

Draft Submittal

(Pink Paper)

1. Senior Reactor Operator Written Exam

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STATION - EXAM 2002-301**

50-395

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1. 001AK1.05 1

The following conditions exist:

- Reactor power = 17%
- Control Bank D is at 137 steps withdrawn
- Rod control is in AUTO
- PT-446 Turbine Impulse Pressure is selected for input to the rod control system

If PT-446 fails HIGH, how will the rods in Control Bank D respond?

- A. Move inward at 48 steps per minute.
- B. Move inward at 72 steps per minute.
- C. Move outward at 72 steps per minute.
- D. Move outward at 48 steps per minute.

REF: Kewaunee Exam 1997

IC-5 Rod Control

TB-5 Turbine Control and Protection System

Distracter A - 48 SPM is the speed for manual operation of control banks and wrong direction.

Distracter B - inward movement is a misapplication of PT-485 failing high.

Answer C - correct maximum speed of 72 SPM in the outward direction

Distracter D - 48 SPM is the speed for manual operation of control banks.

2. 001K1.03 1

A problem with the rod control system requires checking several printed circuit cards in a power cabinet. The affected power cabinet repairs are to be made by supplying power from the DC Hold cabinet.

Which statement describes the proper operation for DC Hold and the associated response in the event of a reactor trip?

- A. Only ONE control rod bank group can be placed on DC Hold, and these rods will drop only if the switch is taken to OFF at the DC Hold cabinet in the event of a reactor trip.
- B. ONE control rod bank group and ONE shutdown bank group can be placed on DC Hold, and these rods will automatically drop in the event of a reactor trip.
- C. ONE control rod bank group and ONE shutdown bank group can be placed on DC Hold, and these rods will drop only if the switch is taken to OFF at the DC Hold cabinet in the event of a reactor trip.
- D. Only ONE control rod bank group can be placed on DC Hold, and these rods will automatically drop in the event of a reactor trip.

REF: Braidwood Exam 1998
IC-5 Rod Control

Only one GROUP of control rods can be placed on HOLD at a time in order to ensure the rods are held without falling. Opening the reactor trip breakers interrupts power to the power cabinet and DC Hold cabinet, so that power to the CRDM is interrupted when the breakers open.

3. 001K5.38 1

The following plant conditions exist:

- A feedwater pump trip results in a turbine runback from 100% power equilibrium conditions to 60% power. The crew immediately reduces reactor power to 45%.
- Ten hours after the runback, it is desired to maintain Tavg on program and reactor power constant.

Which ONE of the following describes rod motion requirements over the next TWO HOURS? (Assume boron concentration is maintained constant.)

- A. Rods will have to be periodically withdrawn since xenon concentration will follow its post-runback build-in rate.
- B. Rods will have to be periodically inserted since xenon concentration will be decreasing due to decay.
- C. Rods will have to be withdrawn since the new power level will result in a high rate of xenon build-in.
- D. Rods will have to be inserted since the new power level will cause a high rate of xenon burnout.

REF: Kewaunee Exam 1997

4. 002A3.01 1

The following conditions exist:

- Reactor power 100%
- RCS activity is elevated but below Technical Specification levels
- PZR pressure 2225 psig
- PZR level 44%
- Leak rate 10 gpm
- An attempt has been made to reseal PORV "A", PCV-445A

- When conditions stabilize
 - Reactor power 100%
 - PZR pressure 2228 psig
 - PZR level 44%

How would the operator be able to tell if the PORV has closed?

- A. The PORV tailpipe temperature should first decrease and then begin to increase to alarm setpoint.
- B. Position lights for PCV-445A showing CLOSE indication.
- C. Level change in RCDT.
- D. Lower readings for containment radiation monitors RE-0011A/0012A.

REF: Braidwood Exam1998
IC-3, Pressurizer Pressure and Level Control
SOP-101, Reactor Coolant System

5. 003A2,01 1

With the plant operating at 100% power the crew took the following actions:

- "RCP A STNDPIP LVL HI/LO" alarm annunciates and XCP-617 2-4 was entered
- "Reactor Coolant Pump Seal Failure", AOP-101.2 was entered
- "Operational Leakage Test", STP-114.002 determined that #2 seal for 'A' RCP has failed.

Which one of the following actions should the crew take on determination of #2 seal for 'A' RCP has failed?

- A. Immediately trip the reactor and secure 'A' RCP.
- B. Reduce reactor power to < 38% within thirty (30) minutes and then secure 'A' RCP.
- C. Isolate seal injection flow to the "A" RCP and continue normal plant operation provided RCP bearing temperatures are not exceeded.
- D. Continue normal plant operation provided 'A' RCP total #1 seal flow is between 0.8 gpm and 6.0 gpm.

REF: Summer Exam Bank Question #3657 Modified
ARP XCP-617 2-4 RCP Standpipe HI/LO Alarm
AOP-101.2 Reactor Coolant Pump Seal Failure

Distracter A incorrect, action not required for #2 seal failure.
Distracter B incorrect, action not required for #2 seal failure.
Distracter C incorrect, Seal injection flow should not be isolated to any running RCP.

Rev.1 changed distracter "c" to "isolate seal injection flow" because as it was previously worded, an argument could be made for two correct answers.

Given the following Unit 1 plant conditions:

- Reactor Power is 20%
- Bank D rods are at 55 steps
- A Control Bank D rod was dropped and recovered
- The Pulse-to-Analog Converter was NOT reset per Step 14 of AOP-403.6, Dropped Control Rod.

What effect will these events have on continued rod control system operation?
As control rods are ...

- A. withdrawn, Over Temperature Delta T Will NOT stop Control Bank D withdrawal when required.
- B. inserted, the Rod Insertion Limit Alarm will be received at a lower actual rod position.
- C. inserted, Bank C control rods will begin insertion at a lower value of Control Bank D actual position.
- D. withdrawn, the Bank D Rod Withdrawal Hi Limit Alarm is will NOT alarm before Control Bank D is fully withdrawn.

REF: Prairie Island Exam 1997
Summer Cycle 13 COLR
AOP-403.6 Dropped Control Rod
IC-5 Rod Control

Distracter A - Incorrect, the Pulse-to-Analog Converter does not input to the OTDT

Answer B - Correct

Distracter C - Incorrect, Bank C control rods will begin to insert at a higher value of Control Bank D position.

Distracter D - Incorrect, the Pulse-to-Analog Converter will think the Bank D rods are higher than actual.

7. 004K6.05 1

Given the following plant conditions:

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

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

- A. Increases to 71% and stabilizes.
- B. Increases to 100% (full).
- C. Cycles between 20% and 40% due to auto-makeup.
- D. Decreases to 0% (empty).

REF: Farley Exam 1998

AB-3 Chemical and Volume Control System

Distracter A - Level will not reach 71% because auto makeup will stop at 40% and with LCV-115A open level will begin decreasing.

Distracter B - Level will initially decrease as LCV-115A diverts. Level will decrease until auto Makeup starts when VCT level reaches 20% but will stop increasing when auto makeup stops at 40%.

Answer C - Level will cycle between 20% and 40% because makeup flow is greater than flow through LCV-115A.

Distracter D - Level will decrease because LVC-115A is open until 20% level when auto makeup begins and causes level to increase.

8. 005AK2.01 1

Plant conditions are as follows:

- The plant is operating at 85% power.
- Control Bank D group step counters indicate 192 steps.
- CBD rod B8 DRPI indicates 206 steps.
- Rod B8 was found to be movable per AOP-403.5, Stuck or Misaligned Control Rod.

Which ONE (1) of the following is the method used to realign rod B8 with Control Bank D, IAW AOP-403.5, Stuck or Misaligned Control Rod?

- A. With Rod Control Bank Selector Switch in CBD, disconnect the lift coils of the unaffected rods and insert rod B8 to 192 steps.
- B. With Rod Control Bank Selector Switch in MAN, disconnect the lift coils of the unaffected rods and insert rod B8 to 192 steps.
- C. With Rod Control Bank Selector Switch in MAN, disconnect the lift coil of the affected rod, and withdraw Bank D to 206 steps.
- D. With Rod Control Bank Selector Switch in CBD, disconnect the lift coil of the affected rod, and withdraw Bank D to 206 steps.
 - a. Correct.
 - b. Rods are moved in individual banks select.
 - c. Rods are moved in individual banks select.
 - d. Disconnecting the unaffected CBD rod lift coils is performed after it has been determined the misaligned rod is movable.

REF:
SOURCE: SMEB#4337

9: 005K3.05 1

- Preparations are being performed for a Reactor Start-up.
- Valve line-ups are in progress and it has been determined that HCV-603A "RHR HEAT EXCHANGER A OUTLET VALVE" has a broken instrument air line.

Which ONE of the following describes the correct condition of the "A" train Emergency Core Cooling System as a result of this malfunction?

- A. ECCS is Inoperable, HCV-603A must be throttled for proper flow balance during hot leg recirculation.
- B. The ECCS is Operable, HCV-603A fails closed on a loss of air to isolate the train if a passive failure occurs.
- C. ECCS is Inoperable, HCV-603A fails closed on a loss of air and must be opened to provide cooling during the recirculation modes of ECCS.
- D. The ECCS is Operable, HCV-603A fails open on a loss of air and this position is proper for all modes of ECCS operation.

Bank Question (Open reference) Question # 209. Modified slightly from original form.

Lesson Plan AB-7 RHR system, Objective AB-7-07

- A. Incorrect, valve is fully open during hot leg recirculation.
- B. Incorrect, valve fails open on a loss of instrument air.
- C. Incorrect, valve fails open on a loss of instrument air.
- D. Correct, ECCS is operable and the valve fails open on a loss of air and this is the required position for proper ECCS operation.

10. 006K2.04 1

- Unit is at 100% power.
- The Electric Plant is in a normal full power line-up.

Which ONE of the following is the power supply to MVG-8808C ACCUM DISCH ISOL.

- A. 1DA2Y
- B. 1DA2X
- C. 1DB2Y
- D. 1DB2X

Question from previous Farley Exam. (1999) Modified for Summer.
Lesson Plan AB-10, Emergency Core Cooling System. Objective AB-10-13.

- A. Incorrect, wrong train of power.
- B. Correct, this is the power supply stated in the lesson material.
- C. Incorrect, power for this valve does not come from 1DB.
- D. Incorrect, power for this valve does not come from 1DB.

11. 007A4.10 1

- Unit is at 100% power.
- An instrument failure occurred and a PORV opened.
- The operator has taken the PORV to the closed position.
- The PORV indicates dual.

Which ONE of the following describes the initial indications the operator could use to verify that the PORV was not fully closed after the PORV was placed in closed?

- A. Tailpipe temperature would rise to between 200-300 °F, PRT pressure would rise, RM-A2 would alarm.
- B. Tailpipe temperature would rise to between 500-600 °F, PRT temperature would rise, RM-A2 would alarm.
- C. Tailpipe temperature would rise to between 200-300 °F, PRT pressure would rise, VCT level would lower.
- D. Tailpipe temperature would rise to between 500-600 °F, PRT temperature would rise, Reactor Building Pressure would increase.

Modified from bank question 541.

Lesson Plan AB-2 Reactor Coolant System, Objective AB-2-14.

- A. Incorrect, RM-A2 would not alarm until the PRT ruptured.
- B. Incorrect, tailpipe temperature will not rise to 500-600 degrees F, and RM-A2 will not alarm until the PRT ruptures.
- C. Correct, this is the correct tailpipe temperatures, PRT pressure will rise and VCT level will lower. (Could put charging system flow would increase)
- D. Incorrect, RB pressure will not increase until the PRT ruptures.

12. 007EA2.02 1

Given the following conditions:

Reactor power is at 100% steady state

	1	2	3	
Power Range NIS	102%	103%	102%	
PZR pressure	1880 psig (455)	1910 psig (456)	2500 psig (457)	instrument numbers
PZR level	72% (459)	92% (460)	90% (462)	instrument numbers
T _{ave}		584F	585F	582F
S/G levels *	43% (A)	34% (B)	89% (C)	

*(all S/G instruments for a S/G read the same level)

What is the FIRST required action for these conditions?

- A. Trip the reactor and initiate actions of EOP-1.0, Reactor Trip/Safety Injection Actuation.
- B. Verify a turbine runback is initiated.
- C. Reduce power to LESS THAN 100% indicated to ensure 8 hour average does NOT exceed 100% power.
- D. Initiate a MANUAL Safety Injection and initiate actions of EOP-1.0, Reactor Trip/Safety Injection Actuation.

REF: Braidwood Exam 2000

EOP-1.0 Reactor Trip/Safety Injection Actuation

IC-9 Reactor Protection and Safeguards Actuation System

Trip	setpoints	Logic
Low PZR Press	1870	2/3
High PZR Press	2380	2/3
High PZR Lvl	92	2/3
Low S/G Lvl	27	2/3
High S/G Lvl	79	2/3 on any S/G

Answer A - Reactor Trip required by turbine trip on high S/G level in (C) S/G

Distracter B - No indications provided that would require a turbine runback.

Distracter C - Not the first action required, but could be focused on if Rx trip required not realized.

Distracter D - Not required by indication provided.

13. 008AK1.01 1

Which one of the following represents the conditions of the steam entering the PRT from a leaking PORV if pressurizer pressure is 1385 psig and PRT pressure is 5 psig? (Assume an ideal thermodynamic process)

- A. Superheated steam 260-270 degrees F
- B. Superheated steam 240-250 degrees F
- C. Saturated steam 225-235 degrees F
- D. Saturated steam 275-285 degrees F

REF: Mollier Diagram

SOURCE: 2000 Summer Exam and Watts Bar RO exam 1998

Reference provided - Steam tables and Mollier Diagram

If the Mollier Diagram is used to determine the temperature, the applicant could start with the intersection of 1400 psia and the saturation line. A reasonable range of enthalpy at this intersection would be 1172-1175 btu/lbm. Following a constant enthalpy of 1172 btu/lbm to the point where it intersects 20 psia (given PRT pressure of 5 psig plus 15 psia) will yield a temperature almost exactly half-way between 240°F and 280°F.

