

Draft Submittal
(Pink Paper)

Reactor Operator Written Exam

NORTH ANNA JUNE 2008 EXAM
05000338/2008301 & 05000339/2008301

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

1. 001 G2.4.31 071/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- During a Unit 1 load reduction for 1-PT-34.3, Turbine Valve Freedom Test, the following alarm is received:
 - 1A-D1, ROD CONTROL URGENT FAILURE
- The Ramp has been held and power is approximately 93%.
- Tave is 2.5°F higher than Tref.
- Investigation reveals that a Logic Cabinet Oscillator Failure has occurred.

Which ONE of the following describes the effect on the unit, and the action that will be taken to match Tave to Tref?

- A. All rod motion is inhibited; adjust Turbine load ONLY to match Tave to Tref.
- B. All rod motion is inhibited; adjust Turbine load or adjust RCS boron concentration to match Tave to Tref.
- C. Rod motion is allowed in 'Bank Select'; adjust Turbine load ONLY to match Tave to Tref.
- D. Rod motion is allowed in 'Bank Select'; adjust Turbine load, adjust RCS boron concentration, or use rods in Bank Select to match Tave to Tref.

A Incorrect. Change in RCS Cb is also allowable IAW the alarm response. Plausible because the applicant may believe that chem shim is not advisable while rods are frozen, and that changing turbine would be better course of action.

B Correct. A Logic Cabinet failure freezes all rod motion, and before attempting to move rods, the problem must be corrected.

C Incorrect. Second half of choice plausibility same as option A, and also an urgent failure in a Power Cabinet would allow the unaffected groups to be moved in Bank Select, therefore choosing either C or D for this reason is credible.

D Incorrect same reasons as C, but second half of option is correct action, with the exception of using rods. Plausibility is enhanced for this choice because the alarm response allows use of rods in 'bank select' if a power cabinet failure has occurred.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Emergency Procedures / Plan: Knowledge of annunciator alarms, indications, or response procedures.

Question Number:

Tier: 2
Group: 2

Importance Rating: 4.2

Technical Reference: 1A-D1, Rod Control LP section 9.2

Proposed references to be provided to applicants during examination: None

Learning Objective: U 6518

Question History:

10 CFR Part 55 Content: 41.7, 10

Comments:

KA Match: Item directly evaluates the knowledge required by the selected topic because it requires knowledge of both the effect of the annunciator, and the action contained in the alarm response procedure

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

2. 003 A4.07 001/BANK/ROBINSON 2004/HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 cooldown is in progress for refueling.
- RCS temperature is 175 degrees F.
- RCS pressure is 360 psig.
- VCT pressure is 30 psig.
- Seal Injection flows are 8 GPM to each RCP.

The following alarm is received:

- 1C-G8, RCP 1A-B-C SEAL LEAK LO FLOW.
- 1C RCP seal leakoff flow indicates 0.8 gpm and slowly decreasing.
- 1C RCP Standpipe alarms are CLEAR.
- 1C RCP #1 Seal Leakoff temperature is 180 degrees F and rising at 1 degree F every 10 minutes.

Which ONE (1) of the following actions will be performed?

- A✓ OPEN 1-CH-HCV-1307, RCP Seal Bypass Isolation Valve, to increase seal leakoff flow.
- B. Raise RCS pressure to high in the allowable band to increase seal leakoff flow.
- C. Trip operating RCPs and isolate seal leakoff due to insufficient seal DP.
- D. Isolate #1 seal leakoff for 1C RCP to establish a pressure boundary at #2 seal.

A Correct. Opening the seal bypass valve under low pressure conditions will raise the seal leakoff flow in accordance with the ARP.

B Incorrect. Raising RCS pressure would increase seal DP, and may increase seal leakoff flow, but is not directed by the ARP. Further the LTOP limit at this temperature per Tech Specs is 375# which will have a negligible effect on leakoff. The candidate who does not recognize this may choose this distractor. Plausible because if pressure could be raised a significant amount it would have the desired effect.

C Incorrect. DP is 330 psig, sufficient for continued RCP operation. Minimum DP for ensuring desired seal leakoff flow as given by the AR is 275 psi. Plausible because pressure is low.

D Incorrect. Isolating seal leakoff will decrease the #1 seal DP, placing a pressure boundary at #2 seal. This would be performed for a seal failure. This condition is expected for low pressure, and is not representative of a seal failure. Plausible because at higher pressures, these indications would lead to seal isolation.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to manually operate and/or monitor in the control room: RCP seal bypass

Question Number:

Tier: 2

Group: 1

Importance Rating: 2.6

Reference(s) - ARP 1C-G8, 1-OP-5.2

Proposed References to be provided to applicants during examination - None

Learning Objective - U 3493

Question History -

10 CFR Part 55 Content - 41.7/10

Comments -

KA Match: Item evaluated knowledge of when and under what conditions seal bypass may be used.

This item was taken from a Robinson item from 2004. Stem was changed to ensure plant specific information, two options were changed for plausibility.

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

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

Source: BANK

Source If Bank: ROBINSON 2004

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

3. 004 G2.2.3 003/NEW//LOWER//RO/NORTH ANNA/6/2008/NO

Which ONE of the following describes a NORMAL Unit 2 BAST alignment?

- A✓ 'C' BAST through 1-CH-P-2D to Unit 2 Boric Acid Filter to Unit 2 BIT/Blender.
- B. 'A' BAST through 1-CH-P-2A to Unit 2 Boric Acid Filter to Unit 2 BIT/Blender.
- C. 'C' BAST through 1-CH-P-2D through recirc valve 1-CH-HCV-1104 ONLY and back to 'C' BAST.
- D. 'B' BAST through 1-CH-P-2A to Unit 2 Boric Acid Filter to Unit 2 BIT/Blender.

A Correct. Lineup is correct for normal arrangement of system (no equipment OOS) and ensures BIT concentration and BIT remains full.

B Incorrect. A BAST is normally aligned to Unit 1; lineup thru BIT is correct.

C Incorrect. This lineup ONLY recircs the specified BAST and as noted above would not be normal since it fails to include the BIT.

D Incorrect. In this case again the B BAST would only be used if the C BAST were unavailable; the BIT lineup portion is correct.

All distractors are plausible since several lineups are possible for various evolutions. The "normal" lineup is based on a configuration that maintains TRM requirements for functional sources and flowpaths. The normal on service tank and associated recirc path is different between the Units.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

004 Chemical and Volume Control System

2.2.3 (multi-unit license) Knowledge of the design, procedural, and operational differences between units.

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.8

Technical Reference: OP-8 series procedures

Proposed references to be provided to applicants during examination: None

Learning Objective:

Question History:

10 CFR Part 55 Content: CFR: 41.5 / 41.6 / 41.7 / 41.10 / 45.12

Comments:

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: A A A A A A A A A A	Items Not Scrambled
Source:	NEW		Source If Bank:	
Cognitive Level:	LOWER		Difficulty Level :	
Job Position:	RO		Plant:	NORTH ANNA
Date:	6/2008		Previous NRC?:	NO

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

4. 005 K1.06 041/MODIFIED//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is in Mode 6.
- The unit has been shutdown for 11 days.
- Cavity level is 22 feet above the reactor vessel flange.
- RCS temperature is 109 degrees F.
- RHR Loop 1A is in service.

Which ONE of the following is the MINIMUM RHR flow required, and the reason for the minimum flow, in accordance with 1-OP-14.1, Residual Heat Removal.

- A. 2500 GPM; satisfies Technical Specification minimum flow requirements in Mode 6.
- B✓ 2500 GPM; prevents flow induced chatter on SI Accumulator check valves.
- C. 3000 GPM; satisfies Technical Specification minimum flow requirements in Mode 6.
- D. 3000 GPM; prevents flow induced chatter on SI Accumulator check valves.

A Incorrect. Plausible because minimum RHR operability requirements are based on cavity level.

B Correct. Flow induced chatter can damage SI Accumulator check valves, because RHR discharge uses a portion of SI Accumulator discharge piping.

C Incorrect. 3000 GPM would be the minimum flow requirement if cavity level was higher than 23 feet or if RCS temperature was greater than 140 degrees F, and the precaution is used to satisfy TS.

D Incorrect. Plausible because reason is correct, but flow is incorrect.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the physical connections and/or cause-effect relationships between the RHRS and the following systems: ECCS

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.5

Technical Reference: 1-OP-14.1

Proposed references to be provided to applicants during examination: None

Learning Objective: U 10457, U 444

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates cause-effect relationship between RHR and SI systems because it tests RHR flow requirement to prevent damage to SI components

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

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

Source: MODIFIED

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

5. 006 K2.02 043/NEW//HIGHER//RO/NORTH ANNA/6/2008/NO

Given the following:

- Unit 1 is in Mode 4 with a plant cooldown to Mode 5 in progress.
- RCS Pressure is 720 psig.
- RCS temperature is 325°F.

Which ONE of the following states the power supply to 1-SI-MOV-1865A, 'A' Accumulator Discharge Isolation Valve, and it's breaker position for the current plant conditions?

480 Volt MCC...

- A✓ 1H1; breaker is open.
- B. 1H1; breaker is closed.
- C. 1J1; breaker is open.
- D. 1J1; breaker is closed.

A Correct. Correct power supply, and breaker is normally open; during RCS cooldown in Mode 3, breaker is closed below 1990 psig until the valve is closed below 950 psig. Once in Mode 4 below 350 degrees, power is again removed from the valve.

B Incorrect. See A above. Breaker would be opened below 950 psig after valve is closed.

C Incorrect. Wrong power supply, but plausible supply. (Supplies MOV-1865C for 1C SI Accumulator) Breaker is normally open, and is open in this condition.

D Incorrect. Wrong power supply, incorrect breaker position, but breaker would be closed throughout most of the cooldown. It is opened below 950 psig. See description of A and C above for detail.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of bus power supplies to the following: Valve operators for accumulators

Question Number:

Tier: 2
Group: 1

Importance Rating: 2.5

Technical Reference: NCRODP-52, Table 3;
SI LP;
1-OP-3.3, step 5.8
1-OP-26A

Proposed references to be provided to applicants during examination: None

Learning Objective: U 3887

Question History:

10 CFR Part 55 Content: 41.5

Comments:

KA Match: Topic asks power supply to Accumulator Valve Actuators; test item evaluates knowledge of the MOVs and their operation

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

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

Source: NEW Source If Bank:
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?: NO

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

6. 007 A4.10 046/MODIFIED//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is in Mode 3.
- PRT level is 74% and INCREASING SLOWLY.
- PRT pressure is 14 psig and INCREASING SLOWLY.
- PRT temperature is 155°F and INCREASING SLOWLY.

Which ONE of the below is the cause of the conditions above, and the indications that may be used to diagnose the cause?

- A. Seat leakage from a Pressurizer Safety valve; Temperature indicator ONLY on the Safety Valve Tailpipe.
- B✓ Seat leakage from a Pressurizer Safety valve; Temperature indicator and acoustical monitor on the Safety Valve Tailpipe.
- C. Seat Leakage from a Pressurizer PORV; Temperature indicator and acoustical monitor on the Relief Valve Tailpipe.
- D. Seat Leakage from a Pressurizer PORV; Acoustical monitor ONLY on the Relief Valve Tailpipe.

A Incorrect. The safety valve has acoustic monitor indication and temperature indication, but plausible because there are multiple temperature indications on the Verical Board.

B Correct. The safety valve has 2 acoustic monitors and 1 temperature indication

C Incorrect. Plausible because of same reason as A, except that PORVs have open/closed indicators, and are not provided with acoustic monitors.

D Incorrect same as C, except that if an applicant believes a PORV is leaking, these are the indications available for a safety valve, so it can be confusing.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to manually operate and/or monitor in the control room: Recognition of leaking PORV/code safety

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.6

Technical Reference: RCS LP, Annunciator Response

Proposed references to be provided to applicants during examination: None

Learning Objective: U 15844

Question History:

10 CFR Part 55 Content: 41.7

Comments:

KA Match: Item evaluates recognition and determination of which valve is leaking into the PRT.

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

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

Source: MODIFIED

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

7. 007 K3.01 047/NEW//HIGHER//RO/NORTH ANNA/6/2008/NO

- A calibration error during the refueling outage results in the PRT level transmitter reading 20% lower than actual level.
- The Unit is now at 100% power and PRT level indication is 72%.

Which ONE of the following describes the affect the calibration error will have assuming multiple PORV lifts occur during recovery from a spurious SI in which one train failed to reset?

- A. More volume will be available in the PRT to accommodate the PORV discharge so it will take more time for the PRT rupture disk to rupture.
- B. More volume will be available to accommodate the PORV discharge but this will not affect the time it takes for the PRT rupture disk to rupture.
- C. Less volume will be available in the PRT to accommodate the PORV discharge so it will take less time for the PRT rupture disk to rupture.
- D. Less volume will be available in the PRT to accommodate the PORV discharge but this will not affect the time it takes for the PRT rupture disk to rupture.

A Incorrect. Plausible since historically the effect of actual vs. indicated is often confused, if candidate assumes more volume available this will tend to imply longer time to reach setting (100#) d/p so this distractor is plausible.

B Incorrect. As noted above operators maintain level based on their indication; for the condition given maintaining the PRT at a typical indicated level of 72% means it is actually 92% full, 2nd part is plausible since rupture disc is a function of pressure, candidate may not connect that volume differences in PRT will affect how fast pressure rises.

C Correct. As noted above in actuality the PRT is almost completely full (horizontal cylindrical tank) as such for the conditions provided (PRT actually above normal operating range and PORVs discharging) the PRT will rupture much sooner than would be expected.

D Incorrect. As stated above the amount and given time for pressure rise is somewhat dependent on initial volume, again the candidate may not equate this to the rupture disc rupturing sooner since the 100# d/p setpoint does not change with respect to the calibration error discussed.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Pressurizer Relief Tank/Quench Tank System (PRTS)

Knowledge of the effect that a loss or malfunction of the PRTS will have on the following: Containment

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.3

Technical Reference: RCS LP, AR, GFES

Proposed references to be provided to applicants during examination: None

Learning Objective:

Question History:

10 CFR Part 55 Content: 41.7 / 45.6

Comments:

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	CCCCCCCCC	Items Not Scrambled
Source:		NEW			Source If Bank:		
Cognitive Level:		HIGHER			Difficulty Level :		
Job Position:		RO			Plant:	NORTH ANNA	
Date:		6/2008			Previous NRC?:	NO	

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

8. 008 AA2.24 002/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- A reactor trip has occurred on Unit 1.
- Safety Injection is actuated.
- RCS pressure is 1200 psig.
- Containment pressure has peaked at 16 psia and is slowly trending down.
- Pressurizer level is 100%.
- The crew is performing 1-E-0, Reactor Trip or Safety Injection.

Which ONE of the following describes the method used to control RCS temperature and the approximate Main Steam pressure maintained?

- A✓ Condenser Steam Dumps; 1010 psig.
- B. Condenser Steam Dumps; 1050 psig.
- C. SG PORVs; 1010 psig.
- D. SG PORVs; 1050 psig.

A Correct. Main Steam pressure of approximately 1020 psia (1005 psig) corresponds to 547 degrees F, 1010 is close based on readability of meters. No MSLI, so condenser remains available.

B Incorrect. Steam pressure is plausible because it is the pressure that the SG PORVs will operate at to maintain 551 degrees F if Condenser dumps are not available.

C Incorrect. Since no MSLI, SG PORVs do not have to control pressure. Plausible because containment pressure is close to setpoint for MSLI, and pressure is correct for actual control point of 547 degrees.

D Incorrect same as C but if SG PORVs were controlling, then this would be the pressure.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: Value at which turbine bypass valve maintains header pressure after a reactor trip

Question Number:

Tier: 1
Group: 1

Importance Rating: 2.6

Technical Reference: E-0, pages 6-10

Proposed references to be provided to applicants during examination: None

Learning Objective: U 12458, U 12463

Question History:

10 CFR Part 55 Content: 41.5, 41.10

Comments:

KA Match: Item evaluates steam pressure maintained during a steam space LOCA, based on whether MSLI has actuated and which Tave would be maintained.

Have developed similar items in the past evaluating steam dumps or PORVs, but not in this context

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

Source: NEW Source If Bank:
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

9. 008 K4.01 047/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is at 100% power.
- CC Pump 1A is running and CC Pump 1B is in standby.
- 4160 V Bus 1H normal feeder is inadvertently opened.
- 1H EDG operates as designed.

Which ONE of the following describes the operation of CC Pumps for this event?

- A. CC Pump 1B starts when Bus 1H is deenergized; CC Pump 1A starts as soon as Bus 1H is reenergized.
- B✓ CC Pump 1B starts when Bus 1H is deenergized; CC Pump 1A restarts 15 to 20 seconds after Bus 1H is reenergized.
- C. CC Pump 1B starts 15 to 20 seconds after Bus 1H is reenergized; CC Pump 1A starts 15 to 20 seconds after Bus 1H is reenergized.
- D. CC Pump 1B starts 15 to 20 seconds after Bus 1H is reenergized; CC Pump 1A remains deenergized.

A Incorrect. CC Pump 1B does start when bus 1H is deenergized due to CC Pump 1A Trip (Breaker disagreement) but since Bus 1H is deenergized, it requires 15 to 20 seconds of normal voltage to restart.

B Correct. CC Pump 1B starts when bus 1H is deenergized due to CC Pump 1A Trip (Breaker disagreement), the associated time delay is correct and is a design feature to ensure EDG is maintained within voltage and frequency as loads are connected.

C Incorrect. Plausible because Pump 1B would operate this way if Bus 1J feeder tripped. The time delay is associated with the bus supplying the affected pump.

D Incorrect. Plausible as in C, and also that Pump 1A would not restart, since 1B would already be running and 1A would not be required.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following:
Automatic start of standby pump

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.1

Technical Reference: CCW LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 3656

Question History:

10 CFR Part 55 Content: 41.7

Comments:

KA Match: KA is matched because item tests knowledge of auto start interlocks for both standby pumps and pumps reenergized from undervoltage

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

10. 009 G2.4.4 059/MODIFIED//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- A LOCA has occurred.
- The crew is performing 1-E-1, Loss of Reactor or Secondary Coolant.
- The following conditions exist:
 - All SG pressures – 930 psig and slowly trending down.
 - All SG levels – being controlled at 42% NR.
 - PZR level – off-scale low.
 - Containment Pressure – 23 psia.
 - Containment Radiation levels - Rising.
 - RWST level – 32% and decreasing at 1% every 4 minutes.
 - RCS pressure – 800 psig and decreasing slowly.
 - Core Exit TCs – 500 degrees F.
 - RVLIS Full Range indication 94%.

Based on these indications, which ONE of the following procedure entry requirements are met?

- A. 1-FR-C.2, Response to Degraded Core Cooling
- B. 1-ES-1.2, Post-LOCA Cooldown and Depressurization
- C. 1-ES-1.3, Transfer to Cold Leg Recirculation
- D. 1-E-2, Faulted Steam Generator Isolation

A-Incorrect. (see B) Subcooling below minimum limit, plausible because RVLIS is less than 100%, but not low enough for entry to FR-C.2.

