage 3 days ago to replace an NC pump motor.

- 2 work crews are involved in replacing the NCP motor, an NC pump crew and an IAE crew. The tagout boundary is being shared by both crews
- The NC pump crew has the new motor in place and has outstanding Work Order Task Assignments (WOTAs) for wiring completion
- The IAE crew has asked the Unit 2 SRO for clearance of their WOTA to allow electrical testing of the new motor which requires connecting an outside power source

Per NSD 500 (Red Tags/Configuration Control Tags), in addition to ensuring the work can be performed safely, what additional condition is <u>required</u> to be met by the Unit 2 SRO prior to granting clearance to the IAE crew WOTA?

- A. The Unit 2 SRO must obtain OSM concurrence
- B. The Unit 2 SRO must ensure the two crews have established constant communication
- C. The Unit 2 SRO must ensure all affected crews have been informed of the intent to apply an outside power source
- D. The Unit 2 SRO must ensure the IAE supervisor has walked down the area where the outside power source will be applied

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General Discussion

If work will apply a Hazardous Energy Source within boundaries of a tagout:

The Work Group Supervisor/designee shall ensure the Operational Control Group is informed.

Prior to the Operational Control Group giving clearance to apply a Hazardous Energy Source within boundaries of a tagout, Operational Control Group Supervisor/designee giving clearance shall:

Ensure any affected crew previously or subsequently given clearance is informed of Hazardous Energy Source being applied.

Ensure that work can be performed safely.

The Work Group Supervisor/designee shall walk down the area into which hazardous energy will be applied.

Answer A Discussion

Plausible: Candidate may believe OSM concurrence is necessary, OSM approval is required for exception to tag placement

Answer B Discussion

Plausible: Candidate may believe constant communication is necessary, this is true for some plant evolutions

Answer C Discussion

Correct: OCG supv shall: Ensure any affected crew previously or subsequently given clearance is informed of Hazardous Energy Source being applied. Ensure that work can be performed safely.

Answer D Discussion

Plausible: The work group supervisor is required to walk down the area as stated above in the discussion, but this is not required for the SRO to grant clearance

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| \checkmark | Developed | Development References | Student References Provided |
|--------------|--------------|------------------------|-----------------------------|
| | OPT Approved | NSD500 | |
| | OPS Approved | | |
| | NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1794 | GEN2.1 | 2.1.26 |
| | | |

KA_desc

Conduct of Operations Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen). (CFR: 41.10 / 45.12)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 95



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1795 | GEN2.2 | 2.2.41 |
| KA_desc | 1 7220 | |

Equipment Control Ability to obtain and interpret station electrical and mechanical drawings. (CFR: 41.10 / 45.12 / 45.13)

Unit 2 was operating at 100% power. Given the following:

- 2ND-64 (2B ND Train Cold Leg Injection Return Safety Relief) lifted and did not reseat
- The crew used the closest valves in the piping available to isolate the leak
- Due to parts availability it will be 4-5 days before repairs can be completed
- The crew began a Technical Specification shutdown
- 1. How many trains of ND are operable?
- 2. What is the first operational mode reached where Technical Specification 3.5.2 (ECCS Operating) no longer applies?

Reference provided

- A. 1. No trains are operable2. Mode 4
- B. 1. No trains are operable2. Mode 5
- C. 1. 2B Train of ND only 2. Mode 4
- D. 1. 2B Train of ND only
 - 2. Mode 5

2008 SRO NRC Retake Examination

QUESTION 95



General Discussion

Per OP/1/A/6200/004 Residual Heat Removal System L&P 2.9 Closing 1ND-32A (ND Train 1A Hot Leg Inj Isol) or 1ND-65B (ND Train 1B Hot Leg Inj Isol) in Modes 1, 2 or 3 makes both trains of ND inoperable since ND must be capable of injecting into all 4 cold legs while meeting single failure criterium. Therefore, both valves are required to be open to ensure operability of both trains.

