Final Submittal

(Blue Paper)

NORTH ANNA 2006-302
RETAKE
RO Written

Combined RO/SRO Written Exam with KAs,

Answers, References, and Analysis

QUESTIONS REPORT
for POST NRC REVIEW R1

1. 002 K3.03 001

The plant was manually tripped because of a slow uncontrollable decrease in RCS pressure. A Safety Injection was manually initiated.

Current indications are as follows:

- RCS pressure is 1700 psig slowly decreasing
- Highest CET temperature reads 555°F
- All PRZR heaters are energized
- PRZR level is 20% and decreasing
- Containment pressure is 15.5 psia and increasing
- CONTAINMENT SUMP HI LEVEL annunciator (1J-A6) is in alarm
- PRT level is 74% and stable
- PRT temperature is 100°F and stable

Which ONE of the following has caused the above indications?

A. A PRZR Spray Valve has failed open.

B. A PRZR reference leg has ruptured.

C✓ A PRZR heater well has ruptured.

D. A PRZR PORV has failed open.

C. Correct. With containment sump level rising, a leak is occurring.
A. Incorrect. PRZR spray valve operation would not raise sump level.
B. Incorrect. A reference leg leaking would make PRZR level indicate higher.
D. Incorrect. PRT parameters are normal, so a PORV is not lifting.

Knowledge of the effect that a loss or malfunction of the (SYSTEM) will have on the following: Containment.

Question Number: 62

Tier 2 Group 2

Importance Rating: RO 4.2

Technical Reference: 1J-A6
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: Bank
Question History: Kewaunee (WTSI 40962)
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C C C C C C C C C C Items Not Scrambled

2. 003 A1.03 001

A Loss of Component Cooling Water has occurred.

Which ONE of the following describes the effect on RCP temperatures, and the action that is required to mitigate the event?

A. Pump bearing temperatures will rise. Affected RCPs must be tripped if temperature reaches 185 deg F

B. Pump bearing temperatures will rise. Affected RCPs must be tripped if temperature reaches 195 deg F

C. Motor stator winding temperatures will rise. Affected RCPs must be tripped if temperature reaches 225 deg F

D✓ Motor stator winding temperatures will rise. Affected RCPs must be tripped if temperature reaches 300 deg F

D. Correct. Motor stator temperatures will rise; when > 300 degrees F, must trip the associated RCP.
A. Incorrect. Pump bearing temperatures will rise, but > 185 degrees F does NOT require trip of the associated RCP (trip setpoint is > 225 degrees F). Plausible because the plant computer will alarm when bearing temperature is > 185 degrees F for many station pumps.
B. Incorrect. Pump bearing temperatures will rise, but > 195 degrees F does NOT require trip of the associated RCP (trip setpoint is > 225 degrees F). Plausible because the RCP must be tripped if motor bearing temperature exceeds 195 degrees F.
C. Incorrect. Motor stator temperatures will rise, but > 225 degrees F does NOT require trip of the associated RCP (trip setpoint is > 300 degrees F). Plausible because the RCP must be tripped if pump bearing temperature exceeds 225 degrees F.

Ability to predict and/or monitor changes in parameters associated with operating the (SYSTEM) controls including: RCP motor stator winding temperatures.

Question Number: 54

Tier 2 Group 1

Importance Rating: RO 2.6
Technical Reference: 1-AP-15
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

QUESTIONS REPORT
for POST NRC REVIEW R1

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9

Answer: D C B C B D A A C B Scramble Range: A - D

3. 003 AA2.04 001

Unit 1 is at 100% power when ONE Control Bank D rod is dropped.

The following NI indications exist:

-PR N-41 - 96.6%
-PR N-42 - 101.8%
-PR N-43 - 102.6%
-PR N-44 - 103.1%

Which ONE of the following describes the status of the Rod Control System (assuming the reactor does NOT trip and NO operator actions are taken)?

A. Manual rod withdrawal is available; automatic rod withdrawal is blocked due to the NIS POWER RANGE OVERPOWER ROD STOP caused by N-44 ONLY.

B. Manual rod withdrawal is available; automatic rod withdrawal is blocked due to the NIS POWER RANGE OVERPOWER ROD STOP caused by N-43 AND N-44.

C✓ Manual and automatic rod withdrawal are blocked due to the NIS POWER RANGE OVERPOWER ROD STOP caused by N-44 ONLY.

D. Manual and automatic rod withdrawal are blocked due to the NIS POWER RANGE OVERPOWER ROD STOP caused by N-43 AND N-44.

C. Correct. At 103% power on any channel, a rod stop is initiated by C-2. Both manual and automatic rod withdrawal are blocked. Flux will be suppressed in the quadrant of the dropped rod (N-41) and will increase in the other three quadrants. A single dropped control rod will normally trip the reactor on high negative flux rate, but there are a few control rods that will NOT cause the negative flux rate trip.
A. Incorrect. C-2 blocks both manual and automatic rod withdrawal. Plausible because some interlocks only block either manual or automatic rod motion.
B. Incorrect. C-2 blocks both manual and automatic rod withdrawal; also, N-43 is not greater than 103%. Plausible because some interlocks only block either manual or automatic rod motion, and candidate could mistake the C-2 setpoint.
D. Incorrect. N-43 is not greater than 103%. Plausible because candidate could mistake the C-2 setpoint.

QUESTIONS REPORT
for POST NRC REVIEW R1

Ability to determine and interpret the following as they apply to: Rod motion stops due to dropped rod.

Question Number: 19

Tier 1 Group 2

Importance Rating: RO 3.4

Technical Reference: NCRODP-62-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C B C B A D D C A B Scramble Range: A - D

4. 003 K6.04 001

Unit 1 was at 100% power when an inadvertant Safety Injection occurred.

Which ONE of the following describes the effect on RCP #1 seal leakoff flow?

RCP seal leakoff flow is...

A. Unaffected.

B. Directed to the PRT.

C. Directed to the containment sump.

D. Directed to the PDTT.

B. Correct. RCP #1 Seal Leakoff Isolation valve will close on CIA based upon the SI actuation. The seal return relief valve will lift to the PRT.
A. Incorrect. Leakoff flow will be diverted from its normal flow path to the PRT via the seal return header relief valve. Plausible if candidate believes the RCP seal leakoff is not affected by a Safety Injection and/or Phase A isolation.
C. Incorrect. The seal return header relief valve does not discharge to the containment sump. Plausible because several relief valves do discharge to the containment sump.
D. Incorrect. The seal return header relief valve does not discharge to the containment sump. Plausible because RCP standpipe overflows to the PDTT (primary drains transfer tank; this is known as the RCDT, or reactor coolant drain tank, at other plants).
Knowledge of the effect that a loss or malfunction of the following will have on the: Containment isolation valves affecting RCP operation.

Question Number: 28

Tier 2 Group 1

Importance Rating: RO 2.8

Technical Reference: NCRODP-38-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: Bank
Question History: Prairie Island (WTSI 42249)
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B B B B B C C B D B Scramble Range: A - D

5. 004 K5.35 001

Given the following conditions:

Unit 1 is at 100% power.
Pressurizer level is lowering slowly.
VCT level is lowering slowly.
Regenerative Heat Exchanger Charging Outlet Temperature is lowering slowly.
Non-Regenerative Heat Exchanger Temperature Control Valve 1-CC-TCV-106 is throttling closed.

Which ONE of the following describes the event in progress?

