

Draft Submittal

(Pink Paper)

NORTH ANNA EXAM 2002-301

50-338 AND 50-339
JUNE 6 AND JUNE 10 - 25, 2002

1. DRAFT Reactor Operator/Senior Reactor
Operator Written Exam

1. 001A3.05 001/T2G1/T2G1/ROD CONTROL/C/A 3.5/3.5/M/NA02301/C/RA/LM

The Rod Control Startup Reset push-buttons are inadvertently depressed while Unit 1 is at 100% power.

Which one of the following describes the control room indication(s) and alarm(s) that will change as a result of this action?

- A. The Rod Banks A/B/C/D Low Limit and Low Low Limit alarms will annunciate and the step counters will go to the full-out position.
- B. The Non-Urgent Failure alarm will annunciate and the step counters will go to the full-out position.
- C. The Rod Banks A/B/C/D Low Limit and Low Low Limit alarms will annunciate and the step counters will go to zero.
- D. The Non-Urgent Failure alarm will annunciate and the Computer Alarm Power Tilt Rod Deviation/Sequence Alarm will annunciate.

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

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

RO Tier: T2G1

SRO Tier: T2G1

Key Word: ROD CONTROL

Cog. Level: C/A 3.5/3.5

Source: M

Exam: NA02301

Test: C

Misc: RA/LM

The unit is at 90% power with the turbine in IMP-OUT.

The following conditions occur -

Pressurizer level is increasing -

Reactor power is increasing -

Reactor Coolant System Tavg/Tref deviation alarm is lit.

Which one of the following has occurred?

- A. a continuous control rod withdrawal has occurred.
- B. a main steam leak has occurred.
- C. selected impulse pressure channel has failed low.
- D. B LoopTc has failed high.

- A. Correct
- B. Pressurizer level would not increase
- C. Reactor power would lower
- D. Would not effect pressurizer

Original question:

89 ID: 2892 Points: 1.00

The unit is at 90% power with the turbine in IMP-OUT. If a continuous control rod withdrawal occurred, which one of the following items would NOT be a consequence?

- A. Pressurizer level increase
- B. Reactor power increasing
- C. Reactor Coolant System Tavg/Tref deviation
- D. Rod control urgent failure

Answer: D

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: A C C B A B C A C B	Scramble Range: A - D
RO Tier:	T1G2		SRO Tier:	T1G1
Key Word:	ROD CONTROL		Cog. Level:	C/A 3.9/4.0
Source:	M		Exam:	NA02301
Test:	C		Misc:	RA/LSM/SC

The LCO for Technical Specification 3.1.4 Rod Group Alignment Limits reads as follows:

LCO 3.1.4 All shutdown and control rods shall be OPERABLE.

AND

Individual indicated rod positions shall be within 12 steps of their group step counter demand position.

NOTE

When THERMAL POWER is less than or equal to 50% RTP, the indicated position of each rod as determined by its individual rod position indicator may be within 24 steps from its group step counter demand position for up to 1 hour per 24 hours. This NOTE is not applicable for control rods known to be greater than 12 steps from the rod group step counter demand position.

Which one of the following is the basis for this note?

- A. ✓ To allow stabilization of known thermal drift in the individual rod position indicator channels.
- B. To ensure that local power density increases due to a misaligned RCCA will not cause the core design criteria to be exceeded.
- C. This represents the time necessary for determining the actual unit SDM and, if necessary, aligning and starting the necessary systems and components to initiate boration.
- D. To allow the determination of hot channel factors and to ensure that the shutdown margin is within limits within one hour.

Rod Group Alignment Limits

B 3.1.4

BASES

North Anna Units 1 and 2 B 3.1.4-5 Rev 0 (Draft 2), 09/18/00 LCO

The LCO has been modified by a Note. The Note permits a wider tolerance on indicated rod position for a maximum of one hour in every 24 hours to allow stabilization of known thermal drift in the individual rod position indicator channels.

This thermal soak time is available both for a continuous one hour period or several discrete intervals as long as the total time does not exceed 1 hour in any 24 hour period and the indicated rod position does not exceed 24 steps from the group step counter demand position. This allowance applies to the indicated position of the rod, not its actual position. If the actual position is known to be greater than 12 steps from the group step counter demand position, the Conditions and Required Actions of the specification must be followed.

Reduction of power to 75% RTP ensures that local LHR increases due to a misaligned RCCA will not cause the core design criteria to be exceeded.

Power operation may continue with one RCCA OPERABLE but misaligned, provided that SDM is verified within 1 hour. The Completion Time of 1 hour represents the time necessary for determining the actual unit SDM and, if necessary, aligning and starting the necessary systems and components to initiate boration. Since the core conditions can change with time, periodic verification of SDM is required. A Frequency of 12 hours is sufficient to ensure this requirement continues to be met.

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

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

RO Tier:

SRO Tier: T1G1

Key Word: TS BASIS

Cog. Level: C/A 2.9/4.0

Source: NEW

Exam: NA02301

Test: S

Misc: RA/LSM/SC

What are the sources of power for the RPS motor generator sets?

The rod drive motor generator sets receive power from which one of the following?

Station service 480-volt busses:

- A. A and C on unit 1 and B and C on unit 2.
- B. ✓ B and C on unit 1 and A and C on unit 2.
- C. A only on unit 1 and C only on unit 2.
- D. C only on unit 1 and B only on unit 2.

REF: Lesson Plan for Rod Control System (65) page 20 9/24/01

OBJ: 2.3.4a

Distractor A - Incorrect Station service 480 volt bus B and C supply MG 2.1.U-1

B - Correct

Distractor C - Incorrect MG 2.1.U-1 is not supplied from Station service 480 volt bus A

Distractor D - Incorrect MG 2.2.U-2 is not supplied from Station service 480 volt bus B

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

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

RO Tier: T2G1

SRO Tier:

Key Word: RPS MOTORS

Cog. Level: M 4.2/4.2

Source: NEW

Exam: NA02301

Test: R

Misc: RA/LM/SC

- Unit 2 is holding at 20% Power for Chemistry.
- "B" Reactor Coolant Pump Trips.

Which one of the following correctly describes how steam flow and water level in the "B" Steam Generator respond initially to the trip of the "B" Reactor Coolant Pump?

- A. steam flow increases, level increases.
- B. steam flow decreases, level increases.
- C. ✓ steam flow decreases, level decreases.
- D. steam flow increases, level decreases.

Bank Question. North Anna Exam Bank. Question # 3780.

Lesson Plan Reactor Coolant System. #38 Objective 9.2

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

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

RO Tier: T2G2

SRO Tier: T2G2

Key Word: RCP TRIP

Cog. Level: M 3.6/3.8

Source: BANK

Exam: NA02301

Test: C

Misc: RA/GWL

Unit 1 is operating at 100 % power. Off site power is lost, however, the EDGs start and load. Which one of the following conditions support(s) or indicate(s) Natural Circulation flow is occurring within the RCS?

- A. RCS hot legs are at saturation temperature for S/G pressure.
- B. RCS subcooling based on Core exit TCs are 30 degrees F.
- C. RCS Tave is INCREASING
- D. Pressurizer level is DECREASING and RCS Tave is INCREASING

REF: Reactor Trip or Safety Injection , EOP 1-E-0 Revision 27

OBJ: 12484

Distractor A - Incorrect - RCS hot leg temperatures stable or decreasing would support or indicate Natural Circulation flow occurring.

B - Correct

Distractor C - Incorrect - RCS Tave increasing by itself is not clear support or indicate Natural Circulation flow occurring

Distractor D - Incorrect - PZR level decreasing and RCS Tave increasing is not support or indication of Natural Circulation flow occurring.

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

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

RO Tier: T2G1

SRO Tier: T2G1

Key Word: LOSP

Cog. Level: C/A 4.3/4.5

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LM/SC

Unit 1 is at 60 % power when an oscillator in the Rod Control logic cabinet fails during rod movement.

You receive a ROD CONTROL URGENT FAILURE alarm. Power to all of the stationary and movable coils have dropped to zero. No other logic or electrical failures have occurred. Which one of the following is your required action?

- A. ✓ Enter E-0, Reactor Trip or Safety Injection.
- B. Enter AP-1.2, Dropped Rod.
- C. Enter AP-1.1, Continuous Rod Motion.
- D. Enter AP-1.3, Control Rod out of Alignment.

Enter E-0 because all rods will drop

MODULE NCRODP-65

4. multiplexing error.

The regulation and phase failures feed a common detector card, referred to as the failure detector card. A phase or regulation failure indicates that the CRDM coil(s) may be overheating, a thyristor supplying power to a CRDM is faulty, or one of the three phases to the power cabinet has been lost. A logic error card senses power to the stationary and movable coils. If voltage to both coils is zero at the same time, the urgent alarm actuates. This condition would result in a dropped control rod, since no gripper coils are energized. A multiplexing error will actuate the alarm when a lift or movable thyristor in the power cabinet(s) fails, causing a multiplexing error.

The logic cabinet failures which result in the ROD CONTROL URGENT FAILURE alarm are as follows:

1. oscillator failure,
2. slave cycler failure, or
3. printed card removed from normal position.

Failure of the oscillator in the logic cabinet can result in improper sequencing of the CRDM coils, or a dropped control rod. Failure of the slave cycler indicates that logic signals between the master cycler and the slave cycler are not being coordinated properly.

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: A C C C A D A C A A	Scramble Range: A - D
RO Tier:	T1G2		SRO Tier:	T1G1
Key Word:	ROD DROP		Cog. Level:	C/A 3.8/4.1
Source:	NEW		Exam:	NA02301
Test:	C		Misc:	RA/LSM/SC

The following plant conditions exist:

All RCPs are running.

Reactor Power is 90% by Power Range NIs.

"C" Reactor Coolant Loop Flow Transmitter High Pressure Tap breaks.

Which one of the following describes the effect of this loss on the RPS (disregard any effects on containment)?

Loss of the flow tap in RCS loop "C" will:

- A. only effect the RCS control function and not affect RPS or continued plant operation.
- B. provide a higher than normal flow signal and not affect RPS or continued plant operation.
- C. have no effect on reactor power.
- D. result in a reactor trip.

REF:

OBJ: Topic 8.14a Terminal Knowledge Objective 12003

Distractor A Incorrect - RCS loop flow has no control functions.

Distractor B Incorrect - Loss of the high side tap will indicated decreased flow and result in a reactor trip.

Distractor C Incorrect - The reactor is above the P8 setpoint.

D Correct

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: D A D A D A D B C

Scramble Range: A - D

RO Tier: T2G1

SRO Tier: T2G1

Key Word: RCS FLOW TAP

Cog. Level: C/A 3.9/4.2

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LM/SC

Given the following plant conditions:

- Unit 1 is at 100% power, with CVCS aligned for normal operation.
- One orifice is in service.
- VCT level is 32%.
- All controls are in automatic, 1-CH-LT- 112, VCT level transmitter, fails high.

Which one of the following describes the final actual VCT level? (Assume no operator action.)

- A. Automatic VCT make-up capability is lost, and the VCT level decreases until charging pump suction automatically shifts to the RWST.
- B. Continuous VCT automatic makeup occurs causing the VCT to overfill and the VCT relief valve lifts.
- C. 1-CH-LCV-115A, VCT level control valve, will divert to the stripper, and VCT level will cycle due to automatic makeup.
- D. 1-CH-LCV-115A, VCT level control valve, will receive an open demand, but will not open until the setpoint on 1-CH-LCV-112C, VCT level controller is exceeded. Normal VCT level will be maintained.

REF:Bank question 5546

OBJ: Chemical & Volume Control 237

Question Comment Level will cycle between 20% and 40% because makeup flow is greater than flow through LCV-1 15.

Distractor A Incorrect - Level will initially decrease as LCV-1 15 diverts. Level will decrease until auto Makeup starts but will stop increasing when auto makeup stops.

Distractor B Incorrect - Level will not overfill because auto makeup will stop and with LCV-1 15 open level will begin decreasing.

C Correct

Distractor D Incorrect - There is no 1-CH-LCV-112C interlock with 1-CH-LCV-115A.

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

Answer: C C C B A D C C A C

Scramble Range: A - D

RO Tier: T2G1
Key Word: VCT LEVEL
Source: BANK
Test: C

SRO Tier: T2G1
Cog. Level: C/A 3.2/3.3
Exam: NA02301
Misc: RA/LM/SC

Which one of the following is the reason for maintaining a hydrogen cover gas in the CVCS VCT during normal at power operation?

- A. To assure N-16 concentrations are ALARA.
- B. To maintain hydrogen concentrations above the TRM lower limit.
- C. To maintain conductivity below .017 Micro Mhos.
- D. To maintain oxygen concentration below the TRM upper limit.

REF: NCRODP-41-NA pages 13, 91-93; NAPS TRM B3.4.1 pages B3.4.1-1 - B3.4.1-3

OBJ: 343 (SOER-97-1)

Distractor A - Incorrect - the use of hydrogen is not dependent on ALARA considerations of N-16 activation.

Distractor B - Incorrect - hydrogen is not added to the VCT to prevent reaching an explosive mixture.

Distractor C - Incorrect - radioactive gases in the VCT are collected by Primary Vents and Drains System from CVCS.

D - Correct - hydrogen is absorbed in the VCT water and helps scavenge oxygen in the RCS. Maintaining oxygen concentration less than the TRM limits with Tavg greater than or equal to 250 F provides adequate corrosion protection.

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

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

RO Tier: T2G1
Key Word: VCT
Source: NEW
Test: C

SRO Tier: T2G1
Cog. Level: C/A 2.7/3.3
Exam: NA02301
Misc: RA/LSM/SC

Unit 1 was increasing power in accordance with 1-PCT-34.3, following the successful performance of a valve freedom test.

A fuse blows that prevents 4 control rods from moving.

Which one of the following describes the required actions?

- A. Stop the power increase and request I&C to adjust the IRPI's.
- B. Enter 1-E-0.
- C. Stop the power increase and enter 1-AP-1.3
- D. Stop the power increase and declare the computer inoperable and enter 1-AP-42.

1-AP-1.3 CONTROL ROD OUT OF ALIGNMENT provides instructions for recovering from the following misaligned rod events:

Any Single Control Rod is out of alignment by any number of steps, or Any Single Control Rod is out of alignment by any number of steps, or Any Single Control Rod is out of alignment by any number of steps, or

Multiple Control Rods are out of alignment provided Misaligned Control Rods are all in the same group

Multiple Control Rods are out of alignment provided All of the misaligned Control Rods are at the same position

Multiple Control Rods are out of alignment provided All of the misaligned Control Rods are less than 12 steps out of alignment.

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

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

RO Tier:

SRO Tier: T1G1

Key Word: MISALIGNED RODS

Cog. Level: M 2.5/3.0

Source: NEW

Exam: NA02301

Test: S

Misc: RA/LSM

-A Unit ramp to 100% is in progress on Unit 1.

-At about 95% power annunciator A-H7, A.F.D.

MONITOR, alarms. The RO determines that rod H-14 in control bank D appears to be stuck at 144 steps.

Which one of the following describes the effect this event will have on core flux patterns?

There should be:

- A. minimal effect on axial flux difference indicators and on power range detectors at the same elevation.
- B. minimal effect on axial flux difference indicators but a large variation on power range detectors at the same elevation.
- C. a large variation on axial flux difference indicators but a minimal effect on power range detectors at the same elevation.
- D. a large variation on axial flux difference indicators and on power range detectors at the same elevation.

North Anna Bank Question # 3761 modified for a stuck rod.

Associated objective: 11025.

A. Incorrect, there will be a large effect on axial flux, and power range detectors.

B. Incorrect, same as A.

C. Incorrect, same as A.

D. Correct, a Stuck rod will cause a large effect on axial flux difference, and a large effect on power range detectors at the same elevation.

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

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

RO Tier: T1G1

SRO Tier:

Key Word: STUCK ROD

Cog. Level: C/A 3.1/3.8

Source: BANK

Exam: NA02301

Test: R

Misc: RA/GWL/SC

Unit one has cooled to slightly less than 100°F in preparation for refueling operations. The Reactor Purification (RP) System is aligned so that the RP pumps take a suction on the reactor cavity and the RHR System downstream of the combined discharge line. Only the 1A pump is running. A RHR Heat Exchanger CC Flow transducer FT-132A has just failed low.

Which one of the following will occur?

MCR alarm annunciation and indication and:

- A. containment isolation trip valve 1-CC-TV-103A will close.
- B. the 1B RHR pump will auto start.
- C. the 1A RHR pump suction will autoswap to the RWST.
- D. ✓ no Automatic actions.

This is for indication only, has no automatic features

Module 40

Refueling operations. The plant cooldown continues to less than 140°F in preparation for refueling operations. During refueling the RHR System is maintained in service with the number of pumps and heat exchangers in operation as required by the decay heat load. During this period the RHR System can be used, in conjunction with the RP System, to purify the reactor cavity coolant. The RP System is aligned so that the RP pumps take a suction on the reactor cavity and the RHR System downstream of the combined discharge line. The flow rate from the RHR System to the RP System is controlled at 60 gpm, which does not affect the shutdown cooling ability of the RHR System.

Component Cooling Components

The Component Cooling (CC) System (see Figure 40-2) supplies cooling water to the RHR heat exchangers and pump seal coolers. The cooling water is supplied to the RHR components from the same header that supplies the reactor coolant pumps. The supply flow is controlled by normally open, manually operated isolation valves. The cooling water flow rate to heat exchanger 1A, as an example, is monitored by flow transducer FT-132A which provides MCR alarm annunciation and indication. The component cooling water flows through the shell of the heat exchanger at a design rate of 1.72×10^6 lbm/hr and receives 30.5×10^6 Btu/hr of heat transferred from the RHR

coolant. The outlet piping of the heat exchanger is protected from overpressurization by relief valve RV-128A which relieves at 150 psig to the containment drain trench. Flow through heat exchanger 1A is controlled by motor-operated valve 1-CC-MOV-100A, which is controlled from the vertical board in the MCR.

The piping from heat exchanger 1A penetrates the Auxiliary Building where flow can be isolated by containment isolation trip valve 1-CC-TV-103A. The valve is operated from the safeguards panel train A but automatically shuts upon receipt of a containment isolation signal. The outlet temperature is monitored by a temperature element (TE-149A) which provides MCR indication before flow combines with the flow from the other heat exchanger and returns to the component cooling pumps.

The supply line to each heat exchanger provides flow to another manifold which provides component cooling water (or makeup) to the following components:

1. PDDT cooler,
2. neutron shield tank cooler,
3. neutron shield tank and surge tank (makeup),
4. excess letdown heat exchanger, and
5. RHR pump seal coolers.

The component cooling water is provided to seal cooler 1A, as an example, at 10 gpm through normally open, manual isolation valves. The cooling water cools the seal coolant to ensure adequate lubrication and cooling exists to maintain zero seal leakage. The component cooling flow rate through the cooler is monitored by a flow switch (FS-131A); the cooler outlet temperature is monitored by TE-150A. Overpressure protection for the cooler component cooling piping is provided by relief valve RV-131A which relieves to the drain trench at 150 psig. The combined seal cooler flow, along with the other components listed above, is returned to the piping downstream of 1-CC-MOV-100B. It is common to receive RCP low CC flow alarms intermittently when additional CC is "cut in" to the RHR heat exchangers (1-CC-MOV-100A and/or B throttled open).

Power Supplies

The power supplies for the major components in the RHR System are listed in Table 40-5 as well as illustrated in Figures 40-3 through 40-6.

RO Tier: T2G3
Key Word: RHR
Source: NEW
Test: C

SRO Tier: T2G3
Cog. Level: M 3.2*/3.6*
Exam: NA02301
Misc: RA/LSM/SC

14. 006K4.13 001/T2G2/T2G2/SOLID STATE PROT/C/A 3.8/4.1/BANK/NA02301/C/RA/LSM/SC

Unit one was operating at 100% power.

An SI has occurred.

Which one of the following describes what INDICATIONS would be observed if one SI reset switch was operated [i.e. one train of SI was reset] instead of the SI initiate switch?

- A. Since only one train was reset, an automatic SI would be reinitiated after 60 seconds.
- B. The reset is transparent and no indications are available to the operators except by referral to the computer printout.
- C. ✓ Several solid state protection system status lights will flash.
- D. All the status and permissive windows will glow steadily and the first out indicator will glow steady red.

BANK 1992

NCRODP-93-10-LP-2, Revision 3, Objective D.; LER 91-009

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

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

RO Tier: T2G2

SRO Tier: T2G2

Key Word: SOLID STATE PROT

Cog. Level: C/A 3.8/4.1

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM/SC

The unit is at 100 % power

Level transmitter 1-RC-LT-1459 failed on a previous shift and was placed in the TRIP.

Vital bus 1-II Inverter fails causing a loss of vital bus 1-II.

Which one of the following statements is correct?