B Correct. RCS Pressure is not stable, and at 1% per 3 minutes RWST reduction, it will be more than 30 minutes to reach entry conditions for ES-1.3.

C Incorrect. RCS pressure and RWST level are high. Entry to ES-1.3 on low RWST level plausible because eventually, entry conditions will be met. But they are met for ES-1.2 now.

D Incorrect. SG pressures are trending down, which leads one to believe they must be isolated in accordance with E-2, but incorrect because the RCS is leading the cooldown, so SGs are not actually faulted, they are a heat source to the RCS.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Emergency Procedures / Plan: Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Question Number:

Tier: 1

Group: 1

Importance Rating: 4.5

Technical Reference: E-0, F-0

Proposed references to be provided to applicants during examination: None

Learning Objective: U 12203

Question History: WTSI Bank

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates system operating parameters (RCS, ECCS) related to entry to EOPs, requiring the applicant to determine which entry requirements are met.

This item has been used before. Facility not identified, by nomenclature, it appears this item was last used on the Wolf Creek AUDIT exam in 2006. Modified several values in stem and changed option A

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

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

Source: MODIFIED

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

11. 010 K5.01 048/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- The RCS is solid in Mode 5.
- The crew is preparing to draw a bubble in accordance with 1-OP-1.1, Unit Startup from Mode 5 at less than 140 degrees F to Mode 5 at less than 200 degrees F.
- PZR pressure is approximately 325 psig.
- PZR temperature is 335 degrees F.
- RCS temperature is 180 degrees F.

Assuming PZR Heatup rate is at the administrative limit of 1-OP-1.1, approximately how long will it take to reach saturation conditions in the pressurizer, and what action will be required when saturation conditions are reached?

- A. 30 minutes; letdown flow will be manually increased to reduce Pressurizer level.
- B. 30 minutes; the letdown backpressure control valve setpoint will be adjusted to ensure charging and letdown flows are approximately equal while PZR pressure rises.
- C✓ 60 minutes; letdown flow will be manually increased to reduce Pressurizer level.
- D. 60 minutes; the letdown backpressure control valve setpoint will be adjusted to ensure charging and letdown flows are approximately equal while PZR pressure rises.

A Incorrect. Plausible because maximum tech spec heatup rate is 200 degrees F per hour. Correct action for letdown flow (1-CH-PCV-1145 is in manual control).

B Incorrect. Plausible same reason as A. Incorrect action for letdown flow since 1-CH-PCV-1145 is in manual control and there must be a Charging/Ltdn mismatch to drop level.

C Correct. Admin limit of 90°F/hr means it will take approximately 60 minutes to reach saturation in the PZR. Correct action for letdown flow (1-CH-PCV-1145 is in manual control).

D Incorrect. Admin limit of 90°F/hr means it will take approximately 60 minutes to reach saturation in the PZR so this part is correct. Incorrect action for letdown flow since 1-CH-PCV-1145 is in manual control and there must be a Charging/Ltdn mismatch to drop level.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the operational implications of the following concepts as they apply to the PZR
PCS: Determination of condition of fluid in PZR, using steam tables

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.5

Technical Reference: 1-OP-1.1, Steam Tables

Proposed references to be provided to applicants during examination: Steam Tables

Learning Objective:

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates subcooling by asking how long it will take to reach saturation conditions at a specified heatup rate that must be known by the applicant.

New item; have developed similar, but always have given actual heatup rate instead of asking limit. Also, this facility draws a bubble in a different manner

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

12. 011 EK2.02 004/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- A Large Break LOCA has occurred on Unit 1.
- The crew has completed transition to 1-ES-1.3, Transfer to Cold Leg Recirculation.
- RWST level is 14%.

Which ONE of the following describes the ECCS pump alignment when the initial swapover to Cold Leg Recirculation is performed?

- A✓ Low Head SI Pump suction from Containment Sump; Charging Pump suction from LHSI Pumps.
- B. Low Head SI Pump discharge to RCS cold legs; Charging Pump suction from Containment Sump.
- C. Low Head SI Pump suction from Containment Sump; Charging Pump suction from RWST.
- D. Low Head SI Pump discharge to RCS Cold Legs; Charging Pump suction from RWST.

A Correct. LHSI Pumps automatically swap to Containment Sump at 16% RWST level. Alignment prior to returning to E-1 is to align LHSI to charging pump suction and to close RWST suction valves for Charging Pumps.

B Incorrect. Plausible because ECCS does discharge to cold legs, and some LHSI flow will go to cold legs, some will go to Charging, but Charging pumps are not aligned to the sump. Plausible because LHSI does take suction from the sump.

C Incorrect. Plausible because suction source is correct, and also that charging is a low volume injection, so the last step is to isolate Charging from the RWST, The applicant may assume that the charging pumps are not realigned until the RWST reaches 8%, as indicated by a caution in the procedure.

D. Incorrect. See explanations above.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the interrelations between the Large Break LOCA and the following: Pumps

Question Number:

Tier: 1

Group: 1

Importance Rating: 2.6

Technical Reference: ES-1.3, through step 8

Proposed references to be provided to applicants during examination: None

Learning Objective: U 3412

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates operation of Charging and Low Head SI pumps following a Large Break LOCA when swap to Cold Leg Recirculation is required. Therefore, the relationship between the major pumps providing RCS makeup during a LOCA

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

13. 012 K6.04 050/MODIFIED//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- A plant load reduction is in progress.
- Turbine First Stage Pressure Channel, 1-MS-PT-1446, sticks at a pressure equivalent to 50% power.
- Reactor power is currently 8%.

Which ONE of the following describes the RPS permissive affected, and the resulting effect on the unit?

- A. P-7 cannot be satisfied; the reactor would trip on loss of 1 RCP.
- B. P-8 cannot be satisfied; the reactor would trip on loss of 1 RCP.
- C✓ P-7 cannot be satisfied; the reactor would trip on loss of 2 RCPs.
- D. P-8 cannot be satisfied; the reactor would trip on loss of 2 RCPs.

A Incorrect. The first part is true, P-7 cannot be satisfied in the current plant condition, because one impulse pressure channel is stuck above 10%. This means that P-13 cannot be satisfied. P-7 requires input from P-13 and P-10. The second part is incorrect but plausible because P-8 inputs the loss of flow trip on 2 RCPs.

B Incorrect. Plausible because the impulse channel is stuck at a value higher than the P-8 power value. P-8 is input by power range instrumentation. Also plausible because if the first half was true, the second half would also be true, because P-8 is the permissive for the loss of flow trip - 1 RCP.

C Correct. P-7 cannot be satisfied because P-13 must be active (2/2 impulse pressures <10%) for P-7 to be active. P-10 is active because 3/4 PR NIs are below 10%, but only solves half of the input for P-7 to be active.

D Incorrect. As described above P-8 is a function of NIS only. Low flow trip combination is incorrect, but could be chosen based purely on logic that with power between 10% and 30% is the range for 2/3 lo flow trip.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the effect of a loss or malfunction of the following will have on the RPS:
Bypass/Block circuits

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.3

Technical Reference: RPS LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 16382

Question History:

10 CFR Part 55 Content: 41.7

Comments:

KA Match: Item evaluates effect of a loss of P-7, Low Flow Reactor Trip block permissive, for a plant condition that would require the that trip to be blocked.

Modified item previously developed by NRC; changed power level, and significantly changed distractors.

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	C C D D D C A A D C	Scramble Range: A - D
Source:		MODIFIED			Source If Bank:		
Cognitive Level:		HIGHER			Difficulty Level :		
Job Position:		RO			Plant:	NORTH ANNA	
Date:		6/2008			Previous NRC?:		

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

14. 013 A1.07 014/NEW//HIGHER//RO/NORTH ANNA/6/2008/

An event has occurred on Unit 1 resulting in core damage.

Containment pressure peaked at 28 psia and is now 16 psia and slowly trending down.

Containment radiation peaked at $2E+5R/hr$ and is now $1E+4R/hr$ and slowly trending down.

Current Plant parameters are as follows:

- RCS temperature is slowly trending down.
- All SGs are 15% Narrow Range and rising.
- AFW flow to each SG is 150 gpm.

The BOP recommends reducing AFW to 50 gpm to each SG to minimize RCS cooldown.

Which ONE of the following describes how the crew should respond to the BOPs recommendation and the Basis for their decision?

- A. AFW may be reduced to 50 gpm to each SG since Adverse Containment Criteria were cleared as Containment pressure decreased to the current value.
- B. AFW may be reduced to 50 gpm to each SG since Adverse Containment Criteria were cleared as Containment radiation decreased to the current value.
- C. AFW must be maintained > 340 gpm total since Adverse Containment Criteria are still in effect because of the Containment pressure transient.
- D✓ AFW must be maintained > 340 gpm total since Adverse Containment Criteria are still in effect because of the Containment radiation transient.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

A Incorrect. Since CNTMT rad level exceeded $1E+5R/hr$ adverse numbers are still required to be used; adverse criteria cannot be cleared when rad levels exceed $1E+5R/hr$ without an engineering evaluation. Would be correct if not for the requirement to use adverse values.

B Incorrect. As noted above Adverse Containment criteria cannot be exited without an Engineering Evaluation.

C Incorrect. First part of the distractor is true, however the reason adverse criteria is required to be used is rad level going above $1E+5R/hr$, NOT pressure.

D Correct. Because of the radiation transient adverse criteria cannot be exited so the procedural requirement is to maintain 340 gpm total AFW flow.

013 Engineered Safety Features Actuation System (ESFAS)

A1.07 Ability to predict and/or monitor changes in parameters (to Prevent exceeding design limits) associated with operating the ESFAS controls including: Containment radiation

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.6

Technical Reference: E-0 and ERG Background document

Proposed references to be provided to applicants during examination: None

Learning Objective:

Question History:

10 CFR Part 55 Content: 43.5

Comments:

Elevated containment radiation results in invoking of adverse CNTMT criteria; these criteria are needed to ensure certain safety functions are met/maintained based on the assumed impact on accident monitoring instrumentation. the operator must understand and correctly apply these criteria in order to correctly operate this portion of ESFAS (AFW).

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

Answer: DDDDDDDDDDD Items Not Scrambled

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

15. 013 K4.15 001/NEW//LOWER//RO/NORTH ANNA/6/2008/NO

The Unit is at 100% power.

Assume a failure of a semi-automatic tester board has occurred in the Solid State Protection System resulting in a General Warning condition.

Which ONE of the following describes how the system is designed for the operator to identify the condition and determine the affected Train?

- A. A common Safeguards Trouble annunciator is provided in the control room; indicating lights in Train A ONLY must be used to determine the affected Train.
- B. Train specific Safeguards Trouble annunciators are provided in the control room; indicating lights in Train A ONLY must be used to determine the affected Train.
- C. A common Safeguards Trouble annunciator is provided in the control room; indicating lights in Train A or Train B can be used to verify the affected Train.
- D. Train specific Safeguards Trouble annunciators are provided in the control room; indicating lights in Train A or Train B can be used to verify the affected Train.

A Incorrect. Plausible because many alarms have multiple inputs and the candidate who is unfamiliar with the system is likely to default to the common alarm, similarly the candidate may assume that one can only identify a general warning condition in the affected train (this is NOT the case) and infer that train A is affected since this distractor directs looking in one train to identify the condition.

B Incorrect. First part is true train specific alarms are provided, as stated above the candidate may assume that one can only identify a general warning condition in the affected train (this is NOT the case) and infer that train A is affected since this distractor directs looking in one train to identify the condition.

C Incorrect. Plausible because many alarms have multiple input and the candidate who is unfamiliar with the system is likely to default to the common alarm, 2nd part is correct, as part of the design feature of the system status light in each train show the status of both trains, although primarily intended as a means of monitoring status during surveillance testing they will provided the same information for the conditions given in the stem.

D Correct. The trouble alarm will alert the operator to the problem, looking in either rack will allow the operator to determine that the trouble annunciator is due to a general warning and using the amber and green lights provided, verify which train is affected and verify that the opposite train is unaffected.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

013 Engineered Safety Features Actuation System (ESFAS)

Knowledge of ESFAS design feature(s) and/or interlock(s) which provide for the following:
Continuous testing

Question Number:

Tier: 2

Group: 1

Importance Rating: 2.6

Technical Reference: AR, RPS Lesson Plan

Proposed references to be provided to applicants during examination: None

Learning Objective: 8958

Question History:

10 CFR Part 55 Content: 41.7

Comments:

NAPS does not have a continuous testing feature that is found in some plant designs. Per discussion w/USNRC R-II, this meets the intent of the KA in that it tests the operators knowledge of how the system is designed to alert the operator to an abnormal condition within a train and how the affected train can be verified (verification of status of both trains relative to a general warning condition)

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

Answer: DDDDDDDDDDD Items Not Scrambled

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?: NO

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

16. 015 AK2.07 005/BANK//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is at 100% power.
- The following alarm is received:
 - 1C-G7, RCP 1A-B-C SEAL LEAK HI FLOW
- RCP 1B Seal Leakoff flow is 5.9 GPM and slowly rising.
- RCP 1B No. 1 Seal DP indicates 220 psid and lowering slowly.
- Annunciator 1C-G2, RCP 1B STANDPIPE HI LEVEL is NOT LIT.
- Seal leakoff has lowered on RCP 1A and 1C.
- Seal Return temperature is rising slowly.

Which ONE of the following describes the event in progress and the action required?

- A ✓ RCP #1 seal failure; trip the reactor, trip the RCP, and isolate seal leakoff within 5 minutes.
- B. RCP #1 seal degraded; monitor RCP bearing temperatures and initiate a plant shutdown to Hot Standby.
- C. RCP #2 seal failure; trip the reactor, trip the RCP, and isolate seal leakoff within 5 minutes.
- D. RCP #2 seal degraded; monitor RCP bearing temperatures and initiate a plant shutdown to Hot Standby.

A Correct. If the seal is not holding, leakoff will rise, and DP will go toward 0. If #1 seal has failed in this way, then a reactor trip is required.

B Incorrect. Plausible because this action would be taken for a seal failure where leakoff flow was low (<.8 gpm).

C Incorrect. #2 Seal failure is indicated by a standpipe high level alarm. In this case, the alarm is not lit. Plausibility is maintained because the applicant must determine failure based on conditions, and also because the standpipe can be associated with #3 seal.

D Incorrect. As noted above degradation of #2 seal will cause decreased #1 seal leakoff, however indications provided are indicative of a more severe condition of failure of the #1 seal. Candidate may choose this if they are unfamiliar with seal failure diagnostics.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: RCP seals

Question Number:

Tier: 1
Group: 1

Importance Rating: 2.9

Technical Reference: 1-AP-33.1

Proposed references to be provided to applicants during examination: None

Learning Objective: U 11101

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: The item evaluates an RCP malfunction by evaluating an RCP seal failure, demonstrating that the topic related to knowledge of interrelations between RCP Malfunctions and RCP seals is met.

This item was developed without use of the bank but there are very similar bank items available

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: A C B B D C D D C C Scramble Range: A - D
Source: BANK Source If Bank:
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

17. 016 K1.02 072/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is operating at 50% power.
- All Control systems are in automatic.
- Loop 1B Tcold RTD fails low.

Which ONE of the following describes the response of the Pressurizer Level Control System and Rod Control System?

- A. Charging flow decreases; Control rods step OUT.
- B. Charging flow decreases; Control rods do not move.
- C. Charging flow remains constant; Control rods step OUT.
- D✓ Charging flow remains constant; Control rods do not move.

A Incorrect. Applicant may misunderstand and assume the failure affects the control circuit (not selected out by Median Signal Selector) since pZR lvl program and rod control program are both a function of temperature it is reasonable to assume both would respond.

B Incorrect. Plausible as in A, but also takes into account the existence of OPdT and OTdT rod stops, although logic is 2/3 the candidate may confuse with the over power rod stop which only requires a single channel, in that case it would be plausible for PZR level program to be affected but rods to remain stationary.

C Incorrect. Plausible if candidate assumes that PZR level control s/p is function of a different process input (e.g. 1st stage pressure, N-44 power , etc..).

D Correct. The failure affects the subject protection channel but is selected out as a function of the Median Signal Selector.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the physical connections and/or cause-effect relationships between the NNIS and the following systems: PZR LCS

Question Number:

Tier: 2
Group: 2

Importance Rating: 3.4

Technical Reference: PZR Press/Lvl Ctrl LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 10654

Question History:

10 CFR Part 55 Content: 41.7

Comments:

KA Match: Item evaluates NNIS (RTD) failure for input to PZR level control

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

18. 017 A4.02 074/MODIFIED//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- A LOCA has occurred on Unit 1.
- 1A Charging Pump is tripped.
- 1B Charging Pump is running.
- BOTH LHSI Pumps are tripped.
- RCPs are running.
- RCS pressure is 1600 psig and lowering.
- Containment pressure peaked at 21 psia and is now slowly trending down.
- Core Exit T/Cs are 545 degrees F.

Which ONE of the following describes the requirement for operation of RCPs in the present condition, and the reason why?

- A. RCPs should remain running because ECCS flow is inadequate to ensure adequate core cooling.
- B. RCPs should remain running because forced circulation provides sufficient core cooling until RCP trip criteria is met.
- C. RCPs should be stopped because an inadequate core cooling condition could develop if RCPs were tripped or lost later in the event.
- D. RCPs should be stopped to prevent damage to the RCPs due to loss of cooling water.

A Incorrect. One Charging pump is running. Only 1 charging pump is required to be running to allow for RCP trip. Plausible because all other ECCS flow is lost and applicant could believe that both must be running. Also, applicant may miss adverse containment and believe they should be running because RCS subcooling is adequate

B Incorrect. Statement is true if RCPs should remain running, but subcooling is below 85 degrees F, and they should be tripped because containment is >20 psia

C Correct. ERG executive volume contains RCP trip/restart discussion, and concern is that if they are allowed to remain running under certain SBLOCA scenarios, and they are tripped later in the event, the core could uncover.

D Incorrect. Containment pressure was never high enough for CDA that would cause the loss of cooling water. (28 PSIA). Plausible because other ESFAS actuations have occurred and the applicant may misunderstand that CC isn't lost until after CDA.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to manually operate and/or monitor in the control room: Temperature values used to determine RCS/RCP operation during inadequate core cooling (i.e., if applicable, average of five highest values)

Question Number:

Tier: 2

Group: 2

Importance Rating: 3.8

Technical Reference: E-0 Continuous action page, ERG Exec Volume

Proposed references to be provided to applicants during examination: None

Learning Objective: U 12451

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: item evaluates RCP operation under a temperature-pressure relationship from indications provided by the ICCM and other plant conditions. The KA is met because RCP operation is being determined based on margin to saturation.

A question evaluating the exact wording of the KA would have been double jeopardy with Question 82. NRC directed to develop an item on this topic instead of allowing KA swap.

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

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

Source: MODIFIED

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

19. 022 A2.06 053/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is at 100% power.
- The Mechanical Chiller has tripped and cannot be restarted.
- The crew enters 1-AP-35, Loss of Containment Air Recirculation Cooling.