Using the Steam Tables would yield a calculated value of 260.1°F for an enthalpy of 1172 btu/lbm.

14. 009EA2.10 1

EA

Which one of the following discriminates between a small break LOCA and a steam line break inside containment per EOP-1.0, Reactor Trip/Safety Injection Actuation?

- A. Reactor building pressure
- B. Reactor building humidity
- C. Reactor building temperature
- D. Reactor building radiation

REF: Summer Exam Bank Question #2028

Distracter A - Incorrect, both can cause pressure to increase.

Distracter B - Incorrect, both can cause humidity to increase.

Distracter C - Incorrect, both can cause temperature to increase.

Answer D - the RCS leakage will cause radiation levels to increase.

15: 010K1.03 1

The control room operators have just completed actions per the ARP-001 XCP-617 1-3, "RCP 'A' Vibration High" for stopping 'A' RCP due to a vibration problem. The pump has been tripped and PZR spray valve PCV-444D has been placed in manual and closed.

Why must PZR spray valve PCV-444D be placed in manual and closed?

- A. With no spray flow and reverse flow in the idle RCS loop, steam could be drawn from the pressurizer back to the loop and be carried into the reactor vessel.
- B. The loop differential pressure would cause flow from the active loop spray line to be ineffective.
- C. RCS pressure could decrease in an uncontrolled manner with PCV-444D left open due to reverse flow in the idle RCS loop.
- D. The loss of spray valve bypass flow from the idle loop could result in thermal shock to this line if spray flow was initiated through PCV-444C.

REF: Summer Exam Bank Question 2899
ARP-001 XCP-617 1-3, RCP A VIBR HI
AB-2, Reactor Coolant System

Distracter A - incorrect, steam would not be drawn into the spray line.

Answer B - correct, if PCV 444D were open flow would be from Loop C to Loop A

Distracter C - incorrect, RCS pressure would not decrease due to reverse flow.

Distracter D - incorrect, thermal shock to the idle loop spray line would not occur.

16. 011EK1.01 1

Given the following plant conditions:

- You have just entered EOP-2.1, Post-LOCA Cooldown and Depressurization.
- Containment pressure has not exceeded 4 psig
- You are confirming that Natural Circulation exists

Which one of the following conditions provides indication that natural circulation exists?

- A. RCS Hot leg temperatures are trending to saturation temperature for steam pressure.
- B. S/G pressures are slowly increasing.
- C. RCS subcooling based on core exit TC's is 40 degrees F and slowly increasing.
- D. The delta-T across the S/G's are 10 degrees F and slowly decreasing.

REF: Robinson Exam 1996

EOP-2.1, Post-LOCA Cooldown and Depressurization

Distracter A - RCS Hot leg temperature should be stable or decreasing for natural circulation indication.

Distracter B - S/G pressure should be stable or decreasing for natural circulation indication.

Answer C - correct

Distracter D - a 10 degree delta-T across the S/Gs would not indicate natural circulation

17. 011K6.04 1

The following conditions exist:

- PZR level is at programmed level of 55% for current stable plant conditions
- ALL systems are operating correctly in automatic

What is the initial plant response for a PZR level controller malfunction that results in a level reference signal decrease of 5%?

- A. PZR backup heaters energize and the proportional heaters are off, the "PZR LCS DEV HI/LO" annunciator actuates, and charging flow decreases.
- B. PZR backup heaters energize and proportional heaters are on, the "PZR LCS DEV HI/LO" annunciator actuates, and the charging flow increases.
- C. Charging flow increases to the new program level of 60% and there is no change in PZR heater status (proportional heaters are on and the backup heaters are off)
- D. Charging flow decreases to the new program level of 50% and there is no change in PZR heater status (proportional heaters are on and the backup heaters are off)

REF: NEW

IC-3 Pressurizer Pressure and Level Control
ARP-001 XCP-616 PZR LCS DEV HI/LO

18. 012K5.01 1

Which of the following Reactor Protection System Trips protects against DNB accidents?

- A. IR High Flux
- B. High Pressurizer Pressure
- C. RCP Undervoltage
- D. High Pressurizer Level

REF: IC-9 Reactor Protection and Safeguards Actuation System
Braidwood Exam 2000

19. 013A4.02 1

Given the following plant conditions:

- Two minutes ago an MSIV inadvertently closed causing secondary safeties to lift and a reactor trip and safety injection due to low pressurizer pressure signal to be generated.
- The reactor trip breakers failed to open.
- The operators tripped the reactor by opening Generator 1 and 2 Generator and Motor breakers on the Rod Drive MG Control cabinet per EOP-13, Response to Abnormal Nuclear Power Generation.
- It is now desired to reset SI and secure SI equipment.
- RCS pressure is 1800 psia.

Which one of the following will prevent resetting SI from the Main Control Board under these conditions?

- A. RCS pressure is less than SI setpoint.
- B. The SI timing relays.
- C. Permissive P- 11 has actuated.
- D. Permissive P-4 has not actuated.

REF: Farley Exam 1998

IC-9 Reactor Protection and Safeguards Actuation System
EOP-13.0, Response to Abnormal Nuclear Power Generation
EOP-1.0, Reactor Trip/Safety Injection Actuation

Distracter A - P- 11 is the set point above which a blocked SI signal will auto unblock. Being below P-11 will not prevent resetting SI.

Distracter B - SI will not reset if the 60 second timer is active, but the timer timed out 1 minute ago.

Distracter C - Pressurizer pressure below the SI setpoint will initiate an SI signal but will not prevent resetting SI.

Answer D - With the reactor trip breakers closed the required P-4 signal will not be generated and SI cannot be reset from the MCB.

20. 013K4.16 1

You are in procedure EOP-16.0, Response to Imminent Pressurized Thermal Shock, with 3 RCPs running.

Which one of the following actions is correct in order to avoid, or limit, thermal shock or pressurized thermal shock to the reactor pressure vessel?

- A. Stabilize RCS pressure and maintain that pressure to provide adequate soak time.
- B. Cooldown at maximum rate using the steam generators.
- C. Isolate the accumulators.
- D. Stop all reactor coolant pumps.

REF: Cook Exam 2001

EOP-16.0, Response to Imminent Pressurized Thermal Shock

EOP-16.1, Response to Anticipated Imminent Pressurized Thermal Shock

To offset thermal stress caused by cooldown, the cooldown must be stopped, temperature stabilized and pressure reduced.

Distracter A - pressure should be reduced.

Distracter B - cooldown should be minimized.

Answer C - Isolate all SI Accumulators to prevent injection of cold water that could cause additional thermal stresses

Distracter D - RCP are restarted if stopped and restart criteria met.

Which one of the following is used as the reactor power input to the rod insertion limit (RIL) computer?

- A. Median Selected \hat{I} Tavg
- B. First stage impulse pressure
- C. Calculated Thermal Power
- D. Calculated Steam Flow

REF: Cook Exam 2001
IC-6 RCS Temperature Indication System

The median selected \hat{I} Tavg is sent to the rod insertion limit programmers.

22. 015AK3.03 1

Given the following conditions:

- Reactor power is at 100% steady state.
- RCP "B" VIBR HI alarm has lit
- Excessive vibration is confirmed on RCP "B" with 20 mils shaft vibration and increased Frame vibrations

Which ONE of the following statements is correct regarding the course of action required?

- A. Reduce Reactor power to less than 38% (P-8 permissive is illuminated) and secure RCP "B".
- B. RCP "B" should be tripped prior to a reactor trip to minimize pump damage.
- C. Trip the reactor prior to tripping RCP "B" to prevent an automatic trip and unnecessary challenge to a safety system.
- D. RCP "B" should be tripped per SOP-101, Reactor Coolant System, and proceed to Hot Standby per GOP-4, Power Operation, and GOP-5, Reactor Shutdown from Startup to Hot Standby.

REF: ARP-001 Panel XCP-618 Annunciator Point 1-3 and SOP-101

Distracter A - incorrect, reflects the method for removing one reactor coolant pump from service per SOP-101 Rev 22, Reactor Coolant System.

Distracter B - incorrect, with reactor power >38% and Shaft vibration > 20 mils and Frame vibration increased the reactor should be tripped first then RCP "B".

Answer C - correct, per ARP-001 Panel XCP-618 Annunciator Point 1-3

Distracter D - incorrect, ARP-001 Panel XCP-618 Annunciator Point 1-3 actions for Reactor Power <38%.

23. 015K3.06 1

- Unit was at 75% power.
- An N-44 failure caused rods to withdraw in automatic.
- Rods have been taken to manual.
- RCS Temperature has been returned to program.

Which ONE of the following correctly describes the effects of this failure on rod control?

- A. With a failed input from N-44 rods cannot be operated in automatic.
- B. Rods can be placed back in automatic, and will operate properly after N-44 is placed in bypass on the NI drawer.
- C. Input from N-44 can be defeated by bypassing the power rate mismatch circuit, and rods can be returned to automatic.
- D. Rods can be placed in automatic, and will operate normally when I&C places the channel in test.

Lesson Plan IC-5 Rod Control. Objective # IC-5-03, and IC-5-06.

- A. Incorrect, rods can be operated in automatic if the input is bypassed.
- B. Incorrect, the power mismatch circuit will have a failed input from N-44.
- C. Correct, the input from N-44 can be bypassed in the 7300 racks and rods can be returned to automatic.
- D. Incorrect, I&C placing the channel in test will not allow the channel to operate properly in automatic

24. 017A1.01 1

An OPEN has developed in a thermocouple used by the Subcooling Monitor. What impact will the failed thermocouple have on the Subcooling Monitor after steady state conditions are reached?

- A. The Subcooling monitor will indicate >200 degrees subcooling.
- B. Subcooling Margin Monitor will use the other thermocouple assigned in the core quadrant.
- C. Subcooling Margin Monitor will use the affected thermocouple and will indicate subcooling < 0 degrees.
- D. Subcooling Margin Monitor will indicate normal subcooling.

REF: Braidwood Exam 2000
IC-7 Incore Instrumentation System

Distracter A - incorrect, an open would result in a high temperature indication and low indication of subcooling.

Distracter B - incorrect, auctioneered high value for the assigned thermocouples is used.

Answer C - correct, auctioneered high value for the assigned thermocouples is used and the open would result in low indication of subcooling.

Distracter D - incorrect, auctioneered high value for the assigned thermocouples is used.

25. 022A1.04 1

Given the following:

- The plant is operating at 75% reactor power.
- The Reactor Building sump was pumped down to the Floor Drain Tank twenty minutes ago.

Which one of the following would provide an alarm for a 0.7 GPM leak from the reactor coolant system to the Reactor building?

- A. Reactor Building Sump level
- B. Reactor Building Radiation level
- C. Reactor Building Temperature
- D. Reactor Building cooling unit condensate drain flow

REF: GS-7 Leak Detection

Distracter A - incorrect, sump level would provide indications of leaks >10GPM

Distracter B - incorrect, radiation level will cause an alarm when leakage exceeds 1 gpm

Distracter C - incorrect, temperature may not increase until leakage is excessive.

Correct D - condensate drain flow will alarm when leakage exceeds 0.5 GPM

26. 022AA2.03 1

- The Plant is at 100% power.
- Reactor Makeup System is in AUTO.
- Rod Control is in Manual.
- The Reactor Operator notices that Tavg has decreased 2 °F.

Which ONE of the following could contribute to decrease in RCS temperature.

- A. The mixed bed demineralizer is depleted and is no longer removing boron ions.
- B. A newly replaced CVCS mixed bed demineralizer was put in service.
- C. The Boric acid filter is clogged preventing boric acid from mixing in the blender.
- D. FCV-113A, Boric Acid to Blender Control Valve has failed open with FCV-113B in the open position.

Bank question # 786.

Lesson Plan AB-5 Reactor Makeup System, objective AB-5-14.

- A. Incorrect, the mixed bed being depleted and not removing boron would cause Tavg to increase.
- B. Incorrect, Placing a new CVCS mixed bed demineralizer in service would tend to dilute the RCS causing Tavg to increase.
- C. Incorrect, If the boric acid filter was clogged boron would tend to be blocked from entering the RCS this would not cause Tavg to decrease.
- D. Correct, This is a valid boration flowpath and could borate the RCS and cause Tavg to decrease.

27. 024AA2.02 1

A plant transient has resulted in a condition that requires rapid emergency boration. The NROATC begins emergency boration via the Emergency Borate valve (MVT-8104).

- FI-110, EMERG BORATION FLOW, read 0 gpm.
- Investigation reveals MVT-8104, EMERG BORATE, will not open.
- Charging flow is 50 gpm.

What operator actions are required next to supply boric acid flow to the RCS?

- A. Transfer charging pump suction to the RWST.
- B. Open FCVs 113A and 113B to borate through the blender.
- C. Open FCVs 113A, 168B, and XVD-8439 to emergency borate through the blender.
- D. Set flow controller 113 to maximum to automatically borate.

REF: Summer Exam Bank #504

Distracter A - Incorrect; Insufficient charging flow rate at RWST boron concentration (<2,500 ppm).

Answer B - Correct

Distracter C - Incorrect; 168B should be verified CLOSED and opening 8439 will not borate through the blender.

Distracter D - Incorrect; Ineffective unless auto makeup in progress.

Rev. 1, (04/12/93) Reformatted stem and given information to eliminate "lookup"; ARP was originally given in stem. Revised COMMENT because original comment was not justified.

Rev. 2, (05/12/93) Replaced "Transfer charging pump suction to the RWST" with "Align gravity drain from the BATs to the charging pump suction" due to Ops. Rep. concerns that original choice a was too defensible as an alternative; therefore, two answers were potentially correct.

Rev. 3, (06/18/93) Restored original choice b. from Rev 1. Reduced charging flow to 50 gpm to ensure that flowrate would be insufficient to achieve an equivalent boric acid flowrate of 30 gpm at 7000 ppm.

Rev.4, (dow 01/21/02) changed wording in stem to "a condition that requires rapid emergency boration" to agree with the latest rev of AOP-106.1.