Answer A Discussion

Correct: Isolation required closing 2ND-65B which results in both trains of ND being inoperable. TS 3.5.2 is applicable to MODES 1-3

Answer B Discussion

Plausible: The student may not realize closing 2ND-65B results in both trains of ND being inoperable and may believe TS 3.5.2 applies in Modes 1-4

Answer C Discussion

Plausible: The student may think only 2B ND train is affected and TS 3.5.2 is not met but knows the applicability

Answer D Discussion

Plausible: The student may think only 2B ND train is affected and TS 3.5.2 is not met and applicability is Modes 1-4

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |
| | | | |

| | Development References | Student References Provided |
|--------------|--------------------------------|-----------------------------|
| | TS 3.5.2 | CN-1561-1.1 |
| OPT Approved | CN-1561-1.1 | CN-1562-1.3 |
| OPS Approved | CN-1562-1.3 OP/1/A/6200/004 | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1795 GEN2.2 2.2.41

KA_desc

Equipment Control Ability to obtain and interpret station electrical and mechanical drawings. (CFR: 41.10 / 45.12 / 45.13)

401-9 Comments:

401-9 Comments RESPONSE

STUDENTS WILL GET FULL SIZE DRAWINGS

2008 SRO NRC Retake Examination

QUESTION 96



| QuestionBank # | KA_system | KA_number |
|----------------|----------------------|-----------|
| 1796 | GEN2.2 | 2.2.44 |
| KA_desc | / a. an . | |

Equipment Control Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. (CFR: 41.5 / 43.5 / 45.12)

Unit 1 is in Mode 3 performing a leakage calculation per PT/1/A/4150/001D (NC System Leakage Calculation). Given the following:

- Reactor coolant pump (NCP) seal leakoff values are:
 - o 1A NCP is 3.6 gpm
 - 1B NCP is 3.8 gpm
 - o 1C NCP is 3.9 gpm
 - o 1D NCP is 4.2 gpm
- NC unidentified leakage is 0.2 gpm
- NC identified leakage is 4.3 gpm
- VCT pressure is 35 psig
- An NLO has been dispatched to reduce VCT pressure to 25 psig

What effect will this operator action have on NCP seal leakoff, and what is a correct action for this situation?

- A. NCP seal leakoff flow will increase. Notify Security within 15 minutes that the SSF is degraded.
- B. NCP seal leakoff flow will decrease.
 Immediately declare the standby makeup pump inoperable and if the standby makeup pump is not restored within 7 days, declare the SSF inoperable.
- NCP seal leakoff flow will increase.
 Immediately declare the standby makeup pump inoperable and if the standby makeup pump is not restored within 7 days, declare the SSF inoperable.
- D. NCP seal leakoff flow will decrease. Notify Security within 15 minutes that the SSF is degraded.

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General Discussion

SRO ONLY because RO job function is not to determine who needs to be notified based on Tech Spec/SLC entries. The SRO function is to enter this into the TSAIL computer which is where the prompt is provided to notify Security. TSAIL entry is part of an SRO T&Q Guide associated with the Work Control Center.

The tank has a hydrogen pressure regulator to maintain overpressure. If pressure decreases, NCP seal leakoff increases.

Answer A Discussion

Correct: When VCT pressure decreases, leakoff will increase. With NC total leakage >/= 20 gpm the standby makeup pump is inoperable and therefore the SSF is inoperable and Security is required to be notified within 15 minutes

Answer B Discussion

Plausible: Student may believe leakoff will decrease with VCT pressure and the standby makeup pump can be inoperable for 7 days prior to declaring the SSF inoperable

Answer C Discussion

Plausible: When VCT pressure decreases, seal leakoff will increase. Student may believe the standby makeup pump can be inoperable for 7 days prior to declaring the SSF inoperable