The reactor should:

- A. have tripped, the crew should manually trip the reactor and enter 1-FR-S.1.
- B. have tripped, the crew should enter ITS 3.0.3.
- C. NOT have tripped, the crew should enter 1-AP-2.2.
- D. NOT have tripped, the crew should place the second channel in TRIP.

Replaced because question was similar to a common question

H. Emergency Response Guideline Procedure Usage

1. Resetting a Safety System

a. If the system has not been reset once, then the RO shall reset the system when directed by procedure with concurrence from the cognizant SRO whether or not it has actuated. This action is not required if the procedure step includes the words "if required".

b. Once the system has been reset, it is not necessary to reposition the reset switches every time a procedure directs a reset; simply verify that the applicable status lights indicate the reset condition. If it does not, then another reset is performed

NCRODP-92-LP-1 Revision 8

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

Answer: B C A C B C B B C D

Scramble Range: A - D

RO Tier: T1G2
Key Word: E-0
Source: NEW
Test: R

SRO Tier:
Cog. Level: M 4.3/4.6
Exam: NA02301
Misc: RA/LSM/GH

16. 007K5.02 001/T2G3/T2G3/PRT/C/A 3.1/3.4/M/NA02301/C/RA/LSM/SC

Which one of the following outlines the appropriate operator actions for drawing a bubble in the Pressurizer once saturation conditions have been reached?

Ensure RCS Temperature is greater than 170 degrees F., and :

- A. Increase PZR spray flow and place another CVCS letdown orifice into service.
- B. Decrease PZR spray flow and place excess letdown into service.
- C. ✓ Increase CVCS letdown flow and maintain charging flow constant.
- D. Decrease CVCS charging flow and maintain letdown flow constant.

Modified SHNPP Exam bank Question B02-062.

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

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

RO Tier: T2G3

SRO Tier: T2G3

Key Word: PRT

Cog. Level: C/A 3.1/3.4

Source: M

Exam: NA02301

Test: C

Misc: RA/LSM/SC

-Unit 1 is stable at 100% power.

-A pressurizer safety valve opens and fails to reseal and the unit trips.

Which one of the following indications would the operator expect to see as a result of this event?

- A. Safety tailpipe temperature would increase to greater than 600 °F and then slowly decrease.
- B. Safety tailpipe temperature would increase to greater than 600 °F and then slowly increase.
- C. Safety tailpipe temperature would increase to between 200 °F and 300 °F and then slowly decrease.
- D. Safety tailpipe temperature would increase to between 200 °F and 300 °F and then slowly increase.

Bank Question From Farley 2000 NRC exam.

North Anna Lesson Plan NCRODP-74-NA objectives A and G. and pages 23 and 24 of the lesson plan.

A. Incorrect, This would be the correct temperature for pressure at 2240 psig. Since the pressure the steam is going to is 8 to 11 psig the temperature will be between 212-330 degrees per the steam tables.

B. Incorrect, Same as above for temperature.

C. (Correct) Incorrect, After the safety has relieved to the PRT the pressure will start increasing towards 100 psig. Per the steam tables, as the pressure rises towards 100 psig, the temperature will also rise until the rupture disc relieves, then the pressure will drop and stabilize out. (PRT remains intact) - This answer is now correct based on NA comments.

D. (Incorrect) Correct, as the pressure rises towards 100 psig, the temperature will also rise.

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

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

RO Tier: T1G2
Key Word: SAFETY VALVE
Source: M
Test: C

SRO Tier: T1G2
Cog. Level: C/A 3.2/3.7
Exam: NA02301
Misc: RA/GWL/LSM/SC

Assume the following plant conditions:

- Unit 1 is at 100% power
- Unit 2 is in mode 6
- The unit-1 and unit-2 component cooling water systems are split
- Component cooling pump 1-CC-P-IA has just been tagged out for bearing replacement
- A ground on 1J emergency bus causes supply breaker 15J11 to trip
- 1J emergency diesel generator starts, but does not load

Which one of the following statements is correct concerning subsequent operation of the reactor coolant pumps (RCPs)?

- A. Component cooling water flow to the pump thermal barriers must be manually isolated to prevent thermal barrier damage.
- B. The RCPs may be run indefinitely provided seal injection flow is maintained, and the seal leak-off valves remain open.
- C. The RCPs must be tripped or the motor windings will be damaged.
- D. Component cooling water flow must be restored within 20 minutes or RCP seal damage will occur.

Associated objective(s):

Bank ID: 5580

3656

List the following information associated with the component cooling water pumps.

- Power supply to each pump
- Interlocks associated with manually starting a pump
- Interlocks associated with automatically starting a pump
- Interlocks associated with automatically tripping a pump

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: C D D D A B C B D A	Scramble Range: A - D
RO Tier:	T2G3		SRO Tier:	
Key Word:	RCP		Cog. Level:	C/A 4.1/4.2
Source:	BANK		Exam:	NA02301
Test:	R		Misc:	RA/LSM

The Continuous Action for 1-E-1 provides the requirements for RCP Trip Criteria. Under some conditions the RCPs are directed to be tripped. Which one of the following is the basis for this trip criteria?

- A. ✓ To Minimize mass loss from a small break LOCA.
- B. To Protect the RCP Seals.
- C. To Minimize RCS heatup.
- D. To establish natural circulation.

ERG exe volume generic issues page 58

the only purpose is to minimize break flow for a small break LOCA

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

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

RO Tier: T1G2

SRO Tier: T1G2

Key Word: RCP TRIP

Cog. Level: M 4.4/4.5

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LSM/SC

20. 010K2.01 001/T2G2/T2G2/UV/DV/M 3.0/.34/M/NA02301/C/RA/LSM/SC

Which one of the following will NOT be automatically powered by its emergency bus, following a UV/DV event? (Assume each component was running/energized prior to the event.)

- A. PZR back-up heater.
- B. Instrument Air compressor.
- C. 480V emergency bus.
- D. Inside recirc. spray pump.

NCRODP-74-LP-1 OBJ. D

BANK 1996/01/29

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

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

RO Tier: T2G2

SRO Tier: T2G2

Key Word: UV/DV

Cog. Level: M 3.0/.34

Source: M

Exam: NA02301

Test: C

Misc: RA/LSM/SC

21. 011EK3.06 001/T1G2/T1G1/PHASE A/M 4.3*/4.3*/NEW/NA02301/C/RA/LSM/SC

A Large Break LOCA has occurred. Which one of the following following is a result of a **Phase A** actuation?

- A. Both Instrument Air 1-IA-TV-102A and RHR CC Return 1-CC-TV-103A close.
- B. Both Blowdown trip valve 1-BD-TV-100F and Instrument Air 1-IA-TV-102A open.
- C. Both Letdown trip valve 1-CH-TV-1204B and Blowdown trip valve 1-BD-TV-100F close.
- D. Blowdown trip valve 1-BD-TV-100F closes and Instrument Air 1-IA-TV-102A opens.

Replaced a KA that did not apply to North Anna

Question replaced to provide a question that matches Operator expected memory level knowledge.

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: C B A D B B D D C D	Scramble Range: A - D
RO Tier:	T1G2		SRO Tier:	T1G1
Key Word:	PHASE A		Cog. Level:	M 4.3*/4.3*
Source:	NEW		Exam:	NA02301
Test:	C		Misc:	RA/LSM/SC

Unit 1 is 100 % power with the following conditions:

- . Normal letdown is isolated by the previous shift due to a leak.
- . Excess letdown flow was maximized, but pressurizer level is still increasing.
- . At 02:00, The power supply to group 4 pressurizer heaters failed, and repairs are estimated to required 18 hours.
- . At 04:00 Pressurizer level is 87% and is increasing at 1.5% per hour.

Assume pressurizer level continues to increase at this rate and that the group 4 heaters are returned to service at the precise time estimated by mechanical Maintenance. Which one of the following is correct:

Unit 1 must be:

- A. in mode 3 no later than 08:00 and must be in Mode 4 no later than 14:00.
- B. in mode 3 no later than 09:00 and must be in Mode 4 no later than 15:00.
- C.✓ in mode 3 no later than 14:00 and must be in Mode 4 no later than 20:00.
- D. in mode 3 no later than 21:00 and repairs will be completed before a mode 4 entry is required.

93% is reached at 8:00 am + six hours is 2:00pm + 12 hours is 8:00pm

Reference:

North Anna Units 1 and 2 B 3.4.9-4 Rev 0 (Draft 3), 10/09/00

Pressurizer

B 3.4.9 BASES ACTIONS A.1, A.2, A.3 and A.4

If the pressurizer water level is not within the limit, action must be taken to bring the unit to a MODE in which the LCO does not apply. To achieve this status, within 6 hours the unit must be brought to MODE 3, with all rods fully inserted and incapable of withdrawal. Additionally, the unit must be brought to MODE 4 within 12 hours. This takes the unit out of the applicable MODES.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

B.1

If one required group of pressurizer heaters is inoperable, restoration is required within 72 hours. The Completion Time of 72 hours is reasonable considering the anticipation that a demand caused by loss of offsite power would be unlikely in this period. Pressure control may be maintained during this time using the remaining heaters.

C.1 and C.2

If one group of pressurizer heaters are inoperable and cannot be restored in the allowed Completion Time of Required Action B.1, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 3 within 6 hours and to MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

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

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

RO Tier:

SRO Tier: T2G2

Key Word: TS

Cog. Level: C/A 2..9/4.0

Source: NEW

Exam: NA02301

Test: S

Misc: RA/LSM/SC

Unit 1 was at 100% power when a loss of offsite power. The crew has transitioned to 1-ES-0.4, Natural Circulation Cooldown with Steam Void in Vessel (without RVLIS), from 1-ES-0.2A, Natural Circulation Cooldown with CRDM Fans.

The following conditions currently exist:

- RCS pressure is 1600 psig.
- RCS temperature is 450 degrees F.

The crew has just completed step 6, which requires them to maintain charging and seal injection flow equal to letdown and seal leakoff flow.

Which one of the following is the reason for equalizing charging and letdown flows during the subsequent depressurization?

- A. ✓ Allows Pressurizer level to be used for monitoring void growth.
- B. Assures RCS total mass does not drop below minimum conditions assumed in FSAR analysis.
- C. Pressurizer level is not accurate during these conditions and flow matching assures the pressurizer will not go solid.
- D. Assures the regenerative heat exchanger is not over stressed due to large fluctuations in charging and letdown.

Reference

EOP Owners Group Guidelines

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: A A A A D B A B B B	Scramble Range: A - D
RO Tier:	T2G2		SRO Tier:	
Key Word:	ES-0.4		Cog. Level:	C/A 2.7/3.1
Source:	NEW		Exam:	NA02301
Test:	R		Misc:	RA/LSM/SC

Which one of the following is the purpose of the overpower delta T trip. The trip was designed to:

- A. provide protection for a departure from nucleate boiling ONLY.
- B. act as backup to the high neutron flux trip and limits required range of OTDT protection.
- C. provide protection for departure from nucleate boiling and act as a backup to the high neutron flux trip.
- D. continuously calculate the RCS overpower delta T trip settings under varying load conditions and transients.

Delta T protection system. The overtemperature delta T trip is designed to protect the reactor core from departure from nucleate boiling (DNB) conditions by continuously calculating the RCS overtemperature delta T trip settings under varying load conditions and transients. The overpower delta T trip is designed to protect against a high fuel rod power density and subsequent fuel rod cladding failure and fuel meltdown. The overpower delta T reactor trip acts as a backup to the high neutron flux trip and limits required range of OTDT protection.

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

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

RO Tier: T2G2
Key Word: RPS
Source: NEW
Test: C

SRO Tier: T2G2
Cog. Level: C/A 3.1/3.3
Exam: NA02301
Misc: RA/LSM

Given the following plant conditions:

1. The unit is currently at 480 degrees F
2. Normal cooldown is in progress.

A steam break occurs on the 40 inch main steam header.

Which one of the following is the ESF response to this failure?

- A. Neither a main steam line isolation or safety injection will occur.
- B. Only a safety injection will occur.
- C.✓ Only a main steam line isolation will occur.
- D. Both a main steam line isolation and a safety injection occurs.

REF: NA bank question 3824

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: C C D D C A A D A C

Scramble Range: A - D

RO Tier: T2G1

SRO Tier: T2G1

Key Word: ESF

Cog. Level: C/A 3.4/3.6

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LM

Given the following plant conditions:

- A reactor shutdown is in progress as required by ITS 3.3.2.
- Pressurizer pressure PT-455 failed downscale .
- The channel has been placed in trip.
- RCS pressure has decreased to 1750 psig during a plant cooldown.
- Lo-Lo Pressurizer Pressure SI signals have been blocked as required by the shutdown procedure.
- Subsequently, pressurizer pressure PT-456 fails high.

Which one of the following correctly describes how the ESF system will respond to this failure?

- A. Only a Phase A actuation will occur.
- B.✓ An SI and containment isolation phase A will occur.
- C. No ESF actuation will occur, Lo-Lo Pressurizer Pressure SI signals have been blocked.
- D. No SI will occur, but the reactor will trip.

REF: Process Instrumentation & Control sheets NA-DW-108D014 sheet 5;
NA-DW-5655D 33 sheets 6 and 8; Lesson Plan for Safety Injection System (52);
Module NCRODP-52 Safety Injection System

OBJ: 1.2 page 45 of 56 LP

Distractor A - Incorrect - Pressurizer Pressure PT-455B in trip position and 456B failed upscale provide will result in more than an SI actuation.

B - Correct - Pressurizer Pressure PT-455B in trip position and 456B failed upscale provide will result in both an SI and Phase A isolation.

Distractor C - Incorrect - Lo-Lo Pressurizer Pressure SI signal auto unblocks.

Distractor D - Incorrect - SI does occur.

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

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

RO Tier: T2G1

SRO Tier: T2G1

Key Word: ESF

Cog. Level: C/A 2.7/3.1

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LSM/SC

The unit is at 100% power when control bank "B" rod D-10 drops with no reactor trip. During the subsequent recovery of rod D-10, the operator mistakenly opens all lift coil disconnect switches in control bank "A," except for rod B-10. The reactor operator selects control bank "B" and begins outward rod motion. As a result of this operation the ROD CONTROL _____ FAILURE annunciator will _____ during rod motion.

- A. URGENT; not alarm as expected.
- B. NON-URGENT; alarm.
- C. URGENT; alarm.
- D. NON-URGENT; not alarm as expected.

bank 2157

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: A A C D A C D B C C	Scramble Range: A - D
RO Tier:			SRO Tier: T2G1	
Key Word:	ROD CONTROL		Cog. Level: M 3.4/3.9	
Source:	BANK		Exam: NA02301	
Test:	S		Misc: RA/LSM/SC	

28. 014K4.06 001/T2G2//ROD CONTROL/C/A 3.4/3.7/NEW/NA02301/R/RA/LSM/SC

While completing AP 1-3, Attachment 2, Realigning Control Rod - Rod Lo The ROD BANK LO/LO-LO LIMIT annunciator alarms. Which one of the following is the cause of this alarm?

- A. More than one rod in the same group has been moved simultaneously.
- B. All of the affected bank's lift coils have been energized.
- C. The local Manual/Automatic switch has been placed in MANUAL.
- D. The affected banks's pulse-to-analog convertor was pulsed to zero.

- A. Does not alarm
- B. May cause urgent failure alarm
- C. Required action, but does not cause this alarm
- D. Correct

Abnormal Procedure AP 1.3 Attachment 2

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

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

RO Tier: T2G2

SRO Tier:

Key Word: ROD CONTROL

Cog. Level: C/A 3.4/3.7

Source: NEW

Exam: NA02301

Test: R

Misc: RA/LSM/SC

Unit 1 is starting up after a refueling outage. At 25 % power the following RCP temperatures exist:

for the "A" RCP

radial bearing 205°F
pump bearing 200°F
stator 295°F
motor bearing 190°F

for the "B" RCP:

radial bearing 210°F
pump bearing 205°F
stator 285°F
motor bearing 185°F

for the "C" RCP:

radial bearing 205°F
pump bearing 195°F
stator 285°F
motor bearing 205°F

Which one of the follow is the appropriate actions to direct the crew to perform?

- A. There are no required actions at this power level.
- B. Secure RCP A.
- C. Secure RCP B.
- D.✓ Secure RCP C.

C RCP motor Radial Bearing temperature is above temperature limit.
NEW SRO ONLY

Reference : BANK Question ID: 5435

Which ONE of the following temperatures would require securing a reactor coolant pump?

- A. RCP radial bearing 210°F
- B. RCP pump bearing 205°F
- C. RCP stator 295°F
- D. RCP motor bearing 205°F

Answer: D

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

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

RO Tier:

SRO Tier: T1G1

Key Word: 3.4/3.5

Cog. Level: M 3.4/3.5

Source: NEW

Exam: NA02301

Test: S

Misc: RA/LSM/SC

- Unit 1 is at 100% power.
- The P-250 computer has failed.
- Annunciator 1-C-G6, RCP 1A-B-C Illuminates LABYTH Seal Low Flow.
- Seal leakoff flows to the RCP's begin to lower.
- "C" RCP seal injection flow drops to zero, and seal leakoff indicates 1.0 gpm.
- "A" and "B" seal injection flows begin to drop.

AR C-G-6 Instructs you to Monitor "C" RCP radial bearing temperature, if bearing temperature approaches 225 degrees then trip the reactor and stop "C" RCP.

Which one of the following describes the indications available for monitoring radial bearing temperature in accordance with 1-AP-42?

- A. 1-RC-TR-1448.
- B. There are no direct indications available. A test instrument must be installed in the rack room.
- C. PCS.
- D. There are no direct indications available. A test instrument must be installed locally.

Annunciator Response procedure 1-AR-C-G6.

Chemical and Volume Control Objective 9.10.

A. Incorrect, This would be the correct action if there was two phase flow in the seal leakoff line.

B. Incorrect, This would be the correct action if cooling to the thermal barrier also existed

D. Incorrect, This would be a correct action if CC had been lost

C. This is the action directed by the AR.

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: C D D D D A B B C B	Scramble Range: A - D
RO Tier:	T1G1		SRO Tier:	
Key Word:	RCP		Cog. Level:	C/A 3.7/3.7
Source:	NEW		Exam:	NA02301
Test:	R		Misc:	RA/GWL/SC

Given the following conditions:

- Unit 1 is at 100 percent power.
- C-G2, "RCP 1B STANDPIPE HI LEVEL" has lit.
- "B" seal injection flow is 7.8 GPM.
- "B" seal leak-off flow is 0.2 GPM.
- Seal return temperature is 150 °F and rising steadily.
- "B" RCP temperatures are as follows:
 - Motor stator - 241.8 °F
 - Motor upper bearing - steady at 114.5 °F
 - Motor lower bearing - steady at 128.5 °F
 - Pump radial bearing - rising slowly at 128.5 °F

Based on the above indications, you should direct the operating crew to perform which one of the following?

- A. trip the unit, secure "B" RCP and close its No. 1 seal leakoff valve after the pump stops.
- B. trip the "B" RCP and close its No. 1 seal leakoff valve after the pump stops.
- C. close the "B" RCP's No. 1 seal leakoff valve within 5 minutes and shutdown the unit within the next 30 minutes then secure the "B" RCP.
- D. trip the unit, secure "B" RCP and contact OMOC.

BANK 1996 VISION OBJ. 11101

1996/01/29

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

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

RO Tier:

SRO Tier: T2G1

Key Word: RCP

Cog. Level: C/A 3.4/3.8

Source: BANK

Exam: NA02301

Test: S

Misc: RA/LSM

32. 015K3.06 001/T2G1//ROD CONTROL/C/A 2.9*/3.2*/BANK/NA02301/R/RA/LM

The unit is at 75% power with "D" bank control rods at 150 steps in AUTOMATIC when power-range nuclear instrument N-44 fails LOW.

Assuming NO OPERATOR ACTION.

Which one of the following describes the effect this failure will have on Rod Control?

- A. The control rods will insert automatically for several seconds and then remain in that position.
- B. The control rods will insert automatically for several seconds and then withdraw to the previous position.
- C. The control rods will withdraw automatically for several seconds and then remain in that position.
- D. The control rods will withdraw automatically for several seconds and then insert to the previous position.

REF: NA Bank question 2162; Lesson Plan Rod Control (065)

OBJ: 2.9.2, 2.9.6

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: D C D B C B A C D A	Scramble Range: A - D
RO Tier:	T2G1		SRO Tier:	
Key Word:	ROD CONTROL		Cog. Level:	C/A 2.9*/3.2*
Source:	BANK		Exam:	NA02301
Test:	R		Misc:	RA/LM

Which one of the following describes how the pulse height discriminator failing low would affect the indication of the failed Source Range channel?

- A. The output would decrease due to failure in removing the higher amplitude neutron generated pluses.
- B. The output would increase due to electronic filtering which narrows the pulse height window.
- C.✓ The output would increase due to counting both the gamma and decay-alpha generated pulses.
- D. The output would decrease due to decreased gamma interaction inside the detector.