28. 026AA2.06 1

Given the following conditions exist:

- A small break LOCA to containment has occurred from 100% power
- The four pumps listed below are running

Which ONE of the following pumps will be damaged in the shortest time following a subsequent loss of Component Cooling Water?

- A. Reactor Coolant Pump
- B. Charging Pump
- C. Residual Heat Removal Pump
- D. Reactor Building Spray Pump

REF: Summer LO 4783, AOP-118.1 Rev 2
CFR 55.41(7,8,10) apply

Source: Kewaunee 1997, correct answer and distracter d changed to be specific to Summer

Distracter A Any running RCP should be stopped within 10 minutes or if a temperature limit associated with the RCP is reached.

Answer B Any running Charging pump should be stopped within 1 minute

Distracter C RHR pumps should not be run longer than 90 minutes without CCW flow

Distracter D Not supplied by CCW

29. 026AK3.03 1

Given the following information:

- You have been directed to enter EOP-14.0, Response to Inadequate Core Cooling, due to a red path on the Core Cooling critical safety function status tree.
- RCS pressure is approximately 1100 psig.
- RCPs are secured with the "A" charging pumps providing seal injection.
- Component Cooling Water (CCW) flow has been lost to the containment.
- In Step 3 of EOP-14.0, it is noted that CCW is not available to the RCPs.

Which one of the following actions should the Control Room staff undertake?

- A. Disregard the lack of CCW flow to containment, and continue with EOP-14.0.
- B. Stop at this point in EOP-14.0; do not continue until an RCP is running.
- C. Continue with EOP-14.0 while attempting to reestablish CCW flow to the RCPs as personnel resources permit.
- D. Complete actions to depressurize the steam generators to 140 psig, and then attempt to reestablish CCW flow to the RCPs.

REF: Summer Exam Bank #387

- a. CCW should be restored if possible to preserve RCP availability.
- b. Procedure may restart pumps w/o support conditions as a "last ditch" effort.
- c. Consistent w/general guidance when unable to complete a step.
- d. Inconsistent w/sequence of procedure.

Requires examinee to interpret and apply alternative action listed after determining support conditions are not met per SOP- 101.

30. 02602.4.6 1

02602.4.6 4

How long are the Reactor Spray Pumps committed to be operated following a Large Break Loss of Coolant Accident and how long is the Reactor Building Spray System required to be capable of continuous operation?

- A. Committed to operate between 30 and 65 minutes and be capable of continuous operation for up to 30 days.
- B. Committed to operate 2 hours and be capable of continuous operation for up to 60 days.
- C. Committed to operate until Reactor Building pressure is less than 12 psig and be capable of continuous operation for up to 30 days.
- D. Committed to operate 1 hour and be capable of continuous operation for up to 60 days.

REF: Summer Exam Bank Question #1350
AB-8 Reactor Building Spray System

Distracter A - incorrect, 30-65 is the time to use the RWST as a source of water. The 30 days is incorrect time required for capable of continuous operation system.

Answer B - correct

Distracter C - incorrect, commitment based on time not RB pressure. The 30 days is incorrect time required for capable of continuous operation system.

Distracter D - incorrect, time committed to run is wrong.

31. 027AA2.16 1

Given the following:

- PT-444, CNTRL CHAN PRESS PSIG, indication fails low.
- Control and both Backup PZR heater groups energized.

What are the immediate actions that should be taken per AOP-401.5, Pressurizer Pressure Control Channel Failure?

- A. Compare PI-444 and PI-445 control channel pressure indications normal, Verify the PZR PORVs are closed, Ensure Rod Control Bank select switch is in Auto.
- B. Ensure Rod Control Bank select switch is in Auto, Maintain RCS pressure between 2220 and 2250 psig.
- C. Verify the PZR PORVs are closed, Compare PZR control channel with protection channel indications, Check PI-444 control channel pressure indication normal.
- D. Maintain RCS pressure between 2220 and 2250 psig, Compare PZR control channel with protection channel indications

REF: AOP-401-5 rev 3

Distracter A PI-445 control channel pressure indications normal and Ensure Rod Control Bank select switch is in Auto are supplemental steps.

Distracter B Ensure Rod Control Bank select switch is in Auto and Maintain RCS pressure between 2220 and 2250 psig are supplemental steps.

Answer C Correct, three immediate actions

Distracter D Maintain RCS pressure between 2220 and 2250 psig is a supplemental step.

32. 027K1.01 1

Which ONE of the following describes how the desired NAOH solution is obtained in the Reactor Building during an accident?

- A. Eductors at the suction of the spray pumps combine NAOH and RWST flow to the desired concentration.
- B. Gravity feed and an orifice in the RWST supply line combine to establish the desired concentration.
- C. Eductors at the discharge of the spray pumps combine NAOH and RWST flow to the desired concentration.
- D. Gravity feed and orifices in the RWST and NOAH supply lines combine to establish the desired concentration.

Lesson Plan AB-08 "Reactor Building Spray System", objective # AB-08-03
Modified from Bank Question 2321.

- A. Incorrect, eductors are not used.
- B. Incorrect, gravity feed is used but the desired concentration is developed by orifices in both the RWST and NAOH lines.
- C. Incorrect, Eductors are not used in this application.
- D. Correct, Gravity feed and orifices in the RWST and NOAH lines combine to establish the desired concentration.

33. 028K2.01 1

Initial Conditions:

- Unit was at 100% power.
- A D/G tagged out for maintenance.

-A LOCA is in progress in conjunction with a loss of off-site power.
-EOP's are being performed and the crew is at the step for placing the H2 Recombiners in service.

Which ONE of the following correctly describes the available recombiner and the source of power?

- A. "A" recombiner from 1DA1
- B. "B" recombiner from 1DB1
- C. "A" recombiner from 1DA2
- D. "B" recombiner from 1DB2

Lesson Plan GS 2 "Safeguards Power", Objective GS-2-20, and 21.

- A. Incorrect, with the A D/G tagged out the A recombiner will not be available with an LOSP.
- B. Incorrect, this recombiner will be available, but from bus 1BD2.
- C. Incorrect, this recombiner will not be available.
- D. Correct, this recombiner will be available and is powered from 1BD2.

34. 029EK3.01 1

- The Unit is at 100% power.
- A total loss of feed has occurred.
- Steam generator lo-lo level alarms have come in.
- An Automatic Reactor Trip did not occur.
- A Manual Reactor Trip is initiated.

Which ONE of the following describes a correct method of verifying that the reactor is tripped, and the reason for tripping the reactor.

- A. Verify Rod all bottom lights lit, OR RCS Temperature trending down; to ensure an RCS over pressurization event will not occur.
- B. Verify all reactor trip AND bypass breakers open, AND SUR decreasing at -0.33 dpm; to ensure only decay and RCP heat are being added to the RCS.
- C. Verify Reactor Power trending down, AND RCS Temperature trending down; to ensure an RCS over pressurization event will not occur.
- D. Verify Reactor Power trending down OR All rod bottom lights lit; to ensure only decay heat and RCP heat is being added to the RCS.

EOP 1.0 "Reactor Trip and Safety Injection", and EOP-13.0 "RESPONSE TO ABNORMAL NUCLEAR POWER GENERATION". Lesson Plan EOP-13.0 objective 2040.

- A. Incorrect RCS temperature trending down is not an indication of a Reactor trip, and this is the wrong reason according to the WOG and lesson plan.
- B. Correct, these are indications that a reactor trip has occurred, and this is the correct reason for performing the trip IAW the WOG, and Lesson Plan.
- C. Incorrect, Reactor Power trending down is one indication that a trip may have occurred, but is also an indication of just a down power condition, and temperature can be indications of the same thing, and this is not the correct reason for verifying the reactor tripped.
- D. Incorrect, the procedure requires both of these actions to be performed to verify that the reactor is tripped.

35. 032AA2.03 1

- Refueling operations are in progress.
- SR N-31 and 32 read 15 cps.
- Both IR NIs indicate off-scale LOW.
- PR N-41 is out of service, all appropriate bistables are tripped.
- All other power range channels are reading 0%.

A failure has occurred on PR N-43 causing it to drift high to about 25% power.

Which ONE of the following actions are required?

- A. Immediately terminate all fuel movement in progress and emergency borate per AOP-106.1 "Emergency Boration."
- B. Immediately terminate all fuel movement in progress and determine the boron concentration of the RCS at least once per 12 hours.
- C. Notify Maintenance to investigate the power range instrument failure and continue with the refueling.
- D. Place the Rod Stop Bypass switch for the failed PR channel to bypass and continue with the refueling.

Bank Question From Farley Exam Bank.

Lesson plan IC-8 Nuclear Instrumentation, objectives IC-8-32,37, and 38.

- A. Incorrect, Terminating all fuel movement is correct, but AOP-106.1 Emergency Boration is not required.
- B. Correct, with a loss of both source range detectors (Auto de-energized due to 2/4 > P-10 technical specifications direct the these actions.
- C. Incorrect, IAW TS 3.9.2 refueling may not continue until the source ranges are returned to service.
- D. Incorrect, this would be the actions that would be taken if the plant was at power, and this will not allow the refueling to be continued.

36. 033A2.01 1

Given the following:

- Previous refuel activity has loaded the Spent Fuel Pool.
- All core alterations have stopped.
- The Spent Fuel pool is isolated from the Transfer Canal.
- Decreasing boron concentration has been verified by sample analysis in the Spent Fuel Pool

What impact would this have, if any, on parameters associated with the Spent Fuel Pool and what actions and/or procedure(s) would be used to correct or mitigate the consequences of this situation?

- A. By the fuel rack design, Keff would remain less than 0.95. Use SOP-123 to transfer water from the transfer canal and the reactor cavity.
- B. By the fuel rack design, Keff would remain less than 0.95. Use SOP-123 to drop the spent fuel pool level 5 feet and make up to the pool from the RWST.
- C. The spent fuel could reach criticality, Use AOP-123.2 and SOP-123 to transfer boric acid from the Boric Acid Tanks to the Recycle Holdup Tank and then pump to the Spent Fuel Pool.
- D. The spent fuel could reach criticality, the situation is not covered by the AOPs or EOPs, but would be covered by the SAMGs.

REF: AOP-123.2 DECREASING BORON CONCENTRATION IN THE SPENT FUEL POOL OR REFUEL CAVITY
SOP-123 Spent Fuel Pool System

Distracter A - Keff could reach 1. SOP-123 is not used to transfer water from the transfer canal or reactor cavity

Distracter B - Keff could reach 1. SOP-123 is not used to transfer water from the RWST.

Answer C - Keff could reach 1. Use AOP-123.2 and SOP-123.

Distracter D - Actions not covered by SAMGs

37. 033AA2.02 1

A reactor startup at BOL is commenced. Both Source Range and Intermediate Range indications are as expected. As reactor power reaches $5 \times 10^{-3}\%$, the At-the-controls operator observes that both Intermediate Range indications noticeably increase to $10^{-2}\%$ without a similar change in the Source Range indication. As the reactor startup continues, Source Range and Intermediate Range indications continue to parallel each other.

Which one of the following describes the probable cause for the change in Intermediate Range indication?

- A. It is an expected circuit response of the Intermediate Range instrumentation.
- B. It is an indication of unreliable channel operation caused by improper calibration of the pulse signal to the DC signal circuits.
- C. Intermediate Range compensating voltage failed high.
- D. It is an indication of unreliable channel operation caused by improper calibration of the second pre-amplifier in the two Intermediate Range circuits.

REF: IC-8, Nuclear Instrumentation

GOP-3 Reactor Startup from Hot Standby to Startup (Mode 3 to Mode 2)

ARP-001 XCP-620 4-1 and 3-1

Distracter A - incorrect, it should be a concern and it is an indication of improper calibration.

Answer B - correct, with improper calibration (DC signal and pulse signal not equal at $5 \times 10^{-3}\%$) a spike in the intermediate range indication will occur.

Distracter C - incorrect, it should be a concern and it is an indication of improper calibration

Distracter D - incorrect, the Intermediate Range circuit does not have a second pre-amplifier.

38. 034K4.01 1

Which ONE of the following helps protect a fuel assembly from binding while being loaded into the core?

- A. The Gripper being fully engaged.
- B. Using slow speed when the fuel assembly is entering the core.
- C. Hoist Overload interlock.
- D. Slack Cable interlock.

Lesson Plan GS-4 Fuel Handling System. Objective GS-4-17.
Modified from Bank question # 2015.

- A. Incorrect, the gripper being fully engaged does not prevent or alert the operator to a binding condition.
- B. Incorrect, the use of slow speed will not prevent the fuel assembly to bind.
- C. Incorrect, an underload interlock would protect the fuel, but an overload would not occur while placing the fuel into the core.
- D. Correct, the slack cable would stop fuel descent into the core if the fuel began to bind.

39. 035K3.01 1

Given the following plant conditions:

- The unit is operating at 75% steady state power
- All systems are in automatic control
- MSIV PVM-2801B slowly goes full closed

Which one of the following indicates the initial RCS response to the closure of MSIV PVM-2801B? (Assume no operator actions)

- A. RCS loops "A, B, C's" Tavgs decrease together. PZR level decreases as expected for a Reactor Trip. The Reactor trips on low Tavgs and High Steam Flow on S/G "B".
- B. RCS loops "A and C's" Tavgs increase while RCS loop "B" Tavgs increase is greater than the increase for RCS Loops "A and C". PZR level increases. No Reactor trip occurs.
- C. RCS loops "A and C's" Tavgs increase while RCS loop "B" Tavgs decrease. PZR level decreases. Reactor trips on Turbine trip.
- D. RCS loops "A and C's" Tavgs decrease while RCS loop "B" Tavgs increase is greater than the increase for RCS Loops "A and C". PZR level decreases. No Reactor trip occurs.

REF: TB-2 Main Steam System

TB-5 Turbine Control and Protection System

IC-9 Reactor Protection and Safeguards Actuation System

AB-2 Reactor Coolant System

Distracter A - incorrect, RCS loop Tavgs will not decrease together and the reactor will not trip.

Distracter B - incorrect, RCS loop A and C Tavgs will decrease not increase. PZR decreases not increase.