Which ONE of the following describes the MINIMUM containment temperature requiring entry into a Technical Specification action statement, and the action required?

- A. 105 degrees F; ensure steam chiller running or align Service Water to Containment Air Recirc Fans.
- B. 105 degrees F; ensure Containment Air Recirc Fans are running with backdraft dampers closed.
- C. 115 degrees F; ensure steam chiller running or align Service Water to Containment Air Recirc Fans.
- D. 115 degrees F; ensure Containment Air Recirc Fans are running with backdraft dampers closed.

A Incorrect. Temperature is incorrect but plausible because the procedure designates 105 degrees F as the minimum temperature.

B Incorrect. Same as A, and also the action may be performed later but backdraft dampers must be checked open. Plausible because it is reasonable to believe that a backdraft damper should be closed to prevent short-cycling of air.

C Correct. TS LCO is 115 degrees F is correct. Procedure provides option of Steam Chiller or Service Water to provide Containment cooling for the case where the Mechanical Chiller is unavailable.

D Incorrect. TS LCO is 115 degrees F is correct. Incorrect for same reason as second half of B.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

CNTMT Cooling: 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: Loss of CCS pump

Question Number:

Tier: 2
Group: 1

Importance Rating: 2.8

Technical Reference: 1-AP-35, tech specs

Proposed references to be provided to applicants during examination: None

Learning Objective: U 1958

Question History:

10 CFR Part 55 Content: CFR: 41.5 / 43.5 / 45.3 / 45.13

Comments:

KA Match: Item evaluates knowledge for the equivalent of a CCS pump at North Anna; it tests knowledge of the effect and actions taken for trip of the Mechanical Chiller, which provides normal containment cooling for CAR Fans.

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

20. 022 AK3.03 006/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is at 100% power following a refueling outage.
- The crew has isolated a Letdown line leak in accordance with 1-AP-16, Increasing Primary Plant Leakage.
- The crew is preparing to place Excess Letdown in service.
- Excess Letdown will be aligned to the VCT.

Which ONE of the following describes restrictions on the Excess Letdown Lineup, and the reason for the restrictions?

- A. Flow through ONLY one loop drain to prevent the possibility of bypassing SI flow to the 2 intact loops in a design basis accident;

reactor power should be monitored because a dilution may occur due to lower boron concentrations in the Excess Letdown piping.

- B✓ Flow through ONLY one loop drain to prevent the possibility of bypassing SI flow to the 2 intact loops in a design basis accident;

reactor power should be monitored because a boration may occur due to higher boron concentrations in the Excess Letdown piping.

- C. Excess Letdown Pressure must NOT exceed 75 psig to prevent overpressurizing the VCT;

reactor power should be monitored because a dilution may occur due to lower boron concentrations in the Excess Letdown piping.

- D. Excess Letdown Pressure must NOT exceed 75 psig to prevent overpressurizing the VCT;

reactor power should be monitored because a boration may occur due to higher boron concentrations in the Excess Letdown piping.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

A Incorrect. The first half is correct. The second half is incorrect but plausible because a reactivity event may occur, and it is reasonable to assume that it is a dilution similar to ion exchange beds being placed in service.

B Correct. Basis for using ONLY one loop is correct. 1-OP-8.5 cautions the operator about the potential for boration based on the likely condition that excess letdown will have likely last been used during the outage with boron concentration much higher than current Cb.

C Incorrect. Excess Letdown is maintained less than 150 psig. VCT pressure is maintained less than 75 psig. If the pressure was correct, the first half of this option would be correct. As noted above the procedure addresses boration concern not dilution.

D Incorrect. Same as C regarding pressure concern, but the reactivity caution is correct.

Knowledge of the reasons for the following responses as they apply to the Loss of Reactor Coolant Makeup: Performance of lineup to establish excess letdown after determining need

Question Number:

Tier: 1
Group: 1

Importance Rating: 3.1

Technical Reference: 1-OP-8.5

Proposed references to be provided to applicants during examination: None

Learning Objective: U 338, 340, 345

Question History:

10 CFR Part 55 Content: 41.5

Comments:

KA Match: Item evaluates knowledge of 2 precautions and further evaluates reason for the 2 precautions associated with establishing Excess Letdown, therefore meeting the KA topic requirement.

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B D B D B A A C B D Scramble Range: A - D
Source: NEW Source If Bank:
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

21. 022 K1.04 001/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Both Units are at 100%.

- A fault on the Unit 2B station service bus results in a Main Generator Lockout and Reactor Trip.
- All Unit 2 Station Service Busses are deenergized due to the feeder breaker to 2B Station Service bus failing to open on the fault.

Which ONE of the following describes the status of Containment cooling to the Units?

- A. Containment Air Recirc Fans remain running on BOTH Units; Chilled water flow to Containment Air Recirc Fans is lost on Unit 2 ONLY.
- B✓ Containment Air Recirc Fans remain running on BOTH Units; Chilled water flow to Containment Air Recirc Fans is lost on BOTH Units.
- C. Containment Air Recirc Fans trip on Unit 2; Chilled water flow to Containment Air Recirc Fans is lost on Unit 2 ONLY.
- D. Containment Air Recirc Fans trip on Unit 2; Chilled water flow to Containment Air Recirc Fans is lost on BOTH Units.

A Incorrect. Fans remain running since they are powered from emergency busses not SS busses, chilled water flow is lost but both units are affected, plausible since the electrical problem relates only to Unit 2.

B Correct. As noted above, the mechanical chiller is powered from Unit 2 SS bus and supplies both units with chilled water.

C Incorrect. Plausible since candidate may assume the electrical fault would cause a loss of power to the affected equipment and again may only consider Unit 2 affected by the loss of power.

D Incorrect. Plausible since candidate may assume the electrical fault would cause a loss of power to the affected equipment and again 2nd part of distractor is correct.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

CNTMT Cooling: Knowledge of the physical connections and/or cause-effect relationships between the CCS and the following: Chilled water

Tier: 2
Group: 1

Importance Rating: 2.9

Technical Reference: 1-AP-35, 0-AP-10

Proposed references to be provided to applicants during examination: None

Learning Objective: U 11999

Question History:

10 CFR Part 55 Content: CFR: 41.5 / 43.5 / 45.3 / 45.13

Comments:

KA Match: The item evaluates the status of Chilled Water for Containment Cooling during a loss of off-site power.

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

Answer: B B B B B B B B B B Items Not Scrambled

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

22. 025 AA1.12 098/NEW//HIGHER//RO/NORTH ANNA/6/2008/NO

Given the following:

- Unit 1 has just entered Mode 4 with cooldown to Mode 5 in progress.
- RHR Pump 1A is in service.
- The OATC notes the following:
 - RHR Pump 1A motor amps indicate 10 and stable.
 - 1-RH-FCV-1605 in automatic indicates 100% demand.

Which ONE of the following describes the status of the RHR system and the additional expected indications?

- A. RHR pump 1A cavitating, 1-RHR-FCV-1605 operating as designed; Core Exit TCs increasing.
- B. RHR pump 1A operating normally, 1-RHR-FCV-1605 failed closed; Core Exit TCs decreasing.
- C✓ RHR pump 1A sheared shaft, 1-RHR-FCV-1605 operating as designed; Core Exit TCs increasing.
- D. RHR pump 1A operating normally, 1-RHR-FCV-1605 failed open; Core Exit TCs decreasing.

A Incorrect. As given amps are low but stable, fluctuating amps are indication of cavitation. For low flow 1-RH-FCV-1605 would be expected to open to try and maintain flow. Inadequate flow would cause temperature to increase.

B Incorrect. The value of 10 and stable is indicative of a sheared shaft NOT a pump that is operating normally. For the sheared shaft 1-RH-FCV-1605 would be expected to open to try and maintain flow. Inadequate flow would cause temperature to increase.

C Correct. Normal amps would be around 35, the value of 10 and stable is indicative of a sheared shaft. For the sheared shaft 1-RH-FCV-1605 would be expected to open to try and maintain flow. Inadequate flow would cause temperature to increase.

D Incorrect. The value of 10 and stable is indicative of a sheared shaft NOT a pump that is operating normally. For the sheared shaft 1-RH-FCV-1605 would be expected to open to try and maintain flow. Inadequate flow would cause temperature to increase not decrease, however if flow were high temperature would decrease.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Loss of RHR: Ability to operate and / or monitor the following as they apply to the Loss of Residual Heat Removal System: RCS temperature indicators

Question Number:

Tier: 3
Group: 4

Importance Rating: 3.8

Technical Reference: AP-11, Pages 2-13 actions

Proposed references to be provided to applicants during examination: None

Learning Objective: U 430

Question History: Bank item with distractor modifications

10 CFR Part 55 Content: 41.10

Comments:

KA match: The KA is matched because the operational implication of loss of RHR during RCS drain-down is that specific actions must be taken to mitigate the condition. This item evaluates knowledge of the correct actions during this condition, choosing from actions that may be performed for all conditions of loss of RHR

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C A C D A C C D C D Scramble Range: A - D
Source: NEW Source If Bank:
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?: NO

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

23. 026 A4.01 056/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- A reactor trip and safety injection has occurred.
- RCS pressure is 1000 psig and stable.
- Containment pressure is 23 psia and rising slowly.
- The crew is performing 1-E-0, Reactor Trip or Safety Injection.

Which ONE of the following describes the appropriate operator action and the SEQUENCE of the action required?

- A. CDA is required; ensure CDA is actuated, stop RCPs, verify Quench Spray running, and verify Containment Isolation Phase B.
- B. CDA is required; ensure CDA is actuated, stop CC pumps, verify Quench Spray running, verify Containment Isolation Phase B, and stop RCPs.
- C. Quench Spray is required; open Quench Spray Discharge Valves and then start Quench Spray Pumps.
- D. Quench Spray is required; start Quench Spray Pumps and then open Quench Spray discharge valves.

A Incorrect. CDA would be required if containment pressure was >28 psia. Plausible because if it was required, these are the correct actions.

B Incorrect because CDA is not required. Plausible because it contains all correct actions, but not in the order required.

C Correct. Even though CDA is not required, facility has a step in E-0 to initiate QSS if containment is above 20 psia.

D Incorrect. Plausible because many pumps are started with discharge valves closed. In this case, valves are opened first.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

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

Question Number:

Tier: 2

Group: 1

Importance Rating: 4.5

Technical Reference: 1-E-0 steps 11/12

Proposed references to be provided to applicants during examination: None

Learning Objective:

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates the ability to determine if Quench Spray is required, and since it is required, the actions required (operating the controls) to initiate it

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

24. 026 AA2.01 005/BANK/NORTH ANNA/LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- The unit is operating at 100% power.
- CC Surge Tank level indication on 1-CC-LI-101 is 50% and lowering.

Which ONE (1) of the following is a possible source of the leak and the source of water for maintaining CC System inventory?

- A. 1A CC Heat Exchanger; PG water
- B✓ 1A CC Heat Exchanger; Condensate System
- C. Non-Regenerative Heat Exchanger; PG water
- D. Non-Regenerative Heat Exchanger; Condensate System

A Incorrect. First part is correct, Service Water pressure is less than CC pressure so this would cause the loss of CC. PG water would not normally be used.

B Correct. Service Water pressure is less than CC pressure so this would cause the loss of CC, condensate is used to fill CC if it is available.

C Incorrect. Surge tank level would rise since pressure at that point in the letdown system (upstream of PCV-1145) is greater than CC system pressure, source of water plausible but also not correct per the procedure.

D Incorrect. Surge tank level would rise since pressure at that point in the letdown system (upstream of PCV-1145) is greater than CC system pressure, water source is correct.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: Location of a leak in the CCWS

Question Number:

Tier: 1
Group: 1

Importance Rating: 2.9

Technical Reference: CC LP, 1-AP-16

Proposed references to be provided to applicants during examination: None

Learning Objective: U 3663

Question History:

10 CFR Part 55 Content: 41.5, 7

Comments:

KA Match: Item evaluates knowledge of components served by CC, and further evaluates knowledge of the makeup sources. The applicant must determine location of a leak in CC to answer this item.

Considered BANK; although not identical to bank question this item has not been significantly modified, thus it is classified as a bank question.

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

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

Source: BANK Source If Bank: NORTH ANNA
Cognitive Level: LOWER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

25. 026 K2.01 055/NEW//HIGHER//RO/NORTH ANNA/6/2008/NO

Given the following on Unit 1:

- Reactor Trip due to a LOCA.
- Safety Injection was actuated 11 minutes ago.
- CDA was actuated 7 minutes ago.
- RCS pressure is 1125 psig.
- Containment pressure is 29 psia.
- RWST level is 72% and lowering.

Which ONE of the following describes the operational status of Inside Recirculation Spray Pump 1-RS-P-1B?

- A. Running; power is supplied directly from 480 volt bus 1J1.
- B. NOT running; power is available directly from 480 volt bus 1J1.
- C. Running, power is supplied directly from 4160 volt bus 1J.
- D. NOT running; power is available directly from 4160 volt bus 1J.

A Incorrect. The pump will not be running because RWST level is not below 60%. Plausible because the start logic is associated with CDA and also has a time delay; if candidate is unaware of the additional logic (RWST level < 60%) they may select this distractor. Power supply is correct.

B Correct. The pump will not be running because RWST level is not below 60%. Power supply is correct.

C Incorrect. The pump will not be running because RWST level is not below 60%. Plausible because the start logic is associated with CDA and also has a time delay; if candidate is unaware of the additional logic (RWST level < 60%) they may select this distractor. Power supply is correct for Outside Recirc Spray Pumps.

D Incorrect. Correct that the pump will not be running because RWST level is not below 60%. Incorrect because power supply is wrong. Plausible because the power supply is correct for Outside Recirc Spray Pumps.

Note: Change in RS pump logic is a recent plant mod making it more likely that the candidate will confuse pump operational status based on past knowledge.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of bus power supplies to the following: Containment spray pumps

Question Number:

Tier: 2

Group: 1

Importance Rating: 3.4

Technical Reference: Recirc Spray LP, NCRODP-54
1-E-0, Att. 2
1-OP-26A

Proposed references to be provided to applicants during examination: None

Learning Objective: U 6278

Question History:

10 CFR Part 55 Content: 41.5

Comments:

KA Match: The KA requires knowledge of Spray Pump power supplies. The item evaluates knowledge of Spray Pump power supply as well as operation under transient conditions

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?: NO

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

26. 027 G2.2.42 011/MODIFIED//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is operating at 100% power.
- An instrument failure causes PORV 1-RC-PCV-1455C to lift.
- RCS Pressure is recovering at a much slower rate than expected.
- The operator closes the PORV Block Valve, 1-RC-MOV-1536, and pressure is now 2100 psig and increasing as expected.
- All other equipment appears to be operating normally.

Which ONE (1) of the following describes the action(s) required within ONE hour in accordance with Technical Specifications?

- A. Maintain closed and remove power from 1-RC-MOV-1536.
- B. Restore RCS pressure to within limits of the COLR.
- C. Maintain closed and maintain power to 1-RC-MOV-1536.
- D. Place and maintain the PORV in MANUAL control.

A Incorrect because for this condition, power does not have to be removed from the block valve. Plausible because it is very close to the correct action, and an interpretation must be made to determine if seat leakage is occurring.

B Incorrect. This action is taken, therefore plausible. However, 2 hours is allowed for the action to be taken.

C Correct. PORV inoperability due to excessive seat leakage (as indicated by the conditions provided) requires that the VALVE IS ISOLATED BY ITS ASSOCIATED BLOCK VALVE. However power is maintained to the block to allow quick access if the PORV were needed for pressure control.

D Incorrect. Action would be required if the block valve was inoperable, but plausible because it is easily confused with inoperability of the PORV itself (controller not functioning in auto, place in manual).

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Equipment Control:: Ability to recognize system parameters that are entry-level conditions for Technical Specifications.

Question Number:

Tier: 1
Group: 1

Importance Rating: 3.9

Technical Reference: TS 3.4.1, 3.4.11

Proposed references to be provided to applicants during examination: None

Learning Objective: U 12363

Question History:

10 CFR Part 55 Content: 41.7

Comments:

KA Match: Item evaluates LCO entry conditions for a condition where there is a failure of the pressurizer pressure control system (PORV failure).

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	C A A D D B D B D C	Scramble Range: A - D
Source:		MODIFIED			Source If Bank:		
Cognitive Level:		LOWER			Difficulty Level :		
Job Position:		RO			Plant:	NORTH ANNA	
Date:		6/2008			Previous NRC?:		

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

27. 028 K3.01 027/NEW//LOWER//RO/NORTH ANNA/6/2008/NO

Given the following:

- Both Units were initially at 100%.
- The Site experiences a Loss of Offsite Power.
- Unit 1 experiences a Design Basis Accident with a failure of 1H EDG.
- Unit 2 is stable in Mode 3 with both Emergency Busses energized from their respective EDGs.

Which ONE of the following describes the operation of the 1-HC-HC-1, Hydrogen Recombiner?

- A. 1-HC-HC-1 should be placed in service if Containment Hydrogen concentration is less than 4%; Power MUST be restored to 1H Bus to place 1-HC-HC-1 in operation.
- B✓ 1-HC-HC-1 should be placed in service if Containment Hydrogen concentration is less than 4%; Power is available to place 1-HC-HC-1 in operation.
- C. 1-HC-HC-1 should be placed in service if Containment Hydrogen concentration exceeds 4%; Power MUST be restored to 1H Bus to place 1-HC-HC-1 in operation.
- D. 1-HC-HC-1 should be placed in service if Containment Hydrogen concentration exceeds 4%; Power is available to place 1-HC-HC-1 in operation.

A Incorrect. Either of the two recombiners may be powered from any of the 4 Emergency Busses; plausible because the candidate may believe that since the recombiners have unit specific mark numbers they also have unit specific power supplies and most ESF equipment is powered from a dedicated train. The recombiner is placed in service when CNTMT H2 conc. exceeds 0.5% but is less than 4%, so this portion of the distractor is correct.

B Correct. As stated above, either of the two recombiners may be powered from any of the 4 Emergency Busses. The recombiner is placed in service when CNTMT H2 conc. exceeds 0.5% but is less than 4%.

C Incorrect. Either of the two recombiners may be powered from any of the 4 Emergency Busses; plausible because the candidate may believe that since the recombiners have unit specific mark numbers they also have unit specific power supplies and most ESF equipment is powered from a dedicated train. At greater than 4% the procedure directs consulting with TSC, NOT placing recombiner inservice.

D Incorrect. First part of distractor is correct as noted above. At greater than 4% the procedure directs consulting with TSC, NOT placing recombiner inservice so this portion is incorrect.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

028 K3.01

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

Question Number:

Tier: 2
Group: 2

Importance Rating: 3.3

Technical Reference: 1-E-1
1-OP-63.1

Proposed references to be provided to applicants during examination: None

Learning Objective:

10 CFR Part 55 Content: CFR: 41.7 / 45.6

Comments:

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	B B B B B B B B B B	Items Not Scrambled
Source:		NEW			Source If Bank:		
Cognitive Level:		LOWER			Difficulty Level :		
Job Position:		RO			Plant:	NORTH ANNA	
Date:		6/2008			Previous NRC?:	NO	

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

28. 029 EK1.05 012/BANK/ROBINSON 2001/LOWER//RO/NORTH ANNA/6/2008/

During an ATWS at 100% Reactor Power, EOL conditions, which ONE of the following actions will insert the MOST negative reactivity within the FIRST 30 seconds of the event?