REF: Braidwood 9/14/98 RO; Ex-core Nuclear Instrumentation System (62) objective 3.2

Comment: The Pulse height discriminator is used to set window to detect those pulses with an energy level high enough to be from an event associated with neutron detection. Gamma and other interactions such as the alpha decay of fission product daughters are of lower height (energy) and the discriminator normally electronically removes them.

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: C C D A D D C A C C	Scramble Range: A - D
RO Tier:	T2G1		SRO Tier:	
Key Word:	SOURCE RANGE		Cog. Level:	C/A 2.6/2.9
Source:	BANK		Exam:	NA02301
Test:	R		Misc:	RA/LM/SC

Which one of the following describes the immediate effects and the long term effects if the main generator hydrogen cooler Air Release Valve Level Switch failed while the bearing cooling system is operating normally in the tower mode? (For the long term effect assume the problem is not corrected)

- A. There is no immediate effect. On the subsequent system startup, the bearing cooling pump discharge MOVs will not open past the 25 percent system flow position.
- B. There is no immediate effect. On the subsequent system startup, the bearing cooling pump discharge MOVs must be opened manually.
- C. Initially the bearing cooling pump discharge valves will not open past the 35 percent system flow position. On the subsequent system startup, the pump discharge MOVs must be opened manually.
- D. Initially the bearing cooling pump discharge valves will not close past the 50 percent system flow position. On the subsequent system startup, the pump discharge MOVs must be de-energized to allow the valves to be open enough for the pump to start. The valve then must be positioned manually.

NRCODP33

If the main generator hydrogen cooler Air Release Valve Level Switch failed while the system is operating normally in the tower mode, there is no immediate effect. If the problem is not corrected, on the subsequent system startup, the pump discharge MOVs will not open past the 25 percent system flow position.

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

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

RO Tier: T2G2
Key Word: NNIS
Source: NEW
Test: C

SRO Tier: T2G2
Cog. Level: C/A 3.0/3.1
Exam: NA02301
Misc: RA/LSM/SC

35. 017K3.01 001/T2G1/T2G1/NATURAL CIRC/M 3.5*/3.7*/BANK/NA02301/C/RA/LM/LSM

If all core exit thermocouples are inoperable during an event in which the RCPs were tripped, what other indication(s) may be used to verify that natural circulation cooling is occurring?

- A. RCS hot leg temperature only.
- B. RCS cold leg temperature only.
- C. Both RCS cold leg and hot leg temperature.
- D. There are no direct indications available.

REF: NA Bank 3796

OBJ: 12484

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

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

RO Tier: T2G1

SRO Tier: T2G1

Key Word: NATURAL CIRC

Cog. Level: M 3.5*/3.7*

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LM/LSM

Which one of the following is the primary purpose of the subcooled margin monitor subsystem associated with the Inadequate Core Cooling Monitor System?

The primary purpose is to provide a :

- A. pressure margin to saturation based on the wide-range Reactor Coolant System pressure.
- B. temperature margin to saturation based on the wide-range Reactor Coolant System temperature.
- C. ✓ temperature margin to saturation based on the core-exit thermocouples.
- D. pressure margin to saturation based on the wide-range Reactor Coolant System temperature and pressure.

REF:NA Bank 501

OBJ:

Distractor A: Incorrect - Subcooled margin monitor is based on a temperature margin.

Distractor B: Incorrect - Subcooled margin monitor utilizes core-exit thermocouples.

C: Correct

Distractor D: Incorrect - combination of two incorrect statements.

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

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

RO Tier: T2G1

SRO Tier:

Key Word: ICCM

Cog. Level: M 3.4/3.7

Source: BANK

Exam: NA02301

Test: R

Misc: RA/LM

The plant is in Mode 4, RCS pressure is 300 psig, and RCS temperature is 250 °F. A large break LOCA occurs and none of the charging pumps can be started due to various malfunctions.

Which one of the following methods is required per 1-AP-17, Shutdown LOCA, to regain adequate core cooling?

- A. Manually actuate Safety Injection.
- B. Establish RHR cooling.
- C. Manually open accumulator isolation valves.
- D. ✓ Establish low head SI flow.

reference

Bank 1993/10/11

1-AP-17, Attachment 8, Rev. 3, page 3

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

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

RO Tier:

SRO Tier: T1G2

Key Word: 3.1/3.6

Cog. Level: C/A 3.1/3.6

Source: M

Exam: NA02301

Test: S

Misc: RA/LSM/SC

38. 022K2.02 001/T2G1//POWER SUPPLY/M 2.5/2.4/BANK/NA02301/R/RA/LSM

Which one of the following is the power supply to the "A" outside recirculation spray pump?

- A. 4160-volt AC bus 1J.
- B. 4160-volt AC bus 1H.
- C. 480-volt AC bus 1J1.
- D. 480-volt AC bus 1H1.

Bank - ID: 280

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: B D D B B D B C A A

Scramble Range: A - D

RO Tier: T2G1

SRO Tier:

Key Word: POWER SUPPLY

Cog. Level: M 2.5/2.4

Source: BANK

Exam: NA02301

Test: R

Misc: RA/LSM

A small leak has developed in the component cooling water supply line to the reactor coolant pumps. An initial idea is to initiate a phase B containment isolation which will close the component cooling water supply trip valves to reactor coolant pumps. Subsequent review has found this is not practical because of which one of the following?

- A. There is no provision for direct manual initiation of only a phase B signal without first initiating a phase A signal.
- B. ✓ There is no provision for direct manual initiation of only a phase B signal without also initiating a containment depressurization signal.
- C. The direct manual initiation of only a phase B signal will also cause a phase A signal which will shut all containment isolation valves for penetrations that are not essential for an orderly cooldown of the reactor with the reactor coolant pumps running.
- D. The direct manual initiation of only a phase B signal will also cause containment depressurization signal.

There are two types of containment isolation signals: (a) phase A and (b) phase B. The phase A containment isolation signal is initiated either automatically by a safety injection actuation signal or manually by operator action. The phase A signal shuts all containment isolation valves for penetrations that are not essential for an orderly cooldown of the reactor with the reactor coolant pumps running. The phase B containment isolation signal is initiated automatically when containment total pressure exceeds 27.75 psia. There is no provision for direct manual initiation of only a phase B signal without also initiating a CDA. The phase B signal completes containment isolation by sending a close signal to containment isolation valves for component cooling water used by the reactor coolant pumps, which will be secured by the control room operator, the return from the containment recirculation air coolers, the steam generator blowdown isolation valves (which are also closed by phase A) and instrument air. Containment isolation must be reset before valves shut by either phase A or phase B can be reopened. The equipment that generates the containment isolation signals is more fully discussed in the Instrumentation and Controls section of this module.

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

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

RO Tier: T2G1

SRO Tier: T2G1

Key Word: 3.6*/4.0

Cog. Level: C/A 3.6/4.0

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LSM/SC

- Unit 1 is operating at 50% power.
- The crew is required to evacuate the control room due to noxious fumes.

Which one of the following would require the crew to commence an emergency boration in accordance with 1-AP-20, "Operation from the Auxiliary Shutdown Panel"?

- A. The crew was unable to verify IRPI status before leaving the control room.
- B. One Control Rod remains fully withdrawn, all other IRPIs indicate zero.
- C. IRPIs indicated for three control rods indicated six steps; all other IRPIs indicate zero.
- D. The control room remains uninhabitable 18 hours following the reactor trip.

North Anna Bank Question # 3779. Modified.

Changed conditions in answers to allow for another answer to be correct.

Changed the time on D to 12 hours instead of 16.

Changed # of rods and rod height.

A. correct. recent procedure change.

B. Incorrect, Shut down margin is calculated with the most reactive rod out of the core, the procedure directs the crew to emergency borate only if two or more rods are out.

C. Incorrect - with three control rods indicated out greater than 10 steps out of the core the procedure calls for an emergency boration. This does not meet that criteria

D. Incorrect , the previous procedure stated - the time is greater than 15 hours and requires emergency boration.

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

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

RO Tier: T1G1

SRO Tier:

Key Word: BORATION

Cog. Level: M 4.1/4.4

Source: M

Exam: NA02301

Test: R

Misc: RA/GWL/LSM/SC

41. 024G2.4.35 001//T1G1/BORATION/C/A 3.3/3.5/M/NA02301/S/RA/LSM/SC

The control room has been evacuated due to an uninhabitable atmosphere. The 1-E-0 immediate actions were performed prior to evacuating the control room. The RO reported the all IRPI's indicated zero except;

- . 1 rod at 30 steps
- . 1 rod at 20 steps
- . 1 rod at 10 steps

Which one of the following describes how long emergency boration is required?

- A. 12 minutes.
- B. 25 minutes.
- C. 50 minutes.
- D. Until a SDM of less than or equal to 0.95 is reached.

Reference required

1993/10/11 Modified bank to match new criteria of 25 minutes per rod changed AP reference

1-AP-20, Rev. 18, page 8

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: C C C D D C D A D C

Scramble Range: A - D

RO Tier:

SRO Tier: T1G1

Key Word: BORATION

Cog. Level: C/A 3.3/3.5

Source: M

Exam: NA02301

Test: S

Misc: RA/LSM/SC

Unit 1 is in Mode 5 for an un-scheduled maintenance outage.

The unit has been shutdown for 10 days.

RCS temperature is 130 °F.

RCS Level is +11" above centerline.

Residual heat removal (RHR) pump 1-RH-P-1B is in service.

Both RHR heat exchangers are in service.

The reactor operator observes the following RHR parameters:

- RHR flow - fluctuating 2800 gpm plus or minus 200 gpm.
- RHR motor amps - fluctuating 35 plus or minus 5 amps.
- RCS Stand Pipe level - fluctuating at 11 plus or minus 1 inch.

Which one of the following describes the RHR flow? The RHR flow is
(1-AP-11 is available for reference)

- A. ✓ above design flow and can be reduced to 2250 gpm.
- B. below design flow and can be raised to 2900 gpm.
- C. below design flow and can be left at 2800 gpm.
- D. above design flow and can be raised to 4000 gpm.

Bank 3037

reference AP-11 _ Question replaced

Original Question

Stand pipe operation changed

Unit 2 is refueling and is on RHR. There has been a degradation of RHRSW causing the running RHR pumps to cavitate. Unit 2 then enters 1-AP-11, LOSS OF RHR. The RCS level stand pipe initially has dropped then began to slowly rise. You get initial reports from the refueling floor that there is some boiling in the core. The caution in 1-AP-11 describes which one of the following effect on the RCS Level measurements?

Changes in RCS temperature due to boiling in the core can result in Reactor Vessel water level changes that may not show on RCS standpipe level indicator.

Changes in RCS pressure due to boiling in the core can result in Reactor Vessel water level changes that may not show on RCS ultrasonic level indicator.

Changes in RCS temperature due to boiling in the core can result in Reactor Vessel water level changes that may not show on RCS ultrasonic level indicator.

Changes in RCS pressure due to boiling in the core can result in Reactor Vessel water level changes that may not show on RCS standpipe level indicator.

Answer - D

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	A A B D C C B B B A	Scramble Range: A - D
RO Tier:	T1G2				SRO Tier:	T1G2	
Key Word:	REFUELING				Cog. Level:	C/A 3.9/4.1	
Source:	BANK				Exam:	NA02301	
Test:	C				Misc:	RA/LSM/SC	

- Unit 2 has entered 2-FR-C.2 "Response to Degraded Core Cooling" due to indications of degraded core cooling.
- "B" RCP is running, "A" and "C" have been secured.
- Component Cooling water flow to the motor has just been lost.

Which one of the following describes the actions that should be taken in accordance with 2-FR-C.2?

- A. Secure the "B" RCP immediately; allowing it to run will cause core cooling to degrade further.
- B. Continue to operate "B" RCP; this will allow better pressure control of the Reactor Coolant System.
- C. Secure the "B" RCP immediately; damage to the motor windings could occur.
- D. Continue to operate "B" RCP until directed by the procedure; the pump may provide core cooling.

North Anna Bank question # 2540.

- A. Incorrect, allowing the B RCP to continue to run could cause reflux cooling to take place, this will not degrade core cooling further.
- B. Incorrect, Pressurizer sprays come off the A and C RCPs, not the B RCP.
- C. Incorrect, The B RCP should remain running until directed by the procedure.
- D. Correct, the B RCP should remain running the pump could provide some reflux cooling.

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9
			Answer: D C B A A A D A A A Scramble Range: A - D
RO Tier:	T1G1		SRO Tier: T1G1
Key Word:	DEGRADED COOLING		Cog. Level: C/A 4.0/4.2
Source:	BANK		Exam: NA02301
Test:	C		Misc: RA/GWL/SC

Which one of the following describes how the Recirculation Spray System would be affected by a rupture outside containment in the Quench Spray Pump discharge piping?

- A. The additional source of water for the Outside Recirculation Spray [ORS] pumps will be lost and ORS pump available NPSH will not be increased by reduced temperature of the water at the suction of the ORS pumps.
- B. The capacity of the Recirculation Spray System will be reduced by the loss of the ORS pumps when the Quench Spray System is isolated.
- C. The additional source of water for the Inside Recirculation Spray [IRS] pumps will be lost and IRS pump available NPSH will be decreased by the increased temperature of the water at the suction of the IRS pumps.
- D. The capacity of the Recirculation Spray System will be reduced by the loss of the ORS pumps when the Quench Spray System is isolated; however, the IRS pump NPSH will be increased by the increase in containment pressure due to the early termination of quench spray.

NCRDOP-91.1-LP-3, Revision 4, Pages 12 & 13

1992 bank

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9
			Answer: C C C A B C B D B B Scramble Range: A - D
RO Tier:	T2G2		SRO Tier: T2G1
Key Word:	RECIRC SPRAY		Cog. Level: C/A 4.2/4.3
Source:	BANK		Exam: NA02301
Test:	C		Misc: RA/LSM/SC

- Unit 1 has had a Reactor Trip and Safety Injection due to a main steam line break.
- The steam break was isolated prior to the diagnostic steps in E-0.
- E-0 "Reactor Trip and/or Safety Injection", has been completed.
- The crew is performing actions in ES-1.1 SI Termination.
- Pressurizer level is 22% and slowly rising.
- Pressurizer heaters have been energized.
- Pressurizer pressure is 1900 psig.
- The crew desires to raise Pressure to normal operating pressure.

Which one of the following describes how and why pressurizer pressure will respond when compared to normal steady state conditions.

- A. Pressure will rise more rapidly than normal due to charging flow being maximized, and the bubble being compressed.
- B. Pressure will rise more slowly than normal due to the liquid in the pressurizer being subcooled.
- C. Pressure will rise more rapidly than normal due to letdown being placed in service, preheating the charging flow.
- D. Pressure will rise more slowly than normal due to the pressurizer vapor space temperature being higher than normal.

A. Incorrect, Cooler water has entered the pressurizer, the actions of SI termination have the crew maintain charging flow to maintain pressurizer level but charging flow will not be maximized. (initial conditions pressurizer level 22% and slowly rising.

B. Correct, the water in the pressurizer is subcooled and will require time to heat, therefore pressure rise will be slower when compared to normal steady state conditions.

C. Incorrect, placing letdown in service will tend to lower pressurizer pressure, so the pressure rise would be slower.

D. Incorrect, pressurizer vapor space temperature will be lower than normal, based on Psat-Tsat conditions.

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

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

RO Tier: T1G1

SRO Tier: T1G2

Key Word: PZR

Cog. Level: C/A 2.8/3.3

Source: NEW

Exam: NA02301

Test: C

Misc: RA/GWL/LSM/SC

46. 028AA2.02 001//T1G3/IA LOSS/C/A 3.4/3.8/BANK/NA02301/S/RA/LSM/SC

Given the following conditions:

- Unit 1 was operating at 100 percent power.
- A loss of station IA has occurred.
- The unit has been tripped due to low IA pressure.

The procedure will eventually direct the closure of one of the charging line MOVs for which one of the following reasons?

- A. a loss of PZR level control.
- B. the letdown divert valve failing to the stripper.
- C. the letdown pressure control valve, 1-CH-PCV-1145, failing closed.
- D. a loss of VCT makeup capability.

***REFERENCE**

VISION OBJ. 11662, AP-28 (bank)

Bases for isolating charging

BANK 1996/01/29

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: A B B B D A B C C A	Scramble Range: A - D
RO Tier:			SRO Tier: T1G3	
Key Word: IA LOSS			Cog. Level: C/A 3.4/3.8	
Source: BANK			Exam: NA02301	
Test: S			Misc: RA/LSM/SC	

47. 028K5.04 001/T2G3/T2G2/HYDROGEN/M 2.6/3.2*/BANK/NA02301/C/RA/LSM

Which one of the following describes the design basis of the Hydrogen Recombiner System?

- A. ✓ Reduce hydrogen concentration from 4 percent to 0.5 percent at a flow rate of 50 SCFM.
- B. Maintain hydrogen concentration less than 6 percent following a LOCA with Zr-Water reaction.
- C. Reduce hydrogen concentration from 15 percent to 4 percent in less than 10 days following a LOCA.
- D. Maintain Hydrogen concentration less than 6 % in less than 10 days following a LOCA.

L.P. NCRODP-91.2-LP-1, Rev. 6, p. 29, Objective G

1992 bank

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

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

RO Tier: T2G3

SRO Tier: T2G2

Key Word: HYDROGEN

Cog. Level: M 2.6/3.2*

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM

48. 029EA2.09 001//T1G1/REACTOR TRIP/M 4.4/4.5/NEW/NA02301/S/RA/LSM/SC

Unit one has had a turbine trip, but the reactor did not trip and the generator out put breaker did not open. The RO verifies automatic rod insertion and verifies the turbine is tripped. Which one of the following describes the procedurally required actions if the generator output breaker cannot be verified open within 30 seconds?

- A. Manually open G-12 ONLY.
- B. Manually open exciter field breaker ONLY.
- C.✓ Manually open both G-12 and the exciter field breaker.
- D. Manually open either G-12 or the exciter field breaker.

both must be opened

reference 1-FR-S.1 step 2.d RNO

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

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

RO Tier:

SRO Tier: T1G1

Key Word: REACTOR TRIP

Cog. Level: M 4.4/4.5

Source: NEW

Exam: NA02301

Test: S

Misc: RA/LSM/SC

49. 029K4.03 001/T2G2/T2G2/PURGE/M 3.2/3.5/BANK/NA02301/C/RA/LM/SC

Which one of the following conditions will automatically trip the containment purge supply fans?

- A. Containment particulate radiation monitor hi-hi alarm.
- B. Safety Injection.
- C. Containment Depressurization.
- D. Vent stack "B" radiation monitor hi-hi alarm.

Bank supplied by Utility for this exam.

Changed K/A since original selected K/A did not apply to North Anna. There was no physical connection between the CTMT and the purge system blowers. The original question also required the operator to know from memory a caution in an OP. This was not considered information an operator should have memorized.

Which one of the following describes the precautions to be taken BEFORE operating a purge blower?

Containment pressure must be atmospheric, RCS temperature < 200 degrees F.

Break containment vacuum using MOV-HV-100B and ensure reactor shut down.

Pressurize containment to atmospheric, verify RCS temperature < 250 degrees F, bypass filters unless particulate is high.

Be in Mode 6, RCS temperature < 200 degrees F, containment pressure within 4 psi of atmospheric.

L.P. NCRODP-91.2-LP-1, Rev. 6, page 33, Objective G
1-OP-21.2 Containment Purge, Rev. 13, page 2 & 3 of 8
1992 bank

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

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

RO Tier: T2G2
Key Word: PURGE
Source: BANK
Test: C

SRO Tier: T2G2
Cog. Level: M 3.2/3.5
Exam: NA02301
Misc: RA/LM/SC

50. 032AA2.04 001//T1G2/SOURCE RANGE/M 2.3.1/3.5/BANK/NA02301/S/RA/LSM/SC

Your shift is in the process of performing a reactor startup, and the reactor operator is withdrawing control rods to take the reactor critical. As reactor power increases, the reactor operator can manually block the source-range nuclear instruments after verifying which one of the following?

- A. Both intermediate-range detectors are properly compensated by indicating within one-half decade of each other.
- B. The intermediate-range detectors have both increased at least one decade from the bottom of their scale.
- C. Both intermediate-range detectors are indicating on-scale.
- D.✓ At least a one decade overlap between the source-range and intermediate-range detectors.

replaced question - KA was not applicable to NA

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

Answer: D D B B A A C D D C

Scramble Range: A - D

RO Tier:

SRO Tier: T1G2

Key Word: SOURCE RANGE

Cog. Level: M 2.3.1/3.5

Source: BANK

Exam: NA02301

Test: S

Misc: RA/LSM/SC

51. 034K4.02 001/T2G3//HOIST/M 2.6/3.4/BANK/NA02301/R/RA/LSM

Which one of the following describes the conditions which render the Manipulator Crane bridge AND trolley inoperative simultaneously?