Distracter C - incorrect, RCS loop A and C Tavgs will decrease not increase. The reactor does not trip.

Answer D - correct, with no reactor trip, RCS Loop A and C Tavgs decrease and Loop B Tavgs increase, and PZR level decreases.

40. 036AK1.01 1

The following plant conditions exist:

- MODE 6 with CORE ALTERATIONS in progress.
 - The REFUEL CAV LVL HI/LO annunciator is actuated.
 - RMG-17A & B (RB Manipulator Crane monitors) have high radiation alarms.
 - The SFP gate is installed.

Which one (1) of the following would require immediate evacuation of the Reactor Building per AOP-123.1, 'Decreasing Level in the Spent Fuel Pool or Refueling Cavity during Refueling'?

- A. Low pressure alarm on the SFP gate boot seals.
- B. Leaking of the SFP.
- C. Readings on RMG-17A(B) 25 R/hr.
- D. Actuation of the SFP LVL HI/LO annunciator.

REF: Summer Exam Bank #1758

Distracter A incorrect, since corrective actions can be taken to repressurize the seal without evacuation of RB.

Distracter B incorrect, incorrect because SFP can be isolated from RB even if it is leaking.

ANSWER C

Distracter D incorrect, incorrect because SFP can be isolated from RB even if it is leaking.

CORE ALTERATIONS was used vs. fuel shuffle to eliminate questions about the credibility of the SFP gate being installed during fuel movement. An initial condition of "SFP gate installed" makes choice "a" a viable distractor.

AOP-123.1 Caution states that RB should be evacuated if dose rates > 20 R/hr.

4. 037AA2.13 1

The plant is operating at 100% power. An RCS inventory balance indicates that there is a primary-to-secondary leak present. The control room operators check the S/Gs for a tube leak and observe the following:

- The I/P demand signal for the S/G A feedwater regulating valve is slightly greater than the demand signals for the other feedwater regulating valves.
- The steam rate flow indication for S/G B is slightly less than the steam flow rates for the other S/Gs.
- The steamline radiation monitor associated with S/G C indicates an activity level of about two times that indicated by monitors on the other steamlines.
- The feedwater flow rate indication for S/G B is slightly greater than the feedwater flow rates for the other S/Gs.

Based on these indications, which one of the following S/G(s) has (have) a tube leak?

- A. S/G 'A'
- B. S/G 'C'
- C. S/Gs 'A' and 'B'
- D. S/Gs 'B' and 'C'

REF: Summer Exam Bank #290

Distracter A - incorrect, demand on leaking S/G less because in leakage tends to raise level.

ANSWER B - Correct consistent w/North Anna & McGuire Events in that steamline radiation monitors were of significant value in identifying ruptured S/G.

Distracter C - incorrect, steam flow lower on a particular S/G (B) is a invalid indicator. Demand of FRV (A) may be a function of characteristics of individual positioners or valve.

Distracter D - incorrect, feedwater flow to leaking S/G will be less by the amount of leakage, rules out S/G.

(REV-A, Removed word 'small' so as not to qualify leak size in question, 10/10/90)

Requires analysis of negative leakage indications on "A" & "B" S/G and positive indication on "C". Reference of symptoms in AOP 112.2 may also be used.

(Rev. 1 Reviewed 6/17/92 - No changes required.)

(Rev. 2, changed "leak rate calculation" to "inventory balance" because with a leak big enough to create a significant difference to RM-G19 reading, it is unlikely the crew would need to perform a detailed leak rate calculation. Also changed COMMENTS relating to choice C to clarify reason that 'C' is incorrect.)

42. 038EK3.08 1

- A SGTR is in progress on the 'B' S/G.
- The Crew has implemented EOP-4.0 "Steam Generator Tube Rupture."
- PI-943 indicates 200 gpm.
- The crew is at the step for determining the required core exit thermocouples for cool down.
- The Reactor Operator reports that RCS pressure has reached 1340 psig.

Which ONE of the following describes what action should be taken next and why?

- A. Trip all RCP's, RCP's should be tripped anytime during EOP-4.0 if the trip criteria is met.
- B. Do not trip RCP's, Trip criteria does not apply and a controlled cooldown is imminent.
- C. Trip all RCP's, the trip criteria has been met and injection flow has been verified.
- D. Do not trip RCP's, RCP trip criteria only applies prior to isolation of the steam generator.

Modified Bank Question # 292 open reference bank.
Lesson Plan EOP-4.0 objective # 1919.

- A. Incorrect, RCP's should be tripped but the trip criteria only applies prior to a operator controlled cooldown.
- B. Incorrect, the trip criteria is met, and a cooldown has not be commenced.
- C. Correct, the trip criteria is met and Injection flow has been verified, and an operator controlled cooldown has not been started.
- D. Incorrect, the RCP trip criteria applies up until the point that a controlled cooldown has be started.

43. 039K1.02 1

Given the following conditions:

- The plant is at 100% power
- Steam Dump Mode Selector switch is selected to "Tavg"
- PORV Manual/Auto stations are selected to "automatic mode"
- Train "A" and "B" Steam Dump Bypass interlock switches are positioned to "ON"
- Steamline "B" pressure transmitter for Loop "B", PT-2010 fails LOW

Which one of the following describes the response of the steamline power reliefs?

- A. The "B" S/G power relief will not open in an overpressure condition but will open if the reactor trips.
- B. The "B" S/G power relief will lift and remain open until P-12 is received.
- C. The "B" S/G power relief will not open in either PORV mode or in Tavg control mode.
- D. The "B" S/G power relief will open and remain open until the reactor trips.

REF: IC-01 Steam Dump System

Answer A - Correct, PT-2010 provides the pressure input to PORV mode selection.

Distracter B - "B" S/G power relief will not open in relief mode.

Distracter C - "B" S/G power relief will open in Tavg control mode.

Distracter D - "B" S/G power relief will not open in relief mode.

44. 041A2.02 1

- Unit is at 80% power.
- A failure in the steam dump control circuitry causes the bank one steam dumps to open.
- The operator immediately takes the Train A and B Steam Dump interlock bypass switch to OFF-RESET to close the valves.
- One of the valves fails to close.

Which one of the following describes the approximate power level that the plant will reach, and what action(s) will mitigate the event?

- A. Power will rise to 92% and stabilize; an emergency boration should be commenced to reduce power, until valve can be isolated.
- B. Power will rise to 86% and stabilize; an emergency boration should be commenced to reduce power, until valve can be isolated.
- C. Power will rise to 92% and stabilize; turbine load must be reduced to lower power, until valve can be isolated.
- D. Power will rise to 86% and stabilize; turbine load must be reduced to lower power, until valve can be isolated.

Modified from Summer Bank question #2578.

Lesson Plan, IC-1 Steam Dumps, objective # IC-1-20.

- A. Incorrect, with only one valve open power should rise about 6%, and turbine load would have to be reduced to reduce power.
- B. Incorrect, this would be the correct power rise, however turbine load should be reduced to lower power until the valve can be isolated.
- C. Incorrect, this would be the power rise if both valves were open.
- D. Correct, this is the correct power rise and action to take to reduce power.

45. 051AK3.01 1

What is the purpose of C-9, Condenser availability, and C-16, Condenser vacuum availability, permissive signals?

- A. C-9 prevents all steam dump valves from operating during conditions that could damage the condensers. C-16 anticipates condenser heat load problems by blocking 2 condenser dump valves at 4.5 "Hg
- B. C-9 prevents 2 steam dump valves from operating during conditions that could damage the condensers. C-16 arms the Atmospheric dump and Relief valves when condenser is below the minimum vacuum and adequate circ water pumps are available.
- C. C-9 reduces turbine control circuit load to 25%, generator stator cooling water runback that could damage the generator, C-16 anticipates the loss of stator cooling and ramps the load reduction rate to 25 percent per minute.
- D. C-9 and C-16 permissives are both necessary to arm/open all condenser steam dump valves and arm/open atmospheric dumps and reliefs.

REF: Learning objective IC1-13, INSTRUMENTATION AND CONTROL SYSTEM

IC-1, STEAM DUMP SYSTEM, REVISION 5

Distracter B C-9 permits all condenser steam dump valves opening, provided breaker for any circ water pumps is closed and < 5 "Hg. C-15 and C-16 prevent 2 steam dump valves from operating during conditions that could damage the condensers.

Distracter C C-7A anticipates the loss of stator cooling and ramps the load reduction rate to 25 percent per minute and reduces turbine control circuit load to 25%, generator stator cooling water runback that could damage the generator, C-16

Distracter D C-15 and C-16 block two condenser dump valves to prevent full steam flow to the condenser.

46. 054AA1.01 1

- A plant startup is in progress.
- MDEFW pumps are being used to control S/G levels.
- The 'A' MFP is started.
- 'A' MDEFW pump has been secured.
- Just prior to securing the 'B' MDEFW pump the 'B' MFP trips.
- Immediately following the following annunciators illuminate.
 - "EFP SUCT HDR PRESS LO XFER TO SW"
 - "MD EFP A (B) SUCT PRESS LO"

Which ONE of the following describes the correct status of the EFW system based on the above conditions?

- A. Both MDEFW pumps will auto start, all the EFW FCV's will get a full open signal, and suction will transfer to SW immediately.
- B. Both MDEFW pumps will running, all the EFW FCV's will get a full open signal, and suction will transfer to SW after a 5 second time delay.
- C. Both MDEFW pumps will running, all the EFW FCV's will remain as is, and suction will transfer to SW after a 5 second time delay.
- D. Both MDEFW pumps will auto start, all the EFW FCV's will remain as is, and suction will transfer to SW immediately.

Lesson Plan IB-3 Emergency Feedwater, objective # IB-3-13 and 16.
Modified from a bank question from the Summer Bank, and Watts Bar Bank.

- A. Incorrect, The B MDEFW pump is already running, the A pump will auto start, the FCV's will not get a full open signal in this condition, and the transfer is delayed 5 seconds.
- B. Incorrect, the FCV's will not get a full open signal.
- C. Correct, both pumps will be running, the FCV's will be as is and the transfer has a 5 second time delay.
- D. Incorrect, B pump is already running, and the transfer is delayed 5 seconds.

47. 055EG2.4.16 1

The following plant conditions exist:

- Operators are performing immediate Operator Actions (IOAs) of EOP-1.0, Reactor Trip or Safety Injection.
- A RED path condition exists on HEAT SINK.

Which ONE of the following actions should be taken if ALL power is lost to the AC emergency busses?

- A. Immediately, transition to EOP-6.0, Loss of All ESF AC Power.
- B. Complete IOAs of EOP-1.0 and then transition to EOP-15.0 Response to Loss of Secondary Heat Sink
- C. Immediately, transition to EOP-15.0 Response to Loss of Secondary Heat Sink
- D. Complete IOAs of EOP-1.0 and then transition to EOP-6.0, Loss of All ESF AC Power.

REF: Summer Exam Bank #1894

48. 05502.4.11 1

- NIs indicate 31% power.
- Turbine Load is 310 MWe.
- CVP A/B/C TRIP annunciator is lit.
- Condenser Vacuum is 4.5 inches Hg absolute.

Which ONE of the following describes the correct actions to be taken to mitigate this event?

- A. Trip the Turbine and go to AOP-214.1 "Turbine Trip."
- B. Start the standby Main Condenser and Auxiliary Vacuum pump and reduce turbine load to 20% at 5% per minute.
- C. Trip the reactor, trip the turbine, and enter EOP-1.0, "Reactor Trip/Safety Injection Actuation."
- D. Start the standby Main Condenser Vacuum pump and auxiliary vacuum pump, if main condenser pressure does not decrease, trip the turbine.

Modified from Bank question #4363.

Lesson Plan AOP-206.1 "Decreasing Main Condenser Vacuum", objective # 3021.

AOP-206.1.

- A. Incorrect, conditions for tripping the turbine is $< 300\text{MWe}$ and main condenser pressure > 5 inches absolute.
- B. Incorrect, Starting the vacuum pumps are correct, however a caution prior to step 4 instructs the operator not to reduce load to 30%.
- C. Incorrect, Conditions are not met for a reactor trip at this time. ($< 50\%$ power)
- D. Correct, IAW AOP-206.1 the operator should start the vacuum pumps if pressure does not decrease then the RNO would have the operator trip the turbine.

49. 056K1.03 1

Given the following:

- Unit is operating at 100% power
- Condensate and feedwater is in normal full power lineup
- A failure of a card in the process racks causes the deaerator startup drain valve to go full open.

Which one of the following describes the affect on the main feedwater system?
(Assume no operator action is taken.)

- A. Feedwater booster and Feedwater pumps trip.
- B. Feedwater booster and Feedwater pumps will not trip.
- C. Feedwater booster pumps do not trip and Feedwater pumps will trip.
- D. Feedwater pumps "C" and "B" will trip and Feedwater pump "A" will not trip.

REF: TB-6 Condensate System
TB-7 Feedwater System

The deaerator level is drained to the condenser. Deaerator storage tank Lo-Lo-Lo Level (2 of 3) trips the feedwater booster pumps and feedwater pumps.

50. 057AA1.06 1

Which one of the following valves should be locally closed to minimize radiation levels in the Auxiliary Building during a Loss of All ESF AC Power?

- A. MVT-8100-CS (RC PUMP SEAL RETURN HDR ISOL VLV).
- B. MVT-8105-CS (SEAL INJECTION HEADER ISOLATION VALVE).
- C. MVG-9606-CC (RB CC RETURN HEADER VALVE).
- D. XVB-653-CO (COND A HOTWELL EMER MU CONT VLV IN VLV).

REF: Summer Exam Bank #585

Answer A - Correct, trainee must comprehend the bases of EOP-6.0 step 10.a.

Distracter B - incorrect, closed in EOP-6.0 but flow is into RB.

Distracter C - incorrect, CC would be closed and not in contact with RCS for significant activity.

Distracter D - incorrect, secondary side function not related to AB activity level.

(Rev. 1, Style corrections, 11/07/90.)

(Reviewed; no changes, 01/15/94.)

(Reviewed; no changes, JEG, 10/28/97.)