Answer D Discussion

Plausible: Student may believe leakoff will decrease with VCT pressure. With NC total leakage >/= 20 gpm the standby makeup pump is inoperable and therefore the SSF is inoperable and Security is required to be notified within 15 minutes

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| SRO | Memory | BANK | 2005 NRC Q84 (Bank 488) |

| Developed | Development References | Student References Provided |
|----------------|------------------------|-----------------------------|
| ✓ OPT Approved | SLC 16.7-9 NCP | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|--|
| 1796 | GEN2.2 | 2.2.44 |
| | | ······································ |

KA_desc

Equipment Control Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. (CFR: 41.5 / 43.5 / 45.12)

401-9 Comments:

OUESTION 97

2008 SRO NRC Retake Examination

QuestionBank #KA_systemKA_number1797GEN2.32.3.4KA desc

Radiation Control Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 41.12 / 43.4 / 45.10)

Given the following:

- A LOCA has occurred in Unit 2
- The TSC has been fully staffed and activated
- An individual is needed for lifesaving activities during which 27 Rem of TEDE exposure is expected to be received

Is the individual required to be a volunteer and who is required to approve the exposure for this lifesaving activity?

- A. The individual is required to be a volunteer and the TSC Emergency Coordinator is required to approve the exposure
- B. The individual is required to be a volunteer and the Operations Shift Manager is required to approve the exposure
- C. The individual is <u>not</u> required to be a volunteer and the TSC Emergency Coordinator is required to approve the exposure
- D. The individual is <u>not</u> required to be a volunteer and the Operations Shift Manager is required to approve the exposure

2008 SRO NRC Retake Examination

QUESTION 97



General Discussion

To save a life or protect a large population on a volunteer basis only, a person may receive greater than 25 rem TEDE, greater than 75 rem to the lens of the eye, and greater than 250 rem to the skin and extremities. The Emergency Coordinator must approve extending the emergency worker dose limits. Since the TSC is fully staffed and activated, this would be the TSC Coordinator.

Answer A Discussion

Correct: For > 25 Rem the individual is required to be a volunteer and TSC coordinator approval is required

Answer B Discussion

Plausible: For > 25 Rem the individual is required to be a volunteer. Student may believe OSM approval is required

Answer C Discussion

Plausible: Student may think volunteer is not required. TSC approval is correct

Answer D Discussion

Plausible: Student may think volunteer is not required and OSM approval is required

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-------------------------|
| SRO | Memory | MODIFIED | 2005 NRC Q92 (Bank 496) |

| | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | HP lesson | |
| | | |
| OPS Approved | | |
| NRC Approved | | |

QuestionBank # KA_system KA_number

| 1797 | GEN2.3 | 2.3.4 | | | | | |
|-------------------|-----------------|-----------------------------|--------------------------|------------------|---------------------|--------|--|
| KA_desc | | | | | | | |
| Radiation Control | Knowledge of ra | adiation exposure limits ur | nder normal or emergency | v conditions. (O | CFR: 41.12 / 43.4 / | 45.10) | |

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 98



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1798 | GEN2.3 | 2.3.7 |
| KA desc | | |

Radiation Control Ability to comply with radiation work permit requirements during normal orabnormal conditions. (CFR: 41.12 / 45.10)

An individual with a current year Total Effective Dose Equivalent (TEDE) of 1500 mR is preparing to perform a job in the RCA. The RWP states that the dose rate in the area is 200 mR/hr.

- 1. What is the <u>maximum</u> time he can work in this area without an approved dose extension?
- 2. If the job were estimated to take 2 hours, what is the <u>minimum</u> level RP position that could provide the approval of the dose extension?
- A. 1. 0.5 hours
 - 2. An RP Supervisor
- B. 1. 0.5 hours 2. The RP Manager
- C. 1. 1.5 hours 2. An RP Supervisor
- D. 1. 1.5 hours 2. The RP Manager

2008 SRO NRC Retake Examination

QUESTION 98



General Discussion

Asked Frank to replace K/A since it was a duplicate of one on the RO exam and we were having trouble determining a good question that was SRO level and operationally valid and with 3 plausible distractors.