- A. The upender is in the vertical position in the fuel transfer canal.
- B. The trolley bypass is engaged.
- C. The hoist is being operated or the gripper tube is down.
- D. The Dillon load cell indicates 1200 pounds or greater.

L.P. NCRODP-92.9-LP-3, Rev. 2, p. 37, Objective D
1992 bank

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: C C B D A C D D D D

Scramble Range: A - D

RO Tier: T2G3

SRO Tier:

Key Word: HOIST

Cog. Level: M 2.6/3.4

Source: BANK

Exam: NA02301

Test: R

Misc: RA/LSM

The crew has entered 1-AP-3, Loss of Vital Instrumentation, due to the failure of "B" Steam Generator Level Channel III. In accordance with 1-AP-3, which one of the following describes the actions that must be taken?

- A. There are no required actions.
- B. Place the associated Main Feed Reg Valves in Manual ONLY.
- C. Place BOTH the associated Main Feed Reg Valves and Main Feed Reg Bypass Valves in Manual.
- D. Select Steam Generator Level Ch II as controlling channel.

1-AP-3 LOSS OF VITAL INSTRUMENTATION 2 of 15

[2] VERIFY STEAM GENERATOR LEVEL

Do the following:

CONTROL PARAMETERS - NORMAL:

·· · Steam Flow
 · · · Feed Flow
 · · · Steam Generator Level Ch III
 · · · Steam Pressure · ·

a) Place the associated valves in
 MANUAL

Main Feed Reg Valves
 Main Feed Reg Bypass Valves

b) Control Steam Generator level

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

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

RO Tier: T2G2

SRO Tier: T2G2

Key Word: S/G LEVEL

Cog. Level: C/A 2.6/3.0

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LSM/SC

53. 036EA2.01 001//T1G3/3.4/4.1/M 3.4/4.1/BANK/NA02301/S/RA/LSM/SC

During the refueling of Unit 2, a fuel assembly was placed in the wrong location. Per transient and accident analysis, this mistake could be found by which one of the following?

- A. During the performance of the normal required calorimetric.
- B. By observing the axial flux differential.
- C.✓ During the incore flux mapping.
- D. At 100% power using the quadrant power tilt ratio.

Replaced with Bank question- original not required knowledge and not the normally required SRO actions.

Reference:

MODULE NCRODP-48 FUEL HANDLING SYSTEM

Inadvertent loading of a fuel assembly into an improper position. This accident analysis assumes that a fuel assembly is placed in the wrong position in the core. An example is the inadvertent loading of a fuel assembly position requiring burnable poison rods with an assembly not having burnable poison rods. The power distortion due to any combination of misplaced fuel assemblies would significantly raise peaking factors and would be readily observable with in-core flux monitors. Core thermocouples would also indicate any abnormally high coolant enthalpy rise. In-core flux measurements are taken during the startup following the refueling operations. The results of this analysis concluded that fuel assembly loading errors are prevented by administrative procedures implemented during core loading. In the unlikely event that a loading error occurs, the power distribution effects either will be readily detected by the in-core movable detector system or will cause sufficiently small perturbation to be acceptable within the uncertainties allowed between nominal and design power shapes.

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

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

RO Tier:

SRO Tier: T1G3

Key Word: 3.4/4.1

Cog. Level: M 3.4/4.1

Source: BANK

Exam: NA02301

Test: S

Misc: RA/LSM/SC

54. 037AK1.02 001/T1G2/T1G2/3.5/3.9/C/A 3.5/3.9/M/NA02301/C/RA/LSM

Given the following conditions:

- The unit was operating at 100% power.
- A major steam line rupture occurred on the "A" SG.
- An automatic SI was received.
- All systems responded as designed.
- The operating crew is now in the later steps of 1-E-2, "FAULTED STEAM GENERATOR ISOLATION".
- PRZR level has suddenly started decreasing.
- PRZR pressure is 2100 PSIG and decreasing.
- 1-MS-RM-170 ("A" SG STEAMLINE RADIATION MONITOR) has a valid HI alarm.

Based on the above information, the crew should do which one of the following?

- A. upon completion of 1-E-2, transition to 1-ES-0.0.
- B. immediately enter 1-E-0.
- C. upon completion of 1-E-2, transition to 1-E-1.
- D. upon completion of 1-E-2, transition to 1-E-3.

VISION OBJ. 13842

modified - bank 1996/01/29

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: D A D A A D A A C C	Scramble Range: A - D
RO Tier:	T1G2		SRO Tier:	T1G2
Key Word:	3.5/3.9		Cog. Level:	C/A 3.5/3.9
Source:	M		Exam:	NA02301
Test:	C		Misc:	RA/LSM

Which one of the following conditions support or indicate natural circulation flow in accordance with 1-E-3, Attachment 1, Natural Circulation Verification?

- A. · · · SG pressures - STABLE OR DECREASING
 · · · RCS Hot Leg temperatures - AT SATURATION TEMPERATURE FOR SG PRESSURE
 · · · RCS Cold Leg temperatures - STABLE OR DECREASING
- B. · · · SG pressures - STABLE OR DECREASING
 · · · RCS Hot Leg temperatures - STABLE OR DECREASING
 · · · RCS Cold Leg temperatures - STABLE OR DECREASING
- C. ✓ · · · SG pressures - STABLE OR DECREASING
 · · · RCS Hot Leg temperatures - STABLE OR DECREASING
 · · · RCS Cold Leg temperatures - AT SATURATION TEMPERATURE FOR SG PRESSURE
- D. · · · SG temperature - AT SATURATION TEMPERATURE FOR SG PRESSURE
 · · · RCS Hot Leg temperatures - STABLE OR DECREASING
 · · · RCS Cold Leg temperatures - STABLE OR DECREASING

Reference -

1-E-3 Attachment 1 NATURAL CIRCULATION VERIFICATION

NOTE: The following conditions support or indicate natural circulation flow.

1. 1. 1. VERIFY NATURAL CIRCULATION FLOW

- · · RCS subcooling based on Core Exit TCs - GREATER THAN 25 [75°F]
- · · SG pressures - STABLE OR DECREASING
- · · RCS Hot Leg temperatures - STABLE OR DECREASING
- · · Core Exit TCs - STABLE OR DECREASING
- · · RCS Cold Leg temperatures - AT SATURATION TEMPERATURE FOR SG PRESSURE

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

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

RO Tier:

SRO Tier: T1G2

Key Word: 4.2/4.2

Cog. Level: C/A 4.2/4.2

Source: NEW

Exam: NA02301

Test: S

Misc: RA/LSM

- Unit 2 has had a steam generator tube rupture.
- The crew is performing 2-E-3.
- At the step for checking RCP trip and charging pump recirc. criteria the crew determines that the all RCPs must be tripped.

Which one of the following correctly describes the reason for tripping the RCPs during a SGTR event when the trip criteria is met?

- A. This will ensure core cooling during a steam generator tube rupture event.
- B. To minimize the effects of a misdiagnosis of the fault or a multiple failure event.
- C. To reduce RCS pressure, since this will slow the rate of inleakage into the steam generator.
- D. To allow natural circulation cooling to develop, since this will expedite steam generator cooldown.

NCRODP-92-LP-5. North Anna Steam Generator Tube Rupture lesson plan page 10. WOG Background document.

- A. Incorrect, Tripping the RCP's during a tube rupture event is to minimize the effects of a misdiagnosis. Core cooling would be better if the RCPs were left running.
- B. Correct, IAW the WOG the tripping of the RCPs during a tube rupture event is so that the event will not be misdiagnosed if for some reason later the pumps were tripped/or lost at an inconvenient time (a time that might mask the diagnosis).
- C. Incorrect, stopping the RCPs will actually take away one of the methods for pressure reduction (sprays) securing the pumps will only slightly lower pressure and then is will be determined by heat input from the core and leak rate.
- D. Incorrect, Stopping the pumps would not in themselves does not allow natural circulation to develop, the pumps must be stopped for natural circ cooling to occur but steam generator position and steam flow actually determine (delta T) natural circ flow. This would not expedite the cooldown.

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

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

RO Tier: T1G2

SRO Tier:

Key Word: RCP TRIP

Cog. Level: M 4.1/4.2

Source: NEW

Exam: NA02301

Test: R

Misc: RA/GWL/LSM/SC

Which one of the following would be the effects on reactor power and enthalpy of the HP Turbine Exhaust Steam entering the MSR if scaling of the heat exchanger reduces the MSR's efficiency by 50%? (Ignore any slight changes in ambient losses or gains)

- A. ✓ Reactor power would increase and enthalpy would remain unchanged.
- B. Both reactor power and enthalpy would increase.
- C. Both reactor power and enthalpy would decrease.
- D. Reactor power would decrease and enthalpy would remain unchanged.

Solution: a

Reactor power would increase because feedwater temperature would not be heated by the MSR. Enthalpy at the inlet of the MSR's would remain at the enthalpy of the outlet of the first stage of the turbine turbine which should essentially remain unchanged.

NCRODP23

Assume that at full power operation 9,798,706 lbm/hr of wet steam exits the HP turbine and enters the MSRs at an enthalpy (h) of 1115.5 Btu/lbm and a pressure of 230 psia. The quality (X) of the steam entering the MSRs is determined by solving the thermodynamic formula; $h = h_f + X h_{fg}$ for X, and by finding the values for h_f (368.3) and h_{fg} (831.8), corresponding to a saturation pressure of 230 psia, in the steam tables:

$$X = (h - h_f)/h_{fg}$$

The quality of the inlet steam to the MSRs in this example is 89.8 percent. The MSRs remove approximately 10 percent (988,745 lbm/hr) of this mass in the form of moisture (100 percent of the liquid). Thus, the steam entering the MSR tube bundle is dry, saturated steam (X=100 percent). The enthalpy of the steam entering the tube bundle is

$$\begin{aligned} h &= h_f + X h_{fg}, \text{ or} \\ h &= 368.3 + 100(831.8), \text{ or} \\ h &= 1200.1 \text{ Btu/lbm.} \end{aligned}$$

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

Scramble Range: A - D

RO Tier: T2G2
Key Word: MSR
Source: NEW
Test: C

SRO Tier: T2G2
Cog. Level: C/A 3.6/3.6
Exam: NA02301
Misc: LSM/LM/GH/SC

58. 041K6.03 001/T2G3/T2G3/STEAM DUMPS/C/A 2.7/2.9/BANK/NA02301/C/LSM/LM/SC

During operation of the Steam Dump System, which one of the following describes how the steam pressure arming signal is cleared?

- A. By shifting the Steam Header Pressure Controller to MANUAL and decreasing signal demand to zero.
- B. Must take the Steam Dump Mode Selector Switch to the Tavg Mode.
- C. Must take the Steam Dump Interlock Switch to OFF/RESET and return the switch to the ON position.
- D. Must take the Steam Dump Interlock Switch to the BYPASS INTERLOCK position.

bank - 1992/03/16 Surry

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: B B B B A C B A B B	Scramble Range: A - D
RO Tier:	T2G3		SRO Tier:	T2G3
Key Word:	STEAM DUMPS		Cog. Level:	C/A 2.7/2.9
Source:	BANK		Exam:	NA02301
Test:	C		Misc:	LSM/LM/SC

59. 045K4.34 001/T2G3/T2G3/ROD CONTROL/C/A 2.7/2.9/NEW/NA02301/C/RA/GWL

- Unit 1 has ramped to 12% Power due to maintenance concerns.
- PT-446 and PT-447 indicate approximately 12 % turbine load.
- Rod control has been left in automatic from the ramp down.
- Steam Dumps have been taken to the steam pressure mode in preparation for removing the turbine.
- The RO inadvertently opens the steam dumps until reactor power indicates 17% on N-41 and N-42, and 16 % on N-43 and N-44.
- RCS temperature lowers to 543 degrees F.

Which one of the following describes the effect this failure will have on the Rod Control System?

- A. Control Rod will step out at 40 spm until Tave and Tref are within 1.5 degrees.
- B. Control Rods will not step out due to control interlock C-5 not being satisfied.
- C. Control Rod will step out at 32 spm until Tave and Tref are within 1.5 degrees.
- D. Control Rods will not step out due to permissive P-10 not being satisfied.

NCRODP-77-NA Objective I, NCRODP-65, Objective A and D.

- A. Incorrect, Rods will not step out in auto due to turbine load being < 15%.
- B. Correct, Rods will not step out due to turbine load being < 15% and C-5 not allowing auto rod motion.
- C. Incorrect, Rods will not step out due to turbine load.
- D. Incorrect, Rods will not step out and P-10 does not effect auto-rod motion.

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

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

RO Tier: T2G3

SRO Tier: T2G3

Key Word: ROD CONTROL

Cog. Level: C/A 2.7/2.9

Source: NEW

Exam: NA02301

Test: C

Misc: RA/GWL

Unit 1 is at 100 percent power. The RO reports that you have degrading Condenser vacuum and decreasing generator output.

You direct the crew to enter 1-AP-14, Low Condenser Vacuum.

Reactor power has been reduced to 60%, condenser pressure is now 5.6 inches of Hg absolute.

Which one of the following is the correct action?

- A. Exit 1-AP-14 and go to 1-E-0.
- B. Go to 1-E-0 and complete 1-AP-14.
- C. Complete 1-AP-14 and then go to 1-E-0
- D. Place Condenser Hogger Ejectors in Service per 1-OP-36.1.

Reference - 1-AP-14, revision 17

- a 1-E-0 does not contain sufficient guidance for this condition, must also remain in the AP
- b correct per step 4, RNO
- c Have reached reactor trip criteria for Condenser pressure, must enter 1-E-0
- d only appropriate, if pressure had not degraded

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: B C D B B B C D A D	Scramble Range: A - D
RO Tier:			SRO Tier: T1G1	
Key Word: 3.9/4.1			Cog. Level: C/A 3.9/4.1	
Source: NEW			Exam: NA02301	
Test: S			Misc: RA/LSM/SC	

61. 055EK1.02 001/T1G1/T1G1/CSFST/C/A 3.3/3.7/BANK/NA02301/C/RA/LSM

When depressurizing SGs in 1-ECA-0.0, the operator is directed to check RCS Tcold temperatures > 315 °F during the depressurization to ensure that the evolution does not do which one of the following?

- A. ✓ challenge the integrity critical safety function.
- B. disrupt natural circulation.
- C. create a void in the reactor vessel upper head.
- D. inject nitrogen from the SI accumulators into the RCS.

VISION OBJ. 13835 (LORP)

BANK 1996/01/29

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: A A B B B D D A C A

Scramble Range: A - D

RO Tier: T1G1

SRO Tier: T1G1

Key Word: CSFST

Cog. Level: C/A 3.3/3.7

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM

Unit 1 is 18% power during startup.

A malfunction causes all condenser waterbox vacuum breakers to open.

Condenser pressure is 5.0 inches Hg absolute and increasing.

Which one of the following is the required immediate action?

A. Reduce turbine power and maintain turbine load until condenser vacuum is stable.

B. Trip the turbine and go to 1-AP-2.1, Turbine Trip without Reactor Trip Required.

C. Trip the turbine and reduce the reactor to less than 5%.

D. Go to 1-E-0, Reactor Trip and Safety Injection.

1-AP-14, Rev. 9, page 2

1993 bank

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

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

RO Tier: T2G2

SRO Tier:

Key Word: CONDENSER

Cog. Level: C/A 2.5/2.7

Source: M

Exam: NA02301

Test: R

Misc: RA/LSM/SC

- Unit 1 is operating at 5% power
- 1B condensate pump is running.
- 1C condensate pumps is in AUTO.
- 1A condensate pump is manually started.
- Condensate pump 1C auto starts

Which ONE of the following is the most probable cause of both condensate pump 1C starting and what action should be taken?

- A. ✓ Caused by the 1C handswitch being in the AUTO position when starting the 1A condensate pump. The 1C condensate pump should be shutdown per normal operating procedures.
- B. Starting condensate pump 1A dropped pressure sensed by PS-CN-118A to below 440 psig, an auto-start for 1C. The 1C condensate pump should be shutdown per normal operating procedures.
- C. Caused by false low hotwell level generated because the 1B pump was running when starting the 1A condensate pump. The 1C condensate pump should be shutdown per normal operating procedures.
- D. Caused by a drop in Feedwater suction pressure below 280 psig, characteristic of starting a second condensate pump at this power level. Notify the Shift Supervisor.

REF: MODULE NCRODP-25 MAIN CONDENSATE SYSTEM pages 62-63

OBJ: 2.19

Distractor B - PS-CN-118A is the condensate pump discharge header pressure.

Header pressure will not decrease on a pump start.

Distractor C - A faulted speed switch will result in the associated pump tripping and auto-start of the third pump.

Distractor D - A drop in Feedwater suction pressure is not characteristic with starting a second condensate pump.

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

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

RO Tier: T2G1

SRO Tier: T2G1

Key Word: CONDENSATE

Cog. Level: C/A 2.6/2.8

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LM/LSM/SC

64. 056AK3.02 001/T1G3//ECA-0.0/C/A 3.5/3.9/NEW/NA02301/R/RA/LSM/SC

Unit 1 has lost off site power and the EDGs failed to start. The crew enters 1-ECA-0.0 Loss of all AC power. The crew was successful in starting the 1H emergency diesel generator and has restored power to the 1H 4160-volt emergency bus. An SI occurred during the recovery efforts. Which one of the following describes your required actions, and the reason for those actions?

- A. The SI should not be reset to allow automatic loading of equipment on the 1H bus.
- B. The running SI pumps should be stopped, operators must manually load equipment on the 1H bus in a controlled fashion per 1-EC-0.0 to prevent overloading the EDG.
- C. The SI should be reset to allow manual loading of equipment on the 1H bus.
- D. The SI should not be reset, the running SI pumps should be stopped because of sequencing and loading concerns on the 1H bus.

NEW

Reference

1-ECA-0.0 Revision 18, Caution before step 9 page 6 of 18

distractor analysis - this is only done because of loading concerns, the SI is required to be reset to allow the manual loading of a recovered EDG.

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

Answer: C A B A C D C B A C

Scramble Range: A - D

RO Tier: T1G3

SRO Tier:

Key Word: ECA-0.0

Cog. Level: C/A 3.5/3.9

Source: NEW

Exam: NA02301

Test: R

Misc: RA/LSM/SC

Given the following conditions:

- Unit 1 is at 35 percent power.
- While hanging a tagout, an operator opened the wrong breaker and de-energized the power to 1-DA-TV-100B.
- The mispositioned breaker has been re-closed IAW procedures.
- J-A6, "RX CONT SUMP HI LEVEL" has alarmed.

In order to pump the containment sump, the operator will have to do which one of the following?

- A. push the OPEN button for 1-DA-TV-100B.
- B.✓ push the CLOSE button for 1-DA-TV-100B.
- C. cycle 1-DA-P-1B to OFF, then back to AUTO.
- D. reset train "B" of Phase "A" isolation.

BANK 1996

VISION OBJ. 11550

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: B C A C C C B D D C

Scramble Range: A - D

RO Tier: T1G1

SRO Tier: T1G1

Key Word: MANUAL CONTROL

Cog. Level: C/A 3.5/3.5

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM

Given the following:

- Unit 1 was operating at 100 percent power.
- 1-CH-P-1A was running.
- A loss of DC control power to the 1J bus has occurred.
- While stabilizing the unit, a spurious SI occurred.

As you enter E-0, which one of the following pump combinations will exist as a result of these failures?

- A. 1-CH-P-1A NOT running, 1-CH-P-1B running, 1-CH-P-1C running.
- B. 1-CH-P-1A running, 1-CH-P-1B NOT running, 1-CH-P-1C NOT running.
- C. 1-CH-P-1A running, 1-CH-P-1B running, 1-CH-P-1C NOT running.
- D. 1-CH-P-1A running, 1-CH-P-1B NOT running, 1-CH-P-1C running.

1996 Bank

NCRODP-35-LP-1 OBJ. B, NCRODP-41-LP-1 OBJ. G

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

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

RO Tier: T1G2

SRO Tier: T1G2

Key Word: LOSS OF DC POWER

Cog. Level: C/A 4.0/4.2

Source: M

Exam: NA02301

Test: C

Misc: RA/LSM/SC

The following plant conditions exist:

- Reactor Power is 100%
- Rod Control is in AUTO
- Steam Generator Level Control is in AUTO
- Steam Generator Level Control inputs (steam flow, feed flow, turbine first stage pressure) are selected to Channel III

With NO OPERATOR ACTION, which one of the following conditions describes the effect on plant operation when channel III stem pressure in "A" Steam Generator fails low?