A. Letdown leak between the regenerative and non-regenerative heat exchangers.

B. Letdown line leak downstream of the non-regenerative heat exchanger

C. Charging line leak upstream of the regenerative heat exchanger

D✓ Charging line leak downstream of the regenerative heat exchanger

D. Correct. RHX outlet temperature lowering and NRHX and CC-TCV-106 throttling closed indicate that charging flow is high.
A and B. Incorrect. If leak was on letdown line between heat exchangers, temperature indication would be high. If letdown leak was downstream of NRHX, the CC-TCV-106 would be throttling open because of the higher flow of letdown (warm water) through the NRHX.
C. Incorrect. If the leak was upstream of the RHX on charging line, then RHX outlet temperature would be high.

Knowledge of the operational implications of the following concepts as they apply to the: Heat Exchanger principles and the effects of flow, temperature, and other parameters.

Question Number: 29

Tier 2 Group 1

Importance Rating: RO 2.5

Technical Reference: NCRODP-41-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D B D C A C A C A D Scramble Range: A - D

6. 005 K5.02 001

Given the following conditions:

Unit 1 is in Mode 5.
RHR is in service.
RCS temperature is 139 degrees F.
Reactor vessel level is 100 inches above loop centerline and slowly decreasing.
RCS drain down is in progress in preparation for refueling.

1-RH-HCV-1758, RHR Heat Exchanger Flow Control Valve begins to drift in the closed direction due to an electrical problem.

Assuming NO action by the operating crew, which ONE of the following describes the effect of this failure on plant operation?

A. Uncontrolled RCS cooldown, potentially violating Tech Spec requirements

B. LTOP PORV actuation due to overpressurization of the RCS.

C✓ Lowering NPSH to the operating RHR pump due to increasing temperature.

D. Loss of RHR letdown and uncontrolled RCS level increase.

C. Correct. Reduction in RCS inventory will lower the pressure at the RHR pump suction, thereby reducing the NPSH available to the running pump.
A. Incorrect. RCS will heat up (not cool down) when 1-RH-HCV-1758 goes closed. Plausible if candidate does not understand the operation of the control valve.
B. Incorrect. LTOP actuation will not occur because RCS must be vented to atmosphere prior to drain down IAW 1-OP-5.4. Plausible if candidate does not understand the RCS lineup during draindown.
D. Incorrect. The flow control valve would not affect the manually throttled RHR letdown at this temperature, and with no inventory makeup in progress, level would not increase appreciably. Plausible if candidate mistakes the operation of 1-RH-HCV-1758 with that of 1-RH-FCV-1605.

QUESTIONS REPORT
for POST NRC REVIEW R1

Knowledge of the operational implications of the following concepts as they apply to the: Need for adequate subcooling.

Question Number: 30

Tier 2 Group 1

Importance Rating: RO 3.4

Technical Reference: NCRODP-40-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: Bank
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C A D B C D C B C A Scramble Range: A - D

7. 006 K6.19 001

Unit 1 is in Mode 6 with the following conditions:

- LHSI pump 1-SI-P-1A is dismantled for seal replacement.
- All Train "B" equipment is operable.

Which ONE of the following is the HIGHEST Mode the unit can operate in with this pump out of service?

Mode...

A. 5

B. 4

C. 3

D. 2

B. Correct. Both trains of ECCS are required in Modes 1-3. Mode change restrictions apply to ECCS.
A. Incorrect. Only one train of ECCS is required, but mode 5 is not the highest mode possible with one train of ECCS inoperable. Plausible if candidate misapplies the ECCS Tech Specs.
C and D. Incorrect. Both trains of ECCS are required to be operable in modes 2 and 3. Plausible if candidate misapplies the ECCS Tech Specs.

Knowledge of the effect that a loss or malfunction of the following will have on the: HPI/LPI systems (mode changes).

Question Number: 31

Tier 2 Group 1

Importance Rating: RO 3.7

Technical Reference: TS 3.5.2
Proposed references to be provided to applicants during examination: None
Learning Objective: 3416
Question Source: New
Question History:
Question Cognitive Level: ~~Higher~~Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B D D A D D D D B D Scramble Range: A - D

8. 007 A3.01 001

With unit 1 at 100% power, a partial phase "A" containment isolation signal results in closure of letdown isolation valve 1-CH-TV-1204A.

NO other valves or components are affected by the signal.

Which ONE of the following is correct concerning the affect of this on letdown?

Letdown flow indication...

A. fluctuates as the relief valve lifts; actual flow continues to the **PRT**.

B. goes to zero; actual flow continues to the **PDTT**.

C. fluctuates as the relief valve lifts; actual flow continues to the **PDTT**.

D. goes to zero; actual flow continues to the **PRT**.

D. Correct. If CH-TV-1204A closes, the flowpath of water is through the low pressure letdown relief valve to the PRT. Flow element is downstream of the isolation valve, so flow indication goes to zero.
A. Incorrect. Flow element is downstream of the isolation valve, so flow indication goes to zero. Plausible if candidate believes the flow element is upstream of the isolation valve.
B. Incorrect. Relief valve discharges to the PRT, not the PDTT (primary drains transfer tank; this is known as the RCDT, or reactor coolant drain tank, at other plants). Plausible if candidate mistakes the RV discharge flow path.
C. Incorrect. Flow element is downstream of the isolation valve, so flow indication goes to zero. Relief valve discharges to the PRT, not the PDTT. Plausible if candidate mistakes the RV discharge flow path and believes the flow element is upstream of the isolation valve.

QUESTIONS REPORT
for POST NRC REVIEW R1

Ability to monitor automatic operations of the (SYSTEM) including: Components which discharge to the PRT.

Question Number: 32

Tier 2 Group 1

Importance Rating: RO 2.7

Technical Reference: Figure 41-3-NA (NCRODP-41-NA)
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: Bank
Question History: North Anna 6092
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D B B C C D D B A C Scramble Range: A - D

9. 007 EA2.05 001

Given the following:

A reactor trip has occurred on Unit 1.
The OATC has acknowledged the control room annunciators.

Which ONE of the following describes how to determine the 'First Out' annunciator?

A. Illuminated solid red; alarm will clear when the initiating condition is clear.

B. Illuminated solid red; alarm will NOT clear until it is manually reset at Benchboard 1-2.

C. Illuminated flashing red; alarm will clear when the initiating condition is clear.

D. Illuminated flashing red; alarm will NOT clear until it is manually reset at Benchboard 1-2.

B. Correct. First out will flash red when it is silenced. Solid red when acknowledged. Although white alarms will clear when the initiating condition is clear, the first out annunciator must be manually reset by depressing the First Out Reset PB.
A. Incorrect. Alarm will not clear when initiating condition clears.
C. Incorrect. After acknowledged, the alarm will not be flashing. Alarm will not clear when initiating condition clears.
D. Incorrect. After acknowledged, the alarm will not be flashing.
Ability to determine and interpret the following as they apply to: Reactor trip first-out indication.

Question Number: 1

Tier 1 Group 1

Importance Rating: RO 3.4

Technical Reference: Self Study Guide for Annunciator and Event Recorder System
Proposed references to be provided to applicants during examination: None
Learning Objective: 7840
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B D A D D C B A D A Scramble Range: A - D

10. 007 K3.01 001

Given the following:

A reactor trip has occurred due to low RCS pressure.
The crew is performing 1-E-0, Reactor Trip or Safety Injection.
ONE (1) PRZR Safety Valve is failed open.
Containment Pressure is 9.7 psia and stable.
PRT pressure is 26 psig and rising.

Which ONE of the following describes the **highest** indicated PRT pressure that will exist **just prior** to Containment pressure rising due to this event?

A. 90.3 psig

B. 100 psig

C. 109.7 psig

D. 115 psig

C. Correct. PRT pressure indication is relative to containment atmospheric pressure. The rupture discs actuate at 100 psid between internal tank pressure and containment atmospheric pressure. If containment is at 9.7 psia, then PRT pressure (indicated) would be at 109.7 psig just prior to rupture discs actuating.
A, B, and D are mathematically possible variations if the applicant has a misconception about the PRT pressure transmitter relationship with Containment
Knowledge of the effect that a loss or malfunction of the (SYSTEM) will have on the following: Containment.