- A. Manual Control Rod Insertion
- B. Manual Turbine Trip
- C. Initiation of Emergency Boration
- D. Automatic Control Rod Insertion

A Incorrect. Manual control rod insertion will be at 48 steps per minute. Plausible because it is in the first step of FR-S.1 and it does insert negative reactivity.

B Correct. When the turbine is tripped, RCS temperature and fuel temperature will rise rapidly, and cause reactor power to be sharply reduced.

C Incorrect. Initiation of Emergency Boration will also cause negative reactivity insertion, but will not reach the RCS until several minutes have elapsed in the event.

D Incorrect. Auto rod insertion maximum speed is 72 steps per minute. Plausible because it inserts reactivity and is the first control system response to the ATWS, but does not insert as much negative reactivity as a turbine trip.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the operational implications of the following concepts as they apply to the ATWS: definition of negative temperature coefficient as applied to large PWR coolant systems

Question Number:

Tier: 1
Group: 1

Importance Rating: 2.8

Technical Reference: FR-S.1 BD

Proposed references to be provided to applicants during examination: None

Learning Objective: U 11570

Question History:

10 CFR Part 55 Content: 41.5

Comments:

KA Match: Item evaluates the action or plant response that would add the most negative reactivity, which is a direct relation to negative temperature coefficient. Therefore, it evaluates applicants knowledge of the definition of negative temperature coefficient

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B B D A A C C B D B Scramble Range: A - D
Source: BANK Source If Bank: ROBINSON 2001
Cognitive Level: LOWER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

29. 029 K4.03 077/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- Both units are in Mode 5.
- Containment Purge is in progress on each unit in preparation for Containment entry.
- Unit 1 Manipulator Crane Area Radiation Monitor RM-162 indication is rising.
- Unit 1 Containment Particulate and Gaseous Radiation Monitors, RM-159 and 160 are in alarm.
- Unit 2 containment conditions are normal.

Which ONE of the following describes the effect of these conditions on the Containment Purge once all automatic actuations have taken place?

- A. Purge Supply Fans 1-HV-F-4A and 1-HV-F-4B trip; Containment Purge Supply isolation valves close on BOTH units.
- B. ONLY Purge Supply Fan 1-HV-F-4A trips; ONLY Unit 1 Containment Purge Supply isolation valves close.
- C. Purge Supply Fans 1-HV-F-4A and 1-HV-F-4B remain running; ONLY Unit 1 Containment Purge Supply isolation valves close.
- D✓ Purge Supply Fans 1-HV-F-4A and 1-HV-F-4B trip and then automatically start; ONLY Unit 1 Containment Purge Supply isolation valves close.

A Incorrect. Plausible because the Purge Supply fans do trip, but valves on unaffected unit do not close.

B Incorrect. Plausible because the 4A fan control switch is on Unit 1 and the 4B on Unit 2, and it is logical to believe that Unit 2 will be unaffected.

C Incorrect. Plausible because with 2 units being purged, the affected unit will isolate, and there is still a flowpath for fans to operate as required without interruption.

D Correct. The purge fans will initially trip however once the valves on the affected unit close the logic is satisfied for the fans to restart (valves on unaffected unit remain open and the release flow path from the affected unit is isolated).

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of design feature(s) and/or interlock(s) which provide for the following: Automatic purge isolation

Question Number:

Tier: 2
Group: 2

Importance Rating: 3.2

Technical Reference: Primary Ventilation LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 4494, 4492

Question History:

10 CFR Part 55 Content: 41.11

Comments:

KA Match: Item evaluates an abnormal condition requiring an automatic containment purge isolation, and therefore directly meets the required topic

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

30. 032 AK3.01 026/BANK/HARRIS/HIGHER//RO/NORTH ANNA/6/2008/

Given the following conditions:

- A reactor startup is in progress and operators have just completed a rod pull.
- Both Intermediate Range channels indicate approximately 3×10^{-11} amps and trending up.
- Source Range Channel N-31 indicates 1×10^3 CPS and is trending down slowly.
- Source Range Channel N-32 indicates approximately 6×10^3 CPS and trending up slowly.

Which one of the following describes the required operator response and the reason for the response?

- A ✓ Suspend the reactor startup; with only one source range channel operable, there is inadequate protection against an uncontrolled rod withdrawal.
- B. Suspend the reactor startup; source range channels are currently not required to trip the reactor, however, the source range monitoring functions must be available.
- C. Continue the reactor startup; the Intermediate Range Neutron Flux Trip and the Power Range Neutron Flux-Low Trip provide the necessary core protection.
- D. Continue the reactor startup; with only one source range channel operable 48 hours is allowed to restore two channels to service.

A Correct. With only 1 Source Range available below P-6, (10-10 amps), the startup must be stopped because a single failure would now make the SR high flux trip unavailable.

B Incorrect. Plausible because tech specs requires the SR in lower modes, and this would be true if rod control was not capable of withdrawal.

C Incorrect. Plausible because the SR provides redundant protection to these trips.

D Incorrect. Plausible because this is the normal TS action statement if rods were not capable of withdrawal.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the reasons for the following responses as they apply to the Loss of Source Range Nuclear Instrumentation: Startup termination on source-range loss

Question Number:

Tier: 1
Group: 2

Importance Rating: 3.2

Technical Reference: TS 3.3.1 and basis

Proposed references to be provided to applicants during examination: None

Learning Objective: U 10390

Question History:

10 CFR Part 55 Content: 41.7, 43.2

Comments:

KA Match: Item evaluates knowledge of the reason for startup termination as well as whether termination is required, based on plant conditions that require operability of the instrument

Item was previously developed for Harris, but has been editorially modified with a different reason on correct answer and shuffled distractors, as well as modified wording on plant conditions.

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

Source: BANK Source If Bank: HARRIS
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

31. 033 K4.05 028/BANK/NORTH ANNA/LOWER//RO/NORTH ANNA/6/2008/YES

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

Minimum required boron concentration is...

- A. 2500 ppm. Leakage is compensated for by making up from the blender with PG water.
- B. 2500 ppm. Leakage is compensated for by making up from the blender with blended flow.
- C✓ 2600 ppm. Evaporation is compensated for by making up from the blender with PG water.
- D. 2600 ppm. Evaporation is compensated for by making up from the blender with blended flow.

A Incorrect. 2500 ppm is incorrect but plausible because it is the minimum boron concentration allowed for SI Accumulators.

B Incorrect. 2500 ppm is incorrect but plausible because it is the minimum boron concentration allowed for SI Accumulators. Boric Acid blender is used for makeup when leakage is evident.

C Correct. Minimum boron concentration per TS-3.9.1 is 2600 ppm. PG water is used to makeup for evaporation. Boric Acid blender is used for makeup when leakage is evident.

D Incorrect. Minimum boron concentration per TS-3.9.1 is 2600 ppm, however normal makeup for evaporation is with PG water since boron does not carry over with evaporation.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

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

Question Number:

Tier: 2
Group: 2

Importance Rating: 3.1

Technical Reference: TS 3.9.1, NCRODP-49-NA
1-Op-16.5

Proposed references to be provided to applicants during examination: None

Learning Objective: U 4472, U-3749

10 CFR Part 55 Content: 41

Comments:

KA Match: Item matches KA because it evaluates knowledge of TS requirement for minimum boron concentration, which provides for adequate SDM. PG water could potentially reduce SDM, so boron concentration for SFP has a TS minimum.

Changed PPM for distractors for added plausibility; shuffled options

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C D C B B C B D C C Scramble Range: A - D
Source: BANK Source If Bank: NORTH ANNA
Cognitive Level: LOWER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?: YES

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

32. 036 AA1.01 027/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is in Mode 6 with Core offload in progress.
- A fuel assembly becomes visibly damaged when removed from the core.
- Containment radiation is rising slowly.
- The assembly is returned to its location.
- Containment evacuation has been initiated.

Which ONE of the following describes the expected indications and response of the Primary Ventilation System?

- A. Vent Stack 'B' Radiation Monitor indication increases; Containment Purge Exhaust automatically isolates when Vent Stack 'B' Radiation Monitor exceeds alarm setpoint.
- B. Vent Stack 'B' Radiation Monitor indication increases; Containment Purge Exhaust should be manually diverted through the Auxiliary Building Iodine Filters.
- C. Vent Stack 'A' Radiation Monitor indication increases; Containment Purge Exhaust automatically isolates when Vent Stack 'A' Radiation Monitor exceeds alarm setpoint.
- D. Vent Stack 'A' Radiation Monitor indication increases; Containment Purge Exhaust should be manually diverted through the Auxiliary Building Iodine Filters

A Incorrect. First portion is correct Purge exhaust is directed through Vent Stack B. Second portion of distractor is incorrect but plausible since several different functions will isolate Containment Purge automatically.

B Correct. First portion is correct as noted above. Second portion is correct as procedure AP-5 provides guidance to direct Purge Exhaust through the Iodine Filter Bank to reduce release activity.

C Incorrect. First portion is incorrect Purge exhaust is directed through Vent Stack B, but the candidate who is unfamiliar with Primary Ventilation System may select this distractor. Second portion of distractor is incorrect but plausible since several different functions will isolate Containment Purge automatically.

D Incorrect. First portion is incorrect as noted above. Second portion is correct as procedure AP-5 provides guidance to direct Purge Exhaust through the Iodine Filter Bank to reduce release activity.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to operate and / or monitor the following as they apply to the Fuel Handling Incidents:
Reactor building containment purge ventilation system

Question Number:

Tier: 1
Group: 2

Importance Rating: 3.3

Technical Reference: 0-AP-30

Proposed references to be provided to applicants during examination: None

Learning Objective: None

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA match because the item evaluates knowledge of the operation of the Containment Purge system, specific to a Fuel Handling Accident. The item further evaluates containment isolation by testing knowledge of allowable containment closure time.

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B D C D C A B A A D Scramble Range: A - D
Source: NEW Source If Bank:
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

33. 039 G2.1.32 057/NEW//LOWER//RO/NORTH ANNA/6/2008/

Which ONE of the following describes the reason for equalizing Main Steam pressure when opening a Main Steam NRV that has been closed?

- A. Prevent thermal overload of breaker for NRV due to excessive DP when opening the NRV.
- B✓ Prevent excessive swell of SG volume.
- C. Prevent inadvertent Hi Steam Line Differential Pressure SI.
- D. Prevent damage to valve internals due to excessive DP when opening the NRV.

A Incorrect. Plausible since there have been industry events related to rotor lockup, however at this point in the procedure the concern is for swell and loss of level control.

B Correct. A rapid pressure drop would occur if the valve were opened against a substantial D/P, this in turn would result in excessive swell and the potential to lose control of Sg level.

C Incorrect. A high steam line differential pressure would not actually be received when opening an NRV. Plausible because an isolated main steam line will have a different pressure than in-service main steam lines.

D Incorrect. NRVs are designed to operate against high DPs, but plausible because mechanical binding of valves due to excessive DP is a known occurrence.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Conduct of Operations: Ability to explain and apply all system limits and precautions.

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.8

Technical Reference: 1-OP-28.1

Proposed references to be provided to applicants during examination: None

Learning Objective: U 10085

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates knowledge of a main steam system precaution and correct answer provides the explanation of why the caution is observed.

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B B A D D C D D D D Scramble Range: A - D
Source: NEW Source If Bank:
Cognitive Level: LOWER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

34. 041 K6.03 002/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is at 100% power.
- Rod Control is in MANUAL.
- All other controls are in AUTO.
- A Turbine control valve failure results in a load rejection.
- Tav_g - Tref deviation indicates 11 degrees F.
- 1M-D4, STEAM DUMP ARMED, is illuminated.

Which ONE of the following describes Steam Dump response?

- A. Two banks of Steam Dumps are modulating open. Two banks of steam dumps are closed.
- B. Two banks of Steam Dumps are tripped open. One bank of steam dumps is modulating open.
- C. Two banks of Steam Dumps are tripped open. Two banks of steam dumps are modulating open.
- D. Four banks of steam dumps are tripped open.

A Incorrect. At 10 degrees, 2 steam dump banks trip open in load reject mode. This value is different for turbine trip mode. The 3rd bank of dump valves will be modulating, and the 4th bank has not yet reached setpoint. Plausible because they are modulating up to 10 degrees.

B Correct. As discussed above both the trip open and modulate functions of the load rejection program are satisfied.

C Incorrect. Plausible because two banks are tripped open. One other bank is modulating, but the 4th has not yet started to open. It would be opening in another 2 degrees, and if candidate is unaware of overlap within the banks they may choose this distractor.

D Incorrect. Plausible, because the next trip open setpoint will be all 4 banks; 5 degrees additional will cause them to trip open.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the effect of a loss or malfunction on the following will have on the SDS:
Controller and positioners, including ICS, S/G, CRDS

Question Number:

Tier: 2
Group: 2

Importance Rating: 2.7

Technical Reference: Steam Dump LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 8865, U 8866

Question History:

10 CFR Part 55 Content: 41.5

Comments:

KA Match: Item evaluates failure of a turbine control valve (SG) on the operation of the steam dump system. (Westinghouse has no ICS and CRDS has no different consequence (no control input))

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
Source: NEW Source If Bank:
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

35. 054 AK3.01 015/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Reactor power is 75%.
- 1B MFW Pump is out of service for pump coupling repairs.
- The following alarms are received:
 - 1F-A4, MAIN FD PPS DISCH HDR LO PRESS
 - 1F-A5, MAIN FD PP 1A-1B-1C AUTO TRIP
 - 1F-F1/F2/F3, SG 1A/1B/1C LEVEL ERROR
 - 1F-D1/D2/D3, STM GEN 1A/1B/1C FW<STM FLOW CH III-IV
- The BOP determines that 1C MFW Pump is tripped.
- The crew enters 1-AP-31, Loss of Feedwater.

Which ONE of the following describes the action required, and reason for the action?

- A ✓ Trip the reactor; prevents a challenge to the Reactor Protection System from loss of secondary heat sink.
- B. Trip the reactor; prevents damage to operating Main Feedwater Pump due to pump runout flow and cavitation.
- C. Reduce load; reduces steam flow to within the capacity of the operating MFW pump.
- D. Reduce load; prevent operating MFW pump windings from overheating due to excessive current.

A Correct. 1B MFW pump cannot be started and with power at 75% and only 1 MFW pump available a reactor trip is initiated since one would otherwise occur automatically. Basis for this reactor trip is the loss of secondary heat sink.

B Incorrect. Correct response for condition but although pump may experience runout the basis is ensuring core protection, not equipment longevity which may be adversely affected by a brief period of operation at high flow conditions.

C Incorrect. Power is at 75% and therefore only slightly above the value for which this would be the correct response. The 2nd half of the distractor is true, power reduction will reduce steam flow and thus ease the burden on the remaining MFW pump.

D Incorrect. As noted above and plausible since since increased flow demand will causes significantly higher current if power remained at the edge of capacity of the pump.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the reasons for the following responses as they apply to the Loss of Main Feedwater (MFW): Reactor and/or turbine trip, manual and automatic

Question Number:

Tier: 1
Group: 1

Importance Rating: 4.1

Technical Reference: 1-AP-31, TS Basis 3.3.1 (SG LO-LO)

Proposed references to be provided to applicants during examination: None

Learning Objective:

Question History:

10 CFR Part 55 Content:

Comments:

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	A C C A A D B C B B	Scramble Range: A - D
Source:		NEW			Source If Bank:		
Cognitive Level:		HIGHER			Difficulty Level :		
Job Position:		RO			Plant:	NORTH ANNA	
Date:		6/2008			Previous NRC?:		

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

36. 055 A3.03 081/NEW//LOWER//RO/NORTH ANNA/6/2008/

Initial Conditions:

- A Steam Generator Tube Leak is occurring on Unit 1.
- The crew is entering 1-AP-24, Steam Generator Tube Leak.
- Condenser Air Ejector Radiation Monitor 1-SV-RM-121 is in Hi-Hi alarm.

Current conditions:

- Reactor Trip.
- Safety Injection is actuated.
- The crew is performing actions of 1-E-0, Reactor Trip or Safety Injection.

Which ONE of the following describes the alignment of the Condenser Air Ejector steam supply and exhaust for the current conditions?

- A. Exhaust isolated on HI-HI radiation; steam supply to air ejectors isolated on HI-HI radiation.
- B. Exhaust diverted to Containment on HI-HI radiation; steam supply to air ejectors isolated on HI-HI radiation.
- C. Exhaust diverted to Containment on Phase A isolation; steam supply to air ejectors isolated on Phase A isolation.
- D Exhaust isolated on Phase A isolation; steam supply to air ejectors isolated on Phase A isolation.

A Incorrect. Plausible because isolation of both supply and discharge is logical on a hi-hi radiation signal to prevent release.

B Incorrect. First half is correct and second half is plausible for same reason as A.

C Incorrect. Second half is correct and first half is plausible because it would prevent radioactive release to the environment.

D Correct. Discharge aligns to Containment via 2 trip valves. Normal discharge valve closes on hi-hi radiation. In the event of Phase A, discharge and steam supply isolate.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to monitor automatic operation of the CARS, including: Automatic diversion of CARS exhaust

Question Number:

Tier: 2
Group: 2

Importance Rating: 2.5

Technical Reference: Condensate LP, 1-AP-24

Proposed references to be provided to applicants during examination: None

Learning Objective: U 4007

Question History:

10 CFR Part 55 Content: 41.5

Comments:

KA Match: Item evaluates parameter that causes automatic divert of air ejector exhaust as well as what causes complete isolation

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

37. 055 EA1.06 016/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- A loss of all AC Power has occurred.
- The crew is performing actions of 1-ECA-0.0, Loss of All AC Power.
- 1H EDG has failed and CANNOT be restarted.
- The crew is performing 1-ECA-0.0, Attachment 4, Attempting to restore power to 1H (1J) Emergency Bus.
- Attempts to start EDG 1J are in progress.
- RCP Seal Water Outlet temperature is 200°F and rising at 2°F per minute.

Which ONE of the following describes the action required in accordance with ECA-0.0?

- A. Place Charging Pumps in PTL prior to attempting to start 1J EDG in MANUAL - LOCAL.
- B. Perform Attachment 3, RCP seal isolation, prior to attempting to start 1J EDG in MANUAL- LOCAL.
- C✓ Place 1J EDG in MANUAL-LOCAL, press EMER GEN Alarm & Shutdown RESET Button, and verify Shutdown Relay Status Light is lit. After one minute, place 1J EDG in MANUAL - REMOTE and determine if the EDG starts.
- D. Place 1J EDG in MANUAL-REMOTE, press EMER GEN Alarm & Shutdown RESET Button, and verify Shutdown Relay Status Light is lit. After one minute, place 1J EDG in MANUAL - LOCAL and determine if the EDG starts.