- A. Increased feed flow results in Steam Generator shrink, Steam Generator level stabilizes at a slightly higher level.
- B. Decreased feed flow results in Steam Generator swell, Steam Generator level stabilizes at a slightly lower level.
- C. Decreased feed flow results in a reactor trip on LO-LO Steam Generator level.
- D. Increased feed flow results in a Hi-Hi Steam Generator level and a P-14 permissive.

REF: NCRODP26 Main Feedwater p77-81

OBJ:

SOURCE: Braidwood 4/1/96

Distractor A - Incorrect - feed flow would decrease.

Distractor B - Incorrect - swell in not caused by decreased feed flow.

Distractor D - Incorrect - feed flow would decrease.

Comment: The mass flow rate of steam is directly proportional to the density of steam, which is proportional to the square root of steam pressure. Loss of steam pressure transmitter appears to the Steam Generator Water Level Control system as a decrease in steam flow.

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

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

RO Tier: T2G1

SRO Tier: T2G1

Key Word: STEAM PRESSURE

Cog. Level: C/A 2..9/3.1

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LM/GH/LSM/SC

Assume the following conditions.

A Liquid radwaste release is in progress.

- Unit 1 is operating at 15% power.
- Unit 2 is in a forced maintenance outage due to multiple condenser tube failures.
- Unit-2 water boxes are tagged out and drained for the repairs.

The liquid Effluent Radiation monitor has been declared inoperable.

Health Physics has take a grab sample and the results indicate the release may continue.

Circulating water pump 1-CW-P-1C has just tripped, leaving the "A," "B," and "D" circulating water pumps running

Which one of the following actions must be taken?

- A. ✓ Secure all liquid waste releases.
- B. Trip the reactor and enter 1-E-0.
- C. Align liquid waste releases to unit-2 discharge tunnel.
- D. Trip the turbine and enter 1-AP-2.1.

A. Not enough dilution water flow

Modified bank ID: 3121

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: A A C B A B A C C D

Scramble Range: A - D

RO Tier: T1G2

SRO Tier: T1G1

Key Word: RADWASTE

Cog. Level: M 3.0/3.7

Source: M

Exam: NA02301

Test: C

Misc: RA/LSM

Which one of the following conditions will cause a main feedwater pump to trip?

- A. "A" main feedwater pump will trip if its lube oil pressure is 7 psig.
- B. "A" or "B" main feedwater pumps will trip on low condenser vacuum.
- C. "B" main feedwater pump will trip if suction pressure is < 300 psig for 45 seconds.
- D. Undervoltage on "A" 4160-volt station service bus will cause "A" main feedwater pump to trip.

REF: NA Bank 3365

OBJ:

Distractor A - Incorrect - lube oil pressure less than 5 psig causes trip.

Distractor B - Incorrect - there is no low condenser vacuum trip

Distractor C - Incorrect - suction pressure less than 280 psig for 55 sec for B pump

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

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

RO Tier: T2G1

SRO Tier:

Key Word: FEED PUMP TRIP

Cog. Level: M 3.1*/3.2*

Source: BANK

Exam: NA02301

Test: R

Misc: RA/LSM/SC

70. 060G2.4.21 001//T1G2/3.7/4.3/M 3.7/4.3/BANK/NA02301/S/RA/LSM

While operating with primary-to-secondary leakage, steam release from the which one of the following does **NOT** require entry into 0-AP-54, Accidental, Unplanned, or Uncontrolled Radioactive Gaseous Waste Release?

- A. containment hogger discharge.
- B. main condenser hogger discharge.
- C. decay heat release valve.
- D. steam generator power-operated relief valve.

BANK ID: 2676

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: A D B C D C C D B D

Scramble Range: A - D

RO Tier:

SRO Tier: T1G2

Key Word: 3.7/4.3

Cog. Level: M 3.7/4.3

Source: BANK

Exam: NA02301

Test: S

Misc: RA/LSM

71. 061K1.07 001/T2G1/T2G1/FIRE PROTECTION/C/A 3.4/3.7/BANK/NA02301/C/RA/LSM/LM

With AFW in service to supply S/G feedwater, ECST level suddenly begins to decrease rapidly due to a rupture in the tank.

Which ONE of the following water sources should be aligned to supply AFW pump suction?

- A. Standby 300,000-gallon condensate storage tank.
- B. In-service 300,000-gallon condensate storage tank.
- C. Fire Protection System using diesel-driven pump 1-FP-P-2.
- D. Fire Protection System using motor-driven pump 1-FP-P-1.

REF: 1-AR-F-E8; 1-AP-22.5; 1-OP-31.2.

OBJ: 5971

COMMENT: Answer correct: Fire protection using lake water is the preferred source; 1-FP-P-1 takes suction on the lake.

Distractors A & B: - candidate misconception concerning piping configuration for CST supply to AFW system. CST cannot be aligned to supply suction directly to the AFW pumps, only to makeup to the ECST; since the ECST is ruptured, this is not an option.

Distractor C - fire protection system is the preferred alternate suction source.

Distractors wrong:

diesel-driven pump takes suction from the service water reservoir.

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

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

RO Tier: T2G1

SRO Tier: T2G1

Key Word: FIRE PROTECTION

Cog. Level: C/A 3.4/3.7

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM/LM

Which one of the following describes the design features that limit the maximum flow from each of the AFW pumps in the event of a piping rupture?

- A. An orifice is installed on the discharge header of the turbine-driven pump. A PCV is installed on the discharge header of each motor-driven pumps.
- B. An orifice is installed on each pump's discharge header.
- C. A PCV is installed on each pump's discharge header.
- D. A PCV is installed on the discharge header of the turbine-driven pump. An orifice is installed on the discharge header of each motor-driven pumps.

REF: NCRODP-26-NA

Three auxiliary feedwater pumps are provided; two are motor- driven and the third is turbine-driven. This ensures that at least one pump is available during a complete loss of power. The discharge header of the turbine-driven pump has an orifice which limits the maximum flow from the pump in the event of a piping rupture downstream of the orifice. This flow-limiting action for the motor-driven pumps is accomplished by pressure control valves located on the pump discharge. One pump is normally dedicated to a particular steam generator, but any pump can feed any steam generator if required. A hand control valve (HCV) and a MOV header are provided on the auxiliary feedwater pumps discharge for each steam generator. These headers permit greater auxiliary feedwater diversity and reliability. Prior to joining the main feedwater headers, a check valve in the auxiliary feedwater line prevents backflow from the steam generators in the event of an auxiliary feedwater piping rupture.

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

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

RO Tier: T2G1

SRO Tier:

Key Word: AUX FEED WATER

Cog. Level: M 3.1/3.4

Source: NEW

Exam: NA02301

Test: R

Misc: RA/LSM/GH/SC

Shutting the battery input breaker on a 120-volt AC Static Inverter without previously charging the capacitors results in which one of the following:

- A. large **voltage** surges, breaker trip, and possible circuit damage.
- B. large **current** surges, breaker trip, and possible circuit damage.
- C. large surges in **both** voltage and current, breaker trip, and possible circuit damage.
- D. normal breaker operations, the capacitors are charged **after** the battery input breaker is closed.

Lesson Plan for VITAL AND EMERGENCY ELECTRICAL DISTRIBUTION SYSTEM
(35)

1. The static inverters provide a reliable source of AC electrical power to vital instrumentation and controls.

1.1. Pre-charging the inverter precharges the filtering capacitors to prevent large current surges.

2.

Shutting the breaker without previously charging the capacitors results in large current surges, breaker over-current trip, and possible circuit damage

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

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

RO Tier: T2G2

SRO Tier:

Key Word: AC CURRENT

Cog. Level: C/A 2.7/3.0

Source: NEW

Exam: NA02301

Test: R

Misc: LSM/LM/GH/SC

Unit 1 was operating at 100% power, with both unit 1's service water pumps in operation, when a total loss of off-site power occurred. The following conditions exist:

All plant equipment responded as designed with the exception of the 1H and 1J emergency diesel generators (EDG) which failed to start.

The operators have corrected the cause of the 1H EDG and are preparing to start the EDG.

Following the successful start of the 1H EDG, Which one of the following is correct concerning the unit 1 "A" service water pump?

- A. will automatically start on loss of reserve station service.
- B. will automatically start on low service water flow.
- C. automatically start on 1J4160V emergency bus UV.
- D. must be manually restarted.

Modified NA Bank ID: 3989

Original Question:

Unit 1 was operating at 100% power, with both unit 1's service water pumps in operation, when a total loss of off-site power occurred. The following conditions exist:

All plant equipment responded as designed with the exception of the U-1 1H and 1J emergency diesel generators (EDG) which failed to start.

The operators have corrected the cause of the start failure and are preparing to start the 1H EDG.

Following the successful start of the 1H EDG, the unit 1 "A" service water pump will automatically start on _____.

- A. loss of reserve station service
- B. low service water flow
- C. 1J4160V emergency bus UV
- D. "B" service water pump trip

Answer: A

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: A B A A D D D A D B Scramble Range: A - D
RO Tier: T1G1 SRO Tier: T1G1
Key Word: SERVICE WATER Cog. Level: C/A 4.0/4.2
Source: M Exam: NA02301
Test: C Misc: RA/LSM

One qualified circuit between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System has been declared inoperable. You instruct the crew to perform 1-PT-80. The circuit that was declared inoperable fails SR 3.8.1.1 acceptance criteria.

Which one of the following are your next required actions?

- A. ✓ Test the remaining circuits.
- B. Enter TS Condition G Required Action G.1 and G.2.
- C. Enter TS Condition I Required Action I1.
- D. Enter TS 3.0.3.

A. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. The remaining circuits must be tested.

B. Only correct if this constitutes a second required circuit failure. The second offsite circuit is inoperable, and Condition G, for two offsite circuits inoperable, is entered.

C. Only required if two EDG's are inoperable. The failure of the SR does not cause the EDG to be inoperable.

D. Entry TS 3.0.3 is required if 3 or more sources are inoperable.

Reference TS/ TS BASIS 3.8.1

AC Sources—Operating B 3.8.1 BASES (Draft 3), 07/17/01
LCO

LCO 3.8.2, "AC Sources—Shutdown."

ACTIONS A.1

To ensure a highly reliable power source remains with one offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit(s) on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition G, for two offsite circuits inoperable, is entered.

A.2

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of

the associated EDG will not result in a complete loss of safety function of critical redundant required features. These features are powered from the redundant AC electrical power trains. The Completion Time for Required Action A.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows
(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources—Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

- a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System;
- b. Two emergency diesel generators (EDGs) capable of supplying the onsite Class 1E power distribution subsystem(s);
- c. One qualified circuit between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System and one EDG capable of supplying the onsite Class 1E AC power distribution subsystem on the other unit for each required shared component; and
- d. Required sequencing timing relays.

A. One LCO 3.8.1.a offsite circuit inoperable.

A.1 Perform SR 3.8.1.1 for required OPERABLE offsite circuit(s).

76. 063K2.01 001/T2G2/T2G1/POWER SUPPLY/M 2.9*/3.1*/M/NA02301/C/RA/GWL/LSM/SC

Which one of the following is the power supply to the Unit 1 air side seal oil back up pump?

- A. 125-volt DC bus 1-IV.
- B. "A" 480-volt AC Bus.
- C. 120-volt AC Vital Bus 1-II.
- D. "H" 480-volt AC Bus.

North Anna Lesson NCRODP-32-NA objective G of detailed descriptions.
Modified from questions # ID 183 and 119.

- A. Correct, this is the power supply for the Air side seal oil back-up pump.
- B. Incorrect, this the emergency bus power supply for B train AC components.
- C. Incorrect, this is the power supply various vital loads.
- D. Incorrect, this the emergency bus power supply for A train AC components.

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

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

RO Tier: T2G2

SRO Tier: T2G1

Key Word: POWER SUPPLY

Cog. Level: M 2.9*/3.1*

Source: M

Exam: NA02301

Test: C

Misc: RA/GWL/LSM/SC

The 1J Emergency Diesel Generator (EDG) is supplying the 1J Bus. The Motor Operated Potentiometer (MOP) has failed. Speed is being controlled manually.

If the 1J EDG trips due to an overspeed condition, which one of the following actions must be taken to restart the 1J EDG?

- A. Reset the shutdown relay in the control room and reset the fuel racks.
- B. Reset the shutdown relay in the control room and return the MOP defeat switch to AUTO.
- C. Reset the fuel racks then return the MOP defeat switch to AUTO.
- D. Return the MOP defeat switch to AUTO then reset the fuel racks.

1-OP-6.2, Rev. 23, pages 3 and 4

1992 bank

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: A A D A C B C C D D

Scramble Range: A - D

RO Tier: T2G2

SRO Tier: T2G2

Key Word: EDG

Cog. Level: C/A 4.0/4.3

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM/GH

Unit 1 was operating at 100% power when a loss of instrument air occurred. The crew tripped the reactor and performed 1-E-0, "Reactor Trip or Safety Injection," and 1-ES-0.1, "Reactor Trip Response."

The following conditions exist:

All RCPs secured due to loss of component cooling water.
Containment instrument air pressure is 0 psig.
CRDM fans 1-HV-F-37A, E, and F are running.
The Operations Manager has approved a natural circulation cooldown.

The crew should use which one of the following ?

- A. 1-ES-0.2B, Natural Circulation Cooldown without CRDM Fans.
- B. 1-OP-3.2, Unit Shutdown From Mode 3 to Mode 4.
- C. 1-ES-0.2A, Natural Circulation Cooldown with CRDM Fans, then transition to 1-ES-0.2B, Natural Circulation Cooldown without CRDM Fans, when directed.
- D. 1-ES-0.2A, "Natural Circulation Cooldown with CRDM Fans," and perform to completion.

Bank 84 modified format only ID: 4097

Associated objective(s):

12492

Plant Mod during the last two outages made "D" correct answer.

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

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

RO Tier: T1G3

SRO Tier: T1G2

Key Word: ES-0.2

Cog. Level: C/A 3.0/3.2

Source: M

Exam: NA02301

Test: C

Misc: RA/LSM/SC

- A fire is in progress in the Unit 1 emergency switchgear room.
- Halon has been discharged into the area.
- No other manual actions have taken place in the emergency switchgear room.
- A Safety Injection signal has resulted in the dumping of the control room air bottles into the emergency switch gear room.

Which one of the following correctly describes how the ventilation lineup will be affected?

- A. The emergency switchgear room recirculation fans will trip.
- B. 1-HV-F-41 fan starts and pressurizes the control room.
- C. All fans remain running and the control room pressurization is unaffected.
- D. The control room will not pressurize due to the closure of the fire dampers.

North Anna Bank Question #678
Associated objective 5781.

- A. Incorrect, Emergency switchgear room recirculation fans have not tripped.
- B. Incorrect, with the fire dampers being closed the control room will not pressurize.
- C. Incorrect, the control room pressurization is affected, it will not pressurize because of the fire dampers being closed.
- D. Correct, with the fire dampers being closed the control room will not pressurize.

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

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

RO Tier: T1G1

SRO Tier:

Key Word: FIRE PROTECTION

Cog. Level: M 2.9/3.4

Source: BANK

Exam: NA02301

Test: R

Misc: RA/GWL/SC

You are the Unit Supervisor. You are informed that there has been an accident involving a company truck colliding with a reserve station service transformer(RSFT). A small fire was involved, but was quickly extinguished by the truck driver using a portable fire extinguisher located in the truck (six minutes). The RSFT has failed resulting in a partial loss of offsite power. The EDG and all the associated equipment responded normally.

Which one of the following describes your required response?

- A. EPIP-1.01 must be initiated because Safety-related equipment was affected by the fire.
- B. EPIP-1.01 must be initiated because the fire was extinguished with out assembling the fire brigade.
- C. EPIP-1.01 is not initiated because although safety related equipment was effected, the fire duration was less than 10 minutes.
- D. The fire caused the activation of safety related equipment, EPIP-1.01 must be entered.

EPIP-1.01 must be initiated if either of the following conditions occur during a fire (0-FCA-0).

- Safety-related equipment is affected by the fire

- Fire duration is greater than ten minutes

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

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

RO Tier:

SRO Tier: T1G1

Key Word: EPIP

Cog. Level: M 2.9/3.3

Source: NEW

Exam: NA02301

Test: S

Misc: RA/LSM/SC

81. 068A3.02 001/T2G1/T2G1/RADWASTE/C/A 3.2/3.5/NEW/NA02301/C/RA/LSM

Which one of the following describes how the liquid waste effluent control valve, PCV-LW-115, operates?

- A. Fails shut on loss of air and fails shut on loss of electric power.
- B. Fails shut on loss of air and fails as-is on loss of electric power.
- C. Automatically closes on high effluent flow rate and fails shut on loss of air.
- D. Fails shut on high effluent flow rate.

NCRODP-92.3-LP.1, Revision 4, Page 22

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

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

RO Tier: T2G1

SRO Tier: T2G1

Key Word: RADWASTE

Cog. Level: C/A 3.2/3.5

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LSM

Given the following plant conditions:

Unit 1 was at 100% power when noxious fumes forced evacuation of the control room. The immediate actions of 1-AP-20, Operation from the Auxiliary Shutdown Panel, were completed prior to evacuation.

AFW flow was throttled to 150 GPM to each S/G prior to evacuation.

Which one of the following describes the sequence of control manipulations required to transfer control of "C" S/G AFW flow?

- A. Decrease the demand on 1-FW-HCV-100C controller, then place the LOCAL-REMOTE switch in LOCAL.
- B. Place the LOCAL-REMOTE switch in LOCAL, then decrease the demand on the controller.
- C. Place the LOCAL-REMOTE switch in LOCAL, then throttle 1-FW-MOV-100C.
- D. Locally throttle 1-FW-MOV-100C, then place the LOCAL-REMOTE switch in LOCAL.

Bank - Supplied by Utility for this examination.

Original Question - replaced. While this question was used on the 1992 exam, it's contents are no longer considered required operator knowledge.

LCV-1460 A and B, Letdown Isolation Valves, do not have "Local/Remote" switches at the auxiliary shutdown panel.

Which one of the following describes the reason?

HCV-1200 A, B, and C provide sufficient letdown isolation alone.

LCV-1460 A and B can be controlled from the Appendix R isolation panel.

LCV-1460 A and B cannot be operated without HCV-1200A, B and C being closed.

There is no need to operate LCV-1460A and B after Control Room Evacuation.

NCRODP-88.3-LP.1, Objective B

1993 bank

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: A A B C A C C A C B

Scramble Range: A - D

RO Tier: T1G1

SRO Tier: T1G1

Key Word: AUX SHUTDOWN

Cog. Level: C/A 2.9/3.1

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM/SC

The "A" waste gas decay tank (WGDT) has been sampled and release paperwork has been delivered to the control room by Health Physics.

Which one of the following correctly describes the personnel involvement in the control room prior to releasing the WGDT?

- A. Any backboards-qualified operator can release the tank and a licensed senior reactor operator must be made aware of the release.
- B. Only a licensed reactor operator can release the tank and a licensed reactor operator must be made aware of the release.
- C. ✓ A licensed reactor operator or license class trainee can release the tank and a licensed senior reactor operator must be made aware of the release.
- D. A licensed reactor operator can release the tank and an additional licensed reactor operator must be made aware of the release.

Source - new - written by licensee for this exam.

Question replaced - based on interpretation of K/A and task was normally performed by HP

Which one of the following describes the controls used for Waste Gas Decay Tank releases?

The Waste Decay Tank is sampled:

and assessed independently to verify compliance with release limits.

and assessed independently for noble gases, radioiodines, particulates, and tritium.

to ensure the 30 day dose commitment estimate is not exceed and to verify compliance with release limits.

to ensure the 30 day dose commitment estimate is not exceed and to verify compliance with 10CFR part 20 limits.

Reference:

Ncrodp-45

The actual source term through the Process Vent System is sampled routinely. Dose calculations are made to ensure that actual releases are within the limits established for this release pathway. Concurrently, dose projections are made to estimate the dose commitment for the next 30 day period. The dose projection provides a degree of assurance that continued operation will not exceed any release limit. In addition to these normal release considerations, specific releases such as a Waste Gas Decay Tank are sampled and assessed independently to verify compliance. The Process Vent System is routinely sampled for noble gases, radioiodines, particulates, and tritium.

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: C B B C D B A C C D	Scramble Range: A - D
RO Tier:	T2G1		SRO Tier:	T2G1
Key Word:	WASTE GAS		Cog. Level:	M 2.9/3.4
Source:	NEW		Exam:	NA02301
Test:	C		Misc:	RA/LSM/SC

Following a seismic event, which one of the following provide high range containment radiation monitors which are for indication/verification purposes only and do not affect the logic schemes of any safety-related plant systems?

- A. Merlin-Gerin Radiation Monitoring Subsystem.
- B. Kaman Radiation Monitoring Subsystem.
- C. ✓ Victoreen Radiation Monitoring Subsystem.
- D. Nuclear Research Corporation Radiation Monitoring Subsystem.