Question Number: 50

Tier 2 Group 1

Importance Rating: RO 3.3

Technical Reference: NCRODP-38-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C A A C A A C A D A Scramble Range: A - D

11. 008 A4.07 001

Given the following:

Both units are at 100% power.
A Component Cooling Water leak is occurring.
The crew is performing actions of 1-AP-15, Loss of Component Cooling Water.
The following alarm has JUST been received:

1G-A1, CC SURGE TK HI/LO LEVEL

Which ONE of the following describes the method that is normally used to raise CC Surge Tank level in accordance with 1-AP-15, Loss of Component Cooling Water?

A. Ensure 1-CC-LCV-100 is automatically making up to the surge tank from the Service Water System.

B. Initiate manual surge tank makeup by aligning Service Water and opening the bypass around 1-CC-LCV-100.

C. Ensure 1-CC-LCV-100 is automatically making up to the surge tank from the unit-1 Condensate System.

D✓ Initiate manual surge tank makeup by aligning either unit's Condensate System and opening the bypass around 1-CC-LCV-100.

D. Correct. Auto makeup is normally isolated and is not used for surge tank makeup. Normal means of makeup is to align main condensate from either unit and open the 1-CC-LCV-100 valve.
A. Incorrect. Auto makeup is normally isolated. Normal source of makeup is main condensate, not Service Water. Plausible because LCV is capable of performing an auto makeup if it were not isolated and Service Water is the backup source of water for CC surge tank makeup
B. Incorrect.Normal source of makeup is main condensate, not Service water. Plausible because manual makeup is the normal means and Service Water is the backup source of water for CC surge tank makeup.
C. Incorrect. Auto makeup is normally isolated. Plausible because LCV is capable of performing an auto makeup if it were not isolated.

QUESTIONS REPORT
for POST NRC REVIEW R1

Ability to manually operate and/or monitor in the control room: Control of minimum level in the CCWS surge tank.

Question Number: 33

Tier 2 Group 1

Importance Rating: RO 2.9

Technical Reference: 1-AP-15
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D C A D A C A C A B Scramble Range: A - D

12. 008 AA1.02 001

Given the following conditions:

- A Small Break LOCA has occurred.
- The crew is performing the actions of 1-ES-1.2, Post LOCA Cooldown and Depressurization.
- Both LHSI pumps have been stopped.
- One charging pump has been stopped.
- Normal charging is aligned.
- RCPs are OFF.
- The crew is depressurizing the RCS.
- When the depressurization is stopped, the following conditions exist:
  - RCS subcooling is 23 degrees F and trending DOWN.
  - PRZR level is 68% and trending UP.

Based on these indications, what actions should be taken in accordance with 1-ES-1.2?

A. Start one RCP to collapse any RCS voids.

B. ✓ Manually start charging pumps and align the BIT to restore RCS subcooling.

C. Reinitiate SI and verify all safeguards equipment has actuated.

D. Increase RCS pressure using PRZR heaters to regain RCS subcooling.

A. Incorrect. Check for RCP start prior to depressurization

B. Correct. Continuous action page directs the action

C. Incorrect. Reinitiation of SI may result in a higher pressure than necessary for the plant conditions, and LHSI will be running again at shutoff head.

D. Incorrect. Although pressurizer heaters are energized to establish a bubble in the pressurizer, they are not used to repressurize the RCS on loss of subcooling

QUESTIONS REPORT
for POST NRC REVIEW R1

Ability to operate and/or monitor the following as they apply to: HPI pump to control PZR level/pressure.

Question Number: 2

Tier 1 Group 1

Importance Rating: RO 4.1

Technical Reference: ES-1.2 Continuous Action Page
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B B D D B A C B B C Scramble Range: A - D

13. 009 EK3.27 001

Given the following conditions:

A small break LOCA has occurred.

The crew is performing the actions in 1-ES-1.2, Post LOCA Cooldown And Depressurization.

The BIT is isolated.

Normal charging has been aligned.

The crew is depressurizing the RCS using normal spray.

Which ONE of the following describes the strategy for the continuing depressurization?

A. Maximize subcooling to ensure continued RCP operation.

B. ✓ Minimize subcooling to reduce RCS break flow.

C. Maximize subcooling to prevent a challenge to the Core Cooling CSF.

D. Minimize subcooling to ensure PRZR level remains above the lower limit to allow heater operation to reduce the rate of increase of PRZR level.

A. Incorrect. RCP operation is not required for this event, although desired.

B. Correct. Strategy is to depressurize and attempt to minimize subcooling so that break flow is reduced due to the minimal makeup provided by charging pumps.

C. Incorrect. Core cooling should not be challenged on a loss of subcooling at these temperatures and pressures at this point in the cooldown.

D. Incorrect. Heater operation may be required to reduce the rate of increase in PRZR level, but is not the reason for minimizing subcooling.

QUESTIONS REPORT
for POST NRC REVIEW R1

Knowledge of the reasons for the following responses as they apply to: Manual depressurization or HPI recirculation for sustained high pressure.

Question Number: 3

Tier 1 Group 1

Importance Rating: RO 3.6

Technical Reference: 1-ES-1.2
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: Bank
Question History: Wolf Creek 2005
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B B A B C B D C D D Scramble Range: A - D

14. 010 K2.02 001

Which ONE of the following **directly** supplies power to PRZR Spray Valve 1455A and 1455B controllers?

A. 125VDC busses 1-I and 1-II

B. 480 volt MCCs 1J1 and 1H1

C. 120VAC Vital Instrument Busses 1-I and 1-II

D. Primary Plant Process Rack 8

D. Correct. Directly supplied from Primary Plant Process Rack 8.
A. Incorrect. (see D). Plausible because DC panels supply the SOVs, but not the controllers.
B. Incorrect. (see D). Plausible because 480 volt MCCs supply transformers that provide power to 1-EP-DB-16A/B, which are a backup P/S to the primary plant process racks.
C. Incorrect. (see D). 120VAC vital instrument busses supply normal source of power to the process racks.
Knowledge of electrical power supplies to the following: Controller for PZR spray valve.

Question Number: 34

Tier 2 Group 1

Importance Rating: RO 2.5
Technical Reference: NCRODP-74-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D A D C C B A D D D Scramble Range: A - D

15. 012 A2.07 001

Unit 1 is at 100% power.

Which ONE of the following identifies how a loss of 48VDC from SSPS directly affects the operation of the associated reactor trip breaker, and what is the crew's required response?

A. SFGDS PROT SYS TR (A/B) TROUBLE alarm ONLY. Ensure only one train is affected and direct Instrument Department to investigate.

B. ONLY the reactor trip breaker UV coil will deenergize. Enter 1-E-0, Reactor Trip or Safety Injection.

C. ONLY the reactor trip breaker auto shunt trip relay will deenergize. Enter the applicable Tech Spec action statement and submit an urgent Work Request.

D. SFGDS PROT SYS TR (A/B) TROUBLE alarm, and reactor trip breaker UV coil and auto shunt trip relay will BOTH deenergize. Enter 1-E-0, Reactor Trip or Safety Injection.

D. Correct. A loss of 48VDC actuates the annunciator and de-energizes both the UV coil and auto shunt trip relay on the associated reactor trip breaker. The breaker will open due to loss of power to the UV coil, and the reactor will trip. 1-E-0 is appropriate response. (Note that loss of power to the auto shunt trip relay will not cause the breaker to open.)
A. Incorrect. This is not the only annunciator that will alarm. 1-E-0 is the appropriate response.
B. Incorrect. The auto shunt trip relay will also de-energize.
C. Incorrect. The UV coil will also de-energize. 1-E-0 is the appropriate response.