RP supervisor gives permission to enter hi rad areas when the alert limit (1600 mr) is exceeded. Dose extensions from 1800 up to 2000 mr are approved by the RPM per NSD507. Work can be done up to the exclude limit without extension which is 1800 mr. At 200 mr /hr, the worker would reach alert in 0.5 hours and exclude in 1.5 hrs

Answer A Discussion

Plausible: Plausible if student believes extension required above 1600 mrem (i.e. exclude status), RP supervisor approval required to enter high rad area above 1600 mrem.

Answer B Discussion

Plausible: Plausible if student believes extension required above 1600 mrem (i.e. exclude status), , correct approval

Answer C Discussion

Plausible: Correct time, 2nd part plausible because RP supervisor approval required to enter high rad area above 1600 mrem.

Answer D Discussion

Correct: At 200 mr /hr, the worker would reach alert in 0.5 hours and exclude in 1.5 hrs. Dose extensions up to 2000 mr are approved by the RPM per NSD507.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Memory | BANK | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| OPT Approved | nsd507 | |
| OPS Approved | | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1798 | GEN2.3 | 2.3.7 |
| | | |

KA_desc

Radiation Control Ability to comply with radiation work permit requirements during normal orabnormal conditions. (CFR: 41.12 / 45.10)

401-9 Comments:

2008 SRO NRC Retake Examination

QUESTION 99



| QuestionBank # | KA_system | KA_number |
|----------------|-----------|-----------|
| 1799 | GEN2.4 | 2.4.20 |
| KA_desc | | |

Emergency Procedures / Plan Knowledge of the operational implications of EOP warnings, cautions, and notes. (CFR: 41.10 / 43.5 / 45.13)

Unit 1 was at 25% and increasing following a refueling outage. Given the following conditions and sequence of events:

- 1 hour ago, Unit 1 experienced a large break LOCA
- Containment sump level is 5.2 ft
- During the swap to cold leg recirculation, 1NI-136B (ND Supply To NI Pump 1B) could <u>not</u> be opened
- The crew has verified S/I flow per EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation)
- The crew is preparing to transition out of EP/1/A/5000/ES-1.3 when all running ECCS pumps begin showing signs of cavitation
- 1. What was the status of 1B NI pump when S/I flow was verified per EP/1/A/5000/ES-1.3?
- 2. Which procedure will provide the <u>mitigative</u> <u>actions</u> to address cavitation of the ECCS pumps?
- A. 1. 1B NI was secured because 1NI-136B could <u>not</u> be opened
 2. EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation)
- B. 1. 1B NI was secured because 1NI-136B could <u>not</u> be opened
 2. EP/1/A/5000/ECA-1.3 (Containment Sump Blockage)
- C. 1. 1B NI is running with suction from 1A train ND
 2. EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation)
- D. 1. 1B NI is running with suction from 1A train ND
 2. EP/1/A/5000/ECA-1.3 (Containment Sump Blockage)

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D

General Discussion

Per ES 1.3 if adequate sump level is present and cavitation occurs with no other known cause, then blockage should be suspected and directs the SRO to ECA-1.3 versus ECA-1.1.

With NI136B closed the NI pump will still have flow from the A train ND. A pump with no suction flow would be secured.

Answer A Discussion

Plausible: The student may believe that 1B NI has no suction since 1NI-136B could not be opened and ECA 1.1 will provide the mitigative actions to address cavitation

Answer B Discussion

Plausible: The student may believe that 1B NI has no suction since 1NI-136B could not be opened. ECA-1.3 will provide the actions to address the cavitation

Answer C Discussion

Plausible: 1B NI pump will receive suction flow from the 1A ND pump discharge. The student may believe ECA 1.1 will provide the mitigative actions to address cavitation

Answer D Discussion

Correct: 1B NI pump will receive suction flow from the 1A ND pump discharge.