51. 058AK3.02 1

Actions contained in EOP for loss of DC power

The following plant conditions exist:

- The plant tripped from MODE 1
- Voltage on Bus 1DA and 1DB is zero
- EOP-6.0, Loss of All ESF AC Power, has been entered.
- An SI signal has been generated.
- Attempts to restore ESF power have been unsuccessful.
- All ESF equipment has been placed in pull-to-lock.

IF DC power supplies start degrading, Which EOP provides direction to meet the conditions and why are the actions, if any, necessary?

- A. EOP-6.2, 'Loss of All ESF AC Power Recovery with SI required'; no specific actions required for DC power supplies required Auxiliary Building batteries are designed for this condition.
- B. EOP-1.5, 'Rediagnosis'; actions serve to maintain DC voltage above 103 VDC.
- C. EOP-6.0, 'Loss of All ESF AC Power'; actions serve to maintain DC voltage above 108 VDC.
- D. SAMGs; conditions are outside design bases and actions will be dictated by TSC.

REF: EOP-6.0, 'Loss of All ESF AC Power'
GS-3, DC Power

Distracter A - incorrect, Operators would remain in EOP-6.0 and EOP-6.0 provides direction to maintain DC voltage above 1.8 VDC.

Distracter B - incorrect, Operators would remain in EOP-6.0

Answer C - correct, EOP-6.0 provides direction to maintain DC voltage above 1.8 VDC.

Distracter D - incorrect, direction to minimize DC loads is provided in EOP-6.0.

52: 059A1.03 1

47 05

Given the following conditions:

- The plant is at 100% power
- Two MFPs trip.

Which ONE of the following power levels is the highest allowed reactor power for this condition per AOP-210.3, Feedwater Pump Malfunction limits?

- A. 60%
- B. 55%
- C. 48%
- D. 43%.

REF: Summer Bank question 2994

53. 061AA2.05 1

Given the following conditions:

- The plant is in Mode 6 conducting a core offload.
- The level in the refueling cavity has started dropping rapidly due to an unknown cause.
- RM-G17A/B, Refuel Bridge, is in alarm

In accordance with AOP-123.1, Decreasing Level in the Spent Fuel Pool or Refueling Cavity During Refueling, which one of the following is the minimum dose rate on the refueling bridge (RM-G17A/B) that requires IMMEDIATE evacuation of all personnel from the Reactor Building and Fuel Handling Building?

- A. 5 R/hr
- B. 10 R/hr
- C. 20 R/hr
- D. 25 R/hr

REF: Summer Exam Bank #4206
Summer Audit Examination RO98001

Distracter A - incorrect, 5 rem/yr is the annual federal limit

Distracter B - incorrect, number chosen to fit sequence.

Answer C - correct, limit by caution prior to step one in SOP-123.1

Distracter D - incorrect, 25 rem TEDE is limit for actions required to save a life or protect a large population

54. 061K4.02 1

Given the following plant conditions:

- The plant was operating steady-state at 100% power.
- 'B' diesel generator was being load tested for periodic surveillance testing.
- A reactor trip coincident with a complete loss of the grid has just occurred, Safety Injection was NOT actuated.
- All offsite power to the safeguards buses has been lost.
- The Train 'A' ESF loading sequencer (ESFLS) malfunctioned and initiated NO actions.
- NO operator actions have been taken in response to the Loss of Offsite Power.
- 'B' diesel generator is still running with its output breaker still closed.

Which one of the following states the operating status of the Emergency Feedwater (EFW) pumps one minute after the plant trip and loss of offsite power occurred?

- A. Only TDEFP running
- B. Only "A" MDEFW and TDEFP running
- C. Only "B" MDEFW and TDEFP running
- D. Only "B" MDEFW running

REF: Summer 1998 Audit Exam RO98001

Distracter A - incorrect, 'A' MDEFW will not start

Distracter B - incorrect, 'A' MDEFW will not start

Answer C - correct, TDEFW pump start occurs due to monetary loss of IDA and IDB.

'B' MDEFW starts undervoltage on the associated bus (XSW1DB).

Distracter D - incorrect, TDEFW will start also.

55. 061K4.04 1

Following a reactor trip, MDEFPP "A" is providing 400 gpm flow. Flow to S/G A (FI-3531) suddenly increases to 800 gpm due to an EFW line break.

Which of the following is correct concerning subsequent EFW operation?.

- A. The damaged line will be further damaged by water hammer due to the high flow, if the HIGH flow interlock does not work.
- B. Less than 380 gpm will be available to the intact S/G's (B and C) from the EFW System.
- C. The "A" MDEFPP may fail due to operation at runout conditions if the HIGH flow interlock does not work.
- D. The water inventory in the CST will be exhausted, leaving no safety-grade source of makeup water.

REF: Summer Exam Bank #115

Distracter A - incorrect, water hammer not caused by high flow.

Distracter B - incorrect, design basis assures 380 gpm to intact S/G by limiting flow to faulted S/G. T.S. Basis (Pg. 3/4 7-2) discusses faulted S/G.

Answer C, 800 gpm is runout on MDEFPP Pp (design is 510 gpm, high flow interlock shuts FCV at 515 gpm). ARPs 622 & 623 (EF to SG A(B,C) FLO HI Annunciators) address runout concerns.

Distracter D - incorrect, service Water is a safety-grade backup supply.

(Rev. A, changed to identify whether Hi flow interlock was working or not, 9/27/90).

T.S. Pg. 3/4 3-21 addresses safety related Suction Transfer on Low Pressure.

56. 06/14.07 1

12A/

Which ONE of the following describes the operator actions required when paralleling the diesel and offsite power with the SYNC SEL switch in NORM and the synchroscope rotating fast in the slow direction?

- A. The operator should go to raise on the VOLT REG switch.
- B. The operator should go to raise on the SPEED switch.
- C. The operator should go to lower on the VOLT REG switch.
- D. The operator should go to lower on the SPEED REG switch.

Bank Question # 47, modified to have the diesel leading instead of site.
SOP-306.

- A. Incorrect, voltage will have no noticeable effect on adjusting frequency.
- B. Incorrect, with the diesel leading offsite power, the speed of the diesel will have to be reduced to slow down the rotation of the synchroscope.
- C. Incorrect, voltage will have no noticeable effect on adjusting frequency
- D. Correct, in order to slow down the rate of the synchroscope the diesel will have to be slowed down.

57. 062AA2.04 1

- Reactor Power is 50%.
- A Total Loss of All Service Water has occurred.
- AOP-117.1 "Total Loss of Service Water has been entered.
- RCP temperatures are beginning to rise.

Which ONE of the following describes the action(s) the operators must take and when?

- A. When RCP motor bearing temperatures reaches 195 °F; trip the affected RCP.
- B. When RCP motor bearing temperature exceeds 175 °F; trip the reactor, then stop the affected RCP.
- C. When RCP lower seal water bearing temperature exceeds 195 °F; trip the affected RCP.
- D. When RCP lower seal water bearing temperature exceeds 225 °F; trip the reactor, then stop the affected RCP.

Lesson Plan AOP-117.1 objective # 8.
AOP-117.1 "Total Loss of All Service Water."

- A. Incorrect, If RCP motor bearing temperature reaches 195 °F, the procedure directs the crew to trip the reactor prior to tripping the RCP if power is greater than P-7.
- B. Incorrect, 175 °F is a normal temperature for motor bearing, the pump is not required to be tripped until 195 °F.
- C. Incorrect, the RCP is not required to be tripped until the lower seal water bearing temperature exceeds 225 °F.
- D. Correct, if RCP lower seal water bearing temperature exceeds 225 °F the AOP has the crew trip the reactor then stop the affected RCP.

58. 063K3.01 1

Diesel Generator 'A' is running for a surveillance when DPN1HA is de-energized.

What is the immediate effect on Diesel Generator 'A' by the loss of DPN1HA?

- A. Diesel will continue to run, the diesel can be stopped from local STOP PB but not the MCB Test switch, and only the emergency engine protective trips are enabled.
- B. Diesel will continue to run, the diesel can not be stopped from the local STOP PB or the MCB TEST switch, and the engine protective trips are disabled.
- C. Diesel will continue to run, Diesel speed control is locked at current speed, the diesel can be stopped from the local STOP PB but not from the MCB TEST switch, and the emergency engine protective trips are disabled.
- D. Diesel will immediately trip due to the engine protective trips being actuated.

REF: Summer Exam Bank #555
ARP-001 4-3 DG A Loss of DC

Distracter A - incorrect, D/G can not be stopped from the local Stop PB and no protective trips are enabled.

Answer B - correct, the ability to shutdown the D/G by placing the Test switch in stop (MCB) or by depressing the STOP PB (Local) is lost. The D/G engine protective trips are disabled due to the inability to energize XVX10998A-DG, Air to Fuel Rack S/D Cyl solenoid valve.

Distracter C - incorrect, speed control is not affected, the D/G can not be stopped from the local Stop PB, and the engine protective trips are disabled.

Distracter D - incorrect, the D/G will not immediately trip.

The following plant conditions exist:

- A loss of all ESF AC power has occurred.
- Bus 1DA Normal Feed breaker and Bus 1DA ALT FEED breaker open, but D/G 'A' fails to start automatically.
- D/G 'A' is locally started, but the Bus 1DA DG FEED breaker fails to close.
- The local 86 lockout relay has not actuated and the condition of the 'A' Diesel Local Control Panel Status lights is as follows:
 - "READY FOR LOAD" - Not Lit
 - "READY FOR AUTO START" - Not Lit
 - "EMERG. START" - Bright
- The IB AO reports that D/G speed is 508 RPM.
- The IB AO reports D/G voltage is 6470 volts

Which ONE of the following conditions could be preventing the Bus 1DA D/G FEED breaker from automatically closing and what action would correct this condition?

- A. Diesel Generator relays not reset, reset generator relays locally.
- B. Diesel Speed below minimum, adjust D/G speed using local speed adjust.
- C. Diesel Control Mode switch in local, place mode control switch in remote.
- D. Diesel Voltage below minimum, raise D/G voltage using local voltage adjust.

Modified from open reference bank question 560.

Lesson plan IB-5 Diesel Generator System, objective # Ib-5-19.

- A. Incorrect, only the 86 lockout relay will prevent the breaker from closing on emergency start and the 86 relay has not picked up.
- B. Incorrect, speed is greater than 504 rpm, therefore this will not prevent the breaker from closing.
- C. Incorrect, the position of the mode switch has no effect on the breaker on an emergency start.
- D. Correct, Voltage < 90% will prevent the output breaker from closing.

- A fire has been reported in the Auxiliary Building.
- IPS-4911, Diesel Fire Pump Discharge Pressure Switch is INOPERABLE.
- The electric fire pump has failed to start.

Which ONE of the following will start the diesel fire pump from the local control panel?

- A. Place the mode selector switch in OFF/RESET and depress the start pushbutton.
- B. Place the mode selector switch in MAN 1 and depress the start pushbutton.
- C. Place the mode selector switch in the TEST position to open the discharge drain valve to emergency start the pump.
- D. Place the mode selector switch in OFF/RESET and cycle the feeder breaker to XSW-1C2.

Bank Question, from GS-11 objective # GS-11-05 and 10.

Could not find any other documentation to support the question. (needs to be supplied by the facility)

61. 068AK3.17 1

Given the following plant conditions:

- Conditions exist that warrant a Control Room Evacuation.
- Offsite power is not available.
- AOP-600.1, Control Room Evacuation, actions are complete to step 21 Alternative Action - The Control Room can not be re-entered.
- Plant Management directs initiation of plant cooldown and entry to GOP-8, Plant Shutdown from Hot Standby to Cold Shutdown with Control Room Inaccessible (Mode 3 to Mode 5)

After borating the RCS to cold, xenon-free shutdown concentration per GOP-8, how is the Pressurizer boron concentration equalized with the RCS?

- A. By increasing normal PZR spray flow with PZR heaters in manual to maintain PZR pressure.
- B. By increasing Auxiliary Spray to the PZR with PZR heaters in manual to maintain PZR pressure.
- C. By raising and lowering PZR level using PZR heaters to maintain PZR pressure.
- D. By using normal boration flowpath and Auxiliary spray flowpath at the same time using PZR heaters to maintain PZR pressure.

REF: GOP-8, Plant Shutdown from Hot Standby to Cold Shutdown with Control Room Inaccessible (Mode 3 to Mode 5)
AOP-600.1, Control Room Evacuation

Distracter A - RCPs have been tripped as initial conditions of GOP-8. Normal spray not available.

Distracter B - Use of Auxiliary spray not directed by procedure GOP-8.

Answer C - Step 3.5 GOP-8 equalize PZR boron concentration by in-surge and out-surge

Distracter D - Use of Auxiliary spray not directed by procedure GOP-8.

62. 068K6.10 1

068K6

- RM-L5 and RM-L9 are out of service.
- Fairfield Hydro is in the "pumping" mode.
- An Immediate discharge to the Penstocks from both Waste Monitor tanks is required.

Which ONE of the following describes the MINIMUM conditions necessary for the Waste Monitor tanks to be released?

- A. The Fairfield Hydro must convert to the generating mode and redundant samples must be performed prior to release.
- B. The Fairfield Hydro must convert to the generating mode prior to release and RM-L5 and RM-L9 must be restored to service.
- C. RM-L5 OR RM-L9 must be restored to operable status before a release can be made.
- D. RM-L5 AND RM-L9 must be restored to operable status before a release can be made.

Bank Question from AB-16 questions # 862. Used Lesson plan AB-16 "Liquid Waste Processing" Rev 6 dated 1996 to verify. (May require some further verification)

- A. Correct, according to the bank question and information found in 1996 AB-16 lesson plan page 33.
- B. Incorrect, RL-5 and RM-L9 do not have to be restored to service to conduct a release.
- C. Incorrect, A release can be made with both RL-5 and RM-L9 out of service.
- D. Incorrect, A release can be made with both RL-5 and RM-L9 out of service.

63. 071K3.05 1

- A waste gas release is in progress.
- RM-A10 is in service, but has failed to upscale during the release.