Ability to (a) predict the impacts of the following on the (SYSTEM) and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Loss of DC Control Power.

Question Number: 49

Tier 2 Group 1

Importance Rating: RO 3.2

Technical Reference: NCRODP-65-NA; 11715-ESK-6V; 1-AR-K-G1
Proposed references to be provided to applicants during examination: None
Learning Objective: OB 19556
Question Source: Bank
Question History: 5085
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

QUESTIONS REPORT
for POST NRC REVIEW R1

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9

Answer: D A D D B C A B A B Scramble Range: A - D

16. 012 A3.05 001

The following plant conditions exist.

- Unit 1 is at 100% power.
- All SGWLC inputs are selected to Channel III.
- Channel III steam generator "C" feed flow fails off scale low.
- The operator takes manual control of "C" main feed regulating valve and controls "C" steam generator level.

Which ONE of the following subsequent failures will cause an immediate reactor trip?

A. Loss of Vital Bus II

B. Loss of Vital Bus IV

C. "C" steam generator Channel III steam flow fails high

D. "C" steam generator Channel III level fails low

A. Correct. Loss of power to SG level channel II will de-energize the bistable for low level Rx trip (coincident with FF<SF) and will cause a reactor trip.
B. Incorrect. Loss of power to SF/FF channel IV will de-energize bistable for FF<SF, but actual level is > 25% trip setpoint, so reactor trip will not occur.
C. Incorrect. FF<SF alone on 2/2 channels will not cause an actuation.
D. Incorrect. SG low level Rx trip (<25%) is sensed from channels I and II SG level, not channel III.

Ability to monitor automatic operations of the (SYSTEM) including: Single and multiple channel trip indicators.

Question Number: 35

Tier 2 Group 1

Importance Rating: RO 3.6

Technical Reference:
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: Bank
Question History: 6054
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: A C B A D C A A A A Scramble Range: A - D

17. 013 A1.06 001

Given the following conditions:

A large-break LOCA has occurred on Unit 1.
The Safety Injection system has automatically swapped to cold-leg recirculation mode.
The OATC observes RWST level increasing approximately 1% every 10 minutes.

Which ONE of the following would account for the increase in RWST level?

A. ✓ "B" LHSI pump recirculation valves 1-SI-MOV-1885B and -1885D both failed to fully close during the swapover, but their CLOSED limits were made up.

B. VCT to charging pump suction valve 1-CH-MOV-1115E failed to close during the swapover.

C. The OATC failed to close charging pump recirculation valves 1-CH-MOV-1275A, -1275B, and -1275C when required.

D. LHSI discharge to HHSI suction valve 1-SI-MOV-1863A failed to fully open during the swapover, but the OPEN limits were made up.

A: Correct. WIth SI system in recirculation mode, both recirculation valves not fully closed would result in a LHSI pumping containment sump water to the RWST.
B: Incorrect. 1-CH-MOV-1115E is in series with 1-CH-MOV-1115C, which is closed.
C: Incorrect. Failure to close charging pump recirculation valves would reduce HHSI flow to the core, but would not divert water to the RWST. Recirculation valves flow back to the charging pump suction via the seal return heat exchanger.
D. Incorrect. Failure of 1-SI-MOV-1863A to fully open could reduce flow from LHSI to charging pump suction, but would not divert water to the RWST.

Ability to predict and/or monitor changes: RWST level.

Question Number: 36

Tier 2 Group 1

Importance Rating: RO 3.6

Technical Reference: NCRODP-52-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: Bank
Question History: 60297 (LORP open-reference)
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

QUESTIONS REPORT
for POST NRC REVIEW R1

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9

Answer: A A C B C C C D A B Scramble Range: A - D

18. 014 K5.02 001

During troubleshooting on the rod control system at 100% power, a power cabinet 2BD non-urgent alarm was received.

The Unit Supervisor directs the ALARM RESET push-button to be depressed, in accordance with a SNSOC approved test procedure.

The OATC mistakenly depresses the STARTUP RESET push buttons.

Which ONE of the following will occur?

A. All IRPIs reset to zero and all rod bottom lights illuminate (actual rod position does not change).

B. ✓ All control rod bank low and low-low insertion limit annunciators will illuminate.

C. Non-Urgent failure internal alarm circuit will reset.

D. CMPTR ALARM ROD DEV/SEQ alarm is disabled.

B. Correct. P/A converter provides the bank position input signal for comparison to the calculated value of Rod insertion limit. If demand is reset (S/U Reset), P/A converter resets bank position to zero steps and all four rod insertion limits annunciators will alarm.
A. Incorrect. Startup reset pushbuttons have no effect on IRPIs.
C. Incorrect. The non-urgent failure resets automatically when the condition no longer exists. Plausible because S/U reset buttons will reset the urgent failure internal alarm circuit.
D. Incorrect. This annunciator will not be disabled; it will actuate as a result of pressing the S/U reset buttons. Plausible because the RPI ROD BOT ROD DROP annunciator is disabled for CBB, CBC, and CBD when the S/U reset buttons are pressed.

QUESTIONS REPORT
for POST NRC REVIEW R1

Knowledge of the operational implications of the following concepts as they apply to the (SYSTEM): RPIS independent of demand position.

Question Number: 63

Tier 2 Group 2

Importance Rating: RO 2.8

Technical Reference: NCRODP-65
Proposed references to be provided to applicants during examination: None
Learning Objective: OB 17853
Question Source: Bank
Question History: 4091
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B C D B A B B D D D Scramble Range: A - D

19. 015 AA1.07 001

Given the following:

Unit 1 is at 100% power.
The following annunciators are received 10 seconds apart in the control room:

Panel C, G-6, RCP 1A-B-C LABYTH SEAL LO FLOW
Panel C, C-4, RCP 1A-B-C THERM BARR CC HI/LO FLOW

The OATC determines that RCP 1A seal injection flow is 0 gpm, and RCP 1A thermal barrier CCW flow is lowering toward 0 gpm.

The US enters 1-AP-33.2, Loss of RCP Seal Cooling.

Which ONE of the following actions will be required?

A. Restore either seal injection OR thermal barrier CCW flow within 5 minutes OR trip the reactor, trip RCP 1A, and isolate RCP 1A seal return

B. Attempt to restore either seal injection OR thermal barrier CCW flow. If RCP 1A exceeds any temperature limits, THEN trip the reactor, trip RCP 1A, and isolate RCP 1A seal return

C. Trip the reactor, trip RCP 1A, isolate RCP 1A seal return, and continue attempts to restore seal injection and thermal barrier CCW flow

D✓ Trip the reactor, trip RCP 1A, isolate RCP 1A seal injection, seal return, and thermal barrier CCW flow

D. Correct. If both methods of seal cooling are lost, reactor and RCP trip are required, and seal is isolated until Mode 5 is reached.
Distractors are wrong because if BOTH seal injection and CCW are lost, there is no 5 minute limit to restore. Temperature indications are not trended on a loss of all seal cooling, only on loss of CCW or on seal injection. Once it is lost, do not attempt to restore. Seal must be isolated.

QUESTIONS REPORT
for POST NRC REVIEW R1

Ability to operate and/or monitor the following as they apply to: RCP seal water injection subsystem.

Question Number: 4

Tier 1 Group 1

Importance Rating: RO 3.5

Technical Reference: 1-AP-33.2
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D D D A D B C A B A Scramble Range: A - D

20. 017 K1.01 001

Which ONE of the following describes a purpose of the Core Exit Thermocouple (CETC) input to the Plant Computer System (PCS)?