A Incorrect. This would be performed if RCP seal return temperature was 235 degrees F or greater. Plausible because it is an action that must be considered.

B Incorrect. As noted above this would be correct if RCPs crossed the 235 degree threshold.

C Correct. Actions are correct for starting the EDG. They are not all inclusive but do not need to be; based on the information in the stem it is reasonable to conclude that RCP seal leakoff has not heated up excessively.

D Incorrect. The EDG must be reset in MANUAL LOCAL, and will not reset if these actions are reversed. Plausible because it requires detailed knowledge of the emergency shutdown circuitry of the EDG.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to operate and monitor the following as they apply to a Station Blackout: Restoration of power with one ED/G

Question Number:

Tier: 1
Group: 1

Importance Rating: 4.1

Technical Reference: ECA-0.0

Proposed references to be provided to applicants during examination: None

Learning Objective: U 5687

Question History:

10 CFR Part 55 Content: 41.10, 41.7

Comments:

KA Match: Item evaluates operation of the EDG that is being used to restore power. Part of the procedure for restoration requires knowledge of RCP seal status as well as switch manipulation for restoration

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: C A C B A C D C D C Scramble Range: A - D
Source: NEW Source If Bank:
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

38. 056 AA2.72 018/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- AFW pump 1-FW-P-2 is tagged out to replace the overspeed trip tappet.
- Unit 1 reactor trip from 100% power.
- Severe weather causes a Loss of Off-Site power.
- An electrical fault on 1H Bus has caused a bus lockout.

Which ONE of the following describes the response of the AFW System during this event?

- A. AFW flow available through the HCV header; flow initiates as soon as the 4160 Volt emergency bus is energized.
- B. AFW flow available through the MOV header; flow initiates as soon as the 4160 Volt emergency bus is energized.
- C. AFW flow available through the HCV header; flow initiates approximately 20 seconds after the 4160 Volt emergency bus is energized.
- D. AFW flow available through the MOV header; flow initiates approximately 20 seconds after the 4160 Volt emergency bus is energized.

A Incorrect. Bus 1H supplies power to the MDAFW Pump 3A which is normally aligned to the HCV header. Plausible because each MDAFW pump is aligned to 1 header, and the applicant may not know which is which.

B Correct. 450 GPM AFW flow is available on the MOV header from MDAFW 3B and will be supplied without delay since this is a LOOP vice LOOP/LOCA scenario.

C Incorrect. Plausible as in A, and also plausible because AFW is on a 20 second time delay for SI initiation. Applicant may confuse sequencer operation for LOOP.

D Incorrect. Plausible as described in C, but correct header provided in this distractor.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to determine and interpret the following as they apply to the Loss of Offsite Power:
Auxiliary feed flow

Question Number:

Tier: 1
Group: 1

Importance Rating: 4.1

Technical Reference: NCRODP-26, AFW LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 6035 U 6037

Question History:

10 CFR Part 55 Content: 41.5

Comments:

KA Match: Item evaluates AFW flow alignment in an event specific to loss of off-site power as opposed to a safety injection signal. Additionally, the applicant must determine which header the flow will be from.

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

39. 057 G2.4.45 039/NEW//HIGHER//RO/NORTH ANNA/6/2008/NO

The Unit is in MODE 3 preparing to startup.

10 minutes ago a loss of vital bus 1-I occurred and power has not yet been restored.

Which ONE of the following describes the correct response and required notifications?

- A✓ Monitor RCP temperatures due to loss of CC flow; Notification of State and Local authorities is NOT yet required.
- B. Monitor RCP temperatures due to loss of CC flow; Notification of State and Local authorities is required within the next 15 minutes.
- C. Monitor SG PORVs due to loss of condenser steam dumps; Notification of State and Local authorities is NOT yet required.
- D. Monitor SG PORVs due to loss of condenser steam dumps; Notification of State and Local authorities is required within the next 15 minutes.

A Correct. AP-10 att.24 directs the need to monitor RCPs which will overheat in ~ 10 minutes with no CC flow. Loss of all control room annunciators is E-plan entry but not until 15 minutes has elapsed.

B Incorrect. First part is ok but threshold for notification not crossed.

C Incorrect. This action is correct for loss of bus 1-III, not 1-I. Loss of all control room annunciators is E-plan entry but not until 15 minutes has elapsed.

D Incorrect. This action is correct for loss of bus 1-III, not 1-I. As noted above no E-plan threshold has been crossed.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Loss of Vital AC Bus: Emergency Procedures / Plan: Ability to prioritize and interpret the significance of each annunciator or alarm.

Question Number:

Tier: 1
Group: 1

Importance Rating: 4.1

Technical Reference: 0-AP-10, EPIP 1.01

Proposed references to be provided to applicants during examination: None

Learning Objective:

Question History:

10 CFR Part 55 Content: CFR: 41.10 / 43.5 / 45.3 / 45.12

Comments:

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	A A A A A A A A A A	Items Not Scrambled
Source:		NEW			Source If Bank:		
Cognitive Level:		HIGHER			Difficulty Level :		
Job Position:		RO			Plant:	NORTH ANNA	
Date:		6/2008			Previous NRC?:	NO	

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

40. 058 AK1.01 039/MODIFIED//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is at 100% power.
- All DC Bus voltages are approximately 131 VDC.
- The following alarm is received in the control room:
 - 1H-B3, BATTERY CHGR 1-III TROUBLE
- Battery Charger 1-III DC Output breaker has tripped and CANNOT be reset.
- DC Bus 1-III voltage is 118 volts and lowering.

Which ONE of the following describes the action that will be taken to restore DC Bus 1-III?

- A. Place Swing Battery Charger 1C-I in service with the NORMAL/EQUALIZE switch in NORMAL.
- B. Place Swing Battery Charger 1C-I in service with the NORMAL/EQUALIZE switch in EQUALIZE.
- C✓ Place Swing Battery Charger 1C-II in service with the NORMAL/EQUALIZE switch in NORMAL.
- D. Place Swing Battery Charger 1C-II in service with the NORMAL/EQUALIZE switch in EQUALIZE.

A. Incorrect. Swing Charger 1-I would be placed in service for a loss of Charger 1-I or 1-II. DC Bus 1-III and 1-IV are supplied by Swing Charger 1-II. Switch position is correct.

B Incorrect. Switch position would be equalize only if the battery charger that tripped was in equalize mode. By all DC Bus voltage being 131 VDC prior to the charger trip, applicant should be able to determine that the chargers were all in NORMAL.

C Correct. DC Bus 1-III and 1-IV are supplied by Swing Charger 1-II. Switch position is correct.

D Incorrect. Wrong switch position is indicated. As noted in B voltage being 131 VDC prior to the charger trip, applicant should be able to determine that the chargers were all in NORMAL.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

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

Question Number:

Tier: 1
Group: 1

Importance Rating: 2.8

Technical Reference: 1-OP-26.4.3, 0-AP-10

Proposed references to be provided to applicants during examination: None

Learning Objective: U 5509

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates knowledge of Charger equipment by evaluating position of the NORMAL/EQUALIZE switch based upon conditions given in the stem.

Item was modified from 2006 test item. Different bus failure and different 2nd half of options

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	C B D C C D A D C D	Scramble Range: A - D
Source:		MODIFIED			Source If Bank:		
Cognitive Level:		HIGHER			Difficulty Level :		
Job Position:		RO			Plant:	NORTH ANNA	
Date:		6/2008			Previous NRC?:		

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

41. 059 K1.02 059/MODIFIED//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- The plant is at 25% power.
- A Condensate header rupture occurs, and the following conditions are present:
 - All Main Feedwater pumps tripped.
 - 10 seconds later SG levels are 30% narrow range and lowering.
 - Reactor power remains at 25%.

Which ONE of the following describes the operation of the Reactor Protection System and the Auxiliary Feedwater (AFW) Pumps for this condition?

- 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.

A Incorrect. RPS trip setpoint was not exceeded, because the steam flow/feed flow mismatch is not active until SG level reaches 25%. Plausible because the steam flow/feed flow mismatch causes a trip at higher than normal SG level trip setpoints. AFW pumps started when all 3 Feed Pumps were tripped.

B Incorrect. See A. AFW pumps are running, but plausible because the applicant may apply the auto start at 18% in any SG level and omit the loss of all feed pumps start.

C Correct. Logic for Reactor trip is not met as noted above, but AFW auto start met based on information provided in stem.

D Incorrect. Logic for Reactor trip is not met as noted above, AFW pumps are running, but plausible because the applicant may apply the auto start at 18% in any SG level and omit the loss of all feed pumps start.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the physical connections and/or cause-effect relationships between the MFW and the following AFW system

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.4

Technical Reference: NCRODP-26, AFW LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 6035, 6037

Question History:

10 CFR Part 55 Content: 41.7, 41.5

Comments:

KA Match: Item evaluates cause-effect relationship of Main Feed Pump trip vs. AFW pump auto start circuitry.

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

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

Source: MODIFIED

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

42. 060 AA2.05 029/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- Release of Waste Gas Decay Tank 1B is in progress.
- 1-GW-RI-178-1, Process Vent Normal Range Monitor, indication is rising.
- 1-GW-RI-178-2, Process Vent High Range Monitor, indication is just coming on scale.

- The following alarms are received:
 - 2B-A5, PROCESS VENT VNT STACK A&B LOW RAD MON ALERT/RAD
 - 2B-B5, PROCESS VENT VNT STACK A&B HI HI RADIATION

Which ONE of the following describes the status of of the Gas Decay Tank release lineup?

- A✓ Flow Control valve 1-GW-FCV-101 closed when 1-GW-RI-178-1 high radiation alarm was received. Pressure Control valve 1-GW-PCV-117 does NOT receive a close signal.
- B. Flow Control valve 1-GW-FCV-101 AND Pressure Control valve 1-GW-PCV-117 closed when 1-GW-RI-178-1 high radiation alarm was received.
- C. Flow Control valve 1-GW-FCV-101 remained open UNTIL 1-GW-RI-178-2 high radiation alarm was received. Pressure Control valve 1-GW-PCV-117 does NOT receive a close signal.
- D. Flow Control valve 1-GW-FCV-101 AND Pressure Control valve 1-GW-PCV-117 remained open until 1-GW-RI-178-2 high radiation alarm was received.

A Correct. 178-1 initiates closure of the flow control valve, but the pressure control valve does not receive a close signal.

B Incorrect. 178-1 initiates closure but the PCV does not receive a close signal. Plausible because the pressure control valve is at the inlet to the FCV and part of the discharge flow path.

C Incorrect. The discharge flowpath will already be closed when the high range monitor goes into alarm. Plausible because it is logical to believe that the high range monitor will initiate control action.

D Incorrect. See C as well as B for plausibility.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to determine and interpret the following as they apply to the Accidental Gaseous Radwaste: That the automatic safety actions have occurred as a result of a high ARM system signal

Question Number:

Tier: 1
Group: 2

Importance Rating: 3.7

Technical Reference: NCRODP-45, GW LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 10705

Question History:

10 CFR Part 55 Content: 41.11

Comments:

KA Match: Item evaluates isolation of gaseous waste release on high radiation. (Accidental release occurring if abnormal radiation is present)

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

43. 061 G2.4.3 030/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- A LOCA occurred on Unit 1 thirty minutes ago.
- The crew is performing 1-E-1, Loss of Reactor or Secondary Coolant.
- 1-RM-RMS-165 and 1-RM-RMS-166, Containment High Range Radiation Monitors, both have amber and red lights illuminated in the control room.

Which ONE of the following describes the additional indications observed if an actual high radiation condition exists?

- A. Monitor green light ON; annunciator received on Unit 1.
- B✓ Monitor green light ON; annunciator received on Unit 2.
- C. Monitor green light OFF; annunciator received on Unit 1.
- D. Monitor green light OFF; annunciator received on Unit 2.

A Incorrect. Green monitor light would be on and plausible because it is logical to assume that the high radiation alarm (RAD TROUBLE) is on the associated unit.

B Correct. Green monitor light would be on and high radiation alarm (RAD TROUBLE) is on Unit 2.

C Incorrect. Amber and red lights indicate alarm, but green light off (SAFE/RESET LIGHT) would indicate a monitor failure. Plausible also because it is logical to assume that the high radiation alarm (RAD TROUBLE) is on the associated unit.

D Incorrect. Amber and red lights indicate alarm, but green light off (SAFE/RESET LIGHT) would indicate a monitor failure. Correct Unit for annunciator provided in this distractor.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Emergency Procedures / Plan: Ability to identify post-accident instrumentation.

Question Number:

Tier: 1

Group: 2

Importance Rating: 3.7

Technical Reference: NCRODP-46, RMS LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 5248, 5250

Question History:

10 CFR Part 55 Content: 41.11

Comments:

KA Match: item evaluates recognition of alarm status of the post accident monitor required by technical specifications, therefore KA is met. (identification of indication and alarm)

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

44. 061 K2.01 060/NEW//LOWER//RO/NORTH ANNA/6/2008/NO

Which ONE of the following states the power supplies to AFW Discharge MOVs, 1-FW-MOV-100A, B, C?

- A. MCC 1H1-2N
- B✓ MCC 1J1-2N
- C. 1A Semi-Vital Bus
- D. 1B Semi-Vital Bus

A Incorrect. The AFW discharge HCVs are powered from 1H bus through semi vital bus 1A. Plausible because the valves are safety related and all valves are ultimately powered from either H or J trains.

B Correct all valves listed powered from this MCC.

C Incorrect. AFW Discharge HCVs (1-FW-HCV-100A, B, C) are powered from this source. Plausible because the valves and power supplies are easily confused, since there are no train designators.

D Incorrect. Semi-Vital 1A supplies AFW Discharge HCVs. Semi-Vital 1B does not provide power to AFW discharge valves, but since the opposite bus does, and there are no train designators, this supply is credible.

Knowledge of bus power supplies to the following: AFW system MOVs

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.2

Technical Reference: NCRODP-26, Table 26-3; AFW Lesson Plan 1-OP-26A

Proposed references to be provided to applicants during examination: None

Learning Objective: U 5980

Question History:

10 CFR Part 55 Content: 41.5

Comments:

KA Match: Topic directly matches the KA as it evaluates knowledge of the power supply to AFW discharge MOVs, as required by KA topic.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B A D A A A B A B A Scramble Range: A - D
Source: NEW Source If Bank:
Cognitive Level: LOWER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?: NO

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

45. 062 G2.1.27 061/BANK/NORTH ANNA/LOWER//RO/NORTH ANNA/6/2008/

A disconnect switch is at the output of vital bus inverters 1-I and 2-I in order to _____.

- A. dedicate the associated Sola transformer to supply power to its vital bus only
- B✓** dedicate the associated inverter to supply power to the opposite unit's channel 1 ex-core flux monitor
- C. isolate the associated inverter from its vital bus for maintenance
- D. isolate the associated Appendix-R power panel for maintenance

A Incorrect. Purpose of bypass switch is for SOLA to supply the vital bus. Plausible because the bypass and disconnect could be confused.

B Correct. This is a design feature for Safe Shutdown function that ensures capability to monitor reactor subcriticality.

C Incorrect. The Inverter Output breaker would be used to disconnect the inverter from the bus. Plausible because the function could potentially be used, but is not the purpose.

D Incorrect. Appendix R panels are isolated by transfer switches. Plausible because disconnects do perform an isolation function, and the disconnects are provided in case of a fire that destroys the vital bus.

Conduct of Operations: Knowledge of system purpose and / or function.

Question Number:

Tier: 2

Group: 1

Importance Rating: 3.9

Technical Reference: Vital AC LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 5534

Question History:

10 CFR Part 55 Content: 41.5

Comments:

KA Match: Item evaluates one of the functions of the 120 VAC vital distribution system, in that cross-tie between units is available

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

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

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

Source: BANK

Source If Bank: NORTH ANNA

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

46. 062 K3.03 062/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- Both Units are at 100% power.
- A Fire in RSST 'A' causes an overcurrent lockout on Transfer Bus D.

Which ONE of the following describes the battery chargers that are temporarily deenergized?

- A. 1-I and 1-II
- B. 1-III and 1-IV**
- C. 2-I and 2-II
- D. 2-III and 2-IV

A Incorrect. Chargers 1-I and 1-II are supplied from 480 volt bus 1H, which is supplied from 4.16KV Bus 1H, which is supplied from Transfer Bus F. Plausible because each of the 4 KV busses have a normal supply from transfer bus D, E, or F. Alternate supplies are from SSTs or from Emergency Diesel Generators.

B Correct. Chargers 1-III and 1-IV are supplied from Bus 1J, which receives power from Transfer Bus D. If Transfer Bus D is deenergized, alternate power will be supplied from Unit 2 SST 2B or from 1J EDG. Power will be temporarily interrupted to the bus.

C Incorrect. Loss of transfer Bus E would cause loss of the 2-I and 2-II chargers. Plausible same reason as A, all are supplied from the Transfer Busses.

D Incorrect. Plausible as in A, Transfer Bus F is the normal supply to 2J, which supplies chargers 2-III and 2-IV.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the effect that a loss or malfunction of the ac distribution system will have on the following: DC system

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.7

Technical Reference: NCRODP Figure 35-1 NA
1-OP-26A
0-AP-10

Proposed references to be provided to applicants during examination: None

Learning Objective: U 5511

Question History:

10 CFR Part 55 Content: 41.7

Comments:

KA Match: Item directly evaluates a loss of AC power to the DC distribution system by evaluating knowledge of which Transfer Bus supplies the emergency bus that provides power to specific vital battery chargers, thus demonstrating knowledge of the effect of a loss of AC on the DC distribution system.

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B A A B A D A C B D Scramble Range: A - D
Source: NEW Source If Bank:
Cognitive Level: LOWER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

47. 063 K4.01 063/BANK/NORTH ANNA/HIGHER//RO/NORTH ANNA/6/2008/

If a loss of Battery Charger 1-I were to occur, what would be the effect on the operation of its associated inverter and the vital DC bus?

- A. Static switch transfer occurs; vital DC bus voltage initially decreases by several volts and then continues to decrease at a faster rate over time.
- B. Static switch transfer occurs; vital DC bus voltage initially decreases by several volts and then continues to decrease at the same rate over time.
- C. NO static switch transfer; vital DC bus voltage initially decreases by several volts and then continues to decrease at a faster rate over time.
- D. NO static switch transfer; vital DC bus voltage initially decreases by several volts and then continues to decrease at the same rate over time.

A Incorrect. If the charger is lost, battery will supply the inverter due to the changed bias on the blocking diode. Plausible because loss of inverter input (both) results in static switch transfer. Second part is true rate of voltage decay increases over time due to cell reversal.

B Incorrect. As noted above conditions DO NOT exist to warrant a transfer. Second part is incorrect but plausible since the candidate may not be aware of the effect of cell reversal on the battery.

C Correct. Inverter will remain powered by it's associated DC bus so no transfer will occur. Second part is also true as the rate of voltage decay increases over time due to cell reversal.