Which ONE of the following describes the effect of this failure on the release in progress?

- A. If its setpoint is exceeded RM-G10 Auxiliary Building Waste Gas Decay Tank Area monitor will alarm and close HCV-014 and terminate the release.
- B. The release will be monitored by RM-G10 Auxiliary Building Waste Gas Decay Tank Area, but no automatic actions will occur.
- C. If its setpoint is exceeded RM-A3 Main Plant Vent Exhaust monitor will alarm and close HCV-014 and terminate the release.
- D. The release will be monitored by RM-A3 Main Plant Vent Exhaust monitor, but RM-A3 has no automatic functions.

Lesson Plan GS-9 Radiation Monitoring Systems, objective GS-9-18.

- A. Incorrect, RM-G10 monitors the waste gas decay tank area and would not indicate upscale conditions unless a leak was in progress, and has no automatic actions.
- B. Incorrect, RM-G10 monitors the area but should not upscale unless a leak occurs.
- C. Correct, if its setpoint is exceeded RM-3A will close HCV-014.
- D. The release will be monitored by RM-3A, however it does have automatic functions.

64. 072A3.01 1

12A

- RMG-17A Reactor Building Radiation Monitor Alarms.
- A High Radiation condition is confirmed in the Reactor Building

Which ONE of the following describes the automatic action(s) that should have occurred?

- A. ONLY the "A" Train purge exhaust fan stops.
- B. Train "A" and "B" purge exhaust fans stop.
- C. Only Reactor Building Purge discharge valve XVB-1A closes.
- D. Reactor Building Purge discharge valves XVB-1A and XVB-2A close.

Bank. Used on 1992 Summer NRC exam.

Lesson Plan GS-9 Radiation Monitoring system. objective GS-9-18.

- A. Incorrect, this radiation monitor closes the purge valves but does not stop the purge fans.
- B. Incorrect, this radiation monitor closes the purge valves but does not stop the purge fans.
- C. Incorrect, this valve does close, but the automatic actions will also close XVB-2A.
- D. Correct, Both valves should have closed.

65. 075G2.1.32 1

- The Unit is starting up after a refueling outage.
- The Circulating water system is being started up.
- At 0800 the 'A' CW pump was started and secured due to a water box cover leaking.
- At 0810 the 'A' pump was started again, but tripped immediately.

Which one of the following describes the earliest time that the "A' Circulating water pump could be restarted?

- A. 'A' circulating pump can be started at any time, six pump starts per day are allowed.
- B. 0840 is the earliest that the 'A' circulating water pump could be started.
- C. 0850 is the earliest that the 'A' circulating water pump could be started.
- D. 0910 is the earliest that the 'A' circulating water pump could be started.

SOP-207, precautions and limitations # 4.

Lesson Plan TB-08 Circulating Water System, objective TB-8-07.

- A. Incorrect, the pump is limited to six starts per day, but should have 40 minutes after two attempts of starting from cold conditions.
- B. Incorrect, this would be correct if the applicant choose 30 minutes as the cooldown time.
- C. Correct, 0810 + 40 minutes would be 0850, this would be the earliest time.
- D. Incorrect, this would be correct if the applicant choose 60 minutes as the cooldown time.

66. 076A2.02 1

- XCP-604 1-2 "SWP A/C TRIP" alarms.
- Annunciator XCP-604 1-4 "SWP A/C DISH PRESS LOW" alarms.
- Annunciators XCP-605 1-4 "SWP B/C DISH PRESS LOW" alarms.
- PI-4402, Service Water Pump "A" Discharge Pressure, indicates 18 psig.
- PI-4422, Service Water Pump "B" Discharge Pressure, indicates 48 psig.
- "A" SW pump will not restart.

Which ONE of the following describes the actions that should be taken to mitigate this event?

- A. Enter SOP-117 "Service Water System", and secure any running diesel generators.
- B. Enter AOP-117.1 "Total Loss of Service Water", and trip all RCPs.
- C. Reference SOP-117 "Service Water System", and start the "C" SW pump.
- D. Reference AOP-118.1 "Total Loss of Component Cooling Water", and isolate all CCW loads.

Modified from Bank question # 3101. (NEED TO CHECK SW PRESSURE VALUES)

Reference: AOP-117.1 "Total Loss of Service Water."

- A. Incorrect, SOP-117 will be referenced, however if diesel generators are required, fire service water would be aligned to supply.
- B. Incorrect, AOP-117.1 is a procedure to enter however the procedure allows stopping up to 2 RCPs when plant conditions permit.
- C. Correct, AOP-117.1 directs the operator to refer to SOP-117 and to start the spare service water pump, this would mitigate this event.
- D. Incorrect, AOP-118.1 may be referenced, but only unnecessary CCW loads would be isolated.

67. 076AK2.01 1

What type of detectors are used for PM-L1, Primary Coolant Letdown Monitor inputs for monitoring high reactor coolant activity and where are the sensing location for RM-L1?

- A. A scintillation and a Geiger-Mueller detector, located near the letdown line upstream of the BTRS Demin.
- B. Two scintillation detectors, located near the letdown line upstream of the BTRS Demin.
- C. A scintillation and a Geiger-Mueller detector, located near the letdown line downstream of the BTRS Demin.
- D. Two Geiger-Mueller detectors, located near the letdown line downstream of the BTRS Demin.

REF: Kewaunee exam 2000
General Systems GS-9 Radiation Monitoring System Rev 6

Answer A - correct

Distracter B - Incorrect, Use of two different detectors with overlapping ranges.

Distracter C - Incorrect, location is upstream of the BTRS Demin

Distracter D - Incorrect, Use of two different detectors with overlapping ranges and location is upstream of the BTRS Demin

68. 0794.01 1

- 'A' Instrument Air Compressor is the only air compressor running.
- A high oil temperature causes the 'A' instrument air compressor to trip.
- The reactor operator "matches flags" by taking its switch to Normal-After-Stop on the MCB.

With no other operator actions:

Which ONE of the following describes the effect this will have on the Instrument Air System?

- A. Instrument Air header pressure will continue to decrease until it reaches 80 psig, and the B Instrument Air Compressor (XAC-3B) will auto start.
- B. Instrument Air header pressure will continue to decrease until an instrument air compressor is manually started.
- C. Instrument Air header pressure will continue to decrease until it reaches 70 psig, and the Supplemental Instrument Air Compressor (XAC-12) will auto start.
- D. Instrument Air header pressure will continue to decrease until it reaches 90 psig, then PVA-2659 INST AIR TO RB AIR SERV, will automatically open.

Bank Question # 563.

Lesson Plan TB-12 "Station Service and Instrument Air System", objective TB-12-17.

- A. Incorrect, this action will not occur with the switch in the Normal-After-Stop position.
- B. Correct, if no actions are taken pressure will continue to decrease.
- C. Incorrect, this action will not occur with the switch in the Normal-After-Stop position.
- D. Incorrect, this auto action does not exist for the conditions described.

69. 086K1.02 1

Which one of the following is the backup cooling water supply to the Diesel Generators?

- A. Circulating Water System.
- B. Fire Service System.
- C. Raw Water System.
- D. Industrial Cooling Water System.

System Bank Question #754 GS-11 Fire Protection System. Objective 1B-1-04.

70. G2.1.10 1

- Unit is at 100% power.
- The TD EFW pump is Tagged out for bearing replacement.
- Both Motor Driven EFW pumps have just been declared inoperable due to a common problem.

Which ONE of the following describes the actions that must be taken?

- A. Restore at least one EFW pump to operable status or be in hot shutdown within 1 hour.
- B. Immediately trip the reactor and initiate safety injection, using the Main Feedwater pumps to maintain S/G levels.
- C. Restore at least one EFW pump to operable status within 1 hour, and a second EFW pump within 6 hours, or be in Hot Standby in the next 6 hours.
- D. Initiate actions to restore at least one EFW pump to operable status as soon as possible.

Bank Question, from Farley exam bank.
T.S. 3.7.1.2

- A. Incorrect, this is not the action called for in the T.S.
- B. Incorrect, a reactor trip is not required by the T.S.
- C. Incorrect, TS does not allow for 1 hour to restore one EFW pump to service.
- D. Correct, the TS directs to initiate actions to restore one EFW pump to operable status as soon as possible.

71. G2.1.12 1

The following plant conditions exist:

- Rod D-8 in Bank D became misaligned 10 minutes ago during a unit ramp up.
- Unit is stable at 87% power.
- QPTR has been determined to be 1.10.
- Troubleshooting of Rod D-8 is in progress.

Which ONE of the following describes the MINIMUM actions required to be taken based on the above plant conditions?

- A. Reduce reactor power to < 70 % within 2 hours.
- B. Reduce reactor power to < 70 % within 30 minutes.
- C. Reduce reactor power to < 57 % within 2 hours.
- D. Reduce reactor power to < 57 % within 30 minutes.

Technical Specification 3.2.4 Action statement.

Modified from a Farley bank question. Could not find a lesson plan on tech specs.

- A. Incorrect, with QPTR exceeding 1.09, action must be taken within 30 minutes.
- B. Correct, with QPTR exceeding 1.09, action must be taken within 30 minutes, 100% is RTP. $100 - (3 \times 10 = 30) 30 = 70\%$ power must be reduced to < 70 %.
- C. Incorrect, action must be taken within 30 minutes, and the power reduction is more than is required.
- D. Incorrect, the power reduction is more than required and the question asks for the minimum action.

72. G2.1.29 1

- The plant is MODE 5 preparing to startup.
- You are the Shift Supervisor.
- A Valve lineup is being conducted on the CVCS.
- Several Valves are reported to need verification in the open position at the 412' level of the Reactor Building.
- None of these valves are designated "IV Exempt."
- Local Radiation levels are about 50 mr/hr.
- The initial positioner received 25 mrem performing his portion.

Which ONE of the following courses of action is preferred?

- A. Order verifications by several persons to limit individual exposures.
- B. Order verification be performed by Health Physics to ensure ALARA compliance.
- C. Waive the independent verification to reduce personnel exposures by verifying correct position by alternate means.
- D. Have the verifier with the most experience perform the independent verifications in the shortest amount of time possible.

Bank question from 1992 Summer NRC Exam.
SAP-153.

- A. Incorrect, SAP-153 directs the shift supervisor to waive the IV if the dose received will be greater than 10mr, and should consider verifying position by alternate means.
- B. Incorrect, SAP-153 directs the shift supervisor to waive the IV if the dose received will be greater than 10mr, and should consider verifying position by alternate means.
- C. Correct, this is the action that is directed in SAP-153.
- D. Incorrect, SAP-153 directs the shift supervisor to waive the IV if the dose received will be greater than 10mr, and should consider verifying position by alternate means.

73. G2.1.3 1

-The NROATC desires to leave the control room for approximately 30 minutes to get a new picture for his badge.

Which ONE of the following describes the MINIMUM items that a unexpected or temporary relief should include?

- A. Discuss existing plant conditions, anticipated evolutions, and log the turnover in the Station Log Book.
- B. Discuss existing plant conditions, anticipated evolutions, review the Main Control board controls, instrumentation and annunciators.
- C. Review the Main Control board controls, instrumentation and annunciators and log the turnover in the Station Log Book.
- D. Review the Main Control board controls, instrumentation and annunciators, complete a turnover sheet, and log the turnover in the Station Log Book.

Bank Question 1992 Summer NRC exam modified slightly.
Reference: SAP-200, pages 7 and 8.

- A. Incorrect, Logging the turnover is only required if the NROATC is leaving the site.
- B. Correct, IAW SAP-200 these are the minimum actions required for a temporary relief.
- C. Incorrect, Logging is not required and all the actions are not listed.
- D. Incorrect, a turnover sheet is not required and the turnover does not have to be logged.

74. G2.2.11 1

Which ONE of the following correctly describes the MINIMUM review/approval required for a temporary procedure change, and when final approval is required?

- A. A Qualified Reviewer and responsible Discipline Supervisor; final approval is required within 30 days.
- B. A Qualified Reviewer and Shift Supervisor; final approval is required within 90 days.
- C. A Qualified Reviewer and responsible Discipline Supervisor; final approval is required within 90 days.
- D. A Qualified Reviewer and Shift Supervisor; final approval is required within 30 days.

REFERENCE: SAP-139, "Procedure Development, Review, Approval, and Control", pages 31 & 32.

- A. Incorrect, A shift supervisor is required to approve the temporary change procedure change.
- B. Incorrect, the time required for final approval is 30 days.
- C. Incorrect, the time required for final approval is 30 days and the SS is required to approve the temporary change.
- D. Correct, the SS and a qualified reviewer must approve, and final approval is required within 30 days.

75. G2.2.13 1

- A danger tagout has several multi-discipline MWRs associated with it.
- Workers have requested that two tags be removed to complete work associated with one of the MWRs.
- It has been determined that removal of the two tags would not violate the level of safety required for the remaining work.

Which ONE of the following describes the action required to be taken to remove the two tags?

- A. Authorize clearance only on the white copy of the Danger Tag Log and Component Log. Updating the yellow copies is not required, because they will be discarded when the tagout is closed out.
- B. Retrieve the yellow copy of the Danger Tag Log and Component Log for the affected MWR, authorize the clearance on the white copy and update only the affected yellow copy.
- C. Authorize clearance only on the affected yellow copy of the Danger Tag Log and Component Log, the removal of the two tags pertains only to the affected MWR.
- D. Retrieve all yellow copies of the Danger Tag Log and Component Log, authorize the clearance on the white copy and update each yellow copy.

Bank Question # 607.
SAP-201, "Danger Tagging."

76. G2.2.19 1

Which ONE of the following describes the type of work that would be ranked as a PRIORITY 1 Maintenance Work Request (MWR)?

- A. Corrective items to avoid a major plant load reduction.
- B. Major plant modification items.
- C. Compliance items to ensure that a 72-hour action statement time limit is not exceeded.
- D. Improvement items for plant efficiency.

*REFERENCE 1992 Summer NRC exam.