A. Input to Integrity CSF Status Tree.

B. Indication and PCS alarm for RCS cooldown/heatup limits.

C. Indication and PCS alarm for average five high CETC.

D. Input to Core Cooling CSF Status Tree.

D. Correct. CETCs provide input to ERG core cooling status tree for CETCs less than 1200 degrees F and less than 700 degrees F.
A. Incorrect. Integrity status tree looks at RCS cold-leg temperatures, not CETCs.
B. Incorrect. RCS heatup and cooldown limits may be trended with CETC, but there is no Plant Computer alarm from CETCs associated with exceeding these limits.
C. Incorrect. Average five high CETCs provides indication only (no alarm).
Knowledge of the physical connections and/or cause-effect relationships between (SYSTEM) and the following: Plant computer.

Question Number: 64

Tier 2 Group 2

Importance Rating: RO 3.2

Technical Reference: NCRODP-64-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D B B C C A A C C D Scramble Range: A - D

21. 022 K3.02 001

Given the following conditions:

-The plant is operating at 100% power.
-Due to a loss of cooling to Containment Air Recirc Fans, containment temperature has risen from 103 degrees F to 119 degrees F.
-Actions are in progress to restore containment cooling.

If the temperature continues to rise in containment, which ONE of the following describes the effect on pressurizer level indication?

A. The controlling pressurizer level channel will indicate slightly lower than actual level, and remain higher than the cold-calibrated pressurizer level instrument.

B. ✓ The controlling pressurizer level channel will indicate slightly higher than actual level, and remain higher than the cold-calibrated pressurizer level instrument.

C. The controlling pressurizer level channel will indicate slightly lower than actual level, and remain lower than the cold-calibrated pressurizer level instrument.

D. The controlling pressurizer level channel will indicate slightly higher than actual level, and remain lower than the cold-calibrated pressure level instrument.

B. Correct. The cold calibrated pressurizer level instrument is calibrated for temperatures far lower than normal operating temperatures and will indicate lower. When the containment atmospheric temperature rises, the pressurizer reference leg will heat up, causing density to decrease, and exerting less pressure on the reference leg side of the transmitter. This will result in an increase in indicated level.
Knowledge of the effect that a loss or malfunction of the (SYSTEM) will have on the following: Containment instrumentation readings.

Question Number: 37

Tier 2 Group 1

Importance Rating: RO 3.0

Technical Reference: NCRODP-74-NA; Self-study guide - PRZR Control & Protection
Proposed references to be provided to applicants during examination: None
Learning Objective: 15804
Question Source: Bank
Question History: Robinson 2002 NRC (WTSI 18564)
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

QUESTIONS REPORT
for POST NRC REVIEW R1

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B C B A C C A D D C Scramble Range: A - D

22. 022AK3.05 001

Plant conditions are follows:

- A power reduction to 50% is scheduled for this shift.
- A loss of power has just rendered the boric acid blender control inoperable.
- Emergency boration is not available.

Which ONE of the following is correct concerning the planned power reduction?

A. The downpower should continue as planned using the RWST as a source of borated makeup.

B. The downpower should continue as planned using the opposite unit's blender as a source of borated makeup.

C. The downpower should be postponed because the crew will be unable to borate to compensate for Xenon effects during the downpower.

D. The downpower should be postponed because the crew will be unable to maintain control rods above the insertion limit.

D. Correct. Downpower to 50% without boration capability would result in control rods well below the insertion limits. Loss of boric acid blender requires unit to be maintained stable.
A. Incorrect. Use of RWST would result in rapid insertion of negative reactivity and the crew would have extreme difficulty controlling RCS temperature and reactor power.
B. Incorrect. Although piping configurations allow using opposite unit's blender for RWST makeup, no procedural guidance exists for using it for RCS makeup.
C. Incorrect. Xenon will be adding negative reactivity during downpower, requiring dilution rather than boration.
Knowledge of the reasons for the following responses as they apply to the Loss of Reactor Coolant Makeup: Need to avoid plant transients.

Question Number: 22

Tier 1 Group 1

Importance Rating: RO 3.2

Technical Reference: NCRODP-41-NA; 11715-FE-4V
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

QUESTIONS REPORT
for POST NRC REVIEW R1

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D C A C B D D A D C Scramble Range: A - D

23. 025 AA1.03 001

Given the following:

Unit 1 is in Mode 5, Reduced Inventory conditions due to removal of "B" RCP for corrective maintenance on the pump impeller.
Reactor coolant loops are **NOT** isolated.
A loss of RHR occurs.
The crew is performing actions of 1-AP-11, Loss of RHR.
RCS temperature is rising and NEITHER RHR pump can be started.

Which ONE of the following describes the method, and the actions that will be taken to restore core cooling?

A. Cold Leg Injection Forced Feed and Spill; start two charging pumps and both LHSI pumps.

B. Cold Leg Injection Forced Feed and Spill; start one charging pump, and if necessary, one LHSI pump.

C. Hot Leg Injection Forced Feed and Spill; start two charging pumps and both LHSI pumps.

D. Hot Leg Injection Forced Feed and Spill; start one charging pump, and if necessary, one LHSI pump.

D. Correct. Per 1-AP-11 and GOP-13.0, hot-leg injection is the preferred method of forced feed and spill. Also, with RCP removed there is a large cold leg opening. Per 1-AP-11, only one charging pump is started; if more flow is required, then one LHSI pump is started.
A. Incorrect. Hot-leg injection is preferred and there is a large opening in the cold leg. Only start one charging pump and one LHSI pump.
B. Incorrect. Hot-leg injection is preferred and there is a large opening in the cold leg.
C. Incorrect. Only start one charging pump and one LHSI pump.

QUESTIONS REPORT
for POST NRC REVIEW R1

Ability to operate and/or monitor the following as they apply to: LPI Pumps

Question Number: 6

Tier 1 Group 1

Importance Rating: RO 3.4

Technical Reference: 1-AP-11
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D B A B D C C A A C Scramble Range: A - D

24. 026 A4.01 001

In accordance with Attachment 3 of 1-E-1, Loss of Reactor or Secondary Coolant, which ONE of the following describes the correct sequence for securing Quench Spray?

A. Reset CDA, Stop Quench Spray Pumps, close Quench Spray Pump discharge valves, and close Chemical Addition Tank outlet valves.

B. Reset CDA, close Quench Spray Pump discharge valves, close Chemical Addition Tank outlet valves, stop Quench Spray Pumps.

C. Ensure the initiating signal has cleared, reset CDA, Stop Quench Spray Pumps, close Quench Spray Pump discharge valves, and close Chemical Addition Tank outlet valves.

D. Ensure the initiating signal has cleared, reset CDA, close Quench Spray Pump discharge valves, close Chemical Addition Tank outlet valves, stop Quench Spray Pumps.

A. Correct. Instructions provided directly by 1-E-0 Attachment 3. Initiating signal does not have to be clear prior to resetting and realigning QS. Question tests memory of sequence of actions, as well as whether an initiating signal must clear prior to reset.
B. Incorrect. Stop QS pumps prior to closing valves.
C. Incorrect. Signal does not have to be clear prior to resetting CDA.
D. Incorrect. Signal does not have to be clear prior to resetting CDA. Stop QS pumps prior to closing valves.

Ability to manually operate and/or monitor in the control room: CSS controls.

Question Number: 38

Tier 2 Group 1

Importance Rating: RO 4.5

Technical Reference: 1-E-1, Attachment 3
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: Bank
Question History: North Anna 2002 NRC (Editorial Mods)
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: A A D C D C B D A D Scramble Range: A - D

25. 027 AK2.03 001

Unit 1 is at 100% power.

PRZR pressure control channel 1-RC-PT-1445 fails high.

Which ONE of the following describes the response of the PRZR Pressure Control System?

Generates an OPEN signal to...