D Incorrect. Inverter will remain powered by it's associated DC bus so no transfer will occur. Second part is incorrect but plausible since the candidate may not be aware of the effect of cell reversal on the battery.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of dc electrical system design feature(s) and/or interlock(s) which provide for the following: Manual/automatic transfers of control

Question Number:

Tier: 2
Group: 1

Importance Rating: 2.7

Technical Reference: Vital Electrical LP/SD

Proposed references to be provided to applicants during examination: None

Learning Objective: U 9619

Question History:

10 CFR Part 55 Content: 41.7

Comments:

KA Match: Item evaluates knowledge of a failure of the DC Electrical Distribution system and its effect on the transfer of vital AC inverters. The question in effect is asking knowledge of an automatic transfer of control to the battery when a charger fails, against the automatic transfer of control to a regulating transformer via static switch

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

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

Source: BANK Source If Bank: NORTH ANNA
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

48. 064 K3.02 064/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- A lightning strike has occurred resulting in a loss of the North Anna Switchyard.
- The 1J EDG Battery and Battery Charger are BOTH lost.
- 125 VDC Bus 1-I is lost.
- A spurious SI occurs.
- The crew has entered 1-E-0, Reactor Trip or Safety Injection, and manually actuated SI.

Which ONE of the following describes the reason that no J Train ESF equipment is running?

- A. 1J EDG did NOT start due to loss of the auxiliary fuel oil pump.
- B✓ 1J EDG did NOT start due to loss of power to both start circuits.
- C. 1J EDG started, but the EDG output breaker did NOT close due to loss of DC field flash capability.
- D. 1J EDG started and the EDG output breaker is closed, but no control power is available to 1J Bus load breakers.

A Incorrect. Plausible since although the EDG Aux Fuel Oil pump is not needed to start the EDG the candidate who is unfamiliar with the EDG System may assume this constitutes a valid reason for the EDG not starting.

B Correct. Without the EDG Battery or Battery Charger there is no power available to the start circuits and thus the EDG will not attempt to start despite the presence of automatic start signals.

C Incorrect. Plausible because the candidate may assume that the EDG is capable of starting but that DC for field flash is unavailable. While the later part is true, as discussed above the EDG will not attempt to start based on the total loss of DC support.

D Correct. Plausible because the candidate may assume that the EDG is capable of starting and obtaining required voltage and frequency. The candidate who is unfamiliar with DC control power to the ESF busses may conclude that this is a logical reason for none of the ESF equipment to be loaded. The control power to 1J Bus is from DC Bus 1-III.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the effect that a loss or malfunction of the ED/G system will have on the following: ESFAS controlled or actuated systems

Question Number:

Tier: 2

Group: 1

Importance Rating: 4.2

Technical Reference: EDG LP/SD (Not a good reference)

Proposed references to be provided to applicants during examination: None

Learning Objective: U 6310 (Partial)

Question History:

10 CFR Part 55 Content: 41.7

Comments:

KA Match: Item evaluates malfunction of EDG based on multiple control power failures, and the resulting effect on the sequencer, which implies effect on the systems controlled by the sequencer

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

49. 065 AK3.03 022/BANK/NORTH ANNA/LOWER//RO/NORTH ANNA/6/2008/

Unit 1 is operating at 100% power.

- The following alarm is received:
 - 1F-F8, SAND FLTR IA SUPPLY LO PRESS.
- The OATC notes instrument air pressure is 85 psig and rapidly decreasing.
- The crew initiates 1-AP-28, LOSS OF INSTRUMENT AIR.
- Instrument Air pressure continues to lower.
- The SRO directs tripping the reactor and closing Main Steam Trip Valves.

Which ONE of the following describes the reason for this action?

- A. To avoid a High PZR Pressure reactor trip due to closure of all main steam trip valves.
- B. To avoid a Lo-Lo SG level reactor trip due to closure of all main steam trip valves.
- C. To avoid a High Steam Flow safety injection due to closure of a single main steam trip valve.
- D. To avoid a High Steam Line Delta P safety injection due to closure of a single main steam trip valve.

A Incorrect. Plausible because RCS pressure would rise significantly on closure of all MSTVs at 100% power.

B Incorrect. Plausible because if MSTVs close, the SGs would shrink and reach the low level trip setpoint.

C Correct. If one MSTV drifts closed (at 100% power) , a high steam flow and lo SG pressure would occur on the other 2 SGs (as steam load does not change), causing a safety injection actuation.

D Incorrect. The high steam flow w/lo SG pressure SI would occur prior to steam line DP SI due to the rate sensitive nature of the pressure component of the logic.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Knowing effects on plant operation of isolating certain equipment from instrument air

Question Number:

Tier: 1
Group: 1

Importance Rating: 2.9

Technical Reference: AP-28, AP LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 11662

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA is matched because it evaluates knowledge of the effect of losing air to an MSIV, and the safety system actuation that will occur.

North Anna Bank item with significant editorial changes

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

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

Source: BANK Source If Bank: NORTH ANNA
Cognitive Level: LOWER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

50. 071 A2.02 082/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- The crew is preparing to release WGDT 1B.
- The maximum allowed flowrate per the release permit is 300 SCFM.

Which ONE of the following describes the **preferred** method for controlling the WGDT release flow rate?

- A. 1-GW-FCV-101, WGDT to Process Vent, should be placed in MANUAL and adjusted to control flow rate at 290 ± 5 SCFM.
- B. 1-GW-FCV-101, WGDT to Process Vent, should be placed in AUTOMATIC and adjusted to control flow rate at 290 ± 5 SCFM.
- C. 1-GW-FCV-101, WGDT to Process Vent, should be placed in MANUAL and adjusted to control flow rate at less than 3 SCFM.
- D. 1-GW-FCV-101, WGDT to Process Vent, should be placed in AUTOMATIC and adjusted to control flow rate at less than 3 SCFM.

A Incorrect. Preferred mode of operation is AUTOMATIC, and maximum indicated flow rate is 3 SCFM; Plausible if operator believes MANUAL control is preferred for radioactive releases, or if operator confuses the normal Process Vent flow rate with the WGDT release flow rate.

B Incorrect. Maximum indicated flow rate is 3 SCFM; Plausible if operator confuses the normal Process Vent flow rate with the WGDT release flow rate.

C Incorrect. Preferred mode of operation is AUTOMATIC; Plausible if operator believes MANUAL control is preferred for radioactive releases.

D Correct. 0-OP-23.2 stipulates a flow rate of < 3 SCFM and operating 1-GW-FCV-101 in AUTOMATIC; Operation of 1-GW-FCV-101 in manual is only permitted with permission from the SRO based on Commitment, P&L, and procedure body, thus AUTOMATIC is clearly preferred.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to (a) predict the impacts of the following malfunctions or operations on the Waste Gas Disposal System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Use of waste gas release monitors, radiation, gas flow rate, and totalizer

Question Number:

Tier: 2

Group: 2

Importance Rating: 3.3

Technical Reference: 0-OP-23.2, Gaseous Waste LP

Proposed references to be provided to applicants during examination:

Learning Objective: U 4160

Question History:

10 CFR Part 55 Content:

Comments:

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	D A A A C D D C C B	Scramble Range: A - D
Source:		NEW			Source If Bank:		
Cognitive Level:		HIGHER			Difficulty Level :		
Job Position:		RO			Plant:	NORTH ANNA	
Date:		6/2008			Previous NRC?:		

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

51. 073 A1.01 001/BANK/NORTH ANNA/LOWER//RO/NORTH ANNA/6/2008/YES

Given the following:

- Each Unit has a containment vacuum pump running.
- 1-GW-RI-178-3, Process Vent particulate radiation Monitor indication spiked, causing an ALERT and HIGH alarm to lock in.

Which ONE of the following describes the plant response?

- A. ONLY the unit 1 vacuum pump will trip.
- B. Both units' vacuum pumps will trip; discharge valves remain open.
- C. Both units' vacuum pump discharge valves will automatically close.
- D. ONLY the unit 1 vacuum pump discharge valve will automatically close.

A Incorrect. Both units' vacuum pump discharge valves will close and pumps will then trip. Plausible because the alarm is on Unit 1.

B Incorrect. Discharge valves will close. Plausible because the vacuum pump tripping would stop the discharge.

C Correct. Discharge valves for both units vacuum pumps will close.

D Incorrect. Condition affects both Units (See A).

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRM system controls including: Radiation levels

Question Number:

Tier: 2

Group: 1

Importance Rating: 3.2

Technical Reference: NCRODP-46-NA

Proposed references to be provided to applicants during examination: None

Learning Objective: U 17679

Question History: NA 5164

10 CFR Part 55 Content: 41.11

Comments:

KA Match: item evaluates process radiation monitoring controls for securing potential discharge in progress.

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

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

Source: BANK

Source If Bank: NORTH ANNA

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?: YES

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

52. 073 K5.02 065/MODIFIED/HARRIS 2003/LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- Following a load reduction, 1-CH-RM-128, Unit 1 Reactor Coolant Letdown Monitor indication is rising.
- Area Surveys 5 feet from a letdown piping hot spot indicate 10 mREM/hr.
- An operator must hang a Tagout on a valve that is located 10 feet from the hot spot.

What is the dose rate in the area where the operator will be hanging the Tagout?
(Assume the hot spot is a point source)

- A. 1 mRem/hr
- B. 2.5 mRem/hr
- C. 5 mRem/hr
- D. 7.5 mRem/hr

A Incorrect. Mathematical error would have to be introduced to arrive at this value but plausible because it is within range and closest to the correct answer.

B Correct. Twice the distance is 1/4 the dose rate.

C Incorrect but plausible if the applicant fails to square the distance to arrive at dose rate.

D Incorrect but plausible if the applicant takes the dose rate and subtracts it from the current dose rate.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: Radiation intensity changes with source distance

Question Number:

Tier: 2
Group: 1

Importance Rating: 2.5

Technical Reference:

Proposed references to be provided to applicants during examination: None

Learning Objective:

Question History: Modified from Harris 2003 exam. Developed by others

10 CFR Part 55 Content: 43.11

Comments:

KA Match: The item intends to evaluate a situation in which an operator must be aware of changing dose rates and the relationship between distance and dose rate from a radioactive source

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

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

Source: MODIFIED

Source If Bank: HARRIS 2003

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

53. 076 A1.02 067/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is at 100% power.
- Computer alarms are received on several components cooled by the Bearing Cooling System.
- Subsequently, the following alarms are received 90 seconds apart:
 - 1A-F4, BASIN TEMP HI/LOW
 - 1T-C1, HYDROGEN TEMP OR CORE MONITOR
- The crew enters 1-AP-19, Loss of Bearing Cooling Water, and verifies a Bearing Cooling Pump is running.

Which ONE of the following describes the initial action required?

- A. Place Bearing Cooling in Lake - to - Lake Mode and verify the operation of the Circ Water System to ensure cooling requirements are met.
- B. Start available Bearing Cooling Tower Fans or shift fans to high speed; verify Bearing Cooling temperatures are decreasing.
- C. Verify Generator Hydrogen temperature is above the alarm setpoint and initiate a plant load reduction until the alarm is clear.
- D. Bypass 1-BC-TCV-104, Generator Hydrogen Cooler TCV, to lower hydrogen temperature. If temperature exceeds the limit, trip the reactor.

A Incorrect. Lake to Lake mode may be initiated after evaluation and after attempting to start all fans; therefore, plausible because it may be performed.

B Correct. AR for basin temperture HI is confirmed by annunciator for Hydrogen temperature so the initial response would be to maximize system cooling and assess if additional cooling is adequate to control system supply temperature.

C Incorrect. Verify temperature but for the Generator Hydrogen cooler, would attempt to bypass the TCV before anything else. Generator Hydrogen Cooler is a priority component in this situation.

D Incorrect. Would bypass the TCV if the BC fans did not solve the problem, but would reduce load instead of trip the reactor if temperature exceeded the limit.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including: Reactor and turbine building closed cooling water temperatures.

Question Number:

Tier: 2
Group: 1

Importance Rating: 2.6

Technical Reference: 1T-C1, 1A-F4, 1-AP-19

Proposed references to be provided to applicants during examination: None

Learning Objective: U 11413

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Facility has a secondary system called Bearing Cooling that serves the same function as the Service Water system at other facilities. KA is met because the item requires operating the system controls to prevent exceeding temperature limits

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B C D B A A D D A B Scramble Range: A - D
Source: NEW Source If Bank:
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

54. 076 AK2.01 032/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- A Turbine runback occurred 3 hours ago on Unit 1.
- The unit is stable at 55% power.
- Chemistry sample indicates that RCS activity has increased significantly.

Which ONE of the following radiation monitors provides the primary confirmation of the Chemistry sample results?

- A. SG and Main Steam N-16 monitors
- B. Reactor Coolant Letdown Radiation monitor
- C. Auxiliary Building and Vent Stack Radiation monitors
- D. Containment Particulate and Gaseous Radiation monitors

A Incorrect. High N-16 activity would show as a secondary or backup indication of high RCS activity where SG Tube Leakage is occurring. These detectors are not sensitive to RCS Activity changes. Plausible because it is logical that an increase in activity would show an increase on the monitor.

B Correct. The letdown line monitor is the primary confirmation that RCS activity has increased.

C Incorrect. Monitors are checked in AP-5 to verify that no release is occurring if the Letdown Monitor is in alarm.

D Incorrect. RCS activity would provide elevated reading in containment for conditions where a small RCS leak is occurring, but not primary indication for fuel failure/RCS activity increase.

All distractors plausible because a high RCS activity could result in an increased indication on the given monitors depended on plant conditions (e.g. RCS leakage, SGTL, CVCS leakage outside CNTMT).

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the interrelations between the High Reactor Coolant Activity and the following:
Process radiation monitors

Question Number:

Tier: 1

Group: 2

Importance Rating: 2.6

Technical Reference: 1-AP-5, Att. 8

Proposed references to be provided to applicants during examination: None

Learning Objective: U 11666

Question History:

10 CFR Part 55 Content: 55.41.12

Comments:

KA Match: Item directly evaluates KA topic by matching the plant condition of high RCS activity based on Chemistry sample with the high rad alarms caused by the Letdown Rad Monitor

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

55. 077 AA1.01 024/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- Both units are at 100% power.
- Due to voltage and frequency fluctuations on the grid, the crew is performing actions contained in 0-AP-8, Response to Grid Instability.
- The crew has verified equipment operability.

Which ONE of the following describes the operation of the Main Generator Voltage Regulators and the condition that requires the offsite power source to be declared inoperable?

- A. Maintain voltage regulators in AUTO; grid voltage increases to 536 kV
- B. Place voltage regulators in MANUAL; grid voltage increases to 536 kV
- C✓ Maintain voltage regulators in AUTO; grid voltage decreases to 504 kV
- D. Place voltage regulators in MANUAL; grid voltage decreases to 504 kV

A Incorrect. Plausible because 536 kV is above the procedural limit of 535 kV, however the procedure directs EVALUATION of the offsite source against GDC 17 and continued operability, but does not require the crew to declare it inoperable.

B Incorrect. Plausible same as A, and VR is not placed in manual. Note in procedure says to leave in AUTO because VR problems have minimal effect. Manual is logical when voltage problems exist.

C Correct. Conditions do not warrant placing VR in manual and 504 kV is the threshold for declaring offsite sources inoperable.

D Incorrect. Plausible because voltage is correct, and placing in manual is logical when there are voltage problems.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: Grid frequency and voltage

Question Number:

Tier: 1
Group: 1

Importance Rating: 3.6

Technical Reference: 0-AP-8

Proposed references to be provided to applicants during examination: None

Learning Objective: U 9364

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match because the item evaluates control of voltage (auto or manual) as well as monitoring voltage for LOW VOLT conditions

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

56. 078 A4.01 003/BANK/NORTH ANNA/LOWER//RO/NORTH ANNA/6/2008/

Which ONE (1) of the following describes the operation of Instrument Air Compressor "1-IA-C-1" when it is placed in AUTO?

- A. Compressor will start and load when pressure drops to 103 psig. Compressor will unload and shut down when pressure increases to 109 psig.
- B. Compressor will start and run continuously for an indefinite period of time. Unloader valves will CLOSE when pressure drops to 103 psig. Unloader valves will OPEN when pressure rises to 109 psig.
- C✓ Compressor will start and load when pressure drops to 98 psig. Compressor will unload when pressure rises to 106 psig.
- D. Compressor will start and run continuously for an indefinite period of time. Unloader valves will CLOSE when pressure drops to 98 psig. Unloader valves will OPEN when pressure rises to 106 psig.

A Incorrect. Plausible because it is a description of how the Service Air Compressor will operate in AUTO, with IA setpoints.

B Incorrect. Plausible because the Service Air Compressor will run in MANUAL in this manner, but IA setpoints used.

C Correct. In AUTO, the IAC will start when pressure is reduced to 98 psig, and unload when pressure reaches 106 psig.

D Incorrect. Plausible because the correct setpoints are used, but in AUTO the compressor would shut down after 15 minutes running unloaded.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

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

Question Number:

Tier: 2

Group: 1

Importance Rating: 3.1

Technical Reference: Compressed Air LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 4271

Question History:

10 CFR Part 55 Content: 41.5

Comments:

KA Match: Item evaluates pressure setpoints for operation of air compressors, which are the pressures that would be seen if an applicant was monitoring the pressure gauges

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

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

Source: BANK

Source If Bank: NORTH ANNA

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

57. 078 K4.03 068/NEW//LOWER//RO/NORTH ANNA/6/2008/

Instrument Air Compressor 1-IA-C-1 has been running loaded for the past 15 minutes.

Which ONE of the following choices contains ONLY alarms that will result in a trip of the Air Compressor?

- A✓ Low Oil Pressure AND Cooling System Fault caused by low cooling system DP
- B. High Discharge Pressure AND Cooling System Fault caused by low cooling system DP
- C. High Temperature HP Outlet AND Cooling System Fault caused by high pressure on surge line
- D. High Oil Temperature AND Cooling System Fault caused by high pressure on surge line

A Correct. A Cooling System Fault alarm will be received either on low DP or on high surge line pressure (SW leak) The low DP will trip the compressor but the high surge line pressure will not.

B Incorrect. High discharge pressure does not trip the compressor, but does cause an alarm. Plausible because most alarms do result in compressor trip.

C Incorrect. See A for description of compressor trip on low DP only for Cooling system Fault. The first alarm listed will trip the compressor.

D Incorrect. See A and C. The first alarm listed will trip the compressor.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: Securing of SAS upon loss of cooling water

Question Number:

Tier: 2
Group: 1

Importance Rating: 3.1

Technical Reference: Compressed Air LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 4272

Question History:

10 CFR Part 55 Content: 41.7

Comments:

KA Match because the item evaluates knowledge of an interlock to trip the air compressor based upon low cooling water flow.

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

58. 079 K1.01 001/MODIFIED//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- A loss of Instrument Air is occurring on Unit 1.
- Instrument Air pressure is 88 psig and dropping slowly.
- The actions of 1-AP-28, Loss of Instrument Air, are being performed.

Which ONE (1) of the following describes the Instrument Air System alignment and the action to be taken based on the system pressure?