1. SNS SAP-300, Rev. 8
2. SNS SAP-601, pp. 3, & 4.

A. Incorrect, IAW SAP-300 priority 1 MWRs are those that must start immediately and be worked through to completion including the call out of maintenance personnel and the establishment of shift work if necessary.

B. Incorrect, IAW SAP-300 priority 1 MWRs are those that must start immediately and be worked through to completion including the call out of maintenance personnel and the establishment of shift work if necessary.

C. Correct, this meets the definition in SAP-300.

D. Incorrect, IAW SAP-300 priority 1 MWRs are those that must start immediately and be worked through to completion including the call out of maintenance personnel and the establishment of shift work if necessary.

77. G2.2.22 1

-Unit is in Mode 3.

-A transient has occurred that raised RCS pressure to 2775 psig.

Which one of the following describes the correct action(s) that are required to be taken?

- A. Reduce RCS pressure to less than 2735 psig in one hour.
- B. The Unit must be placed in HOT SHUTDOWN with pressure stable at 2235 psig within one hour.
- C. Reduce RCS pressure to less than 2735 psig within 5 minutes.
- D. The Unit must be cooled down to COLD SHUTDOWN with pressure less than 350 psig within 6 hours.

Bank question from Farley Exam Bank.

- A. Incorrect, pressure must be reduced to less than 2735 psig, but within 5 min.
- B. Incorrect, this is the correct response if the Unit was in mode one or two.
- C. Correct, Tech specs requires RCS pressure to be reduced to less than the safety limit of 2735 psig within 5 minutes.
- D. Incorrect, there is no requirement to cooldown to cold shutdown.

78. G2.2.33 1

Which ONE of the following describes why the bank overlap unit withdraws control rod banks sequentially?

- A. Provides for uniform rod worth and reduced oscillation in the size and location of peak power production.
- B. Provides input for control rod insertion limit alarms and control bank deviation alarms.
- C. Provides for uniform rod worth and provides an input for control rod insertion alarms.
- D. Provides for reduced oscillation in the size and location of peak power production and an input for control bank deviation alarms.

Lesson Plan IC-5 Rod Control, objective # IC-5-04.

- A. Correct, the bank overlap unit provides these functions.
- B. Incorrect, the Pulse to Analog converter performs these functions.
- C. Incorrect, the P/A converter provides the input for the control rod insertion alarms.
- D. Incorrect, the P/A converter provides the input for control bank deviation alarms.

79. G2.3.1 1

Which ONE of the following dose components are combined to determine a Radiation Worker's Occupational Dose?

- A. Total Effective Dose Equivalent and Committed Effective Dose Equivalent.
- B. Deep Dose Equivalent and Committed Effective Dose Equivalent.
- C. Total Effective Dose Equivalent and Planned Special Exposures.
- D. Committed Effective Dose Equivalent and Planned Special Exposures, only.

Bank Question from Surry NRC Exam 2002.

A. Incorrect, the components that make up a Radiation Worker's Occupational Dose is DDE and CEDE. $DDE + CEDE = TEDE$

B. Correct, DDE and CEDE.

C. Incorrect, the components that make up a Radiation Worker's Occupational Dose is DDE and CEDE.

D. Incorrect, the components that make up a Radiation Worker's Occupational Dose is DDE and CEDE.

80. G2.3.4 1

- A General Emergency has been declared due to a Large Break LOCA.
- An offsite release is in progress due to the leak.
- A Worker isolating the leak has been injured.
- An Emergency Responder has volunteered to go in and remove the injured worker.
- The volunteer has a current year to date exposure of 3 Rem.

Which One of the following describes the MAXIMUM dose the emergency responder could be allowed to receive for this activity?

- A. 7 REM TEDE.
- B. 10 REM TEDE.
- C. 22 REM TEDE.
- D. 25 REM TEDE.

Bank question from Sequoyah.

EPP-020 Emergency Personnel Exposure Control, attachment III.

- A. Incorrect, this is the dose allowed for protecting valuable property minus his current dose which is not used for this activity.
- B. Incorrect, this is the dose allowed for protecting valuable property.
- C. Incorrect, this is the dose for saving a life minus his current dose which is not used in this activity.
- D. Correct, this is the allowed dose IAW EPP-020 attachment III.

- Unit is at 33% reactor power following a start-up.
- Annunciator XCP-617 point 1-5 "RCP A LOW OIL RESVR LVL HI/LO" is in.
- Electrical Maintenance has determined that the oil level is 1.80 inches above static level.
- An oil level has been observed in the sightglass.

Which ONE of the following describes the appropriate action(s) to be taken?

- A. Immediately Trip the Reactor and secure RCP "A" in accordance with SOP-101.
- B. Secure RCP "A" in accordance with SOP-101, and be in Hot standby per GOP-4 and GOP-5 within one hour.
- C. Monitor bearing temperature, if bearing temperature exceeds 195°F then secure RCP "A" in accordance with SOP-101, and be in Hot Standby per GOP-4 and GOP-5 within one hour.
- D. Monitor bearing temperature, if bearing temperature exceeds 195°F then immediately trip the reactor and secure RCP "A" in accordance with SOP-101.

ARP XCP-617 annunciator point 1-5.

AB-4 Reactor Coolant Pump Lesson Plan enabling objective AB-4-20.

- A. Incorrect, this would be the correct action if power was greater than 38%, and there was no level in the sight glass.
- B. Incorrect this would be the correct action if there was no level in the sight glass with current plant conditions.
- C. Correct, with the level high but still in the sight glass the ARP has the crew monitor the lower radial bearing temperature and if it exceeds 195 degrees F then secure the pump and proceed to hot standby.
- D. Incorrect, this would be the correct action if the reactor was greater than 38%.

82. G2.4.11 1

- The Unit is operating at Mid-nozzle.
- RHR is in service.
- The operating RHR pump flow and amps are oscillating.
- AOP-115.1 "RHR Pump Vortexing" has been entered.

Which ONE of the following would require tripping the running RHR pump?

- A. RHR temperature rises to 215°F.
- B. RCS Hot Leg Level decreases to 15 inches.
- C. RHR flow is reduced to 900 gpm for 33 minutes.
- D. RCS Pressure decreases to less than 50 psig.

Modified from VCS bank questions 2355 and 1870.
VCS AOP 115.1 Lesson Plan objective 2277.

- A. Incorrect, the procedure directs the crew to implement STP-103.001 and to monitor Hot leg temperature, but does not direct the tripping of a RHR pump for these conditions.
- B. Incorrect, the procedure directs the crew to trip the running RHR pump if level drops to less than 14 inches.
- C. Correct, the caution prior to step one states that the RHR pump should be limited to less than 30 minutes with less than 1000 gpm flow rate.
- D. Incorrect, at mid loop pressure in the RCS should already be less than 50 psig.

- A reactor trip has occurred due to a loss of MFW.
- EOP-15.0 "Response to a Loss of Secondary Heat Sink" is in progress.
- The RCS is in a feed-and-bleed condition with RCS Temperature stable at 570°F.
- The operators restore a feedwater source and prepare to feed the S/Gs which are dry.
- The CRS directs the operator to establish feed water to only one S/G.

Which one of the following describes the reason for feeding only one S/G under these conditions?

- A. To prevent a rapid cooldown of the RCS that could lead to a pressurized thermal shock condition.
- B. To demonstrate the reliability of the FW source before filling all of the steam generators.
- C. To determine if one S/G is capable of maintaining adequate heat sink so that RCS bleed-and-feed can be terminated.
- D. To ensure that if a S/G failure occurs due to excessive stresses, the failure is isolated to one S/G.

Lesson Plan EOP-15.0 "Response to Loss of Secondary Heat Sink". Objective 2905.

- A. Incorrect, cooldown rate depends on amount of FW, not distribution between generators.
- B. Incorrect, demonstration of reliability not required in EOP-15.0
- C. Incorrect, feed and bleed will not terminated based on having flow to the S/G, water will have to be back in the narrow range.
- D. Correct, this is the correct reason based on FR-H.1 background.

84. G2.4.2 1

- Unit is at 5% reactor power following a start up.
- A Pressurizer Spray valve fails open.

Which one of the following would be the first to trip the reactor? (Assume no operator action).

- A. Pressurizer Pressure Low Reactor Trip.
- B. OT Delta T Reactor Trip.
- C. Pressurizer High Water Level Reactor Trip.
- D. Pressurizer Pressure Low Safety Injection.

Instrumentation and Control Lesson Plan IC-3 enabling objective IC-3-19.
Lesson Material page 18.
Bank question from Farley Exam Bank.

- A. Incorrect, This would trip the reactor first if reactor power was greater than 10%.
- B. Incorrect, With the RCS delta T at a very low power level it would take a very long time and pressure would have to decrease to much less than the 1850 psig setpoint.
- C. Incorrect, this trip is disabled less than 10% reactor power. (P-7).
- D. Correct, with the plant in this condition this will be the first setpoint that will trip the reactor.

85. G2.4.4 1

- An ATWS is in progress.
- EOP-13.0 "Response to Abnormal Nuclear Power Generation" has been entered.
- All Narrow Range SG levels indicate 0%.
- EFW flow to each SG is 0 gpm.
- RCS Pressure is cycling on the PORVs.
- Core Exit Thermocouples indicate 1200°F and are slowly rising.
- Power is low in the PR range, and IR SUR is slightly negative.

Which ONE of the following describes the actions the crew should take?

- A. Transition to EOP-3.1 "Uncontrolled Depressurization of All Steam Generators; all steam generators are faulted.
- B. Immediately Transition to EOP-15.0 "Response to Loss of Secondary Heat Sink; to restore steam generator levels.
- C. Transition to EOP-14.0 "Response to Inadequate Core Cooling upon completion of EOP-13.0; restore core cooling.
- D. Immediately Transition to SACRG-1 "Sever Accident Control Room Guideline-Step 1, core damage is imminent.

Modified from VCS bank questions 3622 and 3623.

Lesson Plan EOP 13.0 objective 2044.

A. Incorrect, plant conditions do not indicate that all SGs have faulted.

B. Incorrect, EOP 13.0 must be completed prior to transitioning out of the procedure.

C. Incorrect, a valid red path exists on core cooling, however the procedure directs the crew to transition to SACRG-1 because with the core still a power core damage is imminent or has already occurred.

D. Correct, with CETC's greater than 1200 degrees and power still in the power range temperatures continuing to increase step directs the crew to transition to SACRG-1 step 1.

86. G2.4.5 1

- A Reactor Trip has occurred from 100% power.
- Buses 1DA and 1DB are de-energized.

Which ONE of the following describes the implementation of procedures referenced by the Critical Safety Function Status Trees under these conditions?

- A. Critical Safety functions should be monitored but not implemented until directed by EOP-1.0 "Reactor Trip or Safety Injection."
- B. Critical Safety Functions should be implemented upon transition from EOP-1.0, "Reactor Trip or Safety Injection."
- C. Critical Safety Functions should be implemented when directed by EOP-6.0 "Loss of All ESF AC Power".
- D. Critical Safety Functions should be monitored but not implemented until directed by EOP-6.1 "Loss of All ESF AC Power Recovery without SI Required".

Modified from 2 bank questions #2448, and a 1990 NRC exam question.
VCS EOP-6.0 and 6.1 Lesson EOP-6.0 objective 1997.

- A. Incorrect, A loss of all AC has occurred EOP-1.0 has not been entered, and the CSFs assume that at least one train of electrical equipment is energized.
- B. Incorrect, A loss of all AC has occurred EOP-1.0 has not been entered, and the CSFs assume that at least one train of electrical equipment is energized.
- C. Incorrect, A loss of all AC has occurred, however EOP 6.0 does not direct implementation of the CSF procedures.
- D. Correct, EOP 6.1 directs implementation of CSFs after step 12 of EOP-6.1

87. W/E02G2.4.18 1

Which one of the following describes the reason that adequate pressurizer (PZR) level alone is NOT sufficient justification for SI termination?

- A. Adverse Containment conditions could result in flashing in the PZR level reference legs which cause large errors in indicated level.
- B. Steam void in the reactor vessel can cause high pressurizer level indications despite inadequate inventory.
- C. Reflux boiling could be providing adequate core cooling even without indicated PZR level.
- D. A main steamline break will significantly cooldown the RCS, and result in only the cold calibrated level instrument providing PZR level indication.

REF: Indian Point Exam 1996
WOG Background Documents
EOP-1.2, Safety Injection Termination

88. W/E03EK1.2 1

A post-LOCA cooldown and depressurization is in progress following a small-break LOCA, and the following conditions exist:

- Charging pumps A and B are running in the injection mode.
- RCS subcooling is 56F
- Tc is 550F.
- The PZR heater control switches are in the OFF position.
- PZR level is below the indicating range.
- Reactor coolant pump A is in service.
- The operating crew is on step 8 of EOP-2.1, Post-LOCA Cooldown and Depressurization, which directs them to refill the PZR by depressurizing the RCS using normal spray.

Why will depressurizing the RCS refill the PZR?

- A. The water in the RCS will expand at lower pressure, forcing water into the PZR.
- B. Voiding throughout the RCS will displace water into the PZR.
- C. Accumulator injection will force water into the PZR.
- D. The lower RCS pressure will increase charging/SI flow, refilling the PZR.

REF: Summer Exam Bank #439

Distracter A - incorrect, negligible magnitude.

Distracter B - incorrect, loss of subcooling margin is expected in this step, but significant voiding is not.

Distracter C- incorrect, not expected at given conditions, requires calculation of PRCS at PSAT ($550 + 56 = 606\text{F}$) _ 1600 psi), accumulator pressure at 650 psig max. Pressure drop will not require 1000 psi drop to cause injection.

ANSWER D - RCS pressure drop will reduce break flow as well as increase injection flow to create conditions for refill. Requires analysis of responses to be able to discard them and application of basis for step 12, EOP-2.1.

(REV-A, Revised stem to delete 'you' term, 10/25/90)

(Rev. 1, reformatted given information into bullets and made minor editorial changes, 3/25/93).

(Rev. 2, changed step in stem from "step 12" due to EOP revision, 11/17/93).