A. both PRZR spray valves and 1-RC-PCV-1455C

B. both PRZR spray valves and 1-RC-PCV-1456

C. 1-RC-PCV-1456 ONLY

D. 1-RC-PCV-1455C ONLY

C. Correct. Pressure channel input to 1-RC-PT-1456 only.
A. Incorrect. Spray valves and PCV-1455C are not affected by PT-1445. Plausible because these actions occur on failure of PT-1444.
B. Incorrect. Spray valves are not affected by PT-1445. Plausible because PCV-1456 will open.
D. Incorrect. PCV-1455C is not affected by PT-1445. Plausible because failure of PT-1444 will open PCV-1455C.
Knowledge of the interrelations between and the following: Controllers and positioners.

Question Number: 7

Tier 1 Group 1

Importance Rating: RO 2.6

Technical Reference: NCRODP-74-NA
Proposed references to be provided to applicants during examination: None
Learning Objective: OB 16736
Question Source: Bank
Question History: 711
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: A B A C A D D C B A Scramble Range: A - D

26. 029 A4.04 001

Given the following conditions:

Unit 1 is in Mode 6, core on-load in progress.
A recently-irradiated fuel assembly appears to fall apart during removal from the containment upender.
Bubbles are coming to the surface of the Refueling Cavity.
The following Containment radiation monitors are in alarm:
-1-RM-RMS-159
-1-RM-RMS-160
-1-RM-RMS-162

Which ONE of the following describes actions that will initially be required in accordance with 0-AP-30, Fuel Failure During Handling?

A. Manually initiate Control Room bottled air dump; evacuate the Fuel Building.

B. Place Fuel Building ventilation in service through the charcoal filters; evacuate the containment.

C✓ Manually initiate Control Room bottled air dump; evacuate the Containment.

D. Isolate reactor cavity from the Spent Fuel Pool; place Fuel Building ventilation in service through the charcoal filters.

C. Correct. Bottled air dump and containment evacuation is required when a Fuel Handling Accident occurs in containment.
A. Incorrect. No need to evacuate the Fuel Building for an accident in the Containment.
B. Incorrect. No need to place Fuel Building ventilation in service with the accident in Containment.
D. Incorrect. No need to close the gate valve or place Fuel Building ventilation in service with the accident in Containment.

QUESTIONS REPORT
for POST NRC REVIEW R1

Ability to manually operate and/or monitor in the control room: Containment evacuation signal.

Question Number: 56

Tier 2 Group 2

Importance Rating: RO 3.5

Technical Reference: 0-AP-30
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C B A B D D A C B B Scramble Range: A - D

27. 029 EG2.2.22 001

In the case of an Anticipated Transient Without Scram (ATWS), the ATWS Mitigation System Actuation Circuitry (AMSAC) is designed to...

A. open reactor trip breakers and actuate AFW to limit DNBR and maintain RCS parameters within the reactor core safety limits; does NOT directly trip the turbine.

B. open the Rod Drive MG Set supply breakers, trip the turbine, and actuate AFW to limit DNBR and maintain RCS parameters within the reactor core safety limits.

C. open reactor trip breakers and actuate AFW to limit the RCS pressure excursion for the event coincident with loss of feedwater; does NOT directly trip the turbine.

D. open the Rod Drive MG Set supply breakers, trip the turbine, and actuate AFW to limit the RCS pressure excursion for the event coincident with loss of feedwater.

D. Correct. AMSAC directly actuates reactor trip by opening rod drive MG supply breakers, and directly actuates turbine trip and AFW pumps start.
A and B are incorrect because AMSAC is not specifically designed to maintain RCS parameters within reactor core safety limits.
A and C are incorrect because AMSAC does directly trip the turbine.
Knowledge of limiting conditions for operations and safety limits.

Question Number: 8

Tier 1 Group 1

Importance Rating: RO 3.4

Technical Reference: NCRODP-77
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D B D D C D D D C C Scramble Range: A - D

28. 033 K4.05 001

Which ONE of the following describes one method for maintaining Spent Fuel Pool water volume and Shutdown Margin?

Minimum required boron concentration is...

A. 2600 ppm. Evaporation is compensated for by making up with Primary Grade water.

B. 2300 ppm. Evaporation is compensated for by making up with blended flow from the boric acid blender.

C. 2600 ppm. Leakage is compensated for by making up with Primary Grade water.

D. 2300 ppm. Leakage is compensated for by making up with blended flow from the boric acid blender.

A. Correct. Minimum boron concentration per TS-3.9.1 and the COLR is 2600 ppm. PG water is used to makeup for evaporation.
B. Incorrect. (see A).
C. Incorrect. Compensate for leakage with blended flow from the boric acid blender.
D. Incorrect. Minimum boron concentration per TS-3.9.1 and the COLR is 2600 ppm.

Knowledge of design feature(s) and interlock(s) which provide for the following: Adequate SDM (boron concentration).

Question Number: 57

Tier 2 Group 2

Importance Rating: RO 3.1

Technical Reference: NCRODP-49-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: A B D B D A C B D D Scramble Range: A - D

29. 034 A4.02 001

Given the following:

Unit 1 in Mode 6.
Refueling Operations are in progress.
Source Range counts on N31 and N32 have been approximately 120 CPS throughout the core reload process.

Which ONE of the following describes the minimum Source Range Count Rate required to automatically initiate the Containment Evacuation alarm?

A. 240 CPS on EITHER channel

B. 240 CPS on BOTH channels

C. 600 CPS on EITHER channel

D. 600 CPS on BOTH channels

C. Correct. Five times normal background on either channel will cause the containment evacuation alarm to sound.
A and B represent counts doubling, which is tracked during core reload during refueling.
Ability to manually operate and/or monitor in the control room: Neutron levels.

Question Number: 58

Tier 2 Group 2

Importance Rating: RO 3.5
Technical Reference: NCRODP-62-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C A C D C C D B C A Scramble Range: A - D

30. 035 K4.03 001

Which ONE of the following is correct concerning the signals that will close the Blowdown Trip Valves in the Auxiliary Building (1-BD-TV-100A, -100C, and -100E) and the actions necessary to re-open the valves following closure?

A. Containment Isolation Phase A closes the valves; depress CLOSE button on each valve to reset signal, then depress OPEN button to re-open.

B. High flow condition from the associated SG closes the valves; depress CLOSE button on each valve to reset signal, then depress OPEN button to re-open.

C. High flow condition from the associated SG closes the valves; depress OPEN button to re-open (signal resets automatically when valves close)

D. Containment Isolation Phase A closes the valves; place the Phase A reset switches in RESET, then depress OPEN buttons to re-open.

D. Correct. Containment isolation phase A will close the valves; reset signal using the Phase A reset switches; re-open using OPEN pushbuttons.
A. Incorrect. Close button does not reset the closure signal. Plausible because some trip valve closure signals are reset in this manner.
B. Incorrect.high flow will not close trip valves.

Knowledge of design feature(s) and or interlock(s) which provide for the following: Automatic blowdown and sample line isolation and reset.

Question Number: 59

Tier 2 Group 2

Importance Rating: RO 2.6
Technical Reference: NCRODP-37-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D B A C D B A C C C Scramble Range: A - D

31. 036 AA1.04 001

Given the following conditions:

Unit 1 is in Mode 6, core off-load is in progress.
A fuel assembly being withdrawn from the core has visible signs of damage.
0-AP-30, Fuel Failure During Handling, has been entered.

Which ONE of the following describes the location where the fuel assembly should be placed?