Reference:

NCRODP-46

Victoreen Radiation Monitoring Subsystem. Each Containment is equipped with two Seismic class I (earthquake-proof) monitor units (see Table 46-4). Each unit consists of a high range detector (100 to 107 R/hour), a control room readout unit, a recorder, and interconnecting cable. The detectors are located approximately 155 degrees apart for Unit 1 and approximately 130o apart for Unit 2 on the inside of the containment polar crane wall to provide physical separation. Their location approximately 5 feet above the operating floor facilitates the periodic calibration of the detectors. The units are designed for intense radiation fields, such as might exist after an accident, and are powered from diverse vital buses. Their indicators and racks in the MCR also meet separation and seismic requirements. The high range containment radiation monitors are for indication/verification purposes only and do not affect the logic schemes of any safety-related plant systems.

Nuclear Research Corporation (NRC) Radiation Monitoring Subsystem. The NRC high range monitors are located on potential effluent lines that were either not provided with Westinghouse monitors or lacked high range monitors. The NRC high range monitors (listed in Table 46-5) were installed prior to the Kaman monitors. (This is mentioned because there are some redundant monitors between the two subsystems.) These monitors measure the gaseous effluent release paths of the Process Vent Subsystem of the Gaseous Waste System, ventilation vent stacks "A" and "B", and potential effluent paths of contaminated steam (in the event of a primary-to-secondary leak in the steam generators.) The potential paths of contaminated steam monitored are the six main steam lines and the exhausts from the two turbine-driven auxiliary feed pumps.

The high range effluent monitors consist of a detector and the control unit. The

detector has an 9-decade range of 10^{-5} to 10^{+4} R/hr which is displayed on an 8-decade display of 10^{-4} to 10^{+4} and is comprised of two G-M tubes, an ion chamber, and an internal cesium check source. The components are enclosed in a box that protects them from expected operating environments. The detector is enclosed in a lead shield to reduce background radiation.

Kaman Radiation Monitoring Subsystem. The high range monitors in this subsystem are supplemented by normal range monitors for verification purposes. The Kaman monitors are listed in Table 46-6. These monitors measure the gaseous effluent release paths of the process vent (a subsystem of the Gaseous Waste System), and ventilation vent stacks "A" and "B". These monitors operate in conjunction with the Westinghouse monitors for the same release paths. They have a greater sensitivity and range than the Westinghouse monitors for these release paths. They can monitor beta/gamma activity from 10^{-7} to 105 microcurie per cubic centimeter and iodine/particulate releases below 100 microcurie per cubic centimeter. They are redundant also with the NRC monitors. (The NRC monitors were originally intended to be a short term solution to NUREG 0578, but have been left in place as backup monitors.)

The normal range monitors consist of a cabinet assembly, a pumping system with automatic flow control, a gas sampler assembly with a beta detector and check source, two particulate-iodine collectors without detectors, and an associated microcomputer. The high range monitors consist of a cabinet assembly, a pumping system with automatic flow control, a gas sampler assembly with two G-M tubes and a check source, and three particulate-iodine collector assemblies with G-M tube detectors.

The process vent normal range monitor from Table 46-6, GW-RM-178-1, has the same automatic functions as those mentioned previously for Westinghouse process vent monitors GW-RM-101 and -102. A high radiation level sensed by GW-RM-178-1 causes the flow control valve GW-FCV-101 from the waste gas decay tanks to shut, the containment vacuum pumps to trip, and the vacuum pumps' discharge valves to shut.

Merlin-Gerin Radiation Monitoring Subsystem. The Merlin-Gerin radiation monitoring subsystem consists of the eight N-16 radiation monitors (1-MS-RM-190, 191, 192, and 193 and 2-MS-RM-290, 291, 292, and 293). These radiation monitors are used to monitor the main steam lines for indication of a Steam Generator tube leak or rupture. The monitors provide the operators with an indication in the Control Room of Steam Generator leaks as small as 1 gallon per day (GPD). The Merlin-Gerin subsystem also is installed in the discharge line of the High Capacity Steam Generator Blowdown System. These monitors, 1-SS-RM-125 and 2-SS-RM-225, monitors the blowdown effluent prior to discharge to the Circulating Water tunnel and subsequent discharge to the environment. Radiation monitor 1-SS-RM-125 is located in the Turbine Building basement adjacent to Blowdown Cooler 1-BD-E-2A/B. The monitor

has a local indicator and provides a signal to the Blowdown System control panel 1-EI-CP-10. A high radiation alarm will be annunciated in the Control Room by a Steam Generator Blowdown Trouble alarm. The Blowdown radiation monitor has a $10\text{E-}07$ to $10\text{E-}03$ $\mu\text{Ci/cc}$ range. The Merlin-Gerin radiation monitors are listed in Table 46-11.

All Rad Monitor Alarm Setpoints are maintained in the "Rad Monitor Setpoint Records" book in the MCR.

Assume the following conditions.

- Unit 1 is in mode 6
- Core off-load is in progress
- A fuel handling accident has occurred
- A high and a high-high alarm was received on Fuel Pit Bridge Radiation Monitor 1-RM-RMS-153.

This alarm will isolate main control room ventilation and which one of the following?

- A. Dump bottled air, and start the unit-1 41 and 42 fans only.
- B.✓ Dump bottled air, and start both units' 41 and 42 fans.
- C. Start all 41 and 42 fans, but will not dump bottled air.
- D. Dump bottled air, but will not start any 41 or 42 fan.

MODIFIED BANK 3088

Original Question:

Assume the following conditions.

- Unit 1 is in mode 6
- Core off-load is in progress
- A fuel handling accident has occurred in the fuel building
- A high and a high-high alarm was received on 1-RM-RMS-153.

This alarm will isolate main control room ventilation, _____.

- A. dump bottled air, and start the unit -1 unit 41 and 42 fans only
- B. dump bottled air, and start both units' 41 and 42 fans
- C. and start all 41 and 42 fans, but will not dump bottled air
- D. and dump bottled air, but will not start any 41 or 42 fan

Answer:

B

MCS Time: 1 Points: 1.00 Version: 0 1 2 3 4 5 6 7 8 9
Answer: B D A D B D C B A B Scramble Range: A - D
RO Tier: T2G1 SRO Tier:
Key Word: 3.1/3.5 Cog. Level: M 3.1/3.5
Source: BANK Exam: NA02301
Test: R Misc: RA/LSM/SC

86. 073A1.01 001/T2G2/T2G2/RAD MONITOR/M 3.2/3.5/M/NA02301/C/LSM/LM/LSM/SC

Which one of the following describe the result of a hi-hi alarm actuation on the Westinghouse clarifier outlet process monitor (RM-111)?

- A. Only clarifier inlet valve PCV-LW-100 closes, which causes the steam generator blowdown pumps to trip. The clarifier outlet FCV-LW-115 does not close.
- B.✓ The actuation causes clarifier outlet valve PCV-LW-115 to close and clarifier inlet FCV-LW-100 to close. The steam generator blowdown pumps trip when the inlet valve closes.
- C. The actuation causes clarifier inlet valve FCV-LW-100 to close and the steam generator blowdown pumps to trip. The clarifier outlet PCV-LW-115 does not close.
- D. Clarifier outlet valve PCV-LW-115 closes, which causes clarifier inlet valve FCV-LW-100 to close, which in turn causes the steam generator blowdown pumps to trip.

Bank 1091

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: B D B A A C C B C D

Scramble Range: A - D

RO Tier: T2G2

SRO Tier: T2G2

Key Word: RAD MONITOR

Cog. Level: M 3.2/3.5

Source: M

Exam: NA02301

Test: C

Misc: LSM/LM/LSM/SC

87. 075G2.1.27 001/T2G2/T2G2/CIRC WATER/M 2.8/2.9/M/NA02301/C/RA/LSM

Which one of the following conditions will cause the unit-1 "A" Circulating Water System's screenwash pump (1-CW-P-2A) to start automatically when its control switch is in the AUTO position?

- A. Rotation of any travelling water screen for any reason.
- B. Screenwash header pressure decreases below 65 psig.
- C. Bearing Lube System PCV is fully closed.
- D. Bearing lube pressure < 25 psig.

Bank - ID: 854

Associated objective(s):

7447

List the following information associated with the circulating water screenwash pumps.

- Functions which can be performed by each pump
- Conditions which will start each screenwash pump manually

Conditions which will start each screenwash pump automatically

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: D A D C C C A D B C	Scramble Range: A - D
RO Tier:	T2G2		SRO Tier:	T2G2
Key Word:	CIRC WATER		Cog. Level:	M 2.8/2.9
Source:	M		Exam:	NA02301
Test:	C		Misc:	RA/LSM

Unit 1 is operating at 100% power.

The letdown radiation monitor is in HIGH alarm.

You request Chemistry to confirm results.

Chemistry report the dose equivalent Iodine is 50 microcuries/gram

Which one of the following should you do?

- A. Consult with Health Physics and Chemistry to determine if a change in letdown flow is desired.
- B. This indicates 1% failed fuel, trip the reactor and enter 1-E-0.
- C. This indicates 1% failed fuel, Isolate letdown.
- D. Request chemistry to take a second sample, declare the monitor inoperable.

Replaced question - based on expected operator knowledge

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

Answer: A D B C B D B A C D

Scramble Range: A - D

RO Tier: T1G1

SRO Tier: T1G1

Key Word: RCS ACTIVITY

Cog. Level: M 3.2/3.4

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LSM/GH

Which one of the following describe the interconnection of the service air and instrument air systems?

- A. the Service Air Receivers are the backup air supply for the Instrument Air Receivers.
- B. ✓ the Service Air Receivers normally supply air to the Instrument Air Receivers.
- C. the Instrument Air Receivers normally supply air to the Service Air Receivers.
- D. the Instrument Air Receivers are the backup air supply for the Service Air Receivers.

Module NCRODP17

At one time, the Service Air Receivers served as the "backup" air supply for the Instrument Air Receivers. This was accomplished by utilizing cross connect piping between both Service Air Receivers and both Instrument Air Receivers. This cross connect piping has four installed Pressure Control Valves and four associated check valves. On decreasing Instrument Air Pressure, the Pressure Control Valves use to automatically open at a predetermined set point to allow the Service Air Receivers to makeup for pressure losses in the Instrument Air Receivers. The check valves associated with the Pressure Control Valves prevent flow reversals from the Instrument Air Receivers to the Service Air Receivers. Therefore, the Instrument Air Receivers will not depressurize if the Service Air Receivers lose pressure. In order to enhance the overall reliability of the Instrument Air Subsystem, the four Pressure Control Valves have been failed open by disconnecting their Instrument Air supply lines. As such, the Service Air Receivers have become the "normal" air supply for the Instrument Air Receivers as opposed to the "backup" air supply that was originally intended.

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9
			Answer: B D B A A D D B D D Scramble Range: A - D
RO Tier:	T2G2		SRO Tier: T2G2
Key Word:	AIR SYSTEMS		Cog. Level: M 3.9/3.1
Source:	NEW		Exam: NA02301
Test:	C		Misc: LSM/LM/SC

Unit 1 receives the following alarm:

1D-C6, MOTOR FIRE PP RUNNING

A few moments later you receive a telephone call and are told that the pump was inadvertently started by an instrument technician during a surveillance. Which one of the following describes how you would secure the pump?

- A. The pump can be secured from the intake structure ONLY.
- B. The pump can be secured from the service water pump house ONLY.
- C. The pump can be secured from the unit 1 benchboard ONLY.
- D. The pump can be secured from both the unit 1 benchboard or at the service water pump house.

Lesson Plan - Fire Protection System - Fire Protection System-construction, Operation and Procedures

- 4. The motor driven fire pump can be started at the unit one main control board or in the motor driven fire pump house at the intake structure.
 - a. The pump can only be stopped at the intake structure.
- 5. Indications available to the control room operator that a pump has started
 - a. Control room annunciator 1D-C6, MOTOR FIRE PP RUNNING.
- 6. The rated discharge flow of the motor driven fire pump is 2500 gpm.
- 7. The relief valve setpoint for the motor driven fire pump is 164 psig.

EE. Diesel-driven fire pump 1-FP-P-2. [6633]

- 1. The diesel driven fire pump 1-FP-P-2 takes a suction from unit one "A" service water bay.
- 2. Conditions that will cause the pump to start or trip automatically
 - a. The diesel-driven pump starts in the AUTO mode if there is a loss of AC control power or main fire loop pressure drops to 52 psig as sensed by

PS-FP-1203 provided the local (AUTO-OFF-MANUAL A- MANUAL B- TEST) switch in the AUTO position.

b. The diesel-driven fire pump automatically stops on overspeed (approx. 1900 rpm) or low oil pressure (12 psig).

3. Manual start and stop

a. The diesel-driven fire pump can be started from the main control room unit 1 benchboard by placing the (ON, AUTO) switch in the ON position.

b. From the service water pump house the pump can be manually started using either of the following methods.

(1) By placing the local test control switch in either MANUAL A or MANUAL B and depressing the START pushbutton.

(2) The pump can also be manually started by placing the local (AUTO-OFF-MANUAL A- MANUAL B- TEST) switch in the TEST position.

c. The pump can be secured from the service water pump house ONLY.

(1) Depressing the local STOP pushbutton (normal method)

(2) Placing the local (AUTO-OFF-MANUAL A- MANUAL B- TEST) switch in the OFF position

Which one of the following describe the operation of the Personnel Air Lock Emergency Doors and equalizing valves?

- A. Interlocked to each other and to the main doors.
- B. Interlocked to each other but not to the main doors.
- C. Not interlocked to each other but are interlocked to the main doors.
- D. Not interlocked to each other or to the main doors.

VIRGINIA POWER 1-OP-18.1

NORTH ANNA POWER STATION REVISION 14

PAGE 22 OF 30

4.5 Operation Of The Personnel Air Lock Emergency Doors

CAUTION: These doors and equalizing valves are not interlocked to each other or to the main doors.

NOTE: These doors are to be used only for emergency entrance or exit from the airlock.

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

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

RO Tier: T2G3

SRO Tier:

Key Word: CONT. EXIT

Cog. Level: M 3.5/3.6

Source: NEW

Exam: NA02301

Test: R

Misc: LSM/LM/SC

When pumping the Gas Stripper, it is permissible to pump to a lower than normal level in order to minimize the number of times that the Stripper must be pumped. Which one of the following allows this to occur?

- A. Standing Order No. 215, Rev 3, Pumping of radioactive fluids to the Boron Recovery Tanks
- B. The NPDES release permit.
- C. Engineering Transmittal SE-97-119, Rev. 0, but must be approved by the Operations Manager or designee.
- D. Engineering Transmittal SE-97-119, Rev. 0, but must be approved by the Operations Manager may not be delegated.

Reference -

NEW

North Anna Power Station
Standing Order No. 215, Rev 3

I. TITLE:

Pumping of radioactive fluids to the Boron Recovery Tanks

II. BACKGROUND:

Deviation Report N-96-1770 was written on September 11, 1996 documenting the unplanned radioactive release while filling the "C" Boron Recovery Tank, 1-BR-TK-4C. The fill rate was approximately 30 gallons per minute which exceeded the capacity of the Process Vent sweep. This produced flow through the BRT vent into the Waste Solids Building. The Waste Solids Building is not a monitored release path within the NAPS license.

Task assignment MCT 96-0226 was initiated to coordinate a test of the BRT vent flow as created by the process vent system. Testing of the vent inlet flow was attempted using a differential pressure measurement across the roof vent of the boron recovery tanks. The differential pressure was too low to be measured on a manometer that has graduations of 0.1 inch (water). The calculated vent flow velocity of 1 foot/second is too low to be measured with a rotameter (REA 97-065 had been written to install throttle valves and rotometers in the vent lines from the three BRTs for utilization during filling operations). Other solutions are being sought for final resolution in accordance with MCT 96-0226.

Engineering Transmittal SE-97-119, Rev. 0 summarized the measurement of sweep gas flow rate from the boron recovery tanks to the process vent. The ET provides guidance to Design Engineering for use in developing DCP 97-110 to add isolation valves as well as liquid and gas flow measuring devices to properly monitor BRT filling activities. Without the addition of these isolation valves to ensure that all sweep gas is drawn from the on-service BRT while filling, the maximum allowable fill rate for a BRT is 5 gpm. After the DCP is completed and installed, and the OP's are properly revised, the maximum allowable fill rate will increase to 30 gpm.

III. INSTRUCTIONS:

A Miscellaneous Gas Release Permit must be completed prior to pumping from any Source to the Boron Recovery Tanks. When pumping the Gas Stripper, it is permissible To pump to a lower than normal level in order to minimize the number of times that the Stripper must be pumped.

The Unit is being maintained within the boundaries of LCO 3.1.4, LCO 3.1.5, "Shutdown Bank Insertion Limits," LCO 3.1.6, LCO 3.2.3, "AXIAL FLUX DIFFERENCE (AFD)," and LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)," . Which one of the following is ensured?

- A. The core operates within the fuel design criteria.
- B. There are no fuel cladding failures in the event of a LOCA, loss of flow, ejected rod, or other accident requiring termination by an RPS trip function.
- C. There are no fuel cladding failures in the event of a LOCA, loss of flow, ejected rod, or other accident requiring termination by an ECCS initiation.
- D. There are no fuel cladding failures in the event of a LOCA, loss of flow, ejected rod, or other accident requiring termination by an RPS trip function or an ECCS initiation.

B, C, and D are incorrect because this will not prevent cladding damage, it will ONLY minimize it.

Reference:

North Anna Units 1 and 2 B 3.1.6-2 Rev 4 (Draft 1), 06/19/01 Control Bank Insertion Limits
B 3.1.6

The control banks are used for precise reactivity control of the reactor. The positions of the control banks are normally controlled automatically by the Rod Control System, but can also be manually controlled. They are capable of adding reactivity very quickly (compared to borating or diluting).

The power density at any point in the core must be limited, so that the fuel design criteria are maintained. Together, LCO 3.1.4, LCO 3.1.5, "Shutdown Bank Insertion Limits," LCO 3.1.6, LCO 3.2.3, "AXIAL FLUX DIFFERENCE (AFD)," and LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)," provide limits on control component operation and on monitored process variables, which ensure that the core operates within the fuel design criteria.

The shutdown and control bank insertion and alignment limits, AFD, and QPTR are process variables that together characterize and control the three dimensional power distribution of the reactor core. Additionally, the control bank insertion limits control the reactivity that could be added in the event of a rod ejection accident, and the shutdown and control bank insertion limits ensure the required SDM is maintained.

Operation within the subject LCO limits will limit fuel cladding failures that would breach the primary fission product barrier and release fission products to the reactor coolant to within acceptable limits in the event of a loss of coolant accident (LOCA), loss of flow, ejected rod, or other accident requiring termination by a Reactor Trip System (RTS) trip function.

APPLICABLE SAFETY ANALYSES

The shutdown and control bank insertion limits, AFD, and QPTR LCOs are required to maintain power distributions that limit fuel cladding failures to within acceptable limits in the event of a LOCA, loss of flow, ejected rod, or other accident requiring termination by an RTS trip function.

MCS	Time:	1	Points:	1.00	Version:	0 1 2 3 4 5 6 7 8 9	
					Answer:	A B B C A B B A C B	Scramble Range: A - D
RO Tier:					SRO Tier:	T3	
Key Word:		QPTR AFD			Cog. Level:	C/A 2.7/3.9	
Source:		NEW			Exam:	NA02301	
Test:		S			Misc:	RA/LSM/SC	

Unit 1 is operating at is 97 %

At 03:00 you were informed that QPTR is 1.04.

It is now 04:00 which one of the following is the highest power level the ITS will allow for this condition?

A. 97 %

B. 94 %

C. 91 %

D. 84 %

A. This is not a 1 hour LCO, no power change is required for two hours.

B. Reflects 3% change (step change for each 1% RTP)

C. Reflects 6% change (half of change required at 2 hours)

D. Reflects required change in two hours.

Reference:

(New SRO ONLY)

QPTR

3.2.4-1 Rev 4 (Draft 1), 06/19/01

3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT RATIO (QPTR)

LCO 3.2.4 The QPTR shall be # 1.02.

MODE 1 with THERMAL POWER > 50% RTP.

TS Required ACTIONS

A. QPTR not within limit.

A.1 Reduce THERMAL POWER 3% from RTP for each 1% of QPTR > 1.00. Within 2 hours

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

Answer: ADCCADBCDB

Scramble Range: A - D

RO Tier:
Key Word: TS
Source: NEW
Test: S

SRO Tier: T3
Cog. Level: C/A 3.0/3.8
Exam: NA02301
Misc: RA/LSM/SC

95. G2.1.29 001/T3/T3/3.4/3.3/M 3.4/3.3/BANK/NA02301/C/RA/LSM

Assume the following conditions.

- Unit 1 is in mode 5 following a refueling outage
- Startup of secondary systems is in progress
- The annex supervisor assigns you to perform a valve lineup on the Main Feedwater System
- You are an operator who is currently working on step 3 of the development program

You should do which one of the following?

- A. inform the annex supervisor that you are not qualified to perform any tasks on the Main Feedwater System.
- B. perform the valve lineup only if you have completed all job performance measures on the Main Feedwater System.
- C. inform the annex supervisor that you are qualified to perform only those tasks in step 3 for which you have completed job performance measures.
- D. perform the valve lineup, but notify the annex supervisor that it will have to be independently verified.

Bank 39

ID: 3224

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: A D C C D C B D D D

Scramble Range: A - D

RO Tier: T3

SRO Tier: T3

Key Word: 3.4/3.3

Cog. Level: M 3.4/3.3

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM

96. G2.1.7 001//T3/E-0/C/A 3.7/4.4/NEW/NA02301/S/RA/LSM/SC

You are the US.

- Unit 1 was at 100 percent power.
- A SGTR occurred,
- The crew is responding to the SGTR in accordance with 1-E-3

You have just dispatch the Turbine Building Operators to Transfer Auxiliary Steam and Secure Powdex System.

Which one of the following describes the reasons that these actions must be taken at this point in this procedure?

- A. To prevent contamination of the secondary systems
- B. To prevent the release of particulates from the powdex filter elements
- C. To ensure proper steam flow is available, because the auxiliary boiler is unreliable.
- D. To prevent lifting the relief valve on the auxiliary steam system.

1-E-3 steps 1 through 6. NCRODP-92-LP-5
Procedure change

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: A D D B B D C A D A	Scramble Range: A - D
RO Tier:			SRO Tier: T3	
Key Word: E-0			Cog. Level: C/A 3.7/4.4	
Source: NEW			Exam: NA02301	
Test: S			Misc: RA/LSM/SC	

Unit 1 is at 100% power. A team of three people plan to enter containment to trouble shoot a failed letdown trip valve.

Which one of the following can an individual team member not waive prior to entry?

- A. ✓ The use of SCBA for a short duration entry.
- B. Two hours rest since last containment entry.
- C. Working in containment twice during the previous 12 hours.
- D. At least six hours of rest during the previous 24 hours.

a. correct - The use of SCBA is required if Containment pressure is greater than or equal to 9.0 psia and less than 12.0 psia. SCBA with 33 to 37 percent oxygen volume shall be used.

b, c, d these requirements are listed as those that can be waived in

source - NEW VPAP-0106 1.6a. Objective
Reference:

Topic 1.6: Subatmospheric Containment Entry (VPAP-0106) 13547

1.6a. Objective

List the following information associated with subatmospheric containment entry (VPAP-0106).

- Definition of subatmospheric containment
- Physical conditions limiting the authorization of individuals for entry into containment that may not be waived
- Conditions limiting the authorization of individuals for entry into containment that may be waived by the individual
- Minimum and maximum number of members of which the entry team shall consist
- Conditions that require the containment to be evacuated

1.6b. Content

1. Definition of subatmospheric containment

1.1. Air Pressure less than or equal to 12.0 psia.

2. Physical conditions limiting the authorization of individuals for entry into containment that may not be waived

2.1. Containment Entry Team personnel shall not have:

2.2. Obvious or known respiratory difficulties (e.g., cold, flu, sinusitis)

2.3. Respiratory or cardiovascular ailments or be under a physician's care for those ailments

3. Conditions limiting the authorization of individuals for entry into containment that may be waived by the individual.

NOTE: The following items may be waived by the Containment Entry Team members.

3.1. Worked at the Station for less than 10 continuous hours immediately before entry

3.2. At least six hours of rest in the previous 24 hours

3.3. More than two hours of light duties since the last exit from Containment

3.4. Not worked twice in containment in the previous 12 hours

4. Minimum and maximum number of members of which the entry team shall consist

4.1. The smallest Containment Entry Team shall consist of two members, one of which shall be a HP Technician.

4.2. The largest Containment Entry Team shall consist of 15 members

4.3. One member shall be the Containment Entry Team Leader.

5. Conditions that require the containment to be evacuated The Containment shall be evacuated if:

5.1. The containment evacuation alarm, Station emergency alarm, or high flux at shutdown alarm sounds

5.2.

Containment evacuation is announced over the Gai-tronics system

Assume the following conditions.

- Unit 1 is at 100% power
- Charging pump 1-CH-P-1C is tagged out
- Preventive maintenance was performed on "C" charging pump suction valve 1-CH-MOV-1270A
- An electrician is prepared to obtain test data on the valve

The valve must be returned to mid-position in accordance with the maintenance procedure. Which one of the following can perform this task?

- A. Operations department personnel are the only personnel authorized to operate the valve. Any operator qualified for the task may operate this valve.
- B. Only an operator with an active license may operate this valve.
- C. Only an operator with an active license, or an operator in training under the direct supervision of an operator with an active license may operate this valve.
- D. The electrician may manually operate the valve.

Source: Bank ID: modified - 3222

distractor analysis:

A, B and C. This valve is part of maintenance and may be operated by Maintenance Department personnel.

D. Correct answer per VPAP 1401 section 6.1.7 a.3

Associated objective(s):

13558

Explain the operating policy associated with the following activities (VPAP-1401).

- Station component operation (SOER-94-2)
- Station valve operation

- Control room notification
- Switchyard activities
- Availability of safety systems (SOER-98-1)

DOMINION VPAP-1401 REVISION 10

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6.1.7 Station Valve Operations [Commitment 3.2.3]

- a. Operations Department personnel shall be the only Station personnel authorized to manipulate valves except:
 1. Instrument valves (e.g., local isolation valves, equalizing valves, and vents and drains) may be operated by qualified Instrument Technicians. Instrument valves are normally downstream of a root valve and are used to isolate an instrument. If an instrument has only one valve for isolation, that valve shall be used as an instrument valve.
 2. Sample valves may be operated by qualified Chemistry and Radiological Control Technicians.
 3. Motor Operated Valves (MOVs) that require testing as part of a Maintenance Procedure may be operated by Maintenance Department personnel.
 4. Valves that require testing as part of an Engineering Work Request (EWR) or Design Change Package (DCP) may be operated by Testing personnel.
 5. Fire Protection valves may be operated by Safety and Loss Prevention personnel with the concurrence of the Operations Shift Supervisor.
 6. Valves that are used to control a process (not related to plant operations) may be operated by individuals responsible for that process, as determined by Operations management.
- b. Valve operation shall be in accordance with approved Station procedures, skill of the craft, or if action is required to protect Station equipment or personnel.
- c. A procedure or process that directs operation of a valve shall include sufficient Shift Supervisor notification.
- d. Valves that have Danger Tags attached to them shall not be operated.

Unit 2 is at 74% reactor power. Severe thunderstorms are in the area and the unit trips for no apparent reason. The crew enters 2-E-0.

The Reactor was verified tripped.

The Turbine Trip Push buttons were manually depressed.

Turbine stop valves FAILED to close.

Which one of the following describes your next two Immediate action?

- A. Put Both EHC pumps in pull to lock, then reset reheaters.
- B. Put Both EHC pumps in pull to lock, then verify Generator output breaker open.
- C. Manually run back turbine, then Put Both EHC pumps in pull to lock.
- D. Put Both EHC pumps in pull to lock , then manually run back turbine.

reference - 1-E-0 rev 27 page 2 of 22

a. Put Both EHC pumps in pull to lock, the turbine is not tripped so turbine must be run back

b. generator output breakers are after first two steps

c turbine is runback only if Put Both EHC pumps in pull to lock fails to close turbine stop valves. Stem states assume no other failures

d. Correct answer

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: D A B A A D B C B D

Scramble Range: A - D

RO Tier: T3

SRO Tier: T3

Key Word: CONTROLS

Cog. Level: C/A 4.0/3.5

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LSM/SC

Unit one is in refueling. 1-OP-4.1 is in effect.

While performing 1-OP-4.1, it becomes necessary to perform two steps out of sequence. Performing these steps requires a Completion Signature. According to 1-OP-4.1, which one of the following groups have been granted Completion Signature authority to authorize these steps to be completed out of sequence?

- A. Refueling SRO, Superintendent of Operations, and Shift Supervisor.
- B. Fueling Handling Supervisor and Supervisor Operations Support.
- C. Refueling SRO, Unit SRO, and Fuel Handling Supervisor.
- D. Refueling SRO, Unit SRO, Fuel Handling Supervisor, Supervisor Operations Support, Superintendent of Operations, and Shift Supervisor.

VIRGINIA POWER 1-OP-4.1

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4.22 Operations NOT requiring the completion of preceding steps may be done out of sequence. The Fueling Handling Supervisor or Supervisor Operations Support must initial and explain any steps done out of sequence on Attachment 5, Step Deviation Comment Sheet. (Steps done concurrently will NOT be considered out of sequence.) Completion Signature authority is granted to the Fueling Handling Supervisor or Supervisor Operations Support only. Unless otherwise noted, other signature authority may be delegated.

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

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

RO Tier:

SRO Tier: T3

Key Word: REFUELING

Cog. Level: M 2.5/3.7

Source: NEW

Exam: NA02301

Test: S

Misc: RA/LSM

Given the following:

- Committed Dose Equivalent (CDE) is 2525 mr
- Deep Dose Equivalent (DDE) is 2335 mr
- Lens Dose Equivalent (LDE) is 744 mr
- Committed Effected Dose Equivalent (CEDE) is 405 mr
- Total Organ Dose Equivalent (TODE) is 4865 mr
- Shallow Dose Equivalent (SDE) is 435 mr
- Maximum Extremity (ME) is 6565 mr

Which one of the following is the Total Effective Dose Equivalent?

- A. 5270 mr
- B. 15249 mr
- C. 6444 mr
- D. 2740 mr.

Source Bank - 62- ID: 3849

Associated objective(s):

13583

List the following information associated with the radiation protection program (VPAP-2101).

- 10-CFR-20 dose limits

Administrative dose limits

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: D A A D A C C A A

Scramble Range: A - D

RO Tier: T3

SRO Tier: T3

Key Word: 2.6/3.0

Cog. Level: C/A 2.6/3.0

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM

An accident an NAPS results in a radioactive plume passing over the switchyard. An operator stationed at the switchyard is exposed to 11 REM/hr whole body for a 2-hour period.

Which one of the follow correctly describes the operator? This operator is in the:

- A. low population zone and has exceeded 10 CFR100 Limits.
- B. low population zone and has not exceeded 10 CFR100 Limits.
- C. exclusion area and has exceeded 10 CFR100 Limits.
- D. exclusion area and has not exceeded 10 CFR100 Limits.

Switch yard is within the exclusion area boundary and the 22 REM Dose is with-in the the 25 REM legal limit.

Question replaced at request of utility- New question more closely reflects information that is required operator knowledge.

When application of process or engineering controls to keep radioactive material in air below values that constitute an Airborne Radioactivity Area are not practicable, then VPAP-2102 directs other controls shall be:

implemented to maintain the total effective dose equivalent (TEDE) ALARA.

implemented to maintain the deep Dose Equivalent (DDE) ALARA.

Implemented through the use of a respiratory device with a higher protection factor (PF) than the peak concentration may be selected to be consistent with TEDE ALARA

Implemented through the use of a respiratory device with a higher protection factor (PF) than the peak concentration may be selected to be consistent with DDE ALARA.

B & D incorrect because of DDE

B&C incorrect because of higher PF

Source - New

VPAP-2102 REVISION 8 PAGE 16 OF 65

6.3.1 TEDE ALARA Evaluation

- a. Radiation exposure control measures should be designed, selected, implemented, and maintained to ensure that anticipated and actual doses are ALARA.
- b. When application of process or engineering controls to keep radioactive material in air below values that constitute an Airborne Radioactivity Area are not practicable, then other controls shall be implemented to maintain the total effective dose equivalent (TEDE) ALARA. The use (or non-use) of a respiratory device with a lower protection

factor (PF) than the peak concentration may be selected to be consistent with TEDE ALARA. A Respiratory Hazards evaluation should be a component of a TEDE ALARA Evaluation.

c. C-HP-1042.210, Respiratory Hazards Evaluation And Respiratory Protection Selection, provides several methods to evaluate respiratory hazards due to airborne radioactive material if historical conditions are not applicable or unavailable. If one of these methods is used in the TEDE ALARA Evaluation process, list methods used in part 2.1 of TEDE ALARA Evaluation (Attachment 2) and attach worksheet from C-HP-1042.210 to the completed TEDE ALARA Evaluation.

d. A TEDE ALARA Evaluation shall be done if any of the following conditions are met. Documented evaluations for use (or non-use) of individual respiratory protection shall be performed on TEDE ALARA Evaluation (Attachment 2) when activity exposure projections meet one or more of the following:

- An individual estimated DDE for an RWP job while using respirator will exceed 0.5 rem
- Ratio of dose rate, mrem/hr, to DAC fraction is greater than 50 and without respirator use, individual DAC-Hour exposure would exceed 10 DAC-Hours
- Requested by Station ALARA Coordinator

e. HP Operations should initiate TEDE ALARA Evaluation (Attachment 2) based on the above criteria, unless deemed appropriate to do so by the Station ALARA Coordinator.

f. If initiated outside the Station ALARA Staff, forward TEDE Evaluation form to the Station ALARA Staff for completion.

Which one of the following are correct concerning EOP immediate actions?

- A. EOP Immediate Action Steps SHOULD be performed from memory.
The Immediate Action Steps of E-0 SHALL be performed in sequence or sequentially.
- B. EOP Immediate Action Steps SHOULD be performed from memory.
The Immediate Action Steps of E-0 and FR-S.1 ONLY SHALL be performed in sequence or sequentially.
- C. EOP Immediate Action Steps SHALL be performed from memory.
The Immediate Action Steps E-0, FR-S.1, and ECA-0.0 ONLY SHALL be performed in sequence or sequentially.
- D. EOP Immediate Action Steps SHALL be performed from memory and SHALL be performed in sequence or sequentially.

Solution. B

A - Immediate Action Steps of FR-S.1 shall be performed in sequence or sequentially

B - correct

C - EOP immediate actions SHOULD not SHALL be performed from memory, and only The first four Immediate Action Steps of E-0 and the Immediate Action Steps of FR-S.1 must be performed sequentially.

D - EOP immediate actions SHOULD not SHALL be performed from memory, and only The first four Immediate Action Steps of E-0 and the Immediate Action Steps of FR-S.1 must be performed sequentially

Reference:

OPAP-0002 REVISION 7 PAGE 24 OF 41

e. Immediate Action Steps

1. EOP Immediate Action Steps should be performed from memory. Immediate Action Steps are designated by brackets around the individual step number in the applicable procedures (e.g., [1.])

2. The first four Immediate Action Steps of E-0 and the Immediate Action Steps of FR-S.1 shall be performed in sequence or sequentially. All other Immediate Action steps do not have specific step sequence requirements.

3. Immediate Action Steps that have been performed shall be verified when the EOP is entered.

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

Answer: B C B B D D C C D C

Scramble Range: A - D

RO Tier: T3
Key Word: IMMEDIATE ACTIONS
Source: NEW
Test: C

SRO Tier: T3
Cog. Level: M 4.3/4.6
Exam: NA02301
Misc: RA/LSM/SC

104. G2.4.10 001/T3/T3/3.0/3.1/M 3.0/3.1/NEW/NA02301/C/RA/LSM/SC

1J EDG has just started. Following the start you receive a "Starting Air Pressure Low" alarm. Which one of the following is the most probable cause?

- A. This is an expected alarm when the EDG starts.
- B. Air compressor control switch is in the off position.
- C. Failure of the 1-EG-PS-1JA to start air compressor.
- D. Refrigerant air dryer line is frozen.

- a. This is an expected alarm for a normal start of the EDG.
- b. Would cause alarm, however the alarm would have come in before the EDG would have started.
- c. Would cause alarm, however the alarm would have come in before the EDG would have started.
- d. Would cause alarm, however the alarm would have come in before the EDG would have started.

Source - NEW1-AR-21, revision 15, page 3 of 36

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

Answer: A C C C A C D C A A

Scramble Range: A - D

RO Tier: T3
Key Word: 3.0/3.1
Source: NEW
Test: C

SRO Tier: T3
Cog. Level: M 3.0/3.1
Exam: NA02301
Misc: RA/LSM/SC

105. G2.4.16 001/T3/T3/CSFST/M 3.0/4.0/M/NA02301/C/RA/LSM/SC

Which one of the following correctly lists the CSF in DESCENDING order of priority?

- A. Subcriticality, Core Cooling, Heat Sink, RCS Inventory, Containment, RCS Integrity.
- B. Subcriticality, Containment, Heat Sink, RCS Integrity, Core Cooling, RCS Inventory.
- C. ✓ Subcriticality, Core Cooling, Heat Sink, RCS Integrity, Containment, RCS Inventory.
- D. Subcriticality, Containment, Heat Sink, RCS Inventory, Core Cooling, RCS Integrity.

Source BANK Modified 1990/11/26 V. C. Summer 1

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: C A C C B B A B D A	Scramble Range: A - D
RO Tier:	T3		SRO Tier:	T3
Key Word:	CSFST		Cog. Level:	M 3.0/4.0
Source:	M		Exam:	NA02301
Test:	C		Misc:	RA/LSM/SC

Which one of the following is correct concerning Safety System Resets within EOPs?

- A. If the system (e.g., Safety Injection, Containment Isolation) has NOT been reset once, then the Crew shall reset the system when directed by procedure if it has actuated. This action is not required if the procedure step includes the words "if necessary."
- B. Once the system (e.g., Safety Injection, Containment Isolation) has been reset once, it is necessary to reposition the reset switches every time a procedure directs a reset. Verifying that the applicable status light still reflects the reset condition is not acceptable. If it does not, another reset shall be performed.
- C. If the system (e.g., Safety Injection, Containment Isolation) has NOT been reset once, then the Crew shall reset the system when directed by procedure whether it has actuated or not. This action is not required if the procedure step includes the words, "if necessary."
- D. Once the system (e.g., Safety Injection, Containment Isolation) has been reset once, it is NOT necessary to reposition the reset switches every time a procedure directs a reset. Verify that the applicable status light still reflects the reset condition. If it does, another reset shall be performed.

Solution - c

- a. Does not have to have actuated
- b. It is not necessary to reset switches
- c. correct answer
- d. if it does not, another reset shall be performed

NEW

OPAP-0002 REVISION 7 PAGE 24 OF 41

d. Safety System Resets

1. If the system (e.g., Safety Injection, Containment Isolation) has not been reset once, then the Reactor Operator shall reset the system when directed by procedure with concurrence from the cognizant SRO whether it has actuated or not. This action is not required if the procedure step includes the words if necessary.

2. Once the system has been reset once, it is not necessary to reposition the reset switches every time a procedure directs a reset. Verify that the applicable status light still reflects the reset condition. If it does not, another reset shall be performed.

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: C A C A A A B A A A	Scramble Range: A - D
RO Tier:	T3		SRO Tier:	T3
Key Word:	RESET		Cog. Level:	M 2.8/3.8
Source:	NEW		Exam:	NA02301
Test:	C		Misc:	RA/LSM/SC

Which of the following station procedures must be initiated if the Hathaway annunciators, the Prodac-250 computer, the PCS computer, and the ERF computer systems are all inoperable during a unit transient?

- A. Emergency Plan Implementing Procedures (EPIPs).
- B. Annunciator Response Procedures (ARs).
- C. Emergency Operating Procedures (EOPs).
- D. Critical Status Function Trees

Source - bank ID: 634

Associated objective(s):

7843

Identify the appropriate controlling station procedure to be used in response to a loss of the Hathaway annunciators, the Prodac-250 computer, and the ERF computer system during a unit transient.

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

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

RO Tier: T3

SRO Tier: T3

Key Word: EPIPS

Cog. Level: M 3.3/3.5

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM

108. G2.4.6 001/T3/T3/QUENCH SPRAY/C/A 3.1/4.0/BANK/NA02301/C/RA/LSM

Given a spurious CDA, the operating crew uses E-1, Attachment #3, "Termination of Quench Spray," as a guide. Which of the following represents the correct sequence for securing Quench Spray?

- A. Reset CDA; stop the QS pumps; close the QS pump discharge valves; then close the CAT discharge valves.
- B. Reset CDA; stop the QS pumps; then close the CAT discharge valves; and then the QS pump discharge valves.
- C. Stop the QS pumps; close the CAT discharge valves; then the QS pump discharge valves.
- D. Stop the QS pumps; close the QS pump discharge valves; then reset CDA.

Source - Bank ID: 4074

Associated objective(s):

13593

Explain the guidelines for using the following types of procedures (OPAP-0002; SER-1999-2).

- Operating procedures
- Emergency operating procedures
- Abnormal procedures

Annunciator response procedures

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

Answer: A B B D C B D B B B

Scramble Range: A - D

RO Tier: T3

SRO Tier: T3

Key Word: QUENCH SPRAY

Cog. Level: C/A 3.1/4.0

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM

Unit 1 is recovering from a small break LOCA.