- A. All available Instrument and Service Air Compressors running; Verify Instrument Air supplied to Containment by verifying open 1-IA-TV-102A and 1-IA-TV-102B, Containment Instrument Air Trip Valves.
- B. All available Instrument and Service Air Compressors running; Isolate Instrument Air to Containment by closing 1-IA-TV-102A or 1-IA-TV-102B, Containment Instrument Air Trip Valves.
- C. All Service Air Compressors running; Instrument Air Compressors either running or in standby; Verify Instrument Air supplied to Containment by verifying open 1-IA-TV-102A and 1-IA-TV-102B, Containment Instrument Air Trip Valves.
- D. All Service Air Compressors running; Instrument Air Compressors either running or in standby; Isolate Instrument Air to Containment by closing 1-IA-TV-102A or 1-IA-TV-102B, Containment Instrument Air Trip Valves.

A Incorrect. Immediate action is to start all available Service Air, Instrument Air, and Containment Instrument Air Compressors. No other immediate actions. Plausible but at 94 psig, the procedure directs isolation of the Containment Air Header to try and identify where the leak is.

B Correct. Immediate action is to start all available Service Air, Instrument Air, and Containment Instrument Air Compressors. No other immediate actions. At 94 psig, the procedure directs isolation of the Containment Air Header to try and identify where the leak is.

C Incorrect. Plausible because Service Air Compressors are normal supply to Instrument Air, and Instrument Air Compressors are only used for backup. Also, Containment Air trip valves are normally open to supply air to Containment.

D Incorrect. Plausible because Service Air Compressors are normal supply to Instrument Air, and Instrument Air Compressors are only used for backup. Also, Containment Air will be split at 94 psig.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the physical connections and/or cause-effect relationships between the SAS and the following IAS

Question Number:

Tier: 2
Group: 2

Importance Rating: 3.0

Technical Reference: 1-AP-28, NCRODP-17

Proposed references to be provided to applicants during examination: None

Learning Objective: U 11662

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates connections between Service Air, Instrument Air, and Containment Instrument Air during an abnormal event. Service and Instrument Air systems are always cross-tied; Containment Air may be automatically or manually isolated

Modified because air pressure was added to stem, and status of Containment Air was also added to options. Correct answer changed based on modifications

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B C D D C C D B D A Scramble Range: A - D
Source: MODIFIED Source If Bank:
Cognitive Level: HIGHER Difficulty Level :
Job Position: RO Plant: NORTH ANNA
Date: 6/2008 Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

59. 103 A3.01 070/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- A LOCA has occurred on Unit 1.
- The following conditions exist:
 - RCS pressure is 1700 psig.
 - Containment pressure has peaked at 21 psia and is now slowly decreasing.
- The crew is performing 1-E-0, Reactor Trip or Safety Injection.
- The RO is performing Attachment 5, Verification of Phase A Isolation.
- The following valves are identified as OPEN:
 - 1-CH-MOV-1115B, RWST To Charging Pumps Isolation
 - 1-CH-MOV-1289B, Normal Charging Line Isolation
 - 1-SV-TV-100A, MSR Vent to First Point Heater
 - 1-SW-MOV-108A, Service Water to CC Heat Exchanger Isolation

For the current plant conditions, which ONE of the following valves must be repositioned to place it in the required accident configuration?

- A. 1-CH-MOV-1115B
- B. 1-CH-MOV-1289B
- C. 1-SV-TV-100A
- D. 1-SW-MOV-108A

A Incorrect. Valve is normally closed but will open on SI. Plausible because it is normally closed and the applicant must determine from conditions and procedure step that SI is actuated, and that VCT valves with same numbers will be open during normal operation (Same designator, different letter).

B Correct. Normal Charging isolates on SI, but plausible that it should be open, because a loss of inventory has occurred, and Charging provides makeup.

C Incorrect. Valve must be closed manually as part of Attachment 5, but does not receive an auto close signal, and not required for safety related function. The MSRs are realigned to the condenser manually.

D Incorrect. Valve will close on CDA (CIB) Conditions do not exist for CIB. Plausible because they do get a close signal on Hi-Hi containment pressure.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to monitor automatic operation of the contain-ment system, including: Containment isolation

Question Number:

Tier: 2

Group: 1

Importance Rating: 3.9

Technical Reference: 1-E-0, Attachment 5

Proposed references to be provided to applicants during examination: None

Learning Objective: U 12021

Question History:

10 CFR Part 55 Content: 41.7

Comments:

KA Match: Item evaluates knowledge of the components that are required to reposition on containment isolation Phase A. Each option has a unique actuation or manipulation to ensure that each is plausible.

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

60. E03 EA1.2 036/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- A LOCA has occurred on Unit 1.
- The crew is performing 1-ES-1.2, Post LOCA Cooldown and Depressurization.
- During the SI flow reduction sequence, the following conditions exist:
 - 1C RCP is running.
 - Two Charging Pumps are running.
 - RCS pressure is 1100 psig and stable.
 - RCS Subcooling based on Core Exit TCs is 32°F
 - Pressurizer level is 44%.
 - Containment pressure is 17.9 psia.

Which ONE of the following describes the action required for the SI flow reduction sequence in accordance with 1-ES-1.2?

- A. RCS subcooling is adequate to prevent the RCS from reaching saturation conditions when one Charging Pump is stopped; maintain RCS temperature stable while stopping one Charging Pump.
- B. RCS subcooling is adequate to prevent the RCS from reaching saturation conditions when one Charging Pump is stopped; continue the RCS cooldown while stopping one Charging Pump.
- C. RCS subcooling is NOT adequate to prevent the RCS from reaching saturation conditions when one Charging Pump is stopped; one Charging Pump may be stopped ONLY IF at least one Low Head SI pump is running.
- D✓ RCS subcooling is NOT adequate to prevent the RCS from reaching saturation conditions when one Charging Pump is stopped; Charging Pumps must remain running with flow aligned to the BIT until RCS subcooling is sufficient to stop a Charging Pump.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

A Incorrect. RCS subcooling is sufficient for normal EOP conditions (>25 Degrees F) but not sufficient (<50 Degrees F) for SI flow reduction. Therefore, this option is plausible. Maintaining temperature (plant conditions) stable is a logical action to perform while stopping a pump that will change RCS subcooling.

B Incorrect. See A above, and also the action is correct for the conditions given if an applicant chose the first part of this option.

C Incorrect. Plausible because this is the RNO action for the step in question. If Hot Leg temperatures were below 345 Degrees F, this would be a correct option.

D Correct. ERG Rev. 2 Basis for SI reduction sequence. With a leak in progress additional subcooling is required to ensure subcooling does not decrease to SI reinitiation criteria when injection flow is reduced. The increased subcooling required is intended to ensure adequate subcooling when new equilibrium conditions establish after a Charging pump is stopped.

Ability to operate and / or monitor the following as they apply to the (LOCA Cooldown and Depressurization) Operating behavior characteristics of the facility.

Question Number:

Tier: 1
Group: 2

Importance Rating: 3.7

Technical Reference: ES-1.2 and BD

Proposed references to be provided to applicants during examination: None

Learning Objective: U 12208

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item requires knowledge of the operating behavior characteristics of the facility in order to eliminate distractors, as well as determine correct answer. The applicant must understand subcooling requirements in an abnormal EOP arrangement, and understand the SI flow reduction process related to stopping a Charging Pump in order to correctly answer.

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

61. E05 EK3.4 023/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Initial Conditions:

- Reactor trip on Unit 1.
- Safety Injection and Main Steam Line Isolation have actuated.
- 1B SG pressure is 220 psig and lowering due to a stuck open safety valve.
- 1A and 1C SG pressures are 700 psig and stable.
- RCS pressure 1600 psig and stable.

Current conditions:

- All AFW flow has been lost.
- 1A and 1C SG Wide Range levels are 30% and lowering.
- 1B SG Wide Range level, indicates 0%.
- RCS pressure is 1750 psig and rising.
- All actions of 1-E-2, Faulted SG Isolation, have been performed.
- The crew has just transitioned to 1-FR-H.1, Loss of Secondary Heat Sink.

Which ONE of the following describes the strategy for recovery of Heat Sink in accordance with 1-FR-H.1, and the reason for the strategy?

- A. Establish AFW flow to ANY SG; establishing Heat Sink takes priority over any previous EOP action.
- B✓ Establish AFW flow to 1A OR 1C SG; 1B SG should remain isolated to prevent potential SG tube damage.
- C. Establish bleed and feed and if AFW becomes available, then establish AFW to ANY SG; establishing Heat Sink takes priority over any previous EOP action.
- D. Establish bleed and feed and if AFW becomes available, then establish AFW to 1A OR 1C SG; 1B SG should remain isolated to prevent potential SG tube damage.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

A Incorrect. Actions of FRPs do take precedence over other procedures, but a caution prior to step 1 of FR-H.1 requires use of intact SGs for initiation of feed instead of faulted SGs. Plausible because a loss of heat sink is in progress.

B Correct. The caution referenced in FR-H.1 is standard throughout the EOP network and is intended to alert the operator to the potential for damage as well as the difficulty involved in attempting to control RCS temperature with a faulted SG; either condition can result in adverse consequences and has the potential to complicate recovery actions.

C Incorrect. SG WR level is below the adverse value, but above the normal value for initiation of bleed and feed; therefore, plausible option. Recovery with AFW would follow the caution to leave the faulted SG isolated.

D Incorrect and plausible same as C. Actions for restoration of AFW are correct. Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink) RO or SRO function as a within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.

Question Number:

Tier: 1
Group: 1

Importance Rating: 3.7

Technical Reference: FR-H.1 and background doc

Proposed references to be provided to applicants during examination: None

Learning Objective: U 11276

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: The item evaluates plant conditions where an applicant must observe a caution in order to perform the correct action during a loss of feedwater. The applicant is presented with 2 plausible options for initial action, as well as 2 plausible options for reasons, both contained in EOPs

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

62. E09 EA2.1 037/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- A loss of off-site power due to a Tornado hitting the switchyard.
- The crew has stabilized the Unit using 1-ES-0.1, Reactor Trip Response.
- Operations Management has directed performance of a Natural Circulation Cooldown.

Which ONE of the following procedures will be used to perform the RCS Cooldown, and which ONE of the following is the MAXIMUM cooldown rate allowable in accordance with the EOP that will be used?

- A✓ ES-0.2A, Natural Circulation Cooldown with CRDM Fans; 25 degrees F/Hr.
- B. ES-0.2A, Natural Circulation Cooldown with CRDM Fans; 15 degrees F/Hr.
- C. ES-0.2B, Natural Circulation Cooldown without CRDM Fans; 25 degrees F/Hr.
- D. ES-0.2B, Natural Circulation Cooldown without CRDM Fans; 15 degrees F/Hr.

A Correct. With loss of off-site power, power is still available to operate CRDM cooling fans, so the crew will use ES-0.2A for the cooldown. Specified cooldown rate is correct.

B Incorrect. The procedure selected is correct, but the cooldown rate is incorrect but plausible because it is associated with selection of ES-0.2B for the cooldown.

C Incorrect. Incorrect procedure; ES-0.2B is performed after the first 5 steps of ES-0.2A are completed, and ONLY if less than 3 CRDM fans are in operation. In this case, 3 CRDM fans are operating/available. The candidate who is unfamiliar with CRDM fan power supplies may assume they are unavailable if they are not Safety Related loads. The cooldown rate is for use of ES-0.2A, but plausible since candidate who is unfamiliar with procedure difference may default to the 25 degree per hour value.

D Incorrect. Incorrect procedure as in C, but cooldown rate is correct if ES-0.2B were the correct procedure to use.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to determine and interpret the following as they apply to the (Natural Circulation Operations) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Question Number:

Tier: 1
Group: 2

Importance Rating: 3.1

Technical Reference: ES-0.2A, ES-0.2B

Proposed references to be provided to applicants during examination: None

Learning Objective: U 12030

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates facility conditions where a Natural Circulation Cooldown is required, and provides the applicant with 2 plausible choices of procedure based upon abnormal plant alignment, and 2 plausible choices for RCS cooldown rate

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

63. E12 EK2.1 083/MODIFIED//LOWER//RO/NORTH ANNA/6/2008/

Upon entry into 1-ECA-2.1, Uncontrolled Depressurization of All Steam Generators, the crew determines that RCS cooldown rate is 109°F/Hr.

Which ONE (1) of the following describes how the crew is directed to control AFW flow?

- A. Total flow is maintained >340 gpm until ALL SG narrow range levels are >11%.
- B. Total flow is maintained >340 gpm until ANY SG narrow range level is >11%.
- C. Flow is reduced to 100 gpm to each SG, and narrow range level is controlled at greater than 11%.
- D Flow is reduced to 100 gpm to each SG, and narrow range level is controlled at less than 50%.

A Incorrect but plausible because it is similar to the action contained in E-0, and also the level that all SGs are maintained in EOPs. Also, applicant must understand that AFW requirements change based upon RCS cooldown rate in ECA-2.1.

B Incorrect but plausible because it is the normal level control in EOPs and is normally required to avoid transition and implementation of FR-H.1.

C Incorrect but plausible because the flow rate is correct. The level value is incorrect, the applicant must understand that level may not be maintained adequately when throttling AFW due to RCS cooldown for different sized breaks, and that FR-H.1 will not be implemented under these circumstances as specific allowance is contained in the procedure to address this situation.

D Correct. Above 100 degrees F RCS cooldown rates, AFW is throttled to minimum. The criteria for raising AFW flow is hot leg temperature increasing, not going below minimum SG level.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the interrelations between the (Uncontrolled Depressurization of all Steam Generators) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Question Number:

Tier: 1
Group: 1

Importance Rating: 3.4

Technical Reference: ECA-2.1, E-0

Proposed references to be provided to applicants during examination: None

Learning Objective: U 13843

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates function and control (as well as manual operation) of AFW system for a condition where an excessive RCS cooldown rate has occurred due to multiple SG depressurization.

Have developed similar with different distractors. None found previous NRC. Original provided from VC Summer previous AUDIT exam

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

Source:	MODIFIED	Source If Bank:
Cognitive Level:	LOWER	Difficulty Level :
Job Position:	RO	Plant: NORTH ANNA
Date:	6/2008	Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

64. E15 EK2.1 034/BANK/NORTH ANNA 2006/HIGHER//RO/NORTH ANNA/6/2008/YES

Given the following:

- A Steam Break has occurred inside Unit 1 Containment.
- SI, Main Steam Line Isolation, Phase A, CDA and Phase B have automatically actuated.
- The crew has completed 1-E-2, Faulted SG Isolation.
- An ORANGE condition exists on the Containment CSF Status Tree.
- The crew transitions to FR-Z.2, Containment Flooding.

Which ONE of the following describes the source of leakage that will require action to isolate?

- A. Chilled Water
- B. Service Water
- C. Primary Grade Water
- D. Component Cooling Water

A Incorrect. Chilled Water will be isolated during CDA, so it would not be causing the level change.

B Correct. With CDA actuated, RS Heat Exchangers are supplied with Service Water flow.

C Incorrect. Primary Grade Water will be isolated in the current plant condition.

D Incorrect. Component Cooling water is isolated on Phase B caused by Hi-Hi Containment pressure (CDA).

All of the above systems are plausible because they are identified as sources by FR-Z.2

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the interrelations between the (Containment Flooding) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Question Number:

Tier: 1
Group: 2

Importance Rating: 2.8

Technical Reference: FR-Z.2, Chilled Water LP, CC LP, PG LP, SW LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 13869

Question History: 2006 Retake; Editorially modified; stem changed, distractors re-ordered (see original)

10 CFR Part 55 Content: 41.5, 7

Comments:

KA Match: This item evaluates the function of safety systems as they apply to FR-Z.2 because ESF actuations occur based upon Containment pressure. The applicant must determine which systems are servicing Containment in the current plant condition, to be able to answer the question.

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

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

Source: BANK

Source If Bank: NORTH ANNA 2006

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?: YES

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

65. E16 EK3.1 035/BANK//LOWER//RO/NORTH ANNA/6/2008/

A Small Break LOCA has occurred on Unit 1.

The following plant conditions exist:

- Complications in recovery have resulted in some core damage.
- Containment Pressure peaked at 13 psia and is slowly decreasing.
- The team has transitioned to 1-FR-Z.3, Response to High Containment Radiation Level.

Which ONE of the following describes the actions provided by 1-FR-Z-3 to mitigate the condition?

- A. Evaluate starting Outside Recirc Spray pumps and injecting the CAT.
- B. Evaluate starting Inside Recirc Spray pumps and injecting the CAT.
- C. Evaluate placing Containment Atmosphere Filtration System in service.
- D. Evaluate venting Containment via the Iodine Filter banks.

A Incorrect. Plausible based on the abnormal Containment conditions. Both cold spray water and the NAOH solution in the CAT help maintain Iodine in solution, thus the candidate who is unfamiliar with FR-Z.3 may default to this as a logical solution.

B incorrect. Plausible based on the abnormal Containment conditions. Both cold spray water and the NAOH solution in the CAT help maintain Iodine in solution, thus the candidate who is unfamiliar with FR-Z.3 may default to this as a logical solution. Since there are obvious differences with ISRS and OSRS, candidate may assume one is preferential to the other for the conditions given in the stem.

C Correct. As described in FR-Z.3 ERG Background Document, use of spray is not appropriate for the given conditions, thus Containment Atmospheric Filtration System is the only viable option.

D Incorrect. Plausible; since the Iodine filters do remove Iodine the candidate who is unfamiliar with FR-Z.3 may default to this as a logical solution.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of the reasons for the following responses as they apply to the (High Containment Radiation) 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 Number:

Tier: 1

Group: 2

Importance Rating: 2.9

Technical Reference: FR-Z.3, FR-Z.3 BD

Proposed references to be provided to applicants during examination: None

Learning Objective: U 13871

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluated reason for elevated radiation levels after a LOCA, as well as action required to mitigate. The reason is based on temperature, as indicated in the KA statement

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

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

Source: BANK

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

66. G2.1.20 084/MODIFIED//LOWER//RO/NORTH ANNA/6/2008/

In Emergency Operating Procedure 1-E-0, Reactor Trip or Safety Injection, steps designated with an asterisk (*) next to the step are _____ ; these steps apply from the time they are encountered until _____.

- A. Continuous Action Steps;
the EOP Network is exited
- B. Decision Making Steps;
the EOP Network is exited
- C✓ Continuous Action Steps;
transition from 1-E-0 is made
- D. Decision Making Steps;
transition from 1-E-0 is made

A Incorrect. Asterisk is used for continuous actions but the requirements to perform the step end when a transition from the procedure in effect is made.

B Incorrect. Circled steps are decision making steps and only apply at the time read.

C Correct. An asterisk is used for continuous actions but the requirements to perform the step end when a transition from the procedure in effect is made.

D Incorrect. Circled steps are decision making steps and only apply at the time read.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Conduct of Operations: Ability to interpret and execute procedure steps.