A. Back in its original location in the core

B. In the RCCA change fixture

C. In a horizontal position in the upender

D. Transport to the Spent Fuel Pool

A. Correct. 0-AP-30 only calls for a safe location. All other areas would require transport of the damaged assembly. Placing it back in its location is the safest way to go.
B, C, D. Incorrect. (see A). Transporting all the way from the core the the upender, then lowering the upender frame would be unnecessarily risky and therefore unsafe. The RCCA change fixture is not an option due to the potential for a loss of reactor cavity level. Transporting to the SFP is even more risky than placing in the upender due to the additional transit through the fuel transfer tube and to the SFP location.
Ability to operate and/or monitor the following as they apply to: Fuel Handling Equipment during an incident

Question Number: 20

Tier 1 Group 2

Importance Rating: RO 3.1

Technical Reference: 0-AP-30
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41/43

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: A A D B A A A C B D Scramble Range: A - D

32. 038 EA2.16 001

Given the following:

A Steam Generator Tube Rupture has occurred on Unit 1.
The crew is preparing to initiate RCS depressurization to minimize break flow in accordance with 1-E-3, Steam Generator Tube Rupture.
Ruptured SG level is OFF-SCALE HIGH.
All equipment is available and operating as required.

Which ONE of the following describes the action that will be required to initiate RCS depressurization?

A. Initiate Normal PRZR Spray flow

B. Open one PRZR PORV

C. Initiate Auxiliary Spray flow

D. Open both PRZR PORVs

B. Correct. If ruptured SG level is off-scale high, preferred method of reducing RCS pressure is to open one PRZR PORV. Immediate depressurization is needed.
A. Incorrect. PRZR spray flow would be less effective, but is normally used before SG level is off-scale.
C. Incorrect. (see A).
D. Incorrect. Would not open both PRZR PORVs; 1-E-3 only directs using one PORV.
Ability to determine and interpret the following as they apply to: Actions to be taken if S/G goes solid and water enters steam line.

Question Number: 9

Tier 1 Group 1

Importance Rating: RO 4.2
Technical Reference: 1-E-3 Step 15, 16
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B D C A B C A D A D Scramble Range: A - D

33. 039 A2.05 001

Given the following conditions:

Unit 1 is at 95% power.
The Main Turbine Generator is operating in IMP-IN.
Steam Dump valve 1-MS-TCV-1408C fails open.

Which ONE of the following describes the effect on the unit and the MINIMUM action required in accordance with 1-AP-38, Excessive Load Increase?

A. Reactor power will rise. Place the affected Condenser Steam Dump Interlock Switch to OFF/RESET.

B✓ Reactor power will rise. Place BOTH Condenser Steam Dump Interlock Switches to OFF/RESET.

C. Reactor power will lower. Place the affected Condenser Steam Dump Interlock Switch to OFF/RESET.

D. Reactor power will lower. Place BOTH Condenser Steam Dump Interlock Switches to OFF/RESET.

B. Correct. Step 1 of 1-AP-38 directs placing both (Train A and B) interlock switches to OFF.
A and C incorrect because procedures requires both switches to OFF, since placing only one interlock switch OFF may not close steam dumps if a single train failure occurs.
C and D incorrect because power will not lower with the TG in IMP-IN.
Ability to (a) predict the impacts of the following on the (SYSTEM) and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Increasing steam demand, its relationship to increases in reactor power.

Question Number: 39

Tier 2 Group 1

Importance Rating: RO 3.3

Technical Reference: 1-AP-38
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B B C A A B B D A C Scramble Range: A - D

34. 039 K1.04 002

A turbine runback has occurred from 100% to 55% power.

Steam Dump Banks 1, 2, 3, and 4 are TRIPPED OPEN.

Which ONE (1) of the following is the MINIMUM plant condition that would cause this alignment?

A. 10° F mismatch between T_{avg} and $T_{no\text{-}load}$

B. 10° F mismatch between T_{avg} and T_{ref}

C. 16° F mismatch between T_{avg} and $T_{no\text{-}load}$

D. 16° F mismatch between T_{avg} and T_{ref}

D. Correct. 16 degree mismatch between Tave and Tref are correct for the load reject controller.
A. Incorrect. Should use Tref instead of Tno-load, which is used by the turbine trip controller
B. Incorrect. wrong setpoint (see A).
C. Incorrect. Correct setpoint, but should use Tref instead of Tno-load (see A).
Knowledge of the physical connections and/or cause-effect relationships between (SYSTEM) and the following: RCS temperature monitoring and control.

Question Number: 52

Tier 2 Group 1

Importance Rating: RO 3.1

Technical Reference: NCRODP-23-NA
Proposed references to be provided to applicants during examination: None
Learning Objective: OB16716
Question Source: Bank
Question History: 3800
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D C D D A D D D C C Scramble Range: A - D

35. 045 A2.12 001

A turbine runback has occurred on Unit 1.

Reactor power is 61% and stable.
Generator load is approximately 600 MWe and stable.
No operator actions have been taken.
The cause of the runback has been determined and the US directs the crew to restore affected systems to normal.

Which ONE of the following describes the method used to accomplish this?

A. Initiate RCS boration and manually withdraw control rods above the insertion limits.

B. Manually withdraw control rods to maintain Tavg on program. Place steam dumps in Steam Pressure mode and manually close.

C. Raise generator load to close steam dumps while borating the RCS to maintain Tavg on program.

D. Manually withdraw control rods to raise Tavg and reactor power. Ensure steam dumps close as Tavg is raised.

A. Correct. Per 1-AR-A-H4, unit power change with excessive rod movement (ramp down) requires boration to restore control rods above the low-low insertion limit.
B. Incorrect. Tavg will be within 1 degree F of program after the runback. Steam dumps will already have closed automatically in the Tavg mode.
C. Incorrect. Steam dumps will already have closed (see B) and no need to borate since Tavg will be within 1 degree F of program.
D. Incorrect. Steam dumps will already have closed (see B) and Tavg will be within 1 degree F of program.
Ability to (a) predict the impacts of the following on the (SYSTEM) and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Control rod insertion limits exceeded (stabilize secondary).

Question Number: 60

Tier 2 Group 2

Importance Rating: RO 2.5

Technical Reference: 1-AR-A-H4
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

QUESTIONS REPORT
for POST NRC REVIEW R1

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9

Answer: A B D A C C B A B B Scramble Range: A - D

36. 056 AK1.03 001

Given the following conditions:

Unit 1 reactor trip from 100% power.
A loss of off-site power has occurred.
Natural Circulation cooldown is being established in accordance with 1-ES-0.2A, Natural Circulation Cooldown with CRDM Fans.
RCS pressure is 1880 psig.
Tavg is 557.5 degrees F
Thot is 575 degrees F
Tcold is 540 degrees F
Core Exit Thermocouples are 580 degrees F
1-ES-0.2A directs the crew to determine RCS subcooling.

Which ONE of the following describes the value of subcooling that will be reported in accordance with 1-ES-0.2A?

A. 46 degrees F

B. 48 degrees F

C. 51 degrees F

D. 53 degrees F

A. Correct. CETCs are used to determine subcooling. 580 degrees F with 1895 psia is approximately 48 degrees subcooling.
B, C, D. Incorrect. The other values are for Thot and CETs for either 1895 or 1865 psia.
Knowledge of the operational implications of the following concepts as they apply to the: Definition of subcooling: use of steam tables to determine it.

Question Number: 10

Tier 1 Group 1

Importance Rating: RO 3.1

Technical Reference: ES-0.2A, Steam Tables
Proposed references to be provided to applicants during examination: Steam Tables
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B D D B B B B D D B Scramble Range: A - D

37. 056 G2.1.30 001

Given the following plant conditions:

- A fire occurred in the main control room.
- The crew relocated to the Auxiliary Shutdown Panel.
- The unit-1 OATC is preparing to secure the main feedwater (MFW) and condensate pumps.