89. W/E04EA2.1 1

- A Reactor Trip and Safety Injection has occurred.
- EOP-1.0 "Reactor Trip/Safety Injection Actuation has been entered.
- Pressurizer Pressure is 1850 psig and stable.
- Steam Generator pressures are all 850 psig and stable.
- Steam Generator Levels are all approximately 20 % and rising.
- Containment Pressure indicates .25 psig.
- RM-A3 "MAIN PLANT VENT EXH ATMOS" is in alarm.
- XCP-631-6-1 (AB SUMP LVL HI) is lit.

Which ONE of the following describes the correct procedure that should be entered next?

- A. EOP- 2.0 "Loss of Reactor or Secondary Coolant."
- B. EOP-3.0 "Faulted Steam Generator Isolation."
- C. EOP-2.5 "LOCA Outside Containment."
- D. EOP-2.1 "Post-LOCA Cooldown and Depressurization."

Lesson Plan EOP-2.5 "LOCA Outside Containment". Objective 3 1883.

- A. Incorrect, a loss of RCS inventory is occurring, however conditions in containment do not indicate that the leak is in Containment, and S/G conditions are normal for this condition.
- B. Incorrect, Indications do not indicate a Faulted S/G.
- C. Correct, plant conditions support this transition.
- D. Incorrect, if a small break LOCA was believed to be in progress this would be the procedure to enter after EOP2.0.

90. W/E05EK3.2 1

- The Unit is in an Emergency condition.
- EOP-15.0 "Response to loss of Secondary Heat Sink" has been entered.
- The Operators verify that a Secondary Heat sink is required.
- Attempts to establish EFW Flow have failed.
- All RCP's are Tripped.

Which ONE of the following is the primary reason for securing the RCP's at this point in the procedure?

- A. This will establish natural circulation conditions and will tend to mitigate the transient.
- B. They are secured to prevent the heat added by the RCPs from adversely affecting indications used to determine whether or not RCS bleed and feed will be required.
- C. This will reduce RCS pressure to ensure subsequent SI flow is adequate for ECCS requirements.
- D. They are secured to reduce the heat input from the RCPs, thereby delaying the need for bleed and feed and gaining time to establish a means of supplying FW to a S/G.

Bank Question Modified some what from a Farley version of same question.
Lesson Plan EOP-15.0 Response to Loss of Secondary Heat Sink. Objective # 2095.

- A. Incorrect, natural circulation conditions will not mitigate this transient with out water in the Steam Generators.
- B. Incorrect, The heat added to the indications by the RCPs will not have an effect on whether bleed or feed will be required.
- C. Incorrect, RCS pressure may be reduced some but by itself this will not ensure that SI flow will be adequate.
- D. Correct, Securing RCPs will reduce the heat input to the RCS and delay the need for going to feed and bleed.

91. W/E06EK1.3 1

A LOCA is in progress with all RCPs secured, and the control room operators are attempting to stabilize plant conditions. An operator who is monitoring plant parameters observes the following:

- | | |
|---------------------------|----------|
| • RVLIS Narrow range: | 50% |
| • RVLIS upper head range: | 0% |
| • Core exit TCs: | 780F |
| • RCS Pressure | 885 psig |

Which one of the following describes current core cooling conditions and operational requirements?

- A. Subcooled. Operator action is not required because core cooling is satisfactory.
- B. Saturated. At their discretion, the operators can take action to restore subcooled core cooling per EOP-14.2, "Response to Saturated Core Cooling."
- C. Degraded. Prompt action must be taken per EOP-14.1, "Response to Degraded Core Cooling," or conditions could degrade.
- D. Inadequate. Prompt action must be taken per EOP-14.0 "Response to Inadequate Core Cooling, or core uncover and fuel damage could occur.

Modified from a Bank Question # 425.

Lesson Plan EOP-14.1 Response to Degraded Core Cooling, objective # 2070 and 2071.

- A. Incorrect, the conditions given indicate that the RCS is in a superheat condition.
- B. Incorrect, the conditions given indicate that the RCS is in a superheat condition.
- C. Correct, the conditions given indicate that the RCS is in a degraded core cooling condition, and this is the correct remedial action to take.
- D. Incorrect, the conditions given indicate a degraded core cooling condition.

92. W/E08EK1.1 1

Given the following:

- The plant is in an emergency condition.
- An excessive RCS cooldown has taken place in combination with an increase in RCS pressure.
- The control room operators identify a RED path on the integrity status tree and start implementing EOP-16.0, Response to Imminent Pressurized Thermal Shock Condition.
- As per EOP-16.0, they allow the RCS to heat up, and they reduce RCS pressure.
- When RCS subcooling has been reduced to 40°F, the operators notice that the integrity status tree has changed from a RED path to a YELLOW path condition. At the same time, they identify an ORANGE path on the containment status tree.

What actions should the operators take?

- A. Go immediately to Step 1 of EOP-17.0 because the containment status tree has a higher priority than the integrity status tree.
- B. Go immediately to Step 1 of EOP-17.0, Response to High Containment Pressure, because ORANGE path has a higher priority than a YELLOW path.
- C. Complete the actions of EOP-16.0, regardless of conditions on the other CSFSTs because EOP-16.0 was entered due to RED path condition.
- D. Complete the actions of EOP-16.0 because, once entered, EOP-16.0 should be performed to completion, unless pre-empted by a higher priority condition.

REF: EOP-16.0, Response to Imminent Pressurized Thermal Shock Condition.

SOURCE: Summer Exam Bank 2961

33. W/E09EA1.3 1

Given the following conditions:

- Loss of Off-site power has occurred
- Reactor and Turbine trip has occurred
- Natural circulation conditions have been established
- Both CRDM Cooling fans are inoperable
- Power is available to ESF Bus 1DA and ESF Bus 1DB

Which of the following RCS pressure and cold leg wide range temperatures relationships are acceptable for a Natural Circulation cooldown?

Reference provided:

- A. 200 F and 100 psig.
- B. 250 F and 300 psig.
- C. 400 F and 800 psig.
- D. 450 F and 700 psig.

REF: Emergency Operating Procedure EOP-1.3 Natural Circulation Cooldown
Source: Kewaunee 2000

REFERENCES PROVIDED EOP-1.3 Natural Circulation Cooldown and EOP-1.4
Natural Circulation Cooldown with Steam Void in Vessel.

Distracter A Incorrect - is plausible answer only if Attachment 1 RCS P/T limits during Natural Circulation cooldown with CRDM fans curve

B Correct - Using Attachment 2 RCS P/T limits during Natural Circulation cooldown without CRDM fans curve

Distracter C Incorrect - is plausible answer only if Attachment 1 RCS P/T limits during Natural Circulation cooldown with CRDM fans curve

Distracter D Incorrect - is a plausible answer only if EOP-1.4 Natural Circulation Cooldown with Steam Void in Vessel is used.

94. W/E09EA2.1 1

- A Loss of Off Site power has occurred due to a seismic event.
- Diesel Generators have started and are supplying electrical power.
- The CST has developed a leak and it has been determined that CST level is not adequate.
- EOP-1.1 has been completed.
- RVLIS is available.

Which ONE of the following describes the correct procedure transition?

- A. Transition to EOP-1.3 "Natural Circulation Cooldown", and proceed to cooldown to cold shutdown.
- B. Transition to GOP-6.0 "Plant Shutdown From Hot Standby To Hot Shutdown," then continue to cold shutdown using GOP-7.0.
- C. Transition directly to EOP-1.4 "Natural Circulation Cooldown With Steam Void in Vessel" and continue to cold shutdown.
- D. Transition to EOP-1.3 "Natural Circulation Cooldown,' perform the first 9 steps, and then transition to EOP-1.4 "Natural Circulation Cooldown With Steam Void in Vessel" and continue to cold shutdown.

New Question. Lesson Plan EOP-1.4 Natural Circulation Cooldown with Steam Void in Vessel, Objective # 1806.

- A. Incorrect, the team will transition to EOP-13.0, but will not continue to cold shutdown using this procedure with CST level not adequate.
- B. Incorrect, RCPs are not available therefore a forced cooldown can not be performed.
- C. Incorrect, EOP-1.4 is the correct procedure to transition to, but transition must be performed after the first 9 steps of EOP1.3 is complete.
- D. Correct, EOP-1.3 should be entered, the first 9 steps completed and then a transition to EOP 1.4 should be done.

95. WE11G2.4.9 1

Given the following conditions:

- The plant is in Cold Shutdown with RCS temperature at 110 deg. F.
- RHR pump A and RHR heat exchanger A are in operation.
- RCS Hot leg level is at 16 inches (mid-loop operations) .
- RHR Heat Exchanger A Outlet Flow Control Valve (FCV-605A) has just stroked from 20% open to full open due to a circuit fault.

If NO operator action is taken, which ONE of the following will occur to cause a loss of RHR cooling?

- A. RHR pump overspeed trip from runout due to low discharge pressure.
- B. RHR pump loss of suction due to vortexing at the RCS loop suction.
- C. RHR pump overcurrent trip due to high discharge pressure.
- D. RHR pump overcurrent trip caused by pump runout due to low discharge pressure.

REF: Indian Point Exam 1996

AB-7 RHR

SOP-115 RHR

AOP-115.5 Loss of RHR with RCS not Intact (Mode 5)

96. W/E12EK1.2 1

EOP-3.1, Uncontrolled Depressurization of All Steam Generators, is being used to mitigate a steam line rupture that CANNOT be isolated from any steam generator (S/G).

What is the operational consideration for the requirement in EOP-3.1 for a minimum EFW flow of 50 gpm to be maintained to each S/G that has a Narrow Range Water Level LESS THAN 30% [50%].

- A. To provide positive break isolation indication.
- B. To ensure adequate subcooling margin.
- C. To minimize thermal shock to S/G components.
- D. To minimize cooldown of the RCS.

REF: EOP-3.1, Uncontrolled Depressurization of All Steam Generators
SOURCE: Summer Exam Bank 3062

97. W/E13EA1.1 1

- "B" S/G Pressure is 1250 psig.
- "B" Narrow range level is 82%
- EOP-15.1, "Response to Steam Generator Overpressure has been entered.
- The condenser is not available.
- The "B" PORV is stuck closed.

Which ONE of the following describes the preferred method to reduce "B" S/G pressure in accordance with EOP-15.1?

- A. Commence an RCS cooldown to below 565 °F.
- B. Start the TD EFW pump using the "B" S/G as the steam supply.
- C. Isolate EFW to the "B" Steam Generator.
- D. Establish Blowdown from the "B" Steam Generator.

Lesson Plan EOP-15.1 Response to Steam Generator Overpressure. Objective 2108.

Bank Question 3924.

- A. Incorrect, this would be done if starting the TD EFW did not work.
- B. Correct, the procedure directs the operator to lower pressure by starting the TD EFW to lower S/G pressure.
- C. Incorrect, this would be done after B.
- D. Incorrect, this would be done to lower level.

98. W/E14EK2.1 1

EOP-17.0, Response to High Reactor Building Pressure, directs that if EOP-2.4, Loss of Emergency Coolant Recirculation, is in effect, then operate RB spray pumps using EOP-2.4.

Which ONE of the following describes the basis for operating the RB spray pumps per EOP-2.4, while in EOP-17.0?

- A. To raise level in the recirculation sump to restore RHR pump operation.
- B. To ensure SI pumps have sufficient NPSH from the recirculation sump.
- C. To Preserve the water level in the RWST.
- D. To prevent automatic swapper of the spray pumps to the recirculation sump.

REF: Sequoyah 1 Exam 1998 modified for Summer
EOP-17.0 Response to High Reactor Building Pressure

- A Large Break LOCA has Occurred.
- EOP-2.2 "Transfer to Cold Leg Recirculation" has just been completed.
- The STA reports the following conditions:
 - Reactor Building Pressure 2.0 psig.
 - Reactor Building Radiation 10 R/HR.
 - RHR Sump Level 420 ft.

Which ONE of the following describes the immediate containment concern and the correct procedure to enter?

- A. Inadequate suction to the RHR pumps, transition to EOP-2.4 "Loss of Emergency Coolant Recirculation."
- B. Erroneous instrumentation readings, transition to EOP-17.2 "Response to High Reactor Building Radiation Level," when desired.
- C. Reactor Building structural integrity; transition to EOP-17.0 "Response to High Reactor Building Pressure."
- D. Flooding vital equipment in the Reactor Building; transition to EOP-17.1 "Response to Reactor Building Flooding."

Modified from Diablo Canyon 99 exam.

Lesson Plan EOP-17.1 "Response to Reactor Building Flooding," objective 2180.

- A. Incorrect, RHR sump level is adequate, Loss of emergency coolant recirculation is not the procedure that is required to be entered with these conditions.
- B. Incorrect, Radiation levels are high, but EOP-17.2 is entered on operator discretion and sump level is a higher priority.
- C. Incorrect, Pressure is somewhat high, however it does not meet the threshold for entry (12psig). in a large break LOCA this procedure would have already been performed, and re-entry is not required.
- D. Correct, Reactor Building sump level is high and flooding is a concern and level has reached the threshold value to enter EOP-17.1.

100. W/E16EK2.1 1

- A Large Break LOCA has occurred.
- Containment Radiation is 5 R/HR.
- The Crew decides to enter EOP-17.2 "Response to High Reactor Building Radiation Level."

Which ONE of the following describes the major actions that will be performed by this procedure?

- A. Verify a Control Room Ventilation Isolation, and start only one RBCU HEPA Filter train.
- B. Verify Containment Ventilation Isolation, and start both RBCU HEPA Filter trains.
- C. Initiate a phase B Containment Isolation, and start only one RBCU HEPA Filter train.
- D. Initiate a phase B Containment Isolation, and start both RBCU HEPA Filter trains.

Lesson Plan EOP-17.2 "Response to High Reactor Building Radiation Level."
Objective # 2193.

- A. Incorrect, the procedure directs the crew to verify a containment ventilation isolation, and start both trains of RBCU HEPA Filters.
- B. Correct, this are the major actions directed by the procedure.
- C. Incorrect, no phase B isolation is mentioned, and both trains should be started.
- D. Incorrect, no phase B isolation is mentioned.