- ES-1.2, "Post-LOCA Cooldown and Depressurization", is in use.
- All ECCS equipment is operating properly.
- Depressurization of the RCS has commenced.
- Pressurizer level has just risen rapidly from off-scale low to 50%.

Which one of the following is the cause of the rapid increase in pressurizer level?

- A. A pressurizer vapor space leak has developed.
- B.✓ Voiding is occurring in the reactor vessel head.
- C. SI flow is refilling the pressurizer.
- D. Temperature variations are affecting the reference leg of the pressurizer level instrument.

REFERENCE

ES-1.2 - Post-LOCA Cooldown and Depressurization, Caution prior to Step 12.

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9
			Answer: B A B A C B D A A B Scramble Range: A - D
RO Tier:	T2G2		SRO Tier: T2G2
Key Word:	2.8/3.2		Cog. Level: C/A 3.3/3.7
Source:	NEW		Exam: NA02301
Test:	C		Misc: RA/LSM/SC

- Unit 1 has had a Reactor Trip and Safety Injection due to a main steam line break in containment.
- "B" S/G has boiled dry and pressure is approximately 50 psig.
- "A" S/G narrow range level is 20% and slowly rising.
- "C" S/G narrow range level is 10% and slowly rising.
- Total AFW Flow is 300 gpm.
- Pressurizer level is 19% and rising.
- Containment pressure is 21 psia and slowly lowering.
- RCS subcooling is stable at 88 °F.
- RCS pressure is 1800 psig and slowly rising.

Which one of the following sets of conditions will allow the crew to transition from 1-E-1 to 1-ES-1.1 "SI Termination"?

- A. One intact steam generator increases to greater than 11 %, and Pressurizer level increases to 45%.
- B. Pressurizer level increases to 45%, and AFW flow is raised to 345 gpm.
- C. One intact steam generator increases to 23%, and AFW flow is raised to 350 gpm.
- D. RCS Subcooling is raised to 100 °F, and Pressurizer level increases to 21%.

Modified from North Anna Bank question # 5019
Associated Objective 13683.

(Adverse Numbers)

- A. Incorrect, Steam generator level is required to be > 22%, or AFW flow > 340 gpm.
- B. Correct, Pressurizer level must be 40% or greater and AFW Flow > 340 gpm.
- C. Incorrect, SG level satisfies one condition, but pressurizer level is still not 40% or greater.
- D. Incorrect, Pressurizer level must be 40% or greater.

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

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

RO Tier: T1G2

SRO Tier:

Key Word: SI TERMINATION

Cog. Level: C/A 4.0/4.3

Source: M

Exam: NA02301

Test: R

Misc: RA/GWL/SC

Unit one is in Post LOCA cooldown. The current temperature is 345 °F. A mechanical failure of one train of SI has just occurred. The other train is available.

Which one of the following describe the TS LCO that apply to this condition:

- A. LCO 3.5.2.
- B. LCO 3.4.7.
- C. LCO 3.9.5.
- D. No LCO's apply.

No LCOs apply only one train is required in mode 4

North Anna Units 1 and 2 B 3.5.3-2 Rev 0 (Draft 1), 06/05/00
 ECCS—Shutdown
 B 3.5.3
 BASES
 LCO

During an event requiring ECCS actuation, a flow path is required to provide an abundant supply of water from the RWST to the RCS via the ECCS pumps and their respective supply headers to each of the three cold leg injection nozzles. In the long term, this flow path may be switched to take its supply from the containment sump and to deliver its flow to the RCS hot or cold legs.

APPLICABILITY In MODES 1, 2, and 3, the OPERABILITY requirements for ECCS are covered by LCO 3.5.2.

In MODE 4 with RCS temperature below 350....F, one OPERABLE ECCS train is acceptable without single failure consideration, on the basis of the stable reactivity of the reactor and the limited core cooling requirements.

In MODES 5 and 6, unit conditions are such that the probability of an event requiring ECCS injection is extremely low. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops—MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops—MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation—High Water Level," and LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation—Low Water Level."

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

Answer: D B C B C C D A A B

Scramble Range: A - D

RO Tier:
Key Word: TS
Source: NEW
Test: S

SRO Tier: T1G1
Cog. Level: C/A 3.5/4.0
Exam: NA02301
Misc: RA/LSM

112. WE03EA2.1 001//T1G2/E-1/M 3.4/4.2/NEW/NA02301/S/RA/LSM

Unit 1 has just transitioned from 1-E-1. Loss of Reactor or Secondary Coolant. The crew has entered 1-ES-1.2, Post LOCA Cooldown and depressurization. At step 5 in the procedure you are directed to place the PRZR heaters in Pull to Lock. Which one of the following is the reason for this?

- A. To Minimize heat load during the cooldown.
- B. To prevent potential overload on any running EDG.
- C.✓ To prevent damaging the heaters.
- D. To prevent pressure transients.

Caution before step five reminds the operator that the PRZR heaters may not be covered at this point and that the heaters should not be energized until the heaters are covered.

NEW

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: C B B B B D D C A C

Scramble Range: A - D

RO Tier:

SRO Tier: T1G2

Key Word: E-1

Cog. Level: M 3.4/4.2

Source: NEW

Exam: NA02301

Test: S

Misc: RA/LSM

Given the following conditions:

- Unit 1 was operating at 100% power.
- An earthquake resulted in a rupture of the 40" main steam manifold.
- The operating crew was unable to close the MSTVs or the MSNRVs and has transitioned to 1-ECA-2.1, "UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS".
- A report comes in from the MSVH that "C" MSNVR has been closed.
- The RO observes "C" SG pressure increasing slowly.

Based on the above information, the operating crew should:

- A. transition to 1-E-2, "FAULTED STEAM GENERATOR ISOLATION".
- B. transition to 1-E-3, "STEAM GENERATOR TUBE RUPTURE.
- C. remain in 1-ECA-2.1 until RHR is in service.
- D. remain in 1-ECA-2.1 until SI is terminated.

1996/01/29

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: A C A A A A D D B C	Scramble Range: A - D
RO Tier:	T1G2		SRO Tier:	T1G2
Key Word:	ECA-2.1		Cog. Level:	C/A 3.6/3.9
Source:	BANK		Exam:	NA02301
Test:	C		Misc:	RA/LSM/SC

Given the following conditions:

- Unit 1 was operating at 100 percent power.
- You were in the MCR restroom when an event occurred.
- 30 seconds after hearing the annunciators, you are in the OATC area and observe the following annunciators lit on the "first-out panels": (NOTE: These are the ONLY annunciators lit on their respective panels.)
 - D-B3, "PZR LO PRESS SI-RX TRIP" is yellow.
 - D-C1, "NIS PWR RGE HI -HI SP RX TRIP" is red.
 - D-E4, "NIS PWR RGE HI RATE RX TRIP" is white.
 - D-F2, "HI STM LINE dP-SG 1B LO SI-RX TRIP" is yellow.
 - D-G1, "STM GEN 1A LO-LO LEVEL RX TRIP" is white.
 - D-G2, "STM GEN 1B LO-LO LEVEL RX TRIP" is white.
 - D-G3, "STM GEN 1C LO-LO LEVEL RX TRIP" is white.
 - D-H2, "STM GEN 1B LO LEV/STM FWF MISMTCH" is white.
 - E-D1, "REACTOR TRIPPED TURB TRIP" is red.
 - E-D4, "AMSAC INITIATED" is white.
 - E-C3, "TURB STOP VV LO TURB TRIP" is white.
 - E-D3, "INTER-RH STOP VV LO TURB TRIP" is white.
 - E-F2, "FEED WTR PP BKRS OPEN TURB TRIP" is white.

Based on the above information, which one of the following has occurred?

- A. large steam break inside containment.
- B. steam break outside containment.
- C. large break LOCA inside containment.
- D. LOCA outside containment.

BANK 1996/01/29
VISION OBJ. 12025, SIMULATOR SETUP
Reactor trip status panel

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: B B A D D C C D C C	Scramble Range: A - D
RO Tier:			SRO Tier: T1G1	
Key Word: STEAM BREAK			Cog. Level: C/A 3.4/4.3	
Source: BANK			Exam: NA02301	
Test: S			Misc: RA/LSM	

115. WE04EK2.1 002/T1G2//E-3/C/A 3.6/4.0/NEW/NA02301/R/RA/LSM

According to 1-E-3, which one of the following is the reason that feed flow to any Ruptured SG that is faulted should remain isolated unless needed for cooldown?

- A. To prevent excessive RCS cooldown.
- B. To Prevent spread of contamination.
- C. To prevent Dilution of the RCS.
- D. To prevent loss of feed flow inventory.

Note prior to step 4 1-E-3, rev 19

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

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

RO Tier: T1G2

SRO Tier:

Key Word: E-3

Cog. Level: C/A 3.6/4.0

Source: NEW

Exam: NA02301

Test: R

Misc: RA/LSM

Operators are responding to three faulted steam generators.

The heat sink status tree has a red terminus. Which one of the following is the reason that the operators should not perform any steps in 1-FR-H.1?

Operator actions taken in ECA 2-1 have:

- A. reduced total AFW flow.
- B. reduced RCS pressure.
- C. increased total AFW flow.
- D. increased RCS pressure.

NEW

Reference 1-FR-H.1, Revision 13, page 2 of 15

Note prior to step one indicated that procedure cannot be entered if AFW flow is less than 340 because of operator actions.

- a. correct answer
- b. RCS only applies if greater than any NON-Faulted SG Pressure
- c. RCS only applies if greater than any NON-Faulted SG Pressure
- d. RCS only applies if greater than any NON-Faulted SG Pressure, RCP pump status does not apply here

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

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

RO Tier: T1G2

SRO Tier: T1G2

Key Word: 3.9/4.5

Cog. Level: M 3.9/4.5

Source: NEW

Exam: NA02301

Test: C

Misc: RA/LSM/SC

While responding to Inadequate Core Cooling in accordance with 1-FR-C.1, which one of the following describes how core recovery by SI accumulator injection is initiated?

- A. Dumping steam to the condenser and initiating forced two phase flow using the RCPs.
- B.✓ Dumping steam to the condenser or using SG PORVs.
- C. Restarting the RCPs to sweep steam voids and nitrogen gas from the core.
- D. Increasing nitrogen pressure on the top of the SI accumulators to increase the injection rate into the RCS.

NCRODP-95.6, Revision 2, Page 3.9, Step 11, Objective D.

1992 bank

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

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

RO Tier: T1G1

SRO Tier: T1G1

Key Word: CORE COOLING

Cog. Level: C/A 3.8/4.1

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM

118. WE08EK1.2 001/T1G1/T1G1/PTS/M 3.4/4.0/BANK/NA02301/C/RA/GWL/SC

- Unit 2 has experienced a Main Steam Line Break
- All systems operated as designed.
- The crew responded in accordance with the emergency operating procedures, and is currently in 2-FR-P.1 "Response to Imminent Pressurized Thermal Shock".
- The crew has been directed by the procedure to perform a "SOAK".

Which one of the following evolutions can be performed during the soak?

- A. Warm up the RHR System and place it in service.
- B.✓ Un-isolate charging pump recirculation.
- C. Raise steam generator water levels to 50% and secure AFW pumps.
- D. Energize the pressurizer heaters.

North Anna Exam bank questions #3109 and 3585.

A. Incorrect, warming up the RHR system could cooldown the RCS even more, and placing it in service would cooldown the RCS.

B. Correct, unisolating the charging pump recirculation would tend to lower RCS pressure, and would not raise pressure or cause a cooldown.

C. Incorrect, raising steam generator water levels would cause an RCS cooldown.

D. Incorrect, Energizing the pressurizer heaters would raise RCS pressure resulting in increased thermal stresses.

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

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

RO Tier: T1G1

SRO Tier: T1G1

Key Word: PTS

Cog. Level: M 3.4/4.0

Source: BANK

Exam: NA02301

Test: C

Misc: RA/GWL/SC

119. WE09EA1.2 001/T1G1/T1G1/NATURAL CIRC/M 3.6/3.9/BANK/NA02301/C/RA/GWL/SC

- A natural circulation cooldown is in progress on Unit 1.
- Steam Generator feed flow rate is increased.
- Assume all parameters are within limits.

Which one of the following describes how this will affect the natural circulation flow rate?

- A. Natural circulation flow rate will decrease.
- B. Natural circulation flow rate will not be affected.
- C. Natural circulation flow rate will be stopped, and will not recommence.
- D. Natural circulation flow rate will increase.

From Farley exam bank.

North Anna associated objective 12484 and 13435.

A. Incorrect, slowly increasing steam flow from the steam generators will increase natural circulation flow.

B. Incorrect, Natural circulation flow will be affected.

C. Incorrect, Natural circulation flow may be stopped momentarily if the steam demand was increased to much, but would re-establish it self, at a higher flow rate.

D. Correct, increasing the steaming rate on the S/G will increase the natural circulation flow rate.

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

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

RO Tier: T1G1

SRO Tier: T1G1

Key Word: NATURAL CIRC

Cog. Level: M 3.6/3.9

Source: BANK

Exam: NA02301

Test: C

Misc: RA/GWL/SC

Given the following conditions:

- A LOCA has occurred
- A CDA signal was received
- The current containment pressure is 25 psia and decreasing
- The RWST level is 24 percent
- CETC's are 430 degrees F and decreasing

Which ONE of the following describes the action to be taken by the operator?

- A. Momentarily place the spray actuation Reset Train A and B Switches in RESET to reset the CDA signal.
- B. Verify changeover from injection mode to recirculation mode or shift manually if not yet accomplished.
- C. Reset the CDA signal and stop the Quench Spray pumps to let the pressure decay naturally and conserve resources.
- D. Refill the RWST from the CVCS system and continue to spray down containment until pressure is 12 psia.

1992/02/24

L.P. NCRODP-91-1-LP-3, Rev. 4, page 13, Objective B

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9
			Answer: B D A B D C B D D A Scramble Range: A - D
RO Tier:	T1G2	SRO Tier:	T1G2
Key Word:	HEAT REMOVAL	Cog. Level:	C/A 3.9/4.3
Source:	BANK	Exam:	NA02301
Test:	C	Misc:	RA/LSM/SC

121. WE12EK3.3 001/T1G1//FEEDWATER/M 3.5/3.7/M/NA02301/R/RA/GWL/SC

- Assume the following plant conditions:

- All steam generators are depressurizing uncontrollably.
- Narrow range level in each steam generator is off scale low.

Which one of the following correctly describes how feedwater flow to the steam generators should be controlled, and why this is necessary?

- A. Maintain a minimum of 340 gpm total to all steam generators, this is the minimum flow required to ensure decay heat removal is sufficient to prevent fuel damage.
- B. Maintain a minimum of 100 gpm to each steam generator, this will minimize thermal shock effects if feedwater flow is increased.
- C. Maintain a minimum of 340 gpm to all steam generators not isolated, this will prevent overheating of the AFW pumps due to running at low flow conditions for long periods of time.
- D. Maintain a minimum of 100 gpm total to all steam generators, this is the minimum flow required to prevent the Reactor Coolant System from re-pressurizing.

Modified from North Anna Bank questions, # 3055,2885, and 3767.
Associated objectives 13842, and 13843.

A. Incorrect, While in ECA-2.1 AFW flow is to be limited to 100 gpm for each generator. 340 gpm is the correct flow rate for other ERGs, and the reason is correct for those procedures.

B. Correct, 100 gpm should be delivered to each steam generator, and this is the correct reason listed in the WOG background documents.

C. Incorrect, This is the incorrect amount, while this would prevent overheating of the AFW pumps, this is not the reason that flow is limited in ECA 2.1.

D. Incorrect, 100 gpm total to all generators is not correct(100 to each S/G is required), the RCS will re pressurize when cooldown (shrinkage of the RCS can be made up by the Safety Injection systems.

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

Answer: B C C A D A D A D C

Scramble Range: A - D

RO Tier: T1G1

SRO Tier:

Key Word: FEEDWATER

Cog. Level: M 3.5/3.7

Source: M

Exam: NA02301

Test: R

Misc: RA/GWL/SC

E-1, Loss Of Reactor Or Secondary Coolant, Step 3, CHECK INTACT SG LEVELS, reads:

- a) Narrow range level - GREATER THAN 11% [23%]
- b) Control feed flow to maintain narrow range level between 23% and 50%

Which one of the following is the REASON or BASIS for these actions?

To maintain RCS Heat Sink and . . .

- A. minimize pressurized thermal shock.
- B. establish symmetric cooling of the RCS.
- C. maintain the SGs in a wet condition.
- D. to establish conditions to prevent core reflux boiling.

1-E-1 Rev 15, Owners Group Guidelines,
NCRODP-95.4, Revision 4, Pages 5.11 & 5.12, Objective D.
MODIFIED BANK 1992

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

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

RO Tier:

SRO Tier: T1G1

Key Word: SG LEVEL

Cog. Level: C/A 3.0/4.3

Source: M

Exam: NA02301

Test: S

Misc: RA/LSM

123. WE14EA1.3 001/T1G1/T1G1/CONTAINMENT/C/A 3.3/3.8/M/NA02301/C/RA/GWL/SC

- A Reactor Trip and Safety Injection has occurred on Unit 1
- CDA has not actuated.
- All Steam Generator Pressures are stable at approximately 800 psig.
- Containment pressure as indicated on recorder 1-LM-PR-110B is 29 psia and slowly decreasing.
- 1-E-0, "Reactor Trip or Safety Injection", is in effect the crew is at the "CHECK IF CDA IS REQUIRED" step.

Which one of the following correctly describes the action that the crew should take?

- A. Start the quench spray pumps and open pump discharge and chemical addition tank valves.
- B. Manually Acuate CDA, and ensure CDA actions are complete.
- C. Continue in 1-E-0, (no action is required)
- D. Go to 1-FR-Z.1, "Response to High Containment Pressure".

Modified From North Anna Bank Question 3312,3320 and 3861. Associated objective s12460, and 12467.

A. Incorrect, this would be the correct action that would be required if containment pressure exceeded 20 psia and a CDA was not required.

B. Correct, if containment pressure exceeded 28 psia a CDA should have occurred and the crew should initiate a CDA.

C. Incorrect, Actions must be taken to address this critical safety concern.

D. Incorrect, FR-Z.1 has steps that will address these conditions, but should not be used until E-0 is exited.

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

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

RO Tier: T1G1

SRO Tier: T1G1

Key Word: CONTAINMENT

Cog. Level: C/A 3.3/3.8

Source: M

Exam: NA02301

Test: C

Misc: RA/GWL/SC

124. WE15EK1.1 001/T1G3/T1G3/FLOODING/C/A 2.8/3.0/NEW/NA02301/C/RA/LSM/SC

Unit 1 control room receives reports of flooding in the auxiliary building. The crew enters 0-AP-39.2. Which one of the following systems could be damaged by this flooding?

- A. ✓ Charging.
- B. Pressurizer Spray.
- C. Containment Ventilation.
- D. Pressurizer level Control.

New

Per 0-AP-39.2 Revision 6, Page 2. Auxiliary Building Flooding could cause a loss of charging.

MCS	Time: 1	Points: 1.00	Version: 0 1 2 3 4 5 6 7 8 9	
			Answer: A A A A D A C A B C	Scramble Range: A - D
RO Tier:	T1G3		SRO Tier:	T1G3
Key Word:	FLOODING		Cog. Level:	C/A 2.8/3.0
Source:	NEW		Exam:	NA02301
Test:	C		Misc:	RA/LSM/SC

125. WE16EK1.3 001/T1G2/T1G2/WASTE GAS/M 3.0/3.3/BANK/NA02301/C/RA/LSM/SC

Which one of the following statements is correct if a high-high alarm is initiated by radiation monitor 1-RM-VG-101, "Process Vent Particulate Rad Monitor" during a waste gas decay tank release?

- A. 1-GW-FCV-101 (decay tanks effluent flow control) will close automatically and must be reset locally before it can be reopened.
- B. 1-GW-TV-102A (containment vacuum pump discharge) will close automatically, and will reopen when the alarm condition clears and the OPEN pushbutton is depressed.
- C. 1-GW-TV-102A (containment vacuum pump discharge) will close automatically and must be reset locally before it can be reopened.
- D. 1-GW-FCV-101 (decay tanks effluent flow control) will close automatically and will reopen automatically when the alarm condition clears and the CLOSE pushbutton is depressed.

Bank 16 ID: 3812

MCS Time: 1 Points: 1.00

Version: 0 1 2 3 4 5 6 7 8 9

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

RO Tier: T1G2

SRO Tier: T1G2

Key Word: WASTE GAS

Cog. Level: M 3.0/3.3

Source: BANK

Exam: NA02301

Test: C

Misc: RA/LSM/SC