Which ONE of the following is correct concerning the method that will be used to secure the pumps in accordance with 0-FCA-1, Control Room Fire.?

A. The condensate pump breakers will be manually opened from the normal switchgear; then the turbine building operator will verify the MFW pumps trip on low suction pressure.

B. The condensate pump breakers will be manually opened from the emergency switchgear; then the turbine building operator will verify the MFW pumps trip on low suction pressure.

C. The MFW pump breakers will be manually opened from the normal switchgear; then the condensate pump breakers will be manually opened from the normal switchgear.

D. The MFW pump breakers will be manually opened from the emergency switchgear; then the condensate pump breakers will be manually opened from the emergency switchgear.

A and B are incorrect because MFW pumps would not be allowed to trip on low suction pressure. Plausible because pumps will trip on low suction pressure.
B is incorrect because CN pump breaker is controlled from the 307 switchgear, not the emergency switchgear.
D is incorrect because CN/MFW pump breakers are controlled from the 307 switchgear, not the emergency switchgear.

Ability to locate and operate components, including local controls.

Question Number: 65

Tier 2 Group 2

Importance Rating: RO 3.9

Technical Reference: ~~NCRODP-250~~-FCA-1
Proposed references to be provided to applicants during examination: None
Learning Objective: OB 16478
Question Source: ~~Bank~~New
Question History: ~~1608~~
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C B A C D C D B D C Scramble Range: A - D

38. 057 AA2.15 001

Given the following conditions:

Unit 1 is at 100% power.
All equipment is in service.
The following events occur:

RPS Channel III status lights illuminate.
NIS Cabinet N-43 indication is extinguished.
Multiple control room annunciators are received.
The crew is performing appropriate actions in accordance with plant procedures.

Which ONE of the following describes the event that has occurred, and the initial response of the unit?

A. Loss of Bus 1J; an automatic reactor trip will occur.

B. Loss of Inverter 1-III; an automatic reactor trip will occur.

C. Loss of Bus 1J; an automatic reactor trip will NOT occur.

D. Loss of Inverter 1-III; an automatic reactor trip will NOT occur.

D. Correct. All channel III bistables illuminate on loss of inverter 1-III and subsequent loss of 120VAC vital bus 1-III. Reactor will not automatically trip on loss of a single protection channel (need at least two channels).
A and C are incorrect because a loss of 1J bus will not cause a loss of the inverter, which is supplied with DC power from the associated battery and charger. Plausible because bus 1J supplies the associated battery charger.
A and B are incorrect because an automatic reactor trip will not occur.
Ability to determine and interpret the following as they apply to: That a loss of AC has occurred.

Question Number: 11

Tier 1 Group 1

Importance Rating: RO 3.8

Technical Reference: NCRODP-35-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

QUESTIONS REPORT
for POST NRC REVIEW R1

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D A A C C D C C B B Scramble Range: A - D

39. 058 AK1.01 001

Given the following conditions:

Unit 1 is at 100% power.
The following alarm is received in the control room:

1H-B2, BATTERY CHGR 1-II TROUBLE

Battery Charger 1-II DC Output breaker has tripped and CANNOT be reset.
DC Bus 1-II voltage is 110 volts and lowering.

Which ONE of the following describes the action that will be taken, and the indication available when the bus is restored?

A. Place Battery Charger 1C-I in service. Charger output voltage will indicate 122 - 129 volts.

B. Place Battery Charger 1C-I in service. Charger output voltage will indicate 132 - 139 volts.

C. Place Battery Charger 1C-II in service. Charger output voltage will indicate 122 - 129 volts.

D. Place Battery Charger 1C-II in service. Charger output voltage will indicate 132 - 139 volts.

A. Incorrect. Voltage required to be between 132-139 for charger output. 122-129 plausible because DC bus voltage is in this range
B Correct.
C and D incorrect because wrong swing charger is indicated. For C, wrong voltage also

QUESTIONS REPORT
for POST NRC REVIEW R1

Knowledge of the operational implications of the following concepts as they apply to the: Battery charger equipment and instrumentation.

Question Number: 12

Tier 1 Group 1

Importance Rating: RO 2.8

Technical Reference: 1-OP-26.4.2, 0-AP-10
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B C A B C C B B D C Scramble Range: A - D

40. 059 K1.03 001

Given the following:

Unit 1 is at 75% power.
"B" Main Feedwater Regulating Valve fails open.
"B" SG level indicates 76% NR and trending up.

Which ONE of the following describes the plant response to the FIRST signal from RPS/ESF?

Directly initiates a...

A. reactor Trip and Feedwater Isolation. Main Feedwater Pumps remain running.

B. reactor Trip, Feedwater Isolation, and Main Feedwater Pump trip.

C. turbine Trip and Feedwater Isolation. Main Feedwater Pumps remain running.

D. turbine Trip, Feedwater Isolation, and Main Feedwater Pump trip.

D. Correct. HI-HI SG level (P-14) directly initiates a turbine trip, MFW trip, and feedwater isolation.
A and B are incorrect because P-14 does not directly initiate a reactor trip.
A and C are incorrect because MFW pumps do not remain running.

Knowledge of the physical connections and/or cause-effect relationships between MFW and the following: S/GS.

Question Number: 40

Tier 2 Group 1

Importance Rating: RO 3.1

Technical Reference: NCRODP-26-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: D B B A D D C C C A Scramble Range: A - D

41. 059 K3.02 001

Given the following conditions:

Unit 1 is at 100% power.
A Main Feed Line Rupture has occurred in the Turbine Building.
SG N/R levels are lowering at a rate of approximately 50% per minute and are currently as follows:

SG "A" 26% N/R
SG "B" 24% N/R
SG "C" 21% N/R

All equipment operates as required.

Which ONE of the following describes the status of the unit?

A. A reactor trip setpoint has been exceeded. AFW Pumps are running.

B. A reactor trip setpoint has been exceeded. AFW Pumps are NOT running.

C. A reactor trip setpoint has NOT been exceeded. AFW Pumps are running.

D. A reactor trip setpoint has NOT been exceeded. AFW Pumps are NOT running.

B. Correct. AFW Pumps will start at 18% SG Level in 1/3 SGs. Level is too high for AFW initiation. A trip setpoint would be exceeded if there is a steam flow/feed flow mismatch and SG level below 25%. In this case, 50% per minute level decrease would mean a significant deviation exists (FF < SF).
A and C are incorrect because AFW pumps are NOT running.
C and D are incorrect because a reactor trip setpoint has been exceeded.
Knowledge of the effect that a loss or malfunction of the (SYSTEM) will have on the following: AFW system.

Question Number: 53

Tier 2 Group 1

Importance Rating: RO 3.6

Technical Reference: NCRODP-26-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Higher
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B D B A D D A A C C Scramble Range: A - D

42. 061 AK1.01 001

Which ONE of the following describes the MAXIMUM reading that can be obtained on the Containment High Range Area Radiation Monitors, 1-RMS-RM-165 and 166?

A. 10^3 R/Hr

B. 10^5 R/Hr

C. 10^7 R/Hr

D. 10^9 R/Hr

C. Correct. Range for Hi Range Monitors is 10^0 to 10^7 R/Hr.
A, B, D are incorrect (see C). Other area radiation monitor upper limits are 10^3 R/Hr. The adverse containment setpoint is 10^5 R/Hr.
Knowledge of the operational implications of the following concepts as they apply to the: Detector limitations.

Question Number: 21

Tier 1 Group 2

Importance Rating: RO 2.5
Technical Reference: NCRODP-46-NA
Proposed references to be provided to applicants during examination: None
Learning Objective:
Question Source: New
Question History:
Question Cognitive Level: Lower
10 CFR Part 55 Content: 41

Comments:

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C D B C D B A C B A Scramble Range: A - D