Question Number:

Tier: 3

Group: 1

Importance Rating: 4.6

Technical Reference: DNAP-0509 Procedure Use, EP LP

Proposed references to be provided to applicants during examination: None

Learning Objective: U 12039

Question History: Modified from North Anna 2004 Exam, question provided

10 CFR Part 55 Content: 41.10

Comments:

KA is matched because the item evaluates whether the applicant understands the designators for steps and how they are applied

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

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

Source: MODIFIED

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

67. G2.1.37 086/NEW//HIGHER//RO/NORTH ANNA/6/2008/

In accordance with OP-AP-300, Reactivity Management, reactor power is required to be reduced below 100% PRIOR to performing which ONE of the following evolutions?

- A. Performing a blended makeup to the RCS
- B. Reducing Steam Generator Blowdown Flow Rate
- C. Raising Letdown temperature
- D Operating the Steam Driven Aux Feed Pump Turbine

A Incorrect. While this action might be considered desirable if power was close to 100%, there is no specific requirement in OP-AP-300 to do so. Plausible because past plant issues with blender components have led to lighter than desired blended makeups.

B Incorrect. Reducing SG blowdown flow rate will result in actual power lowering. The guideline requires reducing power if blowdown flow is raised, as that would result in actual power rising above indicated power. Plausible because power changes with a change in blowdown flow and the applicant must understand which way it does change.

C Incorrect. Raising letdown temperature will actually lower power as the letdown demins will release boron at higher temperatures. Plausible because changing letdown temperature does have an effect on reactor power, and the applicant must know which way it will change for a change in temperature.

D Correct. Starting the TDAFW Pump turbine will result in a larger heat removal from RCS, lowering temperature, and causing an increase in reactor power. OP-AP-300 lists starting the TDAFW pump as an evolution requiring power reduction.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Conduct of Operations: Knowledge of procedures, guidelines, or limitations associated with reactivity management.

Question Number:

Tier: 3
Group: 1

Importance Rating: 4.3

Technical Reference: OP-AP-300 Attachment 2

Proposed references to be provided to applicants during examination: None

Learning Objective: U 13307

Question History:

10 CFR Part 55 Content: 41.5, 10

Comments:

KA Match: Item directly evaluates knowledge of the required topic based on a facility procedure, Reactivity Management, for operation at 100% power.

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

68. G2.1.41 085/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

Unit 1 is shut down in preparation for Refueling in accordance with 1-OP-4.1, Controlling procedure for Refueling.

In accordance with 1-OP-4.1, which ONE of the following choices describes

- (1) the method of filling the Refueling Cavity
and
(2) which evolution constitutes the FIRST Core Alteration?
- A. (1) Gravity fill from RWST, then LHSI pump
(2) Lifting of the Reactor Vessel Upper Internals
- B✓** (1) Gravity fill from RWST, then LHSI pump
(2) Control Rod Drive Shaft unlatching
- C. (1) LHSI pump ONLY
(2) Lifting of the Reactor Vessel Upper Internals
- D. (1) LHSI pump ONLY
(2) Control Rod Drive Shaft unlatching

A Incorrect. Gravity fill is the method used to fill the cavity if RWST is at normal level. Upper internals lift is considered a core alteration however it can not occur until after rod unlatching. Candidates who are unfamiliar with the sequence of reactor disassembly may choose this distractor.

B Correct. Method of filling is correct, as stated above unlatching is performed before the upper internals are lifted, so it constitutes the first core alteration.

C Incorrect. LHSI fill is performed after the gravity fill flow rate drops below 1600 GPM. Plausible because it is the method used once gravity fill is no longer effective. As stated above the upper internals lift follows rod unlatching, but candidates who are unfamiliar with the sequence of reactor disassembly may choose this distractor.

D Incorrect. LHSI fill is performed after the gravity fill flow rate drops below 1600 GPM. Plausible because it is the method used once gravity fill is no longer effective. First core alteration is correct.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Conduct of Operations: Knowledge of the refueling process.

Question Number:

Tier: 3

Group: 1

Importance Rating: 2.8

Technical Reference: 1-OP-4.1

Proposed references to be provided to applicants during examination: None

Learning Objective: U 9025

Question History:

10 CFR Part 55 Content: 41.10, 43.6

Comments:

KA Match: This item directly matches the KA topic because it evaluates actions contained in the refueling process, specifically the first core alteration and the method of filling the refueling cavity. Both evolutions are covered in the controlling procedure for refueling

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

69. G2.2.1 089/NEW//HIGHER//RO/NORTH ANNA/6/2008/

Given the following:

- An approach to criticality is in progress in accordance with 1-OP-1.7, Unit Startup from Mode 3 to Mode 2 Following Refueling.
- Control Banks are at their estimated critical position.
- RCS dilution has been secured.
- Criticality is imminent above the ECC Upper Boron Limit.

Which ONE of the following actions is required in accordance with 1-OP-1.7?

- A. Wait approximately 20 minutes to ensure mixing of PG water; establish a startup rate below 1 DPM using additional dilution or Control Bank D withdrawal.
- B. Reinitiate RCS dilution in approximately 200 gallon batches; ensure Control Bank D is above the rod insertion limit; when criticality is declared, establish a startup rate below 1 DPM using additional dilution or Control Bank D withdrawal.
- C. Stop the reactor startup; stabilize reactor power level, and direct Reactor Engineering to reevaluate parameters and values used to calculate the ECC prior to continuing.
- D. Insert Control Bank D to 5 steps; manually trip the reactor and verify Shutdown Margin requirements are met.

A Incorrect. If criticality is achieved above the upper boron limit, that means that the reactor will be critical significantly prior to when it is supposed to be. Plausible because this is an infrequently performed evolution, and it is easy to confuse 'above' and 'below' as well as 'upper' and 'lower' boron concentration limits. Actions are consistent with normal startup actions.

B Incorrect. This would also be consistent with normal startup actions. Applicant may confuse 'above upper' and 'below lower' and believe that a normal startup is in progress. If wording was changed in stem to 'slightly below the upper limit' this would be true.

C Incorrect. RE will evaluate the ECC, but reactor would be tripped, not stabilized. Plausible, because stabilizing power places the plant in a safe condition with RILs met, as stem describes.

D Correct. See discussion above and procedure.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Equipment Control: Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.

Question Number:

Tier: 3

Group: 2

Importance Rating: 4.5

Technical Reference: 1-OP-1.7 and attachment 3

Proposed references to be provided to applicants during examination: None

Learning Objective: U 15997

Question History:

10 CFR Part 55 Content: 41.10, 5

Comments:

KA is matched because this item evaluates operating controls that could affect reactivity, whether inserting or withdrawing rods, or initiation of dilution. Inserting rods to 5 steps and manually tripping the reactor on a premature criticality meets the intent of this KA

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

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

Source: NEW

Source If Bank:

Cognitive Level: HIGHER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

70. G2.2.39 091/MODIFIED//LOWER//RO/NORTH ANNA/6/2008/NO

Given the following:

- Unit 1 is at 45% power.
- Plant startup is in progress.
- No other evolutions are in progress

Which ONE of the following indications requires Technical Specification action within ONE (1) hour?

- A. RWST temperature 38 degrees F.
- B. Containment air partial pressure 12.9 psia.
- C. Quadrant Power Tilt Ratio 1.022.
- D. RCS UNIDENTIFIED LEAKAGE is 1.20 gpm.

A Incorrect. RWST temperature requires action within 8 hours. Plausible because RWST inoperability for any reason other than temperature or boron concentration requires action within 1 hour.

B Correct. Applicant must determine that the value will exceed the tech spec limit based on the curve under all conditions.

C Incorrect. QPTR requires action within 30 minutes if it is greater than 1.02, but only applies with the unit >50% power. Plausible because it would require action if power were higher.

D Incorrect. RCS operational leakage Tech Spec allows 4 hours to restore leakage to within limits. Plausible since an operator who is unfamiliar with Tech Specs may feel that 1 hour is appropriate based on urgency of the situation.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Equipment Control: Knowledge of less than one hour technical specification action statements for systems.

Question Number:

Tier: 3
Group: 2

Importance Rating: 3.9

Technical Reference: TS 3.6.4

Proposed references to be provided to applicants during examination: None

Learning Objective: U 10698

Question History:

10 CFR Part 55 Content: 43.2

Comments:

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	B A C B B A D A C D	Scramble Range: A - D
Source:		MODIFIED			Source If Bank:		
Cognitive Level:		LOWER			Difficulty Level :		
Job Position:		RO			Plant:	NORTH ANNA	
Date:		6/2008			Previous NRC?:	NO	

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

71. G2.2.7 090/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- A mid-cycle reactor startup is planned for Unit 1.
- NO special tests or evolutions are required during the startup.

In accordance with OP-AA-106, Infrequently Conducted or Complex Evolutions, which ONE of the following describes the category of ICCE, and the level of supervision required for the ICCE?

Note:

Category II - Tests or Evolutions That Have the Potential to Degrade Safety Due to the Complexity or Unpredictability of the Test or Evolution

Category III - Routine Tests or Evolutions That Are Complex Due to Abnormal Initial Conditions, Concurrent Tests, or Infrequent Performance

- A. Category II; Shift Manager, OMOC Qualified
- B. Category II; Department Manager, presently or previously SRO licensed
- C✓ Category III; Shift Manager, OMOC Qualified
- D. Category III; Department Manager, presently or previously SRO licensed

A Incorrect. Category II would be for tests performed during a reactor startup that would degrade or potentially degrade plant performance. Plausible because reactor startup-related tasks are given as examples of Category II ICCEs.

B Incorrect. Same reason as A and Dept. Mgr would be correct if the ICCE was a category II.

C Correct. Reactor startup noted as a category III ICCE, and SM (OMOC qualified) must be provided for oversight.

D Incorrect. Plausible because category is correct, but level of supervision would be required for category II or I ICCE.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Equipment Control: Knowledge of the process for conducting special or infrequent tests.

Question Number:

Tier: 3

Group: 2

Importance Rating: 2.9

Technical Reference: OP-AA-106, section 5.3

Proposed references to be provided to applicants during examination: None

Learning Objective:

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA is matched because item directly evaluates knowledge of the process and hierarchy of ICCEs, providing for selection of level as well as required supervision for an operationally relevant evolution

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

72. G2.3.15 095/BANK/NORTH ANNA 6135/LOWER//RO/NORTH ANNA/6/2008/NO

Given the following:

- Unit 1 is defueled and the fuel assembly insert shuffle is in progress.
- Annunciator 1K-D3, RAD MONITOR SYSTEM FAILURE TEST, actuates.
- The new fuel storage area radiation monitor is noted to be pegged high and unresponsive to source check.
- The fuel pit bridge radiation monitor indication has not changed.
- Health Physics reports radiation levels in the fuel building have not changed.

Which ONE of the following describes the FIRST action that will be required?

- A. Verify the fuel pit bridge radiation monitor is operable.
- B. Verify the fuel building ventilation exhaust is aligned to the charcoal filter.
- C✓ Place the fuel building radiation automatic interlock key switch in DISABLE.
- D. Reset the new fuel storage area radiation monitor by pulling and reinserting fuses.

A Incorrect. SFP bridge monitor does not show indication of inoperability, supported by HP determination of radiation levels. Plausible because it is logical to use redundant indication for a monitor in alarm.

B Incorrect. The Fuel Building Ventilation system and doors are normally in Configuration B. High radiation would cause ventilation alignment to filtered exhaust. Verification is not required based on the failure presented, but would be required for an actual high radiation condition IAW AP-30.

C Correct. ARP will send the operator to 0-AP-5.1, which will place switch in DISABLE prior to bottled air dump.

D Incorrect. Subsequent action in attachment 3 will attempt to reset the radiation monitor by pulling and reinserting fuses.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Radiation Control: Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.

Question Number:

Tier: 3

Group: 3

Importance Rating: 2.9

Technical Reference: 1K-D3, 0-AP-5.1 steps 1, 2, and attachment 3

Proposed references to be provided to applicants during examination: None

Learning Objective: U 10705

Question History:

10 CFR Part 55 Content: 41.11

Comments:

KA match: Item directly evaluates the radiation monitoring system for the Fuel Handling system by requiring knowledge of actuation based on alarm status, and action required to prevent actuation based upon 'the alarm status of a fixed radiation monitor'.

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

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

Source: BANK

Source If Bank: NORTH ANNA 6135

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?: NO

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

73. G2.3.4 094/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- An explosion and fire occurred in the Auxiliary Building.
- The fire has been extinguished.
- Process Vents radiation monitor indication is increasing.
- Auxiliary Building radiation monitor indications are increasing..
- After the explosion, the Auxiliary Building watchstander informed the Shift Manager that he was injured and unable to move.

The Station Emergency Manager (SEM) is evaluating dispatching a team to the Auxiliary Building.

Which ONE of the following is CORRECT concerning the SEM's decision making process?

- A. The SEM should authorize no more than 10 rem TEDE for each search and rescue individual to retrieve the injured watchstander.
- B. The SEM should authorize no more than 10 rem TEDE combined dose for the search and rescue team to retrieve the injured watchstander.
- C. The SEM should authorize no more than 25 rem TEDE for each search and rescue individual to retrieve the injured watchstander.
- D. The SEM should authorize no more than 25 rem TEDE combined dose for the search and rescue team to retrieve the injured watchstander.

A Incorrect. Plausible because there is a limit of 10 Rem TEDE, but that limit is applicable to save valuable equipment or limit off-site releases.

B Incorrect. Plausible; as stated above the limit of 10 Rem TEDE is applicable to save valuable equipment or limit off-site releases. Further, since most ALARA practices are concerned with total dose; the candidate who is unfamiliar with the specific guidance of the EPIP may default to this since with a team of people, allowing each one to get up to 10 rem seems excessive.

C Correct. The limit of 25 Rem TEDE is applicable for search and rescue, first aid, and (as given in the stem) removal of injured personnel. Limit is for each individual.

D Incorrect. The limit of 25 Rem TEDE is applicable for search and rescue, first aid, and (as given in the stem) removal of injured personnel. Plausible since most ALARA practices are concerned with total dose; the candidate who is unfamiliar with the specific guidance of the EPIP may default to this since with a team of people, allowing each one to get up to 25 rem seems excessive.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Knowledge of radiation exposure limits under normal or emergency conditions

Question Number:

Tier: 3

Group: 3

Importance Rating: 3.2

Technical Reference: VPAP 2101

Proposed references to be provided to applicants during examination: None

Learning Objective: 13583

Question History: This is called a Bank question, although it is written new. Items are in the bank containing similar attributes and context

10 CFR Part 55 Content: 41.12

Comments:

KA Match: Item directly evaluates administrative exposure limits, which is the topic addressed by the KA

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

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

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

74. G2.4.32 097/NEW//LOWER//RO/NORTH ANNA/6/2008/

Given the following:

- Both Units are at 100% power.
- The following alarm is received on Unit 2 Panel F:
 - UNIT #1 ANN SYS POWER SUPPLY FAILURE
- Unit 1 determines that the control room annunciators have stopped functioning.
- The crew enters 1-AP-6, Loss of Main Control Room Annunciators.

Which ONE of the following actions is required in accordance with 1-AP-6 if the Unit 1 Annunciators are not immediately restored?

- A. Initiate a controlled plant shutdown to Mode 3; log AFD every 3 hours.
- B. Maintain reactor power stable; log AFD every 3 hours.
- C. Initiate a controlled plant shutdown to Mode 3; log AFD hourly.
- D. Maintain reactor power stable; log AFD hourly.

A Incorrect. Power would be maintained stable with increased monitoring of plant parameters. Operations that upset plant stability will be stopped or not performed. The AFD is required to be logged hourly not every 3 hours.

B Incorrect. Maintaining power stable is correct, but frequency of logging AFD is greater than that allowed by procedure.

C Incorrect. Power reduction is incorrect as noted in A above. Plausible as frequency provided for logging AFD is correct.

D Correct. Unit is maintained in stable condition. Increased monitoring of AFD is required as the AFD alarm is inoperable and frequency provided is correct.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Emergency Procedures / Plan: Knowledge of operator response to loss of all annunciators.

Question Number:

Tier: 3

Group: 4

Importance Rating: 3.6

Technical Reference: 1-AP-6 (Whole procedure)

Proposed references to be provided to applicants during examination: None

Learning Objective: U 11667

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: This item directly evaluates operator response to loss of control room annunciators at 100% power.

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

Answer: DCDBBCCBDD Scramble Range: A - D

Source: NEW

Source If Bank:

Cognitive Level: LOWER

Difficulty Level :

Job Position: RO

Plant: NORTH ANNA

Date: 6/2008

Previous NRC?:

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

75. G2.4.9 001/BANK/NORTH ANNA/HIGHER/RO/NORTH ANNA/6/2008/

Given the following:

- Unit 1 is in Mode 5.
- RCS Drain Down to Mid Loop is in progress in preparation for welding on a Hot Leg opening.
- RHR Pump 1A is in service.
- During the drain down, RHR amps and discharge pressure begin fluctuating erratically.
- RCS temperature has risen from 121 degrees F to 127 degrees F.
- The crew enters 1-AP-11, Loss of RHR, and stops the RCS drain down.

Which ONE (1) of the following describes the next actions that will be required in accordance with 1-AP-11?

- A. Reduce RHR flow to minimum required to maintain RCS temperature and maximize CC flow to inservice RHR heat exchangers.
- B✓ Reduce RHR flow to minimum required to maintain RCS temperature and/or raise RCS level to ensure at least 10 inches above the Hot Leg centerline.
- C. Stop RHR Pump 1A and start RHR Pump 1B and verify that RCS temperature stabilizes.
- D. Stop RHR Pump 1A and initiate the appropriate attachment for Alternate Core Cooling to control RCS temperature.

A Incorrect. Actions appear correct and are very close to the required actions, except that level must be raised higher than 10 inches above Centerline.

B Correct. Actions provided minimize required net positive suction head and increase available NPSH and are directed by the procedure to assess the condition of the RHR System prior to taking more radical actions.

C Incorrect. Plausible because stopping the pump would be performed subsequently for the case where reducing flow was ineffective. Since the pump would be air-bound, the other pump would not be started without venting.

D Incorrect. Plausible same as C, and also that alternate core cooling could be performed if that condition was reached. Again these actions are subsequent to those that attempt to maintain the system in operation is the preferred method of decay heat removal.

QUESTIONS REPORT

for NORTH ANNA NRC exam - Rev0 04 15 08 RO ONLY

Ability to operate and / or monitor the following as they apply to the Loss of Residual Heat Removal System: RCS temperature indicators

Question Number:

Tier: 1
Group: 1

Importance Rating: 3.6

Technical Reference: 1-AP-11

Proposed references to be provided to applicants during examination: None

Learning Objective: None

Question History:

10 CFR Part 55 Content: 41.10

Comments:

KA Match: Item evaluates action required for a loss of RHR. One part of this is the indication of RCS temperature rising. While the item does not isolate 'monitoring of RCS temperature indicators', the actions would be the same and the procedure does not differentiate any actions based on temperature alone.

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	B A A D D C D B D C	Scramble Range: A - D
Source:		BANK			Source If Bank:	NORTH ANNA	
Cognitive Level:		HIGHER			Difficulty Level :		
Job Position:		RO			Plant:	NORTH ANNA	
Date:		6/2008			Previous NRC?:		