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| Developed | Development References | Student References Provided |
|--------------|------------------------|-----------------------------|
| | es1.3 | |
| OPT Approved | ecal.1 | |
| OPS Approved | ecal.3 | |
| NRC Approved | | |

QuestionBank # KA_system KA_number 1799 GEN2.4 2.4.20

KA_desc

Emergency Procedures / Plan Knowledge of the operational implications of EOP warnings, cautions, and notes. (CFR: 41.10 / 43.5 / 45.13)

401-9 Comments:

2008 SRO NRC Retake Examination

С

| QuestionBank # | KA_system | KA_number |
|-------------------|--|-----------------------------|
| 1800 | GEN2.4 | 2.4.50 |
| KA_desc | la 200 - 120 | |
| Emergency Procedu | res / Plan Al | nility to verify system ala |

Emergency Procedures / Plan Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / 45.3)

OUESTION 100

Unit 1 is in Mode 5 after refueling. Given the following conditions and sequence of events:

- The control room receives a 4911 emergency call reporting an explosion in Unit 1 containment
- Operators note VCT level decreasing and estimate NC leakage to be 22 gpm
- 1RAD-1, A/2 (1EMF-39 Containment Gas Hi Rad) is LIT
- 1RAD-3, E/2 (1EMF 22 594 KK,53 VP Filter) is LIT and indicates 5200 mR/hr
- NC system is in a "Loops Filled" condition
- Both trains of SSPS are in "TEST"
- Security has confirmed the explosion in containment was an act of sabotage
- 1. Based on the above conditions, how would this event be classified?
- 2. What operator action is required prior to clearing the 1EMF-39 trip 2 alarm?

Reference provided

- A. 1. Site Area Emergency2. Initiate Containment Closure
- B. 1. Alert2. Initiate Containment Closure
- C. 1. Site Area Emergency2. Secure VP per the operating procedure
- D. 1. Alert2. Secure VP per the operating procedure

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General Discussion

The event is classified as a Site Area Emergency (4.6.S.1-3) due to confirmed sabotage. This would otherwise be classified as an Alert (4.3.A.3-3) based on the dose rates associated with 1EMF-22.

The reactor coolant leak results in 1EMF-39 trip 2 alarm. 1EMF-39 will send a direct signal to trip VP even if both trains of SSPS are in test. To prevent an automatic restart of VP following the 1EMF-39 trip 2, VP must be secured by procedure.

Containment closure would be initiated if the NC system was in a loops not filled condition

Answer A Discussion

Plausible: Site Area Emergency is correct. Containment closure would be initiated if NC was in a loops not filled condition

Answer B Discussion

Plausible: The student may believe the correct classification is alert due to the VP filter EMF reading and that containment closure should be initiated as the required action

Answer C Discussion

Correct: Site area Emergency is correct per 4.6.S.1-3. VP is secured per the OP to prevent automatic restart on reset of 1EMF-39 trip 2

Answer D Discussion

Plausible: The student may believe the correct classification is alert due to the VP filter EMF reading. VP is secured per the OP to prevent automatic restart on reset of 1EMF-39 trip 2

| Job Level | Cognitive Level | QuestionType | Question Source |
|-----------|-----------------|--------------|-----------------|
| SRO | Comprehension | NEW | |

| | Development References | Student References Provided |
|--------------|-------------------------------|------------------------------------|
| OPT Approved | 1RAD-1 and 1RAD-3 Annunc resp | RP/0/A/5000/001 (Classification of |
| OPS Approved | VP | |
| NRC Approved | | |

| QuestionBank # | KA_system | KA_number |
|----------------|---------------------------------------|-----------|
| 1800 | GEN2.4 | 2.4.50 |
| KA daga | · · · · · · · · · · · · · · · · · · · | |

KA_desc

Emergency Procedures / Plan Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / 45.3)

401-9 Comments: