

1. INOP/STUCK CEA 003

A reactor startup is in progress per OP-2, group 2 CEAs are being fully withdrawn in the Manual Individual mode. Which set of conditions would indicate an inoperable stuck CEA?

- A. CEAPDS position for the affected CEA indicates 130", primary position indicates 126", "PRIMARY CEA POSITION DEVIATION +/- 4" alarm.
- B. Primary position for the affected CEA indicates 130.5", CEAPDS position is 127", "SECONDARY CEA POSITION DEVIATION +/- 4" alarm.
- C. Primary position for the affected CEA indicates 130.5", CEAPDS position is 120", "PRIMARY CEA POSITION DEVIATION +/- 8" alarm.
- D. CEAPDS position for the affected CEA indicates 1.5", primary position indicates 0", "PRIMARY CEA POSITION DEVIATION +/- 8" alarm.

Distractor A has reed switch position higher than pulse counts, indicating that although there is a mismatch in indicating channels, primary position indication is most likely in error, the CEA is not immovable.

B is correct. Primary position higher than secondary indicates that electronic pulses are being sent to the grippers, but secondary indication is that the CEA has not moved. If primary position.

Distractor C is incorrect--this is an indication of a slipped (partial drop) CEA. the stem states that a startup is in progress, per OP-2 startup procedure, Manually Individual operation would not start until CEAs were at a minimum of 130.5".

Distractor D is indication of a dropped CEA.

References: 55.41.2,6 55.43.2 ,6 TS basis defines inoperable as untrippable. Untrippable indicates mechanically stuck as opposed to electrically immovable.

2. NATURAL CIRC 001

Given the following:

- \* Unit 2 has tripped due to a Loss of Offsite Power, EOP-2 has been implemented
- \* Plant cooldown has commenced
- \* 21 loop Th 520°F and Tc 525°F
- \* 22 loop Th 535°F and Tc 520°F

Which of the following is the required action by the CRO for this condition?

- A. Increase steaming rate via TBVs.
- B. Increase steaming from 21 S/G via ADV.
- C. Increase steaming from 22 S/G via ADV.
- D. Lower steaming from 21 S/G.

Correct answer is based on actions for an inverted d/t condition during natural circ, distractors are conditions which will not restore the normal d/t on 21 SG.

References: 55.41.5 author:REN The question Th and Tc for 21 SG was modified to put the inverted d/t within 22 SG parameters to avoid confusion (comment from WPB) after question validation. Minor modification, changed 2 distractors mlw--2/06/02 4/98 SRO make up exam

3. LOSS OF CCW 001

Given the following:

- Unit 1 is operating at 100% power.
- Alarm 1C07B X-02 11A RCP, CCW FLOW LO, has actuated.

WHICH of the following RCP conditions requires the operator to trip the reactor and the reactor coolant pump?

- A. Upper thrust bearing temperature is 197°F.
- B. Controlled bleed off flow is 2.0 gpm.
- C. Guidebearing temperature is 193°F.
- D. Component cooling water outlet temperature at the RCP is 135°F.

Correct answer is trip criteria from AOP 7C, distractors are below trip criteria or not a trip criteria (CCW outlet temperature).

References: 55.41.3,7 4/98 SRO makeup exam. (Significant Operator Actions in CC PRA)

4. PZR PRESS MALF 002

Given the following conditions:

- \* Unit 1 at 100% power
- \* Pressurizer pressure is 2250 psia
- \* PZR backup and proportional heater control in auto
- \* 1-HS-100 (PZR pressure control) in the "Y" position
- \* 1-HS-100-3 (PZR htr cutoff) in the "X+Y" position
- \* 1-PT-100Y fails high

Select the expected PROPORTIONAL HEATER response. Assume no Operator action.

- A. Proportional heaters will continue to operate at approximately 1/3 higher power level than before the failure.
- B. Proportional heaters will operate at approximately 1/3 lower power level than before the failure.
- C. Proportional heaters will de-energize and the green light will be illuminated.
- D. Proportional heaters will de-energize and the red light will be illuminated.

D is correct, the heaters will respond as if RCS pressure was high. A is incorrect, a high pressure will cause power to the heaters to lower, not raise. B is incorrect, the pressure difference will be outside the control band. C is incorrect, the light indication is a function of the breaker position, breakers will be shut but SCRs will keep power from going to the heaters. See FSAR drawing.

References: 55.41.7, 55.43.5 Modified from PZR PRESS MALF 003 from this bank--mlw  
2/6/02

5. STM LINE RUPTURE 003

What action does the Unit-2 CRO take to prevent an excessive heat transfer condition in the event of an uncomplicated reactor trip?

- A. Press "Reset" button on the MSR control panel.
- B. Ensure both 2nd stage steam source MOVs shut.
- C. Shut upstream drain MOVs.
- D. Shut the Main Steam Isolation Valves.

Correct answer, A, is based on Unit-2 EOP-0 step D.3., B is incorrect, it is the proper step for Unit-1. C is incorrect, there is no direction to shut upstream drain valves, leaking drain valves would have a small effect on RCS temperature immediately after a trip. D is incorrect, it is a mitigating action taken if there is an excessive cooldown in progress such that S/G pressure falls below 800#.

references: 55.41.4, 5,10 55.43.5 Modified from STM LINE RUPTURE 001, this bank.--mlw 2/06/02 (original question used 09/00 exam)

6. STM LINE RUPTURE 005

Given the following:

- An overcooling event has occurred

WHICH Steam Generator should be isolated?

- A. The Steam Generator with the highest Tcold.
- B. The Steam Generator with the lowest steam pressure.
- C. The Steam Generator with the lowest AFW flow.
- D. The Steam Generator with the highest level.

Correct answer is specified by EOP-4, distractors are incorrect parameters.

References: 55.41.5,7 55.43.5 4/98 SRO makeup exam

7. LOR-020270301-003 003

A Unit-1 plant startup is in progress. Turbine load is 230 MWe and increasing when condenser vacuum begins to lower. The power increase is stopped, but vacuum continues to degrade and is now 24" Hg. Which one of the following actions are required?

- A. Direct the operators to decrease turbine load until vacuum is > 25".
- B. Direct the operators to trip the reactor and implement EOP-0.
- C. Direct the CRO to trip the turbine and start an Auxiliary Feed Pump.
- D. Direct the CRO to shift all steam flow to TBVs and shutdown the main turbine.

- A. Is incorrect, a trip is required since you are less than 270 MWE per AOP-7G
- B. Is correct, a trip is required since you are less than 270 MWE
- C. Is incorrect you never want to trip the turbine first and hope that loss of load takes the Rx out.
- D. Is incorrect, no procedure exists for this.

References: 55.41.4, 10, 55.43.5

8. BATTERY DISCHARGE 001

In EOP-7 (Station Blackout), if none of the 4KV buses have been re-energized, the operators are directed to check 125V DC bus amps less than stated limits. What is the basis for this step?

- A. Ensure DC bus feeder breakers do not trip on overload
- B. Ensures DC loads are not damaged by overcurrent
- C. Allows operators to take action to maintain battery life
- D. Allows operators to take action to protect loads from undervoltage

C is correct per EOP-7 and basis. Distractors are possible concerns of electrical systems with an unlimited life power source

References: 55.41.5, 55.43.1,2

9. LOSS VITAL AC 002

Given the following:

- Unit 1 is at 100% power
- Pressurizer level instrumentation is selected to channel X
- Reactor Reg is selected to channel X
- 120VAC bus 1Y01 has been de-energized, resulting in:  
Channel X pressurizer level control and indication fails low  
Loss of Reactor Reg system channel X  
Loss of RCS loop 11 instruments to Reactor Reg system channel Y  
CNTMT IA Control Valve, 1-IA-2085-CV shuts

With no operator action, how will pressurizer level respond long term and why?

- A. Pressurizer level will lower slightly due to an improper level setpoint generated by the reactor regulating system using failed Tc inputs.
- B. Pressurizer level will rise slightly due to an improper level setpoint generated by the reactor regulating system using failed Tavg inputs.
- C. Pressurizer level will rise continuously due to all charging pumps starting and letdown being isolated.
- D. Pressurizer level will lower continuously due to letdown going to maximum and the backup charging pumps receiving a stop signal.

Correct answer is based on actions in AOP basis. Distractor A is incorrect, failure of temperature instruments will reflect a higher PZR level setpoint, not lower. Distractor B is incorrect, actions do not reflect loss of instrument air. Distractor D is incorrect as letdown will be lost, not maximized.

References:55.41.4,7,10 55.43.1,2,5 AOP-7J and basis

10. LOR-020380304-005 001

Unit-1 is at 100% power when 11 SW pump trips. "U-1 4KV ESF MOTOR OVERLOAD" alarm is annunciated. No common mode failure is indicated and the Control Room crew has decided to align align the standby pump per the applicable procedure.

Per plant administrative procedures, which is a correct method to direct the Plant Operators' response to this situation?

- A. Direct the PPO to "restore Saltwater per AOP-7A".
- B. Direct the Turbine Building Operator to "align 13 SW power supply from 11 4KV bus" and direct the Outside Operator to "align 13 SW pump to 11 header per AOP-7A".
- C. Announce over the plant page "11 SW pump has tripped, realign 13 SW pump."
- D. Direct the Outside Operator to "align 13 SW pump to 11 header".

A. is incorrect because no direction to what part of the procedure to use or what corrective action is being requested.

B. is incorrect because the AOP does not direct shifting power supplies if power is available to the swing pump.

C. is incorrect, a general announcement over the plant page to direct operator actions is not authorized per NO-1-200.

D. is correct per the AOP and NO procedures.

References: 55-41.10, 55-43.5 55-45.5, 45.12,45.13 AOP-7A, NO-1-201

11. CRO-202-9A-2-48 048

AOP-9A allows the Turbine Building Operator to control AFW discharge pressure locally. How can the operator at 1(2)C43 verify adequate AFW pump speed?

- A. Comparing local (AFW pump room) AFW pump discharge pressure with local (AFW pump room) 11 and 12 S/G pressure indications as reported by the TBO.
- B. Comparing local (AFW pump room) AFW pump speed indications as reported by the TBO with 1(2)C43 AFW pump discharge flow indications.
- C. Comparing local (AFW pump room) AFW pump discharge pressure as reported by the TBO with 1(2)C43 11 and 12 S/G pressure indications.
- D. Comparing local (AFW pump room) AFW pump flow as reported by the TBO with 1(2)C43 Main Steam header flow indications and monitoring S/G levels at 1(2)C43.

A. is incorrect because S/G pressures are not available locally, (only Main Steam header pressure).

B. is incorrect because AFW pump speed is not available locally and flow indications at C43 panels are to the individual steam generators, not at pump discharge.

C. is correct, these indications are available as listed.

D. is incorrect because AFW flow is not available locally and Main Steam header flow is not indicated at C43 panels.

references: 55.41.8, 10

12. CRO-7-1-5-81A 811

When recirculating the SDC system to the RWT in Mode 4 through the SIT recirc leakoff isolation valves, 1-SI-463 and 1-SI-455, what satisfies the requirements for maintaining containment integrity?

- A. A locked valve log entry per NO-1-105.
- B. Verification and a log entry of valve position every 15 minutes.
- C. Verification that the valves have been shut within 72 hours of being opened.
- D. A dedicated operator in continuous communication with the control room to shut

valves if required.

D is correct per a basis captured step in the procedure. Distractors are plausible actions but are not requirements of procedures. Basis: Recirculating SDC System  
References: 55.41:10 55.43:5 / OI-3BKA1: 07A6.03KA2: 01K8.04

13. SRO-201-2-1-18 018

Using provided references:

A reactor trip from 100% has occurred due to a loss of offsite power. The correct EOP has been entered and recovery actions are underway when the following conditions are noted:

- RCS That is 500°F and stable
- RCS pressure is 1500 psia and lowering
- Charging flow < letdown flow (letdown is rising)
- CETs indicate 500°F and stable
- 11 S/G pressure 700 psia
- 12 S/G pressure 680 psia
- Pressurizer level is 160 inches and rising

Based on the above conditions what is the required corrective action?

- A. Energize 12 and 13 backup heaters to raise subcooling to 140°F.
- B. Raise RCS cooldown rate (maintain < 100°F/hr).
- C. Initiate Auxiliary Spray.
- D. Lower RCS cooldown rate.

A.is incorrect, 12 backup heater has no power available.

B is most correct, temperature will have to be lowered as subcooling decreases during depressurization.

C and D are incorrect, they would lower subcooling at a faster rate.

References: 55.41.5,10 55.43.5 Steam tables permitted

14. AOP-6A-03 001

A high activity condition exists in the RCS. The Auxiliary Building has been evacuated except for Rad Con personnel taking surveys and the ABO. The Control Room has implemented the proper AOP. How will the Letdown and Purification lineup be configured and why?

- A. Letdown is set at minimum with Purification in service to reduce RCS activity and limit radiation levels in the Auxiliary Building.
- B. Letdown is secured to limit radiation levels in the Auxiliary Building.
- C. Letdown is maximized and Purification is bypassed to protect the ion exchanger.
- D. Letdown is maximized with Purification in service to reduce RCS activity.

D is correct per AOP-6A and basis. Distractors A and B will not maximize RCS cleanup, distractor D is incorrect, ion exchanger protection is not a concern with high RCS activity.

References: 55.41.12 55.43.4,5 AOP-6A 11/97 exam

15. CRO-106-1-2-12 012  
Unit one is in Mode one at 100% power. Given the following trend on the 11B RCP:

TIME	VIBRATION	ALARMS
0000	14 mils	Alert - RCP vibration alarm
0100	16 mils	
0115	30 mils	Danger - RCP vibration alarm
0130	40 mils	
0145	44 mils	

What action is required?

- A. Conduct a plant shutdown, and then secure RCP 11B.
- B. Trip reactor, perform reactivity control, and then secure RCP 11B.
- C. RCP 11B must be secured within 8 hours.
- D. Perform an Engineering Evaluation for continued operation.

B is correct per the OI and the Alarm Response Manual. Distractors are actions to be taken at lower vibration levels. Basis: Action to be Taken

References: 55.41:10 55.43:5 / CCI-302KA1: 005K1.07KA2: K5.02,K6.03

16. LOR-020060218-002 003

What determines the boric acid flow rate when borating per EOP-0 for more than one CEA failing to insert?

- A. Number of boric acid pumps running
- B. Number of charging pumps running
- C. Setpoint of Boric Acid Flow Controller, FIC-110Y
- D. RWT boron concentration

A. is incorrect, BA pump capacity is greater than capacity of 3 charging pumps.

B. is correct:

C. is incorrect FIC 110Y is not in the flowpath for boration per EOP-0.

D is incorrect, EOP-0 does not direct use of the RWT flowpath, and if aligned by the operator, the discharge pressure of the BA pumps would be greater than the head due to the RWT level.

References: 55.41.6,7

17. CRO-202-1B-1-04 004

During reactor startup, at 1% power group 5 CEAs continue to move out after the "raise/lower" switch has been released and the CEDS control panel has been turned "off".

What is the correct response?

- A. Initiate fast boration.
- B. Trip the reactor and implement EOP-0.
- C. Attempt to stop the CEA motion by holding the "raise/lower" switch in the "lower" position.
- D. Attempt to stop CEA motion by selecting an alternate regulating group of CEAs.

B is correct per the initial actions of AOP-1B. A is incorrect, fast boration is used if CEAs are inserted beyond the transient insertion limit, not on a continuous withdrawal event. C and D are incorrect, if CEAs continue to move after turning the control panel off, it is assumed that the panel is not functioning properly and there is no guidance to support these actions.

References: 55.41.10,2 AOP-1B

18. CRO-60-1-51 051

How is the value of FrT expected to have changed from its initial value as a result of a dropped CEA, short term (1 hour later) and long term (6 to 8 hours later)? Assume no operator action.

- A. Increase, Increase.
- B. Increase, Decrease.
- C. Decrease, Increase.
- D. Decrease, Decrease.

A is correct, neutron flux is initially distributed to another part of the core due to the local effects of the CEA. Xenon builds in this area of the core over time, making the flux distribution even worse.

Basis: Value of FrT ChangesReferences: 55.41:2,5,6,10 55.43:2 / SOER-84-2KA1: 060K5.03KA2: 001000GEN6

19. SRO-201-0-3-23 023

During EOP-0, in addition to the "CIS ACTUATED" annunciator alarm, which one of the following is required to verify that CIS has actuated?

- A. SG Blowdown CVs have shut and blowdown has shifted to the Miscellaneous Waste system.
- B. RCPs are tripped and all available containment air coolers are started in HIGH speed with maximum SRW cooling.
- C. Containment Spray pumps start, spray header CVs open, and adequate spray flow is indicated through each header.
- D. Component Cooling containment isolation valves have shut.

D is correct per EOP basis document. Distractor A is verification action for an RMS alarm, RCPs are not automatically tripped on CIS and containment coolers do not receive a CIS signal. Distractor C are the verification actions of CSAS. Basis: Verification That CIS Has Occurred

References: 55.41.9 55.43.5 EOP-0 Rev. 3 basis documentKA1: 02063A3.04KA2:

20. CRO-202-2A-0-09 001

Unit-2 is at 100% power with the following conditions:

- Accoustic monitors ERV-402 and RV-200 indicate .01
- Quench tank pressure is rising slowly
- Pressurizer level is 216" and steady
- one charging pump is running
- letdown flow is 32 GPM
- AOP-2A has been implemented
- PORV block valves 402 and 404 are shut

What is the proper direction given to the RO and CRO?

- A. Place the unit in cold shutdown per OP-3, OP-4 and OP-5.
- B. Shut 2-CVC-515 and 2-CVC -516.
- C. With S-NO concurrence, raise RCS pressure to cycle and reset the leaking RV.
- D. Trip the reactor and implement EOP-0.

A. is correct per AOP 2A.

B. is incorrect, pressurizer level is steady, maintaining letdown and charging will make stabilization easier during the later part of shutdown.  
C. is incorrect, the RV may stick or leak worse, and, to reach the pressure to open the RV, the plant would trip and PORVs would also cycle. It would also not pass a 50.59 screen  
D. is incorrect, the indications are of a leak within the capacity of one charging pump, the plant transient could make the RV leak worse.

References: 55.41.3,8 55.43.1,5 TS, AOP-2A

21. SMALL BREAK LOCA 001

Using references provided:

The plant has experienced a small break LOCA. The following plant conditions exist:

- Core exit thermocouples read 600°F.
- All RCPs are stopped.
- Pressurizer level indicates 300".
- Thot indicates 590°F.
- Tcold indicates 560°F.
- Pressurizer pressure indicates 1545 psia.

Calculate subcooled margin.

- A. 40°F
- B. 10°F
- C. 5°F
- D. 0°F

A is incorrect, used Tc for calculation.

B is incorrect, used Th for calculation.

C is incorrect, used 1500 psia for calculation (misreads steam tables)

D is correct. using CETs, saturation temperature for 1545 psia is 600.1.

References: 55.41.7 4/98 SRO makeup exam

22. CRO-113-5-5-22A 001

For Safety Injection pump operation without Component Cooling, under what plant conditions would you direct the Control Room Operators to monitor Shutdown Cooling Heat Exchanger RCS inlet temperature more frequently?

- A. After RAS during a large break LOCA
- B. Operational testing per STP-O-73 series
- C. After more than 15 minutes of continuous operation during a small break LOCA
- D. After more than 2 hours of Shutdown Cooling operation.

A is correct, operation with pumped water temperatures of less than 170 degrees for HPSI and less than 300 degrees for LPSI is allowed continuously. RAS would have the highest temperature water flowing through the HPSI pumps. Distractor B is incorrect, the RWT temperature limits prevent this from being a concern and the flowpaths do not include the shutdown cooling heat exchangers. C is incorrect for the same reasons. D is incorrect, as shutdown cooling initiation is not allowed with RCS above 300 degrees.

Basis: HPSI/LPSI Operation during a loss of CC References: 55.41.8, 55.43.5 OI-3B B0277

BASIS KA1: 02040A6.02KA2:

23. CRO-107-1-3-50 050

A charging header leak would be identified by which one of the following?

- A. Lowering pressurizer level with minimum letdown flow and one charging pump operating.
- B. Charging header pressure greater than RCS pressure with two charging pumps operating.
- C. Charging header flow equals letdown flow with one charging pump operating and VCT level is lowering.
- D. Charging header pressure less than RCS pressure with one charging pump operating.

D is correct per AOP-2A. Distractor 2 would be true for any leak greater than about 12 GPM but does not distinguish a charging header leak. B is incorrect, a charging header leak can be disguised with 2 pumps running. C is true for any small leak and would not distinguish a leak on the charging header. Basis: Identification of Charging Header Leak

References: 55.41:10 55.43:5 / AOP-2AKA1: 006K5.13KA2: 004020K6.05 09/00 exam

24. CRO-7-1-5-76B 762

Which condition would cause a SDC loop to be inoperable?

- A. Placing the standby LPSI pump handswitch in Pull to Lock.
- B. Shutting 1-CC-162 (11 Supply Header Isolation).
- C. Shutting 1-SI-444 (11 LPSI Normal Suction Isolation).
- D. Placing 13 CC pump handswitch in Pull to Lock.

A. is incorrect, automatic start of the LPSI is not required.

B. is correct. 1- CC-162 isolates 11 SDC heat exchanger.

C. is incorrect, the normal suction is not part of the SDC lineup and is shut when on SDC

D. is incorrect. 13 CC pump is not required to have 2 operable CC subsystems.

References: 55.41.8, 55.43.2 Loss of decay heat removal, 54% contribution to CDF sequence.

25. SRO-201-0-3-02A 003

At Calvert Cliffs, what method of responding to an ATWS is used and why is this action taken?

- A. Manually inserting all CEAs using "Manual Sequential" mode since there is no alternate means of de-energizing the CEDS from the control room.
- B. Depressing one set of Manual Reactor Trip buttons, this energizes the TCB shunt trip relays and RPS actuation does not.
- C. De-energizing 12A and 13A 480 volt buses, this removes power from the CEDM Motor Generator Sets and is independent of RPS actuation.
- D. Manually opening the trip circuit breakers in the Cable Spreading Room as there is no alternate method of opening all the trip circuit breakers from the control room.

A. is incorrect, this step would take several minutes to shutdown the reactor.

B is incorrect, although the stated action is correct, the trip buttons and RPS function to open the TCBs in the same manner.

C is correct, this is a rapid means of removing power from the CEDMs from the control room. D is incorrect, EOP-0 directs pushing one set of trip buttons and if that is unsuccessful, de-energizing the MG sets by opening their power supply feeder breakers.

Basis: Reason Reactivity Control is the 1st Safety Function Addressed

References: 55.41.6,7 55.43.1 EOP-0 Rev. 14 Basis DocumentKA1: O2005PK4.01KA2: ATWS- 5% initiating event contributor to CDF, SOER 86-1.

26. AOP-2A-01 001

A shutdown per AOP-2A is in progress due to a tube leak in 11 S/G. Assuming the plant does not automatically trip, which one of the following conditions would require you to manually trip the reactor?

- A. Tavg is reduced to less than 557°F.
- B. Pressurizer level cannot be maintained above 101 inches.
- C. Condenser off gas or S/G blowdown RMS alarms.
- D. 11 S/G tube leakage exceeds 100 gallons per day.

Correct response B, from AOP-2A actions. Distractors are other indications of a S/G tube leak. Basis: REQUIREMENTS TO TRIP RX DURING SG TUBE LEAK

References: 55.41.5,10 55.43.5 AOP-2AKA1: 000037EK3.07KA2: 11/95 exam (SGTR in PRA and CDF report.)

27. SRO-201-6-1-06A 007

When responding to Steam Generator tube failures, one input used by the CRS in setting priorities and assigning actions is the magnitude of the rupture.

Which set of parameters can be used to determine the magnitude of the SGTR?

- A. RCS cooldown rate, VCT level rate of change, PZR level rate of change.
- B. Safety Injection flowrate, S/G level rate of change, PZR level rate of change.
- C. RCS cooldown rate, S/G pressure rate of change, PZR level rate of change.
- D. Safety Injection flowrate, S/G pressure rate of change, PZR pressure rate of change.

B is correct. A is incorrect, the VCT will not be a suction path because either boration from RWT or BASTs will be used, or SIAS will have initiated boration. C and D are incorrect, S/G pressure trends will not indicate relative leak size. Basis: SGTR subcooling range

References: 55.43.5 EOP-6 Rev.14 and Basis Document KA1: 02005K5.13KA2:

28. SRO-201-3-1-18 018

A reactor trip from 100% power due to a loss of all feedwater has occurred. The crew is unable to regain a source of feedwater and has initiated Once Through Core Cooling. Plant conditions at start of OTCC are:

Time after Trip-1 hour

RCS Temperatures are 525°F and RCS pressure is 1000 psia

CETs are 527°F

RWT level is 25'6"

2 charging pumps are available

MCC-114R is deenergized

Based on the above conditions and using provided references, what is the expected HPSI flow and will Once -Through -Cooling be successful? Assume no operator actions outside of the control room.

- A. 380 gpm, not successful
- B. 380 gpm, successful
- C. 750 gpm, not successful
- D. 750 gpm, successful

A is correct per EOP attachments, one HPSI train will not inject due to HPSI header isolations being de-energized. Basis: Reactor Trip from 100% Power  
References: 55.41.7,8 55.43.1, 5 KA1: ?KA2: CDF, references to loss of, or misoperation of AFW system.

29. AOP-7J-06 001  
21 125 VDC bus is de-energized.

What is the effect on the Emergency Diesel Generators?

- A. 1A will receive a UV start signal, 2B will be unaffected.
- B. 1A will be inoperable, 1B will receive a UV start signal.
- C. 2B will receive a UV start signal, 1B will be inoperable.
- D. 2B will be inoperable, 2A is unaffected.

D is correct per 1E-36, and AOP-7J unit 2 listed indications. A is incorrect, 1A is unaffected, 2B losses field flash and control power. Distractor B is incorrect, 1A and 1B are unaffected. C is incorrect, 2b losses field flash and control power, 1B is unaffected.

References: 55.41.7, 10 55.43.5 AOP-7J. Loss of DC buses, contributing to CDF.

30. CRO-57-1-5-12A 014

Unit 1 is stable at 100% power. "NI CH INOPERATIVE" alarm has annunciated at 1C05. The following indications are reported by the RO:

- \* Channel A WR Log Pwr --120%
- \* Channel B SUR -- -.3 DPM
- \* Channel C TMLP setpoint-- 2500 psia
- \* Channel D VOPT setpoint-- 6%

Which of the control room indications will aid the CRS in determining a probable cause of the alarm?

- A. Channel A WR Log Pwr
- B. Channel B SUR
- C. Channel C TMLP setpoint
- D. Channel D VOPT setpoint

C is correct, indicates a possible NI failure (high) or a switch out of position. Distractors are in the normal range of expected instrument readings for 100% power operation.

References: 55.41.7, 55.43.5

31. CRO-122-1-3-42 001

Unit-1 Waste Processing Ventilation Radiation Monitor (1-RE-5410) is in alarm. All other RMS indications appear normal.

Which of the following would be a likely cause?

- A. A fuel handling event in the spent fuel pool.
- B. Elevated dose rates in the ECCS pump rooms due SDC operations.
- C. Excessive packing leakage from a Charging pump.
- D. Leakage from a Waste Gas Compressor.

A. Is incorrect, the SFP area monitor and Main Vent RMS would have some indication of an event in the SFP area.

B. is incorrect, ECCS pump room ventilation RMS would detect this, the WPS ventilation monitor would not see this unless leakage were present.

C. is correct per alarm response manual, and experience.  
D. is incorrect, a leak at a waste gas compressor would most likely also be apparent to the Waste Gas Equipment Room area monitor and the MainVent monitor.  
References: 55.41.11,12,13 55.43.4 Alarm Manual

32. CRO-134-1-5-36 036

Which instrumentation must be operable to ensure the Containment Purge System will be automatically secured should a fuel handling incident occur inside containment?

- A. Containment High Range Monitors (RE-5317 A/B)
- B. Containment Area Radiation Monitors (RE-5316 A thru D)
- C. Main Vent Gaseous Monitor (RE-5415)
- D. Wide Range Noble Gas Monitor (RIC-5415)

B is correct per Op-7 checklists and technical specifications. Distractors are various RMSs that are not required to be operable and do not support automatic actions. Basis: Containment Purge System Automatically Secured

References: 55.41:4,10 55.43:2 / SD 43B, Tech Spec 3.9.9KA1: 43BK4.02KA2: K8.01,K8.02 1/99 exam (Calvert Cliffs event , Unit 1 2000 refueling with one sensor for CRS bypassed at ESFAS.)

33. CRO-122-1-3-27A 001

Which automatic action is performed by the Containment High Range Rad Monitor (RE-5317 A/B)?

- A. Starts the 11(21) and 12 (22) Penetration Room Exhaust Fans.
- B. Shuts the Containment Normal Sump Drain Valves, 1(2)-EAD-5462 and 5463 MOVs.
- C. Shuts the Containment Vent / H2 Purge MOVs, 1(2),-HP-6900 and 6901.
- D. Starts 11(21), 12 (22) and 13(23) Iodine Removal Units.

C is correct per lesson plan and LD-58. A is incorrect, Pen rm Fans start on CIS. B and D are incorrect, these components receive SIAs signals. Basis: Alarms on the Containment High Range Rad Monitor

References: 55.41:10,11 55.43:5 / SD-15, ARP 1C22KA1, LD-58 015A2.04KA2: 072000A2.02

34. CRO-62-1-3-19A 020

Unit-2 is operating at 100% power with LT-110X , PZR Level transmitter selected and PZR Heater Low Level Cutout Switch, 2- HS-100-3 in the X + Y position. If a leak on the variable leg for LT-110X developed, what is an operator action which the CRS must direct to restore PZR level control system functions?

- A. Shut Letdown Stop valves, 2-CVC-515 and 516.
- B. Place the PZR HTR LO LVL SEL switch, 2-HS-100-3 to channel Y .
- C. Adjust Pressurizer Level Controller, 2-LIC-110X, setpoint to shut the letdown control valve.
- D. Place Pressurizer Level Controller, 2-LIC-110Y in AUTO-LOCAL.

B is the correct response per the alarm response manual. A may be necessary for controlling the leak, but does not restore level control. C is incorrect, not procedurally correct and may take continuous operator action. D is incorrect, you would be selecting the failed channel. Basis: Plant Response

References: 55.41:7 55.43.5 / 1/2C06KA1: 005K4.09-.10KA2: 011000K3.03

35. SRO-201-2-1-24 024

A loss of offsite power has occurred and 1A Diesel Generator has failed to start. What is the status of the PORVs on Unit-1?

- A. Both PORVs will operate on high pressure, their "manual open" handswitch positions will not function to open the PORVs.
- B. One PORV will not operate on high pressure, its "manual open" handswitch position will not function to open the PORV.
- C. Neither PORV will operate on high pressure, both "manual open" handswitch positions will function normally.
- D. One PORV will fail open but can be overridden shut using the "override shut" handswitch position.

Answer D. is correct, all power supplies to the PORVs and controls are energized from the diesels and/or battery buses. Distractors are possible combinations of affects if the PORV controls were powered from a combination of sources similar to the arrangement of the PORVs and their blocking valves.

from LOR lesson materials. References: 55.41.3,7, Plant modification unit-1 2002 refueling outage.

36. EXCESSIVE RCS LEAK 001

Given the following:

- Unit 2 is at 80% power
- Unidentified RCS leakage is .5 GPM
- No SG leakage is identified
- RO reports that VCT trace indicates an increase in RCS leakage

AOP 2A (Excessive RCS leakage) has been implemented.

Which of the following conditions would require Unit-2 to be shutdown per T.S. 3.4.13?

- A. 5 GPM known leakage from body of 2-CVC-500 (VCT Diversion).
- B. 5 GPM leakage identified from the packing gland on PORV-404.
- C. 5 GPM leakage identified from RCP integral heat exchanger.
- D. 5 GPM leakby from seat of SI-652-MOV.

RCP integral heat exchanger is considered pressure boundary leakage, distractors are non-pressure boundary leakage for the RCS or system connected to RCS.

References: 55.41.3 55.43.2 author:REN

37. CRO-7-1-5-06 006

Following a LOCA on U-1, both #11 and #13 HPSI pumps are operating when RAS actuates. Oscillating amps are observed on both pumps. Loop injection header flow values are observed to be: (Assume time after LOCA event is 40 minutes)

--Loop 11A - 275 gpm      --Loop 11B - 260 gpm  
--Loop 12A - 265 gpm      --Loop 12B - 270 gpm

Based on observed indications, what action must the CRS direct be taken first?

- A. Secure a HPSI pump and after flow stabilizes reduce total flow until cavitation stops on operating pump.
- B. Align SDC HX outlet flow to the suction of the HPSI pumps to minimize cavitation.

- C. Throttle flow in each header to 250 gpm not to exceed a total HPSI flow of 1000 gpm.
- D. Secure a HPSI pump, align the SDC HX flow to suction of the operating HPSI pump and throttle flow to stop cavitation.

C is correct per EOP-5. Distractors are variations of actions listed in EOP-5, but are improperly worded or fall further down the list of actions to prevent cavitation.

References: 55.41:7 55.43.5 / EOP Basis DocumentKA1: 07K5.03,6.02KA2: 006000K6.03

38. AOP-1B-08 001

AOP-1B directs that after a large CEA misalignment, if Quadrant Power Tilt (Tq) is greater than .1, Nuclear Fuel Management will provide guidance for restoration of Tq.

Why does the procedure direct operators to Nuclear Fuel Management for guidance instead of providing specific steps to restore Tq?

- A. The 10 CFR 50.59 process is required to change operating procedures allowing operation with Tq greater than .1.
- B. CEAs must be inserted to correct Tq, and the effect on ASI must be analyzed to determine which CEAs to insert.
- C. Insertion or withdrawal of CEAs may be required to correct Tq, power history and power density must be analyzed.
- D. Recommendations from SOER 84-02 direct that Reactor Engineering are consulted prior to taking corrective actions for any abnormal power distribution events.

C is correct. Distractors contain words and phrases found in the AOP basis, but are out of context for this condition.

References:55.41.2, 10, 55.43.1,5,6

39. SRO-201-4-1-08 008

During an Excess Steam Demand Event, the unaffected S/G is maintained as a viable heat sink during the blowdown phase of the affected S/G because:

- A. it is required to provide the thermal driving head necessary for natural circulation.
- B. it ensures that a rapid repressurization of the RCS after a large cooldown does not occur, leading to a PTS event.
- C. cooling the non-affected S/G helps to maintain subcooled margin in the 30-140 F range to prevent voiding during blowdown.
- D. insufficient RCS cooldown due to the break may be occurring and the unaffected S/G may be needed to maintain the required RCS cooldown rate close to 100 F/Hr.

B is correct, as stated in EOP-4 basis. A is incorrect-if natural circulation is required, the event itself provides sufficient thermal driving head, C is incorrect, voiding is a concern after the blowdown phase, when the unaffected S/G could be a heat sink if it is not cooled sufficiently. D is incorrect, cooling the unaffected S/G in this manner does not affect RCS cooldown rate.

Basis: Reason for Maintaining S/G as Viable Heat Sink During Blowdown References: 55.43.5 PRA concerns of PTS events, important operator actions.

40. LOR-020050447-002 003

Unit 1 is operating at 100% power. RCP 11B parameters are as follows: ♂

VCT pressure	40 PSIG	σ11B RCP upper seal
1100 PSIA	σ11B RCP middle seal	2150 PSIA
temperature	160°F	σ11B RCP lower seal cavity
bleedoff temperature	152°F	2.0 GPM
		σControlled

Which one of the following statements correctly describes the condition of 11B RCP seals?

- A. No RCP seal is degraded
- B. Lower RCP seal is degraded
- C. Middle RCP seal is degraded
- D. Upper RCP seal is degraded

B is correct per OI-1A indications. Distractors are other seals that indications do not support degradation. Basis: RCP SEAL

References: 55.41.3,7 55.43.5 OI-1A Rev.15

41. CRO-57-1-5-04 005

While operating at 100% power, power is lowered to 80% using fast boration.

How is NI power indication effected?

- A. Indicated power is less than actual power due to greater neutron absorption by boron.
- B. Indicated power is greater than actual power because of increased thermalization of neutrons by colder Tave.
- C. Indicated power is less than actual power due to less neutron leakage from the core.
- D. Indicated power is greater than actual power due to more neutron leakage from the core.

C is correct, as power is lowered, RCS temperature is lowered, this increase in moderator density allows less neutron flux to the detectors. Basis: NI Indication

References: 55.41:2,5,7 55.43KA1: 057K5.04KA2: 015000K5.04

42. CRO-202-9A-2-14A 015

Who is responsible for supplying plant operational information to the fire brigade members and the Control Room staff from the scene of the fire?

- A. Fire Brigade Leader
- B. Shift Fire and Safety Responder
- C. Operations Technical Advisor
- D. Plant Watch Supervisor

C is correct per NO-1-100. Distractors are other shift positions.

References:55.41.2,8 55.43.5 NO-1-100

43. CRO-63-1-3-15 015

If ESFAS sensor channel ZF is de-energized for maintenance, what is the resultant actuation logic?

- A. 1 of 2
- B. 2 of 3
- C. 1 of 3
- D. 2 of 4

C is correct per system logic diagram, LD-58A. Distractors are other possible algebraic combinations. Basis: Resultant Trip Logic for Remaining Channels for SIAS

References: 55.41:10 55.43:2 / OI-34KA1: 063K4.01KA2: A6.03

44. CRO-59-1-5-60 060

Which set of conditions would cause a CEA Withdrawal Prohibit?

- A. 1/4 pretrips from TM/LP, APD or High SUR.
- B. 1/4 pretrips from High SUR, VOPT or APD.
- C. 2/4 pretrips from VOPT, High SUR or TM/LP.
- D. 2/4 pretrips from APD, TM/LP or VOPT.

C is correct per Alarm Response Manual D-35 rev. 39. Distractors contain either incorrect logic (1/4) or incorrect inputs (VOPT, APD), Basis: Conditions Not Causing a CEA Withdrawal Prohibit  
References: 55.41:2,7 55.43KA1: 059K1.01KA2: 012000K1.03

45. CRO-57-1-5-39 039

Why will a linear range NI calibration require an adjustment to the NUCLEAR PWR CALIBRATE potentiometer over core life, even if the same power level is maintained?

- A. More competition for neutrons by boron concentration over core life reduces leakage seen by the detectors
- B. Moderator density changes over core life increases leakage seen by the detectors
- C. A greater neutron flux is required to maintain the same power level as fuel is depleted
- D. A higher fission rate is required to maintain the same power level as fuel is depleted

C is correct per system description and theory lesson plan. A is incorrect, boron concentration goes down and leakage increases. B is incorrect, it is the actual decrease in boron concentration that causes leakage to increase, not a change in density

,Basis: Linear Range NI Calibration

References: 55.41:10 55.43:5 / OI-30, Tech Spec 3.3.1.1KA1: 057K9.2KA2: K9.3

46. CRO-64-1-4-09 009

While operating in mode 3 on natural circulation, how many CETs must be read as a minimum to ensure consistency with Thot?

- A. One per quadrant
- B. Two per quadrant
- C. Two
- D. One

C is correct per AOP and EOP basis documents. A and B distractors may be chosen as operability requirements are in quadrants and trains (ZA or ZB) Basis: Mode 3 Natural Circulation CETs

References: 55.41:10 55.43:5 / OP-5KA1: 064K6.02KA2: 017020A3.01 1/99 exam

47. CRO-7-1-5-115 116

Using provided reference(s):

-- Unit 1 is at 50% power

-- Plant Air is being used inside the Containment by Fermanite contractors to repair a small feedwater leak on #11 MFW Check Valve.

Which of the below statements meets the requirement regarding containment integrity?

- A. The Technical Specification LCO is not met and the affected flowpath must be isolated within 4 hours.
- B. The Technical Specification LCO is met because 1-PA-1040 receives an automatic CIS signal to shut.
- C. The LCO is not met and Technical Specifications require the flowpath to be isolated within 1 hour.
- D. The LCO is met, as Technical Specifications allow opening of this penetration under administrative control.

D is correct per TS 3.6.3. A and C are incorrect, the action does not apply, the valves are not inoperable. B is incorrect, the valve does not receive a close signal. Basis: Violation of Containment Isolation in Mode 1

References: 55.43.2, KA1: 1K8.01KA2: NO205 ATT1

48. CRO-7-1-5-100 101

Given the following:

Unit 1 is at 100% power. A loss of offsite power occurs and 1B DG fails to start.

Which Containment Coolers will remain operable?

- A. 11 and 12
- B. 11 and 13
- C. 12 and 13
- D. 13 and 14

A is correct based on power supplies--11 and 12 will receive power from the 1A EDG. Distractors are other possible combinations, and could be selected if candidate does not know which components are "A" train vs. "B" train. CC Normal Lineup

Basis: References: 55.41.7, 8

49. CRO-113-3-5-04 004

Which of the conditions below will provide an automatic start signal to a SRW pump with the Control Room handswitch in AUTO?

- A. Service Water header pressure less than 35 PSIG.
- B. A SIAS signal has actuated with or without an undervoltage signal present.
- C. The operating pump breaker has tripped on overcurrent and standby pump disconnect is aligned to that bus.
- D. An RAS signal has actuated during plant cooldown to shutdown cooling conditions with a LOCA in progress.

B is correct. A is incorrect, taking the switch to local defeats all automatic actions. C is incorrect there is no loss of power or low pressure signal which starts a SRW pump. D is incorrect, RAS does not affect SRW pumps. Basis: Starting and Stopping the SRW PP Motor with CR Handswitch

References: 55.41.7 ?KA1: ?KA2:

50. CRO-57-1-5-10A 011

Per Technical Specifications, which of the following is a basis for the automatic bypass setpoints for the high SUR trip?

- A. With power > 1E-5%, all other RPS trips provide adequate protection.
- B. With power < 13%, all other RPS provide adequate protection.
- C. With power < 1E-4%, erroneous indication of power may occur.

D. With power > 12%, erroneous indication of SUR may occur.  
C is correct per Basis B.3.3.1. A is incorrect, wrong setpoint and the listed bases is for the high setpoint. B is incorrect, the setpoint is < 12%. D is incorrect, other trips provide adequate protection above 12%. Basis: Startup Rate Trip A, B, C and D Enable Alarm  
References: 55.43:2, 5 / TS bases IC05KA1: 057GK.05KA2: 015000GEN8

51. CRO-202-3G-1-0003 003

U-1 is at 75% power when two condensate pumps trip. The TBO reports the condensate header has ruptured spraying water near the Condensate Booster Pumps. What is the proper response?

- A. Trip the Reactor, verify reactivity control, secure main feed system to stop flooding and continue with EOP-0.
- B. Perform a rapid shutdown and secure the last condensate pump use AFW to maintain SG levels.
- C. Secure remaining condensate pump, await TBO's report that flooding has stopped and trip the reactor when SGFPs trip on low suction.
- D. Insert CEAs and fast borate to reduce power to maintain < 8000 gpm condensate header flow and direct TBO to isolate leak if possible.

Basis: Actions for condensate rupture  
References: AOP-3GKA1: 02032A2.12KA2:

52. LOR-020320305-002 003

#12 SGFP tripped at 60% power during a load increase. It has been determined that 12 SGFP cannot be restarted. Which one of the following requirements must be met to maintain power above 440 MWe with only #11 SGFP in operation?

- A. #11 SGFP speed must be controlled in manual.
- B. SGFP suction flow must be maintained < 16,500 GPM.
- C. SGFP suction pressure must be maintained > 250 PSIG.
- D. All 3 condensate pumps must remain running.

C is correct per OI-12A rev. 37. Precaution F. Basis: SGFP

References: 55.41.7 AOP-3G Rev. 0, OI-12A G. P., OP-3 G. P. 11/97 exam

53. CRO-34-2-3-04 005

Which of the following are AFW water sources which can be used per existing Emergency Operating Procedures?

- A. 21 Condensate Storage Tank to 13 AFW pump suction via fire hose connections.
- B. Condenser hotwell to the 11 CST to the AFW pump suction.
- C. Condensate hotwell directly to the suction of 13 AFW pump.
- D. Condensate pump discharge header to the AFW pump suction.

B is correct per EOP attachments. Distractors are plausible sources, but would require plant alterations and are not in the procedures. Basis: AFW SOURCES

References: 10CFR55.41:7 - SD-34KA1: 02034K1.02KA2: 02034K1.03

54. CRO-34-2-3-21A 022

Given the following conditions:

- Unit 2 is at 100% power
- Fuel Burnup is 8900 MWD/MTU
- Tc is 547.8 °F
- PZR pressure is 2262 PSIA

An inadvertent AFAS channel A actuation occurs. How will the RCS respond?

- A. Reactor power rises, Tc increases, spray valves open to maintain PZR pressure.
- B. Tc lowers, reactor power rises, PZR heaters energize to maintain PZR pressure.
- C. All parameters remain constant as the Main Feedwater Reg. Valves compensate for the increased feed flow to the S/Gs.
- D. The reactor trips on TM/LP or VOPT and SIAS initiates due to the drop in RCS pressure.

B is correct based on lesson plan information and simulator response.

A is incorrect, initially Tc will lower, causing power to rise. Tc lowering will cause an outsurge and a reduction in pressure. C is incorrect, although main feed does compensate for level changes, the effect of the cooler AFW causes parameters to change. D is incorrect, per the LP and simulator response, power increases about 1%, the change in RCS pressure is only about 25-35 PSIA, TM/LP setpoint is approximately 1980 PSIA.

Basis: AFW effect on RCS References: 10CFR55.41: 7 - SD-34KA1: 02034K5.01KA2: 061000K1.04

55. CRO-219-1-0-33 034

An alarm occurs on the liquid waste discharge radiation monitor (RE-2201) during a discharge of the 11 RCWMT. The radiation monitor is flushed with demineralized water in an attempt to reduce background radiation levels. Where is the flush water discharged to?

- A. Miscellaneous Waste Monitor Tank
- B. On-service RCWMT
- C. On-service degasifier
- D. Miscellaneous Waste Receiver Tank

D is correct per OI and OM print. Distractors are other tanks within the waste systems but do not receive water from this flowpath.

Basis: Flush Water Discharge

References: 55.41:12,13 55.43:5 / SD-14BKA1: 14BA2.01KA2: 068000K1.07 11/95 exam

56. CRO-134-1-7-03 003

The concentration of oxygen in the waste gas holdup system shall be limited to \_\_\_\_\_ % by volume?

- A. 3
- B. 4
- C. 5
- D. 6

B is correct, TRM limit based on explosive mixture. Basis: Concentration of Oxygen in the Waste Gas Holdup System

References: 55.41:13 55.43:2 / TRM 15.11.1 SD-14A, KA1: 14AK8.03KA2: 071000A4.29

57. CRO-107-1-3-04A 005

RCS boration is in progress when a loss of Instrument Air occurs. Which mode of operation would require the CRS to direct an alternate means of boration?

- A. BA pump makeup to VCT.
- B. BA pump to charging pump suction (fast boration).
- C. Gravity feed to charging pump suction.
- D. RWT to charging pump suction.

A is correct, the boric acid flow control valve will shut on loss of IA. The distractors have flowpaths which only contain MOVs so are not affected by loss of IA. Basis: Boration Flow Path Availability

References: 55.41:6 55.43.5 / OI-2KA1: 006K1.04KA2: 004000K1.14

58. SRO-201-8-1-22 022

The functional recovery procedure (EOP-8) directs plant configuration changes, such as aligning fire hoses to the suction of AFW pumps.

What process is used to control these changes to plant systems?

- A. Procedure deviations allowed per 10 CFR 50.54x.
- B. The procedure review and approval process, per PR-1-100 and PR1-101.
- C. Changes to the facility allowed per 10 CFR 50.59
- D. Temporary Alterations per MD-1-100 and MN-1-110.

D is correct. Distractors are plausible administrative procedures.

Reference 55.41.1,55.43.3: EOP-ATTACHMENT13, MN-1-110, MD-1-100

59. CRO-107-1-3-63 063

An RCS leak has been diagnosed, AOP-2A has been implemented and the following plant conditions exist:

- Letdown flow is 37 GPM
- Waste processing RMS alarm
- One Charging pump is running
- PZR level is on program
- Rate of VCT decrease has risen

What action directed by the CRS will minimize personnel exposure when investigating for leaks in the West Penetration Room?

- A. Increase purification flow rate.
- B. Secure Charging and letdown.
- C. Notify Radiation Safety to investigate by video camera.
- D. Declare a radiological event per the ERPIP.

A. is incorrect, raising charging and letdown flows would increase dose rates in the room.

B. Would be a good thing to do when it is necessary to send people into the room, but may prevent leak identification.

C. Will eliminate the need to send individuals in the room, and still locate the source of leakage.

D. Is appropriate for the RMS alarm, but will minimize possible exposure.

References: 55.41.12, 55.43.4

60. CRO-203-5A-3-03 003

What instrumentation provides the best indications for monitoring RCS level when draining from 47 ft. to 37.6 ft.?

- A. RVLMS, LIC-110X, LT-4138 (narrow range) and LT-4139 (wide range).
- B. Refueling level Tygon hose, LT-4138 (narrow range) and LT-4139 (wide range).
- C. LT-4140 (d/p transmitter), GEMS sightglass and LI-103.
- D. LT-4138 (narrow range), LT-4140 (d/p transmitter), LT-4139 (wide range).

A. is incorrect, RVLMS will most likely be unavailable, and only provides gross level indication. RCS level is below the indicating range for LIC-110X.

B. is incorrect, industry experience has shown tygon level indicators are subject to unreliabilities associated with kinked hoses, improper vent paths and irregular routing (tygon is no longer used at CCNPP)

C. is incorrect, RCS level is below the indicating range for LI-103 D is correct, all listed indications are available for midloop level monitoring. Basis: Draining RCS From 47 ft. to 37.5 ft  
References: 55.41.3 55.43.1 OP-7 Table 1KA1: 05K4.01KA2: A1.05

61. SRO-301-15-1-05 007

As pressurizer temperature lowers, pressurizer level instruments LI-110X and 110Y are expected to be:

- A. Indicating less than actual level.
- B. Indicating greater than actual level.
- C. Pegged high due to draining reference legs.
- D. Tracking actual level due to density compensation.

B is correct, 110-X and Y are calibrated for NOP, NOT and are not density compensated. As RCS temperature lowers, the density rises and actual level decreases. Actual mass stays the same, so the indication would be higher than actual level. Basis: Pressurizer Level Indication  
References: 55.41.3,5, 7 KA1: K15.07KA2:

62. CRO-5-2-3-39 039

Given the following conditions in the Quench Tank:

- 1) Pressure is 8 psig
- 2) Temperature is 122°F
- 3) Level is 28 inches

What action should be taken to restore normal operating conditions to the quench tank?

- A. Drain the Quench Tank.
- B. Fill the Quench Tank.
- C. Add Nitrogen to raise pressure.
- D. Perform a bleed and feed to cool the Quench Tank .

D is correct per ARM E-01. A and B are incorrect, normal level is 27.5- 29.5" C is incorrect, normal pressure band is 1 to 9 psig. Basis: Restoring Normal Operating Conditions to Quench Tank

References: 55.41:10 55.43.5 / OI-1BKA1: 005K5.08KA2: 007000K4.01

63. CRO-62-1-3-22 023

Which of the following signals will energize all Pressurizer Backup heaters?

(Assume heater control H/Ss are in AUTO)

- A. Key switches HS-100-4A & 100-6A on 1(2)C43 in ON.
- B. +13 inches level deviation above level setpoint.
- C. PZR level lowers to 101 inches.
- D. PZR pressure lowers to 2225 PSIG.

B is correct per FSAR figure 7-13 and RCS Instrumentation lesson plan materials A is incorrect, only 2 banks of heaters can be operated from 1C43. C is incorrect, 101" de-energizes the heaters. D is incorrect, setpoint for backup heaters is 2200 (50psia below setpoint)

Basis: Signal Energizing the Backup Heaters References: 55.41:7 55.43KA1: 005K11.05KA2: K11.06

64. CRO-59-1-5-04 004

Which statement describes the basis for the Axial Power Distribution Trip?

- A. DNB and peak linear heat rate will not be exceeded
- B. DNB SAFDL of 1.25 is not exceeded
- C. Provides protection for uncontrolled CEA withdrawal event
- D. Minimize radial power redistribution above 15% power

A is correct per TS basis 3.3.1. B is a basis for TM/LP trip. C is a basis for Power Level High trip. D contains similar wording from the original TS basis, but "axial" was replaced with "radial".

Basis: Basis for Axial Power Distribution Trip References: 55.41:7,10 55.43:2 / Tech Spec 2.2.1KA1: 059K6.01KA2: 012000K.02

65. CRO-60-1-58A 059

While inserting group 5 CEAs from ARO during a power decrease, PRIMARY CEA POSITION DEVIATION +/- 4" alarm annunciates. CEA 34 computer position indication is 130", indication by CEAPDS is 125". All other group 5 CEA position indications are 124.5" to 125.5" What action is required?

- A. Align CEA 34 to the rest of group 5 CEAs per AOP-1B.
- B. Declare CEA 34 primary position indication inoperable and refer to the TRM (TNC15.1.4).
- C. Declare CEA 34 inoperable and refer to Technical Specifications (LCO 3.1.4).
- D. Declare CEA secondary position indication inoperable and refer to the TRM (TNC 15.1.4).

A is incorrect, if it were an actual misposition, secondary position indication would agree with primary. B is correct, primary indication is higher than secondary while inserting CEAs, indicating that pulses are not being counted. C is incorrect, no indication of an untrippable CEA is evident. D is incorrect, all secondary indications are normal.

Basis: Tech Spec Requirements

References: 55.41:2,6,10 55.43:2KA1: 060K9.01KA2: 0014000GEN5

66. CRO-58-1-13 001

Which control signals are supplied by the Reactor Regulating System?

- A. PZR level control, Main turbine runback, Turbine Bypass Valve (TBV) analog demand, and SG level control modes for Digital Feedwater Control System (DFWCS).
- B. Atmospheric dump valve (ADV) analog demand, TBV quick open, Main turbine runback, and SG level control modes for the DFWCS.
- C. PZR Level control, Pressurizer Heater Cutout, ADV quick open, and SG level control modes for the DFWCS.
- D. ADV analog demand and quick open, TBV quick open, PZR level control, and SG level control modes for the DFWCS.

D is correct per FSAR section 7.4.1 A is incorrect, RRS does not supply turbine runback or an analog signal to TBVs. B is incorrect, does not supply turbine runback signal. C is incorrect, it does not supply heater cutoff signals. Basis: Control Signals Supplied by RRS

References: 55.41:7 KA1: 058K4.01KA2: K6.01, K6.02

67. CRO-7-1-5-17A 001

Which combination of Containment Spray pumps and/or Containment Air Coolers will be unable to maintain the pressure and temperature of the containment within design parameters for the most limiting UFSAR analyzed accident?

- A. Four (4) Containment Air Coolers
- B. Two (2) Containment Spray Pumps
- C. One (1) Containment Spray Pump and One (1) Containment Air Cooler
- D. One (1) Containment Spray Pump and Two (2) Containment Air Coolers

C is correct per TS 3.6.6 basis Basis: Ensure Design Pressure and Temperature of Containment

References: 55.41:7 55.43 / UFSAR Chapter 14.20KA1: 07K12.05KA2: 43BK8.07

68. CRO-134-1-5-44 044

Unit-2 is in mode 6, refueling in progress with Containment Purge in service.

A momentary loss of power causes the operating Main Exhaust Fan to trip.

What is the most likely effect on parameters in containment?

- A. Containment pressure rises 1 to 2 PSIG.
- B. Refueling pool level changes.
- C. Area radiation monitors indicate higher.
- D. Containment temperature rises 5 to 10 degrees.

OI-36 precaution F.

A. is incorrect, pressure may increase or decrease, and would most likely not be observable on available indications.

B. is correct per OI-36 precautions

C. is incorrect, these are area monitors and would not be affected unless a fuel handling incident occurred.

D. Any temperature change would be small, and most likely, temperature would fall, if plant heating were aligned to purge.

References: 55.41.4,5,7,11

69. CRO-113-4-3-07 007

High Spent Fuel Pool temperature can be caused by:

- A. Throttling shut SFP CLR DISCH HDR stop valve.
- B. Shutting the spent fuel pool heat exchanger Component Cooling outlet valve.
- C. Opening the 21A SRW HXR bypass valve.
- D. Raising the setpoint of the spent fuel pool temperature controller on 1C13.

A is correct per the OI and ARM. B is incorrect, the system is cooled by SRW water. C is incorrect, 22 header supplies a SFP cooler, 21 does not. D is incorrect, there is no controller for SFP cooling.

References: 55.41.4

70. CRO-103-2-4-61A 001

Given the following:

Unit-1 is at 100% power. 11 MSIV is being partial stroke tested per the Surveillance Test Procedure. A system failure results in 11 MSIV shutting completely.

How will the plant respond?

- A. RCS pressure will rise due to less steam demand, a High Pressure reactor trip will occur and the PORVs will open.
- B. 12 S/G level will lower due to the steam demand imbalance, causing a Low S/G

- level reactor trip.
- C. 11 S/G pressure will rise, 12 S/G pressure will lower due to the steam demand imbalance, resulting in an ASGT reactor trip.
  - D. RCS pressure will lower due to the increased steam demand from 12 S/G, resulting in a TM/LP reactor trip.

Distractors A. and B. are possible RPS trips which could result from this event, however, ASGT is designed specifically for this event.

D. is incorrect, the overall effect is lowering steam demand which raises RCS pressure. Basis: Test MSIV

References: 55.41:7 55.43 /

71. CRO-122-1-3-04 005

Which radiation monitor detects noble gas releases from the Atmospheric Dump Valves?

- A. Wide Range Noble Gas Monitor (RIC-5415)
- B. Main Vent Gaseous Monitor (RE-5415)
- C. Main Steam Line Radiation Monitor (RE-5421)
- D. Condenser Off-Gas Radiation Monitor (RE-5414)

A. and B are incorrect, these only monitor the ventilation stack which does not interface with the dumps.

C. is the correct answer, the detector is located as close to containment as possible to detect releases from the dumps, steam safeties and AFW exhaust.

D is incorrect, steam that exits via the ADVs does not reach the condenser, so would not be seen by Off-gas. Basis: Detecting Noble Gas Releases

References: 55.41:11 55.43.4 / SD-15KA1:

72. LOR-032030504-003 001

Per the applicable OP-7 checklist, all of the following must be verified prior to entering Mode 6, EXCEPT:

- A. Reactor has been subcritical for > 72 hours.
- B. A shutdown cooling loop is in operation with > 3000 GPM flow.
- C. RCS temperature < 140°F.
- D. RCS boron concentration > 2300 PPM.

B is the correct response per TS and OP requirements. A, C and D are all LCO requirements of TS for Mode 6. Basis: Requirements to enter mode 6

References: 55.41.10. 55.43.2, 5, 6 OP-5 Mode 6 chklst, TS 3.9.1, TS 3.9.3, TS TABLE 1.1

73. CRO-54-1-1-12A 01A

Using provided references:

Both units are in Mode 1. 24B 480V bus is lost due to a fault on the bus, de-energizing #24 battery charger.

Select the most appropriate response.

- A. Verify #12 battery charger is in operation.
- B. Restore #24 battery charger to operation in 2 hours.
- C. Unit-2 in Mode 3 within 6 hours and Mode 5 in 36 hours.
- D. Place 1Y03 and 2Y03 on the inverter backup bus.

- A. is correct, this ensures the bus remains operable and batteries are not discharging.
  - B. is incorrect, only one charger is required per TS basis.
  - C. is incorrect, either battery charger can be credited as long as the EDG remains operable, the LCO is met.
  - D. is incorrect, the inverters and associated instrument buses will have normal power available.
- References: 55.41.8, 55.43.2

74. CRO-54-1-1-23 023

Using provided references:

An electrician performing a surveillance requirement reports that #11 battery has one cell with its electrolyte level below the top of the plates.

What action is required? Assume both units operating at 100% power.

- A. Verify pilot cell(s) electrolyte level and individual cell float voltage meet Table 3.8.6-1 Category C limits within 1 hour.
- B. Replace #11 Battery with the reserve battery within 4 hours.
- C. Restore #11 125 VDC bus to operable within 2 hours.
- D. Restore battery cell parameters to Category A and B limits of Table 3.8.6-1 within 31 days.

A. is incorrect, this is a category C limit, which falls under condition B.

B. is correct per condition B and LCO 3.8.4

C. is incorrect, LCO 3.8.6 directs the operator to declare the BATTERY immediately out of service, which would be condition A for LCO 3.8.4.

D is incorrect, it is a condition A action.

References: 55.41.4, 55.43.2

75. CRO-48-1-2-28 028

2A Diesel Generator is running fully loaded when the operator monitoring the diesel reports that the "FUEL-OIL LEVEL LOW IN DAY TANK" alarm has annunciated and the fuel oil transfer pump will not run.

With no operator action, how long will 2A Diesel Generator continue to operate?

- A. 30 to 45 minutes
- B. 1 to 2 hours
- C. 5 to 6 hours
- D. 7 to 8 days

A. is incorrect minimum time by design is one hour at a load of 3500KW.

B. is correct for loads assumed by CCNPP procedures.

C. is incorrect, more than twice the design time

D. is incorrect but reflects a possible correct answer for design of the fuel oil storage tanks.

References: 55.41.7 55.43.2 system description 24A, TS 3.8.3 basis

76. CRO-60-1-52 052

Per the Technical Specifications, which statement is a basis for the CEA insertion limits?

- A. Ensures that Rod drop times per tech specs are met.
- B. Boron Dilution event power excursion is limited.
- C. Potential effects of a dropped rod are limited to acceptable values.
- D. Potential effects of an ejected rod are limited to acceptable values.

D is correct per TS 3.1.6 basis Basis: CEA Insertion Limits

References: 55.43:2 / TECH SPEC 3.1.6KA1: 060K12.01KA2: 001000K5.08

77. CRO-113-1-5-20A 001

The wind speed has been > 5 MPH from the south-southeast for the last two days and the bay temperature is 75°F. Why is this a concern for operators and where is guidance for monitoring parameters associated with this condition?

- A. These are precursor conditions for the tsunami analyzed in the FSAR which renders the intake inoperable. AOP-7L, Intake Malfunctions Abnormal Operating Procedure
- B. This condition is indicative of continuing high injection temperature which leads to lower MWe output. OI-43A Main Turbine and Generator/Excitor Operation Operating Instruction
- C. This condition requires a special report to be written to explain why the condenser differential temperature limit is being exceeded. Maryland State Discharge Permit
- D. This condition is indicative of a potential fish kill resulting in loss of circulating water pumps and power reductions or trips. OI-14A Circulating Water System Operating Instruction

A. is incorrect, no mention of this is in FSAR

B. and C are incorrect, the listed conditions do not pertain directly to injection temperatures or the deltaT of the condenser.

D. is correct per OI-14

References: 55.41.10, 55.43.1,5 KA1: ?KA2: OE12437 and Salem 1994 event

78. STATION AIR 001

Unit 1 was at 100% power when a reduction in the Instrument Air Header pressure occurred. The CRO observed that Instrument Air header pressure lowered to 83 PSIG and is rising while Plant Air header pressure is 84 PSIG and lowering.

Which of the following set of actions would you direct the CRO to verify?

- A. PA-2061-CV, PA to IA Cross Connect is OPEN, the Standby Instrument Air Compressor has STARTED and PA-2059-CV, PA header isolation valve is OPEN.
- B. PA-2061-CV, PA to IA Cross Connect is OPEN, the Standby Plant Air Compressor has STARTED and PA-2059-CV, PA header Isolation Valve is SHUT.
- C. Standby Instrument Air Compressor has STARTED, IA-2085-CV, Containment IA Isolation Valve is SHUT and the Standby Plant Air Compressor has STARTED.
- D. Standby Instrument Air Compressor has STARTED, PA-2059-CV, PA header Isolation Valve is SHUT, and IA-2085-CV, Containment IA Isolation Valve is SHUT.

AOP-7D-05 from LOIT bank

A is incorrect, the plant header isolation valve shuts at 85 PSIG PA header pressure

B is correct per AOP-7D

C and D are incorrect, containment header isolation shuts at 75 PSIG IA header pressure.

References: 55.41.4,10 55.43.5

79. FIRE PROTECTION 002

A smoke detector for the Unit-1 27' Switch Gear Room malfunctions, causing an alarm. Which one of the following describes the effect on the system?

- A. "FIRE PROT PANEL 1C24B" alarm actuates and after a time delay, Halon system discharges.
- B. "FIRE PROT PANEL 1C24B" alarm actuates and immediately results in Halon system discharge.
- C. "FIRE SYS" alarm actuates and after a time delay, Halon system discharges.
- D. "FIRE SYS" alarm actuates but does not result in Halon system discharge.

A and B are incorrect, circuitry problems cause FIRE SYS alarms

C is incorrect, circuitry problems do not result in Halon system discharges additionally, it requires 2 smoke detector outputs to cause a Halon discharge.

D is correct.

References: 55.41.8, 55.43.5

80. CORE ONLOAD 001

Which of the following is a responsibility of the Shift Manager, prior to commencing a core onload from a defueled condition?

- A. Verify Containment Purge is in operation and that all required ESFAS equipment is operable to support core alterations.
- B. Review the Temporary Alteration Log for operability impact of equipment required for core alterations.
- C. Review Required Reading for changes in procedures that may affect the operation of equipment required for core alterations.
- D. Verify that no projects or modifications are currently outstanding which could impact core alterations.

B is correct per OP-7 Mode 6 checklist. A is not a requirement (purge does not have to be in service). C is not listed as a requirement in OP-7. D is a responsibility of Principle Engineers.

References: 55.41.10, 55.43.6

81. CRO-5-2-3-46 046

A loss of load transient resulted in a plant trip with PORVs lifting.

What would indicate that the quench tank rupture disk has ruptured?

- A. RCS pressure lowers more rapidly.
- B. RCS pressure lowers less rapidly.
- C. "QUENCH TK TEMP LVL PRESS" alarm clears.
- D. "CNTMT NORMAL SUMP LVL HI" alarm actuates.

A and B are incorrect, the relieving capacity of the PORVs is not appreciably affected by the range of back pressure associated with the quench tank. C is incorrect, the level and temperature will remain high and cause the alarm to stay in. D is correct, a rapid decrease in quench tank pressure along with the sump alarm are indications of a blown quench tank rupture disk.

References: 55.41.3,7

82. CRO-113-5-5-03 003

The normal power supply and header lineup of #13 and (23) Component Cooling pumps is:

- A. Powered from bus 14A(21B) and aligned to 11(22) CCW headers respectively.
- B. Powered from bus 14 B(24B) and aligned to both CCW headers respectively.
- C. Powered from bus 11A(24A) and aligned to 12(21) CCW headers respectively.
- D. Powered from bus 11B(21B) and aligned to both CCW headers respectively.

B. is correct per OI-16, The distractors are all possible combinations of power supplies and lineups for Component Cooling Pumps. Basis: Power Supply and Header Lineup of #13 and 23 CC Pumps

References: 55.41.4,10 ?KA1: ?KA2: 1/99 exam

83. CRO-134-1-5-40B 001

U-1 is in Mode 6 with fuel handling in progress when the refueling machine operator notices the refueling pool level is rapidly lowering.

Per the applicable plant procedure, which statement summarizes the control room actions required to ensure containment and atmosphere activity levels are kept to a minimum and the general public will be protected?

- A. Start all Containment Air Coolers in high with maximum SRW flow, start Penetration Room Exhaust fans, and ensure the SFP charcoal filters are in service.
- B. Isolate containment purge, start all Containment Air Coolers in low with maximum SRW flow, and start Penetration Room Exhaust fans.
- C. Start all Containment Air Coolers in low with minimum SRW flow, start all Iodine Filter Fans, and ensure the SFP charcoal filters are in service.
- D. Isolate containment purge, start all Containment Air Coolers in high with maximum SRW flow, start all Iodine Filter Fans, and ensure the SFP charcoal filters are in service.

D is correct per AOP-6E and basis. A is incorrect, purge must be isolated, and starting Pen room exhaust fans is not required B is incorrect, Pen room exh. fans are not required, cntmt air cooler alignment is wrong. C is incorrect, purge must be isolated and cntmt air cooler alignment is wrong Basis: U-1 in Mode 6 with Fuel Handling in Progress

References: 55.41:4,10 55.43:5 / SD 43BKA1: 43BK9.02KA2: K10.03

84. CRO-113-6-4-17 001

While raising a fuel assembly for a core to upender sequence, the hoist position is approximately 127 inches and being raised. The load increases from 1230 pounds to 2530 pounds. What is causing the weight change?

- A. A grid-to-grid hangup with adjacent fuel assemblies is occurring.
- B. The fuel assembly is bowed and contacting reactor vessel internals.
- C. The hoist box is off the down stop, and the weight gain is normal.
- D. The camera has contacted the core support barrel.

C is correct, OI-25C refernces picking up the weight of the hoist box at about 126.5" . A is incorrect, at this height, the fuel is inside the hoist box and above other fuel assemblies. B is incorrect, same as above. D is incorrect, interlocks should prevent this condition and the weight gain couldn't be attributed to camera interference.

References: 55.41.2 55.43.7

85. CRO-58-1-07 007

Following a reactor trip from 100% power, how do the ADVs respond?

- A. Initially they quick open and as RCS temperature lowers they ramp shut and when That is 532 F they are fully shut.
- B. Initially they quick open and as RCS temperatures lower they ramp shut and when Tave is 535 F they are fully shut.
- C. Initially they ramp fully open and as RCS temperature lowers they ramp shut and when That is 535 F the ADVs are fully shut.

- D. As RCS temperature lowers they remain open until the control room operator places the ADV controller in MANUAL with 0% signal to shut them.

B is correct per instrumentation section of FSAR and setpoint manual.

A is incorrect, wrong setpoint and referenced from Thot instead of Tave

C is incorrect, the ADVs receive a quick open signal above 63% power snf ttThot is referenced instead of Tave

D is incorrect, the valves will ramp in auto. Basis: Temp. of ADVs Fully Shut

References: 55.41:7 55.43:5 KA1: 058K4.01KA2: K4.02

86. CRO-113-6-4-21 001

A fuel bundle is suspended from the hoist, at 263" and as the Fuel Handling Supervisor, you have determined it is required to move .2" away from the core to alleviate a grid interference.

What direction do you provide the Refueling Machine Operator to accomplish this task?

- A. Open the main breaker on the console and manually operate the bridge and/or trolley.
- B. Select an off index option in full auto mode.
- C. Depress the "emergency stop" button and manually operate the bridge and/or trolley.
- D. Depress the "travel override" button and move in manual electric.

C is the correct response which is allowed by procedure. It ensures movement of the machine slowly, with all indications of weight and position available. A would remove weight and position indication. B is not physically an option with the refueling machine in this situation. D is not possible with the hoist in this position.

References 55.43.7

87. CRO-113-3-5-29A 030

As the OWC, under which condition would rescheduling routine maintenance on 12B Service Water Heat Exchanger be warranted?

- A. 12A SRW HX Bypass Valve is in MANUAL AND SHUT.
- B. The associated SRW pump differential pressure is less than the value stated in OI-15 for determining minimum header flowrate.
- C. Saltwater temperature is greater than 80°F.
- D. Saltwater header pressure less than 27 PSIG.

C is correct per note in OI-29 section 6.12 rev 48. A is incorrect, per OI-29 placing the bypass in any position other than this or AUTO requires the SW header be declared inoperable. B is incorrect-the D/P must be less than the OI to ensure minimum flow. D is incorrect, maintaining SW header pressure less than 27 PSIG ensures minimum flow requirements are met. Basis: Precautions in OI-15 and OI-29

References: 55.41.4,10 55.43.1, 2.

88. CRO-202-9A-2-23 023

When operating the controls at 1C43, what is the effect on any AFW controller output signal if the operating lever is moved past its detent pin when placed toward the "MIN" position? (assume output signal is presently at 20%)

- A. Signal goes to 0% output.
- B. Signal goes to 50% output.

- C. Signal stays at 20% output.
- D. Signal goes to 100% output.

C is correct. Distractors are possible controller output signals. Basis: Effect on any AFW controller output signal

References: 55.41.4 KA1: KA2:

89. SRO-204-1-1-22 022

Given electrical drawing 61-076-B sh 14J rev 2:

With no SIAS present, when 1HS5467 is placed in OPEN with HS5467A in NORMAL, what is the initial current flowpath?

- A. Through 1HS5467A contact 9-10, through relays 1SV5467 and 5467A, through relay 94.
- B. Through contact 94, through 1HS5467 contact 1-2, through 1HS5467A contact 3-4, through relays 1SV5467 and 5467A.
- C. Through 1HS5467 contact 7-8, through contact SIAS A4, through relays 1SV5467 and 5467A.
- D. Through contact 94, through 1HS5467 contact 1-2, through contact SIAS A4, through relays 1SV5467 and 5467A.

C is the correct answer.

A is incorrect, current does not go backwards through the relays.

B is incorrect, the 94 contact is initially open until closed by the 94 relay being energized when C is completed and 1HS5467A contact 3-4 is open with the HS in NORMAL.

D is incorrect, is incorrect, the 94 contact is initially open until closed by the 94 relay being energized when C is completed .

References: 55.41.7

90. SRO-204-1-1-12 012

Under which of the following circumstances may you depart from a procedure as written?

- A. With GS-NPO approval, to prevent damage to plant equipment or if safety functions are not being met.
- B. With Shift Manager, or in his absence, CRS approval, to prevent conditions adverse to personnel safety, plant safety, plant stability or safety of the public.
- C. With CRS approval, in the event that safety functions are not being met, or unexpected alarms/plant responses are being received.
- D. With shift manager approval, if safety functions are not being met.

B is correct per NO-1-201 section 5.1.C, all distractors are possible conditions, but not according to administrative requirements. Basis: Procedural Compliance

References: 55.41.10 55.43.5 NO-1-201 5.1.C KA1: KA2:

91. SRO-201-3-1-27 027

Given the following conditions:

- Unit 1 is shutdown for a maintenance outage
- Shutdown cooling has been lost, AOP-3B has been implemented
- CET temperature is 220°F
- RCS is capable of being pressurized
- S/G levels are -35"

--Main Feedwater was secured 4 hours ago

What is required for the reinitiation of Main Feedwater ?

- A. Raise S/G levels to > -26" with Auxiliary Feedwater.
- B. Place the Feedwater Regulating Bypass Valve controller in Manual with a 95% output.
- C. Purge the gooseneck for at least 10 minutes at 100 to 160 gpm.
- D. Maintain Main Feedwater flow < 80 gpm for at least 10 minutes.

C is correct per AOP-3B. A is incorrect, but is the required action for the original steam generators. B is incorrect, but is similar to the actions for restoring SDC. D is incorrect, there is no basis for this action.

References: 55.45.2,6. 55.43.5 55.43.10

92. CRO-134-1-5-31 031

Which one of the following operations requires you, as the CRS or Shift Manager, to approve a gaseous waste discharge permit?

- A. Shifting Waste Gas Decay Tanks.
- B. Containment modified purge.
- C. Nitrogen Purging of the VCT.
- D. Containment negative pressure vent.

B is correct per OI-36. Distractors are other operations performed on potentially contaminated systems but do not release activity to the environment. Basis: Approved Purge Permit

References: 55.41:10 55.43:4 / SD 43B, OI-36KA1: 43BK10.01KA2: 029000GEN10

93. SRO-204-200-01 001

Which of the following is a function of the Refueling Control Room Operator (RCRO)?

- A. Approving temporary changes to core alteration procedures, such as CEA or fuel assembly location due to malfunctioning refueling equipment.
- B. Verifying the qualifications of refueling machine, spent fuel handling machine and transfer machine operators prior to commencing core alterations.
- C. Ensuring that all applicable requirements of the Technical Specifications and the TRM are met for the evolution in progress.
- D. Documenting any fuel handling problems and maintaining the Refueling Status

board.

D is correct per NO-1-200

references: 55.41.10 55.43.7

94. EQUIPMENT CONTROL 002

A new electric motor has been installed on an existing pump. The MO requires the motor to be checked for proper rotation and not all clearances have been returned.

Which one of the following actions are required to remove the Danger Tag from the motor power supply? (assume the pump suction and discharge valves are to remain tagged out)

- A. Process a Supplementary Clearance.
- B. Process a clearance order to the existing clearance.
- C. Clear all tags and use a "human danger tag" for equipment not ready for operation.
- D. Verbally authorize the "lifting" of the motor tag and re-tag after rotation check.

B is correct per NO 1-112. A is incorrect, supplementary clearances are no longer used. C is incorrect, human danger tags cannot be used for testing equipment. D is incorrect, not allowed per NO-1-112.

55.41.10 09/00 exam

95. CRO-203-2-4-012 012

Per OP-2, Plant Startup from Hot Standby to Minimum Load, 11 and 12 MSIVs may be opened when the differential pressure across the valves is less than 100 PSID.

How could you verify the differential pressure across the MSIVs?

- A. Compare the applicable Steam Generator Header Pressure indication (PI-3991 or PI-4008) with the process variable indication on the Turbine Bypass Controller, (PIC-4056).
- B. Use the computer points of MSIV differential pressure from computer group 4, (11 & 12 Steam Generators).
- C. Compare the process variable indication with the setpoint indication on the Turbine Bypass Controller (PIC-4056).
- D. Compare one of the safety channel S/G pressures PI-1013A-D (1023A-D) with the associated Steam Generator Header Pressure indications on 1C03, PI-3991 (PI-4008).

See OM-35 sheet 1 and 1C03 indications

A is correct, the PDIC indication is down stream of the MSIVs, header pressure is upstream

B is incorrect, there is no computer point for MSIV differential pressure.

C is incorrect, the setpoint is generated by the controller.

D. is incorrect, both of these indications are upstream of the MSIV.

References: 55.41.10 OP-2 OM-35 sh1 1C03

96. RADIATION CONTROL 007

A female operator that you supervise provided you with the required written declaration that she is 3 months pregnant. Reviewing her dosimetry records with Rad Protection, you determine that she has received 60 mR TEDE during the previous 3 months.

To ensure Federal limits are not exceeded, you must limit her exposure over the next 6 months to:

- A. 60 mR
- B. 300 mR
- C. 340 mR
- D. 440 mR

A is incorrect, 120 mR is an annual admin. alert flag

B is incorrect, 50 mR per month is an administrative goal

C is incorrect, 400 is the Calvert Cliffs administrative maximum level.

D is correct, 500 is the regulatory limit

references: 55.41.12 55.43.4 Modified from Palisades exam bank off INPO web page.

97. RADIATION CONTROL 006

Given the following:

- \* Unit 2 is in Mode 6, with refueling operations in progress
- \* A Gaseous Waste Release Permit has been issued for commencing containment purge

\* Satisfactory RMS operability checks on RI-5316 A through D have been completed

\* The OWC requests that you bypass Containment Radiation Signal sensor channel ZG for maintenance

What is the appropriate action for the stated conditions?

- A. Ensure that the COD is shut, the Equipment Hatch is installed, the Personnel Airlock interlocks are installed, and bypass the ESFAS sensor channel.
- B. Deny the OWC's request to bypass the ESFAS sensor channel.
- C. Verify operability of RI-5316 A through C, and bypass the ESFAS sensor channel.
- D. Verify containment closure and bypass the ESFAS sensor channel.

B is correct, all CRS sensors channels must be operable during fuel movement. Distractors are based on actions to start refueling per OP-7 checklists.

References: 55.41.11, 12. 55.43.6,7 Calvert Cliffs event during 2001 outage, refueling with less than 4 channels CRS operable.

98. RADIATION CONTROL 001

The setpoint for the normal liquid effluent monitor is based on assumptions in the Offsite Dose Calculation Manual (ODCM).

Which one of the following would require the Plant Computer activity setpoint to be decreased?

- A. Decrease in actual release rate from 120 gpm to 90 gpm.
- B. Decrease in operating circ water pumps from 6 to 5.
- C. Decrease in monitor background radiation level.
- D. Decrease in Bay level.

Correct answer is based on setup conditions for a liquid waste discharge, distractors are conditions which have no effect on the conditions specified in the permit.

References: 55.41.13 55.43.1 CP-601, OI-17C and D 4/98 SRO makeup exam

99. CRO-202-9A-2-14 014

Which statement defines a Severe Fire as it applies to determining if AOP-9 series procedures must be implemented?

- A. A fire located in an dedicated/alternate shutdown area which inhibits or prohibits the use of normal shutdown procedures.
- B. A fire located anywhere that requires the plant be shutdown and cooldown initiated to comply with Technical Specifications.
- C. Any fire located within the protected area that requires offsite assistance from local fire agencies.
- D. Any fire located within the protected area that has not been extinguished within 15 minutes of applying an extinguishing agent.

A is correct per AOP entry conditions and basis. Distractors are basic descriptions of other fire effects and have no basis in the AOP. C and D have some basis in ERPIP.

References:55.41.2,8 55.43.5

100. LOR-042040404-001A 001

There has been a reactor trip with safety injection actuation. During EOP-0, it was determined something more than an uncomplicated reactor trip had occurred for which an Optimal Recovery Procedure was not available. EOP-8 was then entered, a Site Emergency was declared and a cooldown commenced. The Technical Support Center staff was asked to provide a procedure for this situation. The procedure has been completed and approved. When may you direct exiting the current procedure and implement this new procedure developed by the Technical Support Center?

- A. When EOP-0 Safety Function Acceptance Criteria are met.
- B. When the EOP-8 Safety Function Acceptance Criteria are met.
- C. Upon direction by the Site Emergency Coordinator (SEC).
- D. When any Optimal Recovery Procedure's (i.e. EOPs 1-7) Intermediate Safety Function Acceptance Criteria can be met.

B is correct per EOP-8 V.G.1, rev 24 and basis doc. Distractors are plausible conditions, but not supported by plant procedures.

References 55.43.1, 5 EOP-8 and basis

1. INOP/STUCK CEA 003

A reactor startup is in progress per OP-2, group 2 CEAs are being fully withdrawn in the Manual Individual mode. Which set of conditions would indicate an inoperable stuck CEA?

- A. CEAPDS position for the affected CEA indicates 130", primary position indicates 126", "PRIMARY CEA POSITION DEVIATION +/- 4" alarm.
- B. Primary position for the affected CEA indicates 130.5", CEAPDS position is 127", "SECONDARY CEA POSITION DEVIATION +/- 4" alarm.
- C. Primary position for the affected CEA indicates 130.5", CEAPDS position is 120", "PRIMARY CEA POSITION DEVIATION +/- 8" alarm.
- D. CEAPDS position for the affected CEA indicates 1.5", primary position indicates 0", "PRIMARY CEA POSITION DEVIATION +/- 8" alarm.

Distractor A has reed switch position higher than pulse counts, indicating that although there is a mismatch in indicating channels, primary position indication is most likely in error, the CEA is not immovable.

B is correct. Primary position higher than secondary indicates that electronic pulses are being sent to the grippers, but secondary indication is that the CEA has not moved. If primary position.

Distractor C is incorrect--this is an indication of a slipped (partial drop) CEA. the stem states that a startup is in progress, per OP-2 startup procedure, Manually Individual operation would not start until CEAs were at a minimum of 130.5".

Distractor D is indication of a dropped CEA.

References: 55.41.2,6 55.43.2 ,6 TS basis defines inoperable as untrippable. Untrippable indicates mechanically stuck as opposed to electrically immovable.

2. NATURAL CIRC 001

Given the following:

- \* Unit 2 has tripped due to a Loss of Offsite Power, EOP-2 has been implemented
- \* Plant cooldown has commenced
- \* 21 loop Th 520°F and Tc 525°F
- \* 22 loop Th 535°F and Tc 520°F

Which of the following is the required action by the CRO for this condition?

- A. Increase steaming rate via TBVs.
- B. Increase steaming from 21 S/G via ADV.
- C. Increase steaming from 22 S/G via ADV.
- D. Lower steaming from 21 S/G.

Correct answer is based on actions for an inverted d/t condition during natural circ, distractors are conditions which will not restore the normal d/t on 21 SG.

References: 55.41.5 author:REN The question Th and Tc for 21 SG was modified to put the inverted d/t within 22 SG parameters to avoid confusion (comment from WPB) after question validation. Minor modification, changed 2 distractors mlw--2/06/02 4/98 SRO make up exam

3. LOSS OF CCW 001

Given the following:

- Unit 1 is operating at 100% power.
- Alarm 1C07B X-02 11A RCP, CCW FLOW LO, has actuated.

WHICH of the following RCP conditions requires the operator to trip the reactor and the reactor coolant pump?

- A. Upper thrust bearing temperature is 197°F.
- B. Controlled bleed off flow is 2.0 gpm.
- C. Guidebearing temperature is 193°F.
- D. Component cooling water outlet temperature at the RCP is 135°F.

Correct answer is trip criteria from AOP 7C, distractors are below trip criteria or not a trip criteria (CCW outlet temperature).

References: 55.41.3,7 4/98 SRO makeup exam. (Significant Operator Actions in CC PRA)

4. PZR PRESS MALF 002

Given the following conditions:

- \* Unit 1 at 100% power
- \* Pressurizer pressure is 2250 psia
- \* PZR backup and proportional heater control in auto
- \* 1-HS-100 (PZR pressure control) in the "Y" position
- \* 1-HS-100-3 (PZR htr cutoff) in the "X+Y" position
- \* 1-PT-100Y fails high

Select the expected PROPORTIONAL HEATER response. Assume no Operator action.

- A. Proportional heaters will continue to operate at approximately 1/3 higher power level than before the failure.
- B. Proportional heaters will operate at approximately 1/3 lower power level than before the failure.
- C. Proportional heaters will de-energize and the green light will be illuminated.
- D. Proportional heaters will de-energize and the red light will be illuminated.

D is correct, the heaters will respond as if RCS pressure was high. A is incorrect, a high pressure will cause power to the heaters to lower, not raise. B is incorrect, the pressure difference will be outside the control band. C is incorrect, the light indication is a function of the breaker position, breakers will be shut but SCRs will keep power from going to the heaters. See FSAR drawing.

References: 55.41.7, 55.43.5 Modified from PZR PRESS MALF 003 from this bank--mlw 2/6/02

5. STM LINE RUPTURE 003

What action does the Unit-2 CRO take to prevent an excessive heat transfer condition in the event of an uncomplicated reactor trip?

- A. Press "Reset" button on the MSR control panel.
- B. Ensure both 2nd stage steam source MOVs shut.
- C. Shut upstream drain MOVs.
- D. Shut the Main Steam Isolation Valves.

Correct answer, A, is based on Unit-2 EOP-0 step D.3., B is incorrect, it is the proper step for Unit-1. C is incorrect, there is no direction to shut upstream drain valves, leaking drain valves would have a small effect on RCS temperature immediately after a trip. D is incorrect, it is a mitigating action taken if there is an excessive cooldown in progress such that S/G pressure falls below 800#.

references: 55.41.4, 5,10 55.43.5 Modified from STM LINE RUPTURE 001, this bank--mlw 2/06/02 (original question used 09/00 exam)

6. STM LINE RUPTURE 005

Given the following:

- An overcooling event has occurred

WHICH Steam Generator should be isolated?

- A. The Steam Generator with the highest Tcold.
- B. The Steam Generator with the lowest steam pressure.
- C. The Steam Generator with the lowest AFW flow.
- D. The Steam Generator with the highest level.

Correct answer is specified by EOP-4, distractors are incorrect parameters.

References: 55.41.5,7 55.43.5 4/98 SRO makeup exam

7. CRO-48-3-0-12 002

An electrical malfunction has occurred on U-1. Diagnosis by the CRS has determined that a loss of 16 4KV bus has occurred. What effect will this have on the plant? Assume U-1 is at 100% power

- A. One condensate and two condensate booster pumps have tripped, requiring a power reduction.
- B. Three circulating water pumps have tripped, requiring a manual reactor trip.
- C. All circulating water pumps have tripped, requiring a manual reactor trip.
- D. Two condensate and one condensate booster pump has tripped, requiring a power reduction.

B is correct per AOP 7I. Distractors are affects of loss of other 4 KV busses: A-12, C-15 and D-13 bus.

References: 55.41.4, 10 55.43.5

8. STATION BLACK OUT 001

Given the following:

- \* Unit 2 tripped
- \* EOP-5 (Loss of Coolant Accident) is implemented
- \* a concurrent loss of AC power occurs

What is the minimum design life of the 125 VDC batteries if unable to restore power to an associated battery charger?

- A. 2 hours from initial loss of power
- B. 4 hours from initial loss of power
- C. 6 hours from time of Reactor Trip
- D. 8 hours from time of Reactor Trip

Correct answer is based on FSAR description and Tech Spec LCO time, distractors are unrelated times or conditions.

References: 55.41.5,8 FSAR, TS bases Changed to memory level per CE comments of 3/19/98. 09/00 exam

9. LOSS VITAL AC 002

Given the following:

- Unit 1 is at 100% power
- Pressurizer level instrumentation is selected to channel X
- Reactor Reg is selected to channel X
- 120VAC bus 1Y01 has been de-energized, resulting in:  
Channel X pressurizer level control and indication fails low

Loss of Reactor Reg system channel X  
Loss of RCS loop 11 instruments to Reactor Reg system channel Y  
CNTMT IA Control Valve, 1-IA-2085-CV shuts

With no operator action, how will pressurizer level respond long term and why?

- A. Pressurizer level will lower slightly due to an improper level setpoint generated by the reactor regulating system using failed Tc inputs.
- B. Pressurizer level will rise slightly due to an improper level setpoint generated by the reactor regulating system using failed Tavg inputs.
- C. Pressurizer level will rise continuously due to all charging pumps starting and letdown being isolated.
- D. Pressurizer level will lower continuously due to letdown going to maximum and the backup charging pumps receiving a stop signal.

Correct answer is based on actions in AOP basis. Distractor A is incorrect, failure of temperature instruments will reflect a higher PZR level setpoint, not lower. Distractor B is incorrect, actions do not reflect loss of instrument air. Distractor D is incorrect as letdown will be lost, not maximized.

References:55.41.4,7,10 55.43.1,2,5 AOP-7J and basis

10. LOR-020380304-005 001

Unit-1 is at 100% power when 11 SW pump trips. "U-1 4KV ESF MOTOR OVERLOAD" alarm is annunciated. No common mode failure is indicated and the Control Room crew has decided to align align the standby pump per the applicable procedure.

Per plant administrative procedures, which is a correct method to direct the Plant Operators' response to this situation?

- A. Direct the PPO to "restore Saltwater per AOP-7A".
- B. Direct the Turbine Building Operator to "align 13 SW power supply from 11 4KV bus" and direct the Outside Operator to "align 13 SW pump to 11 header per AOP-7A".
- C. Announce over the plant page "11 SW pump has tripped, realign 13 SW pump."
- D. Direct the Outside Operator to "align 13 SW pump to 11 header".

A. is incorrect because no direction to what part of the procedure to use or what corrective action is being requested.

B. is incorrect because the AOP does not direct shifting power supplies if power is available to the swing pump.

C. is incorrect, a general announcement over the plant page to direct operator actions is not authorized per NO-1-200.

D. is correct per the AOP and NO procedures.

References:,55-41.10, 55-43.5 55-45.5, 45.12,45.13 AOP-7A, NO-1-201

11. CRO-202-9A-2-48 048

AOP-9A allows the Turbine Building Operator to control AFW discharge pressure locally. How can the operator at 1(2)C43 verify adequate AFW pump speed?

- A. Comparing local (AFW pump room) AFW pump discharge pressure with local (AFW pump room)11 and 12 S/G pressure indications as reported by the TBO.

- B. Comparing local (AFW pump room) AFW pump speed indications as reported by the TBO with 1(2)C43 AFW pump discharge flow indications.
- C. Comparing local (AFW pump room) AFW pump discharge pressure as reported by the TBO with 1(2)C43 11 and 12 S/G pressure indications.
- D. Comparing local (AFW pump room) AFW pump flow as reported by the TBO with 1(2)C43 Main Steam header flow indications and monitoring S/G levels at 1(2)C43.

A. is incorrect because S/G pressures are not available locally, (only Main Steam header pressure).

B. is incorrect because AFW pump speed is not available locally and flow indications at C43 panels are to the individual steam generators, not at pump discharge.

C. is correct, these indications are available as listed.

D. is incorrect because AFW flow is not available locally and Main Steam header flow is not indicated at C43 panels.

references: 55.41.8, 10

12. CRO-7-1-5-81A 811

When recirculating the SDC system to the RWT in Mode 4 through the SIT recirc leakoff isolation valves, 1-SI-463 and 1-SI-455, what satisfies the requirements for maintaining containment integrity?

- A. A locked valve log entry per NO-1-105.
- B. Verification and a log entry of valve position every 15 minutes.
- C. Verification that the valves have been shut within 72 hours of being opened.
- D. A dedicated operator in continuous communication with the control room to shut valves if required.

D is correct per a basis captured step in the procedure. Distractors are plausible actions but are not requirements of procedures. Basis: Recirculating SDC System

References: 55.41:10 55.43:5 / OI-3BKA1: 07A6.03KA2: 01K8.04

13. AOP-3F-04A 001

What is a method of lowering RCS subcooling margin?

- A. Raise RCS cooldown rate.
- B. Initiate Aux spray.
- C. Stop Reactor Coolant Pumps.
- D. Energize pressurizer heaters.

B is correct per boiler plate step in EOPs for controlling subcooling. Distractors are all ways of raising subcooling. Basis: METHOD TO DECREASE RCS SUBCOOLING MARGIN

References: 55.41.5,10 55.43.5 AOP-3FKA1: 02005A2.05KA2:

14. AOP-6A-03 001

A high activity condition exists in the RCS. The Auxiliary Building has been evacuated except for Rad Con personnel taking surveys and the ABO. The Control Room has implemented the proper AOP. How will the Letdown and Purification lineup be configured and why?

- A. Letdown is set at minimum with Purification in service to reduce RCS activity and limit radiation levels in the Auxiliary Building.
- B. Letdown is secured to limit radiation levels in the Auxiliary Building.
- C. Letdown is maximized and Purification is bypassed to protect the ion exchanger.
- D. Letdown is maximized with Purification in service to reduce RCS activity.

D is correct per AOP-6A and basis. Distractors A and B will not maximize RCS cleanup, distractor D is incorrect, ion exchanger protection is not a concern with high RCS activity. References: 55.41.12 55.43.4,5 AOP-6A 11/97 exam

15. CRO-106-1-2-12 012

Unit one is in Mode one at 100% power. Given the following trend on the 11B RCP:

TIME	VIBRATION	ALARMS
0000	14 mils	Alert - RCP vibration alarm
0100	16 mils	
0115	30 mils	Danger - RCP vibration alarm
0130	40 mils	
0145	44 mils	

What action is required?

- A. Conduct a plant shutdown, and then secure RCP 11B.
- B. Trip reactor, perform reactivity control, and then secure RCP 11B.
- C. RCP 11B must be secured within 8 hours.
- D. Perform an Engineering Evaluation for continued operation.

B is correct per the OI and the Alarm Response Manual. Distractors are actions to be taken at lower vibration levels. Basis: Action to be Taken

References: 55.41:10 55:43:5 / CCI-302KA1: 005K1.07KA2: K5.02,K6.03

16. LOR-020060218-002 003

What determines the boric acid flow rate when borating per EOP-0 for more than one CEA failing to insert?

- A. Number of boric acid pumps running
- B. Number of charging pumps running
- C. Setpoint of Boric Acid Flow Controller, FIC-110Y
- D. RWT boron concentration

A. is incorrect, BA pump capacity is greater than capacity of 3 charging pumps.

B. is correct:

C. is incorrect FIC 110Y is not in the flowpath for boration per EOP-0.

D is incorrect, EOP-0 does not direct use of the RWT flowpath, and if aligned by the operator, the discharge pressure of the BA pumps would be greater than the head due to the RWT level.

References: 55.41.6,7

17. CRO-202-1B-1-04 004

During reactor startup, at 1% power group 5 CEAs continue to move out after the "raise/lower" switch has been released and the CEDS control panel has been turned "off".

What is the correct response?

- A. Initiate fast boration.
- B. Trip the reactor and implement EOP-0.
- C. Attempt to stop the CEA motion by holding the "raise/lower" switch in the "lower" position.
- D. Attempt to stop CEA motion by selecting an alternate regulating group of CEAs.

B is correct per the initial actions of AOP-1B. A is incorrect, fast boration is used if CEAs are inserted beyond the transient insertion limit, not on a continuous withdrawal event. C and D are

incorrect, if CEAs continue to move after turning the control panel off, it is assumed that the panel is not functioning properly and there is no guidance to support these actions.

References: 55.41.10,2 AOP-1B

18. CRO-60-1-51 051

How is the value of FrT expected to have changed from its initial value as a result of a dropped CEA, short term (1 hour later) and long term (6 to 8 hours later)? Assume no operator action.

- A. Increase, Increase.
- B. Increase, Decrease.
- C. Decrease, Increase.
- D. Decrease, Decrease.

A is correct, neutron flux is initially distributed to another part of the core due to the local effects of the CEA. Xenon builds in this area of the core over time, making the flux distribution even worse.

Basis: Value of FrT Changes  
References: 55.41:2,5,6,10 55.43:2 / SOER-84-2KA1: 060K5.03KA2: 001000GEN6

19. SRO-201-0-3-23 023

During EOP-0, in addition to the "CIS ACTUATED" annunciator alarm, which one of the following is required to verify that CIS has actuated?

- A. SG Blowdown CVs have shut and blowdown has shifted to the Miscellaneous Waste system.
- B. RCPs are tripped and all available containment air coolers are started in HIGH speed with maximum SRW cooling.
- C. Containment Spray pumps start, spray header CVs open, and adequate spray flow is indicated through each header.
- D. Component Cooling containment isolation valves have shut.

D is correct per EOP basis document. Distractor A is verification action for an RMS alarm, RCPs are not automatically tripped on CIS and containment coolers do not receive a CIS signal. Distractor C are the verification actions of CSAS. Basis: Verification That CIS Has Occurred

References: 55.41.9 55.43.5 EOP-0 Rev. 3 basis documentKA1: 02063A3.04KA2:

20. CRO-202-2A-0-09A 002

Unit-2 is at 100% power with the following conditions:

- Acoustic monitors ERV-402 and RV-200 indicate .01
- Quench tank pressure is slowly rising
- Pressurizer level is 216" and steady
- RCS pressure is 2250 PSIG
- one charging pump is running, charging header pressure is 2280 PSIG
- letdown flow is 32 GPM

Per AOP-2A, which action will terminate the event?

- A. Lower RCS pressure by adjusting the setpoint of pressure controller 2-PIC-100X.
- B. Realign charging pump discharge to the HPSI header.
- C. Place PORV handswitches in OVERRIDE SHUT.

- D. Secure charging and isolate letdown.
- C. is correct per AOP 2A, attachment 2.
- B. is incorrect, but candidate may think a charging header leak is occurring given RCS and charging header pressures.
- A. is incorrect, no procedure guidance supports this action and this places the plant close to DNB LCO limits
- D. is incorrect, with indications of an RCS leak, charging should not be secured. Candidate may assume a RV on the letdown line is leaking.
- References: 55.41.3,8 55.43.1,5 TS, AOP-2A

21. SMALL BREAK LOCA 001

Using references provided:

The plant has experienced a small break LOCA. The following plant conditions exist:

- Core exit thermocouples read 600°F.
- All RCPs are stopped.
- Pressurizer level indicates 300".
- Thot indicates 590°F.
- Tcold indicates 560°F.
- Pressurizer pressure indicates 1545 psia.

Calculate subcooled margin.

- A. 40°F
- B. 10°F
- C. 5°F
- D. 0°F

A is incorrect, used Tc for calculation.

B is incorrect, used Th for calculation.

C is incorrect, used 1500 psia for calculation (misreads steam tables)

D is correct . using CETs, saturation temperature for 1545 psia is 600.1.

References: 55.41.7 4/98 SRO makeup exam

22. CRO-113-5-5-22 022

Which one of the following describes the limits for operation of HPSI and LPSI pumps with no Component Cooling flow?

- A. 45 minutes then pumps must be secured and allowed to cool for the next 15 minutes.
- B. 2 hours then pumps must be allowed to cool for 45 minutes before allowing another 2 hours of operation.
- C. Continuously, as long as the pumped fluid is maintained at or below 350°F.
- D. Continuously, as long as the pumped fluid is maintained at or below 170°F for HPSI pumps and at or below 300°F for LPSI pumps.

D is correct per OI-3A precautions. Distractors are based on starting duties or an incorrect temperature. Basis: HPSI/LPSI Operation during a loss of CC

References: 55.41.8, 55.43.5 OI-3A 0277 BASIS KA1: 02040A6.02KA2:

23. CRO-107-1-3-50 050

A charging header leak would be identified by which one of the following?

- A. Lowering pressurizer level with minimum letdown flow and one charging pump

- operating.
- B. Charging header pressure greater than RCS pressure with two charging pumps operating.
- C. Charging header flow equals letdown flow with one charging pump operating and VCT level is lowering.
- D. Charging header pressure less than RCS pressure with one charging pump operating.

D is correct per AOP-2A. Distractor 2 would be true for any leak greater than about 12 GPM but does not distinguish a charging header leak. B is incorrect, a charging header leak can be disguised with 2 pumps running. C is true for any small leak and would not distinguish a leak on the charging header. Basis: Identification of Charging Header Leak

References: 55.41:10 55.43:5 / AOP-2AKA1: 006K5.13KA2: 004020K6.05 09/00 exam

24. CRO-7-1-5-76B 762

Which condition would cause a SDC loop to be inoperable?

- A. Placing the standby LPSI pump handswitch in Pull to Lock.
- B. Shutting 1-CC-162 (11 Supply Header Isolation).
- C. Shutting 1-SI-444 (11 LPSI Normal Suction Isolation).
- D. Placing 13 CC pump handswitch in Pull to Lock.

A. is incorrect, automatic start of the LPSI is not required.

B. is correct. 1- CC-162 isolates 11 SDC heat exchanger.

C. is incorrect, the normal suction is not part of the SDC lineup and is shut when on SDC

D. is incorrect. 13 CC pump is not required to have 2 operable CC subsystems.

References: 55.41.8, 55.43.2 Loss of decay heat removal, 54% contribution to CDF sequence.

25. SRO-201-0-3-02A 003

At Calvert Cliffs, what method of responding to an ATWS is used and why is this action taken?

- A. Manually inserting all CEAs using "Manual Sequential" mode since there is no alternate means of de-energizing the CEDS from the control room.
- B. Depressing one set of Manual Reactor Trip buttons, this energizes the TCB shunt trip relays and RPS actuation does not.
- C. De-energizing 12A and 13A 480 volt buses, this removes power from the CEDM Motor Generator Sets and is independent of RPS actuation.
- D. Manually opening the trip circuit breakers in the Cable Spreading Room as there is no alternate method of opening all the trip circuit breakers from the control room.

A. is incorrect, this step would take several minutes to shutdown the reactor.

B is incorrect, although the stated action is correct, the trip buttons and RPS function to open the TCBs in the same manner.

C is correct, this is a rapid means of removing power from the CEDMs from the control room. D is incorrect, EOP-0 directs pushing one set of trip buttons and if that is unsuccessful, de-energizing the MG sets by opening their power supply feeder breakers.

Basis: Reason Reactivity Control is the 1st Safety Function Addressed

References: 55.41.6,7 55.43.1 EOP-0 Rev. 14 Basis DocumentKA1: O2005PK4.01KA2: ATWS- 5% initiating event contributor to CDF, SOER 86-1.

26. AOP-2A-01 001

A shutdown per AOP-2A is in progress due to a tube leak in 11 S/G. Assuming the plant does not automatically trip, which one of the following conditions would require you to manually trip the reactor?

- A. Tavg is reduced to less than 557°F.
- B. Pressurizer level cannot be maintained above 101 inches.
- C. Condenser off gas or S/G blowdown RMS alarms.
- D. 11 S/G tube leakage exceeds 100 gallons per day.

Correct response B, from AOP-2A actions. Distractors are other indications of a S/G tube leak. Basis: REQUIREMENTS TO TRIP RX DURING SG TUBE LEAK

References: 55.41.5, 10 55.43.5 AOP-2AKA1: 000037EK3.07KA2: 11/95 exam (SGTR in PRA and CDF report.)

27. SRO-201-6-0-01 001

Which one of the following indications would differentiate between a steam generator tube leak and a steam generator tube rupture?

- A. condenser off-gas radiation monitor alarm
- B. unbalanced charging and letdown flow
- C. decrease in steam generator pressure
- D. decreasing pressurizer level

D, correct answer is based on guidance in AOP-2A. Distractors A and B are entry conditions for AOP-2A. Distractor C is entry condition for excess steam demand. Basis: Distinction between tube leak and tube rupture

References: 55.41.5 AOP-2A Rev. 9KA1: 02005A3.01KA2:

28. SRO-201-3-1-18 018

A reactor trip from 100% power due to a loss of all feedwater has occurred. The crew is unable to regain a source of feedwater and has initiated Once Through Core Cooling. Plant conditions at start of OTCC are:

Time after Trip-1 hour

RCS Temperatures are 525°F and RCS pressure is 1000 psia

CETs are 527°F

RWT level is 25'6"

2 charging pumps are available

MCC-114R is deenergized

Based on the above conditions and using provided references, what is the expected HPSI flow and will Once -Through -Cooling be successful? Assume no operator actions outside of the control room.

- A. 380 gpm, not successful
- B. 380 gpm, successful
- C. 750 gpm, not successful
- D. 750 gpm, successful

A is correct per EOP attachments, one HPSI train will not inject due to HPSI header isolations being de-energized. Basis: Reactor Trip from 100% Power

References: 55.41.7,8 55.43.1, 5 KA1: ?KA2: CDF, references to loss of, or misoperation of AFW system.

29. AOP-7J-06 001

21 125 VDC bus is de-energized.

What is the effect on the Emergency Diesel Generators?

- A. 1A will receive a UV start signal, 2B will be unaffected.
- B. 1A will be inoperable, 1B will receive a UV start signal.
- C. 2B will receive a UV start signal, 1B will be inoperable.
- D. 2B will be inoperable, 2A is unaffected.

D is correct per 1E-36, and AOP-7J unit 2 listed indications. A is incorrect, 1A is unaffected, 2B losses field flash and control power. Distractor B is incorrect, 1A and 1B are unaffected. C is incorrect, 2b losses field flash and control power, 1B is unaffected.

References: 55.41.7, 10 55.43.5 AOP-7J. Loss of DC buses, contributing to CDF.

30. CRO-57-1-5-12 013

"NI CH INOPERATIVE" alarm has annunciated at 1C05.

Where are the indications that would allow you to identify the cause of the alarm?

- A. 1C15, 1C43, Plant Computer
- B. 1C05, 1C15, Plant Computer
- C. 1C05, 1C43, Plant Computer
- D. 1C05, 1C15, 1C43

B is correct, all channels of NIs are available at each location. Incorrect distractors involve 1C43 which contains only 2 wide range instruments (one selected at a time).

References: 55.41.7, 55.43.5

31. CRO-122-1-3-42 001

Unit-1 Waste Processing Ventilation Radiation Monitor (1-RE-5410) is in alarm. All other RMS indications appear normal.

Which of the following would be a likely cause?

- A. A fuel handling event in the spent fuel pool.
- B. Elevated dose rates in the ECCS pump rooms due SDC operations.
- C. Excessive packing leakage from a Charging pump.
- D. Leakage from a Waste Gas Compressor.

A. Is incorrect, the SFP area monitor and Main Vent RMS would have some indication of an event in the SFP area.

B. is incorrect, ECCS pump room ventilation RMS would detect this, the WPS ventilation monitor would not see this unless leakage were present.

C. is correct per alarm response manual, and experience.

D. is incorrect, a leak at a waste gas compressor would most likely also be apparent to the Waste Gas Equipment Room area monitor and the MainVent monitor.

References: 55.41.11,12,13 55.43.4 Alarm Manual

32. CRO-134-1-5-36 036

Which instrumentation must be operable to ensure the Containment Purge System will be automatically secured should a fuel handling incident occur inside containment?

- A. Containment High Range Monitors (RE-5317 A/B)
- B. Containment Area Radiation Monitors (RE-5316 A thru D)
- C. Main Vent Gaseous Monitor (RE-5415)
- D. Wide Range Noble Gas Monitor (RIC-5415)

B is correct per Op-7 checklists and technical specifications. Distractors are various RMSs that are not required to be operable and do not support automatic actions. Basis: Containment Purge System Automatically Secured  
References: 55.41:4,10 55.43:2 / SD 43B, Tech Spec 3.9.9KA1: 43BK4.02KA2: K8.01,K8.02 1/99 exam (Calvert Cliffs event , Unit 1 2000 refueling with one sensor for CRS bypassed at ESFAS.)

33. CRO-122-1-3-27A 001

Which automatic action is performed by the Containment High Range Rad Monitor (RE-5317 A/B)?

- A. Starts the 11(21) and 12 (22) Penetration Room Exhaust Fans.
- B. Shuts the Containment Normal Sump Drain Valves, 1(2)-EAD-5462 and 5463 MOVs.
- C. Shuts the Containment Vent / H2 Purge MOVs, 1(2), -HP-6900 and 6901.
- D. Starts 11(21), 12 (22) and 13(23) Iodine Removal Units.

C is correct per lesson plan and LD-58. A is incorrect, Pen rm Fans start on CIS. B and D are incorrect, these components receive SIAs signals. Basis: Alarms on the Containment High Range Rad Monitor

References: 55.41:10,11 55.43:5 / SD-15, ARP 1C22KA1, LD-58 015A2.04KA2: 072000A2.02

34. CRO-62-1-3-29 029

Given the following conditions:

- Plant is at 100% power
- HS-110 (PZR Level Control) is selected to Y position
- HS-100-3 (PZR Heater Cutoff) is in X + Y position
- LT-110Y fails low

Operator response is required to prevent which of the following conditions?

- A. Filling the PZR solid followed by a high pressurizer pressure trip.
- B. Continuous cycling of backup charging pumps due to conflicting signals.
- C. All charging pumps stopping at + 13" deviation from setpoint.
- D. Loss of PZR level followed by a Thermal Margin/Low pressure trip.

A is correct, all charging pumps will start, letdown will be minimized, leading to the correct response. B is incorrect, charging pumps start, letdown is minimum and containment is unaffected. C is incorrect, heater cutoff will occur below 101". Basis: LT-110Y fails low.

References: 55.41:7,10 55.43:5 / CO6 E-33, AOP 2AKA1: 005K3.02KA2: 000028GEN5 1/99 exam

35. SRO-201-2-1-24 024

A loss of offsite power has occurred and 1A Diesel Generator has failed to start. What is the status of the PORVs on Unit-1?

- A. Both PORVs will operate on high pressure, their "manual open" handswitch positions will not function to open the PORVs.
- B. One PORV will not operate on high pressure, its "manual open" handswitch position will not function to open the PORV.
- C. Neither PORV will operate on high pressure, both "manual open" handswitch positions will function normally.

- D. One PORV will fail open but can be overridden shut using the "override shut" handswitch position.

Answer D. is correct, all power supplies to the PORVs and controls are energized from the diesels and/or battery buses. Distractors are possible combinations of affects if the PORV controls were powered from a combination of sources similar to the arrangement of the PORVs and their blocking valves.

from LOR lesson materials. References: 55.41.3,7, Plant modification unit-1 2002 refueling outage.

36. EXCESSIVE RCS LEAK 001

Given the following:

- Unit 2 is at 80% power
- Unidentified RCS leakage is .5 GPM
- No SG leakage is identified
- RO reports that VCT trace indicates an increase in RCS leakage

AOP 2A (Excessive RCS leakage) has been implemented.

Which of the following conditions would require Unit-2 to be shutdown per T.S. 3.4.13?

- A. 5 GPM known leakage from body of 2-CVC-500 (VCT Diversion).
- B. 5 GPM leakage identified from the packing gland on PORV-404.
- C. 5 GPM leakage identified from RCP integral heat exchanger.
- D. 5 GPM leakby from seat of SI-652-MOV.

RCP integral heat exchanger is considered pressure boundary leakage, distractors are non-pressure boundary leakage for the RCS or system connected to RCS.

References: 55.41.3 55.43.2 author:REN

37. CRO 5-2-3-47 047

What component of the CEDM constitutes part of the RCS pressure boundary?

- A. Operating Coil Stack Assembly
- B. Shroud Assembly
- C. Magnetic Jack Motor Assembly
- D. Motor Housing Assembly

D is correct per lesson plan material. Distractors are other components of the CRDM

References: 55.41.2,3

38. CONTROL ROD DRIVE 4 045

The most likely cause of an excessive Azimuthal Power Tilt (Tq) is:

- A. A misaligned CEA
- B. Axial xenon oscillations due to power changes
- C. Uneven boron distribution within the core
- D. Insertion of CEAs below PDIL

A is correct per TS and AOP-1B basis. B has more affect on ASI than Tq. C is not a concern with RCPs in operation, D is associated with the loss of shutdown margin, rod grouping maintains Tq Basis: Cause of Excessive Quadrant Power Tilt Ratio

References: 55.43..2,6, 55.43.1,2

39. SRO-201-2-1-25 025

Unit-1 is in EOP-1 with feed water controls in automatic when RCP Bus Feeder breaker, 252-1201, trips. Assume no operator action.

Which of the following secondary plant parameters indicate a loss of RCS flow is occurring ?

- A. Lowering feed flow and steam flow with rising S/G pressures
- B. Rising steam flow and feed flow with lowering S/G pressures
- C. Rising steam flow and feed flow with rising S/G pressures
- D. Lowering steam flow and feed flow with lowering S/G pressures

C is correct, Tave will increase causing ADV valves to open, increasing steam flow. With Feed control in auto, the feed system will respond by increasing flow to maintain generator level. S/G pressure will rise due to Th increasing.

Distractors are possible combinations of feed, steam flows and S/G pressures Basis: Loss of Flow Accident Indicators in Control Room

References: 55.41.5 KA1: ?KA2:

40. LOR-020050447-002 003

Unit 1 is operating at 100% power. RCP 11B parameters are as follows:

VCT pressure	40 PSIG	11B RCP upper seal
1100 PSIA	11B RCP middle seal	2150 PSIA 11B RCP lower seal cavity
temperature 160°F	11B RCP bleedoff flow	2.0 GPM Controlled
bleedoff temperature	152°F	

Which one of the following statements correctly describes the condition of 11B RCP seals?

- A. No RCP seal is degraded
- B. Lower RCP seal is degraded
- C. Middle RCP seal is degraded
- D. Upper RCP seal is degraded

B is correct per OI-1A indications. Distractors are other seals that indications do not support degradation. Basis: RCP SEAL

References: 55.41.3,7 55.43.5 OI-1A Rev.15

41. CRO-57-1-5-04 005

While operating at 100% power, power is lowered to 80% using fast boration.

How is NI power indication effected?

- A. Indicated power is less than actual power due to greater neutron absorption by boron.
- B. Indicated power is greater than actual power because of increased thermalization of neutrons by colder Tave.
- C. Indicated power is less than actual power due to less neutron leakage from the core.
- D. Indicated power is greater than actual power due to more neutron leakage from the core.

C is correct, as power is lowered, RCS temperature is lowered, this increase in moderator density allows less neutron flux to the detectors. Basis: NI Indication

References: 55.41:2,5,7 55.43KA1: 057K5.04KA2: 015000K5.04

42. CRO-63-1-3-09A 001

Given the same magnitude steam line rupture inside containment in each case, which condition would result in the highest containment temperature? (Assume no operator action)

- A. failure of CIS Channel B to actuate
- B. failure of SIAS Channel A to actuate
- C. failure of CSAS Channel B to actuate
- D. failure of SGIS channel A to actuate

A is incorrect, containment parameters would not change appreciably with loss of CIS on a SGIS. B is correct, one train of containment coolers would fail to operate and one train of containment spray would fail to operate (spray pump doesn't start.) C is incorrect, one train of spray would fail to initiate, but all containment coolers would operate. D is incorrect, each channel actuates all required equipment.

References: 55.41:7 55.43 KA1: 063K4.01KA2: 013000GEN. Original question ( CRO 63-1-3-09 009) used on 1/99 exam

43. CRO-63-1-3-15 015

If ESFAS sensor channel ZF is de-energized for maintenance, what is the resultant actuation logic?

- A. 1 of 2
- B. 2 of 3
- C. 1 of 3
- D. 2 of 4

C is correct per system logic diagram, LD-58A. Distractors are other possible algebraic combinations. Basis: Resultant Trip Logic for Remaining Channels for SIAS

References: 55.41:10 55.43:2 / OI-34KA1: 063K4.01KA2: A6.03

44. CRO-59-1-5-60 060

Which set of conditions would cause a CEA Withdrawal Prohibit?

- A. 1/4 pretrips from TM/LP, APD or High SUR.
- B. 1/4 pretrips from High SUR, VOPT or APD.
- C. 2/4 pretrips from VOPT, High SUR or TM/LP.
- D. 2/4 pretrips from APD, TM/LP or VOPT.

C is correct per Alarm Response Manual D-35 rev. 39. Distractors contain either incorrect logic (1/4) or incorrect inputs (VOPT,APD), Basis: Conditions Not Causing a CEA Withdrawal Prohibit

References: 55.41:2,7 55.43KA1: 059K1.01KA2: 012000K1.03

45. CRO-57-1-5-39 039

Why will a linear range NI calibration require an adjustment to the NUCLEAR PWR CALIBRATE potentiometer over core life, even if the same power level is maintained?

- A. More competition for neutrons by boron concentration over core life reduces leakage seen by the detectors
- B. Moderator density changes over core life increases leakage seen by the detectors
- C. A greater neutron flux is required to maintain the same power level as fuel is depleted
- D. A higher fission rate is required to maintain the same power level as fuel is depleted

C is correct per system description and theory lesson plan. A is incorrect, boron concentration goes down and leakage increases. B is incorrect, it is the actual decrease in boron concentration that causes leakage to increase, not a change in density

,Basis: Linear Range NI Calibration

References: 55.41:10 55.43:5 / OI-30, Tech Spec 3.3.1.1KA1: 057K9.2KA2: K9.3

46. CRO-202-3F-1-0003 004

When CETs are unavailable, what other indications are used to verify natural circulation?

- A. T-hot minus T-cold less than 50°F and temperatures constant or lowering
- B. T-hot minus T-cold greater than 50°F and loop subcooling constant or lowering
- C. T-hot minus T-cold less than 10°F and feed rate equal to steaming rate
- D. T-hot minus T-cold greater than 10°F and steam/feed rate affects temperature

A is correct, boilerplate step in EOPs for verifying Natural Circ. B is incorrect, subcooling lowering would indicate a loss of heat removal. C and D contain wording that does or did appear in the steps but are incorrectly worded or out of context. Basis: DETERMINE SUBCOOLING MARGIN DURING NATURAL CIRCULATION

References: 55.41.7 EOP-2 Step S.9KA1: 02005A1.06KA2:

47. SRO-201-3-1-13 013

A Loss of All Feedwater requires that OTCC be initiated prior to CETs reaching 560°F.

What is the basis for ensuring OTCC has been initiated prior to reaching this temperature?

- A. Reflux boiling heat removal mechanism degrades considerably above this temperature.
- B. Energy released to the containment will exceed design values above this temperature.
- C. Above this temperature the corresponding RCS pressure may prevent achieving the minimum adequate core cooling flow needed for decay heat conditions.
- D. To ensure RCS voiding does not occur in quantities sufficient to prevent natural circulation flow.

C is correct per Procedure basis. Distractors are sentences taken out of context from other EOP basis. Basis: Once Through Core Cooling

References: 55.41.7 EOP-3 basis KA1: KA2:

48. CRO-7-1-5-100 101

Given the following:

Unit 1 is at 100% power. A loss of offsite power occurs and 1B DG fails to start.

Which Containment Coolers will remain operable?

- A. 11 and 12
- B. 11 and 13
- C. 12 and 13
- D. 13 and 14

A is correct based on power supplies--11 and 12 will receive power from the 1A EDG.

Distractors are other possible combinations, and could be selected if candidate does not know which components are "A" train vs. "B" train. CC Normal Lineup

Basis: References: 55.41.7, 8

49. CRO-113-3-5-04 004

Which of the conditions below will provide an automatic start signal to a SRW pump with the Control Room handswitch in AUTO?

- A. Service Water header pressure less than 35 PSIG.
- B. A SIAS signal has actuated with or without an undervoltage signal present.
- C. The operating pump breaker has tripped on overcurrent and standby pump disconnect is aligned to that bus.

- D. An RAS signal has actuated during plant cooldown to shutdown cooling conditions with a LOCA in progress.

B is correct. A is incorrect, taking the switch to local defeats all automatic actions. C is incorrect there is no loss of power or low pressure signal which starts a SRW pump. D is incorrect, RAS does not affect SRW pumps. Basis: Starting and Stopping the SRW PP Motor with CR Handswitch

References: 55.41.7 ?KA1: ?KA2:

50. CRO-103-2-4-24 024

Unit 1 is operating at 100% reactor power when the 11 Heater Drain Pump trips on overcurrent. What will determine continued operation at present power level?

- A. Condensate Header pressure.
- B. MSR drain tank levels.
- C. Feedwater heater levels.
- D. SGFP suction pressure.

D is correct per AOP-3G, (loss of a pump at > 5% power). Distractors are other feed system components which are non-limiting. Basis: Plant Power Level for Continued Operation

References: 55.41:4 55.43:5 / SD-26, AOP-3GKA1: 026K3.02KA2: 056000K1.03

51. CRO-103-2-4-06 007

Unit 1 is operating at 100% power with condensate pumps 11, 12 and 13 running when #12 condensate pump trips.

What effect will this have on the secondary and what steps should be taken to mitigate the consequences?

- A. Reduced feed flow to the S/Gs and lowering levels will result. Bias feed pumps as required to maintain S/G levels.
- B. Lower feed pump suction pressure will exist. Verify a condensate booster pump automatically starts.
- C. Lower condensate header pressure will exist. Place hotwell level control in manual and bypass condensate demineralizers and precoat filters.
- D. Cavitation and unnecessary wear will occur. Reduce power to maintain condensate header flow less than 8,000 GPM.

C is correct per indications and actions of AOP-3G. A is incorrect, with feed pumps in automatic, feed flow will be restored with no operator action. B is incorrect, this condition should not start a condensate booster pump automatically. D is incorrect, a power reduction will not be required.

References: 55.41:4 55.43.5 /

52. LOR-020320305-002 003

#12 SGFP tripped at 60% power during a load increase. It has been determined that 12 SGFP cannot be restarted. Which one of the following requirements must be met to maintain power above 440 MWe with only #11 SGFP in operation?

- A. #11 SGFP speed must be controlled in manual.
- B. SGFP suction flow must be maintained < 16,500 GPM.
- C. SGFP suction pressure must be maintained > 250 PSIG.
- D. All 3 condensate pumps must remain running.

C is correct per OI-12A rev. 37. Precaution F. Basis: SGFP

References: 55.41.7 AOP-3G Rev. 0, OI-12A G. P., OP-3 G. P. 11/97 exam

53. CRO-34-2-3-04 005

Which of the following are AFW water sources which can be used per existing Emergency Operating Procedures?

- A. 21 Condensate Storage Tank to 13 AFW pump suction via fire hose connections.
- B. Condenser hotwell to the 11 CST to the AFW pump suctions.
- C. Condensate hotwell directly to the suction of 13 AFW pump.
- D. Condensate pump discharge header to the AFW pump suctions.

B is correct per EOP attachments. Distractors are plausible sources, but would require plant alterations and are not in the procedures. Basis: AFW SOURCES

References: 10CFR55.41:7 - SD-34KA1: 02034K1.02KA2: 02034K1.03

54. CRO-34-2-3-21A 022

Given the following conditions:

- Unit 2 is at 100% power
- Fuel Burnup is 8900 MWD/MTU
- Tc is 547.8 °F
- PZR pressure is 2262 PSIA

An inadvertent AFAS channel A actuation occurs. How will the RCS respond?

- A. Reactor power rises, Tc increases, spray valves open to maintain PZR pressure.
- B. Tc lowers, reactor power rises, PZR heaters energize to maintain PZR pressure.
- C. All parameters remain constant as the Main Feedwater Reg. Valves compensate for the increased feed flow to the S/Gs.
- D. The reactor trips on TM/LP or VOPT and SIAS initiates due to the drop in RCS pressure.

B is correct based on lesson plan information and simulator response.

A is incorrect, initially Tc will lower, causing power to rise. Tc lowering will cause an outsurge and a reduction in pressure. C is incorrect, although main feed does compensate for level changes, the effect of the cooler AFW causes parameters to change. D is incorrect, per the LP and simulator response, power increases about 1%, the change in RCS pressure is only about 25-35 PSIA, TM/LP setpoint is approximately 1980 PSIA.

Basis: AFW effect on RCS References: 10CFR55.41: 7 - SD-34KA1: 02034K5.01KA2: 061000K1.04

55. CRO-219-1-0-33 034

An alarm occurs on the liquid waste discharge radiation monitor (RE-2201) during a discharge of the 11 RCWMT. The radiation monitor is flushed with demineralized water in an attempt to reduce background radiation levels. Where is the flush water discharged to?

- A. Miscellaneous Waste Monitor Tank
- B. On-service RCWMT
- C. On-service degasifier
- D. Miscellaneous Waste Receiver Tank

D is correct per OI and OM print. Distractors are other tanks within the waste systems but do not receive water from this flowpath.

Basis: Flush Water Discharge

References: 55.41:12,13 55.43:5 / SD-14BKA1: 14BA2.01KA2: 068000K1.07 11/95 exam

56. CRO-134-1-7-03 003

The concentration of oxygen in the waste gas holdup system shall be limited to \_\_\_\_\_ % by volume?

- A. 3
- B. 4
- C. 5
- D. 6

B is correct, TRM limit based on explosive mixture. Basis: Concentration of Oxygen in the Waste Gas Holdup System

References: 55.41:13 55.43:2 / TRM 15.11.1 SD-14A, KA1: 14AK8.03KA2: 071000A4.29

57. CRO-219-1-0-34 034

During a waste gas decay tank release through the U-1 plant vent, the waste gas discharge radiation monitor (RI-2191) alarms.

Which valve must be shut to prevent a possible waste gas decay tank discharge to the waste gas surge tank?

- A. Waste gas discharge isolation (WGS-2191-CV)
- B. Waste gas discharge to Unit 1 plant vent (WGS-683)
- C. Waste gas discharge pressure control (WGS-2191-PCV)
- D. Waste gas discharge final filter bypass (WGS-630)

C is correct per OI-17B. and OM-78. Distractors are WGS valves that are not in the flowpath to cause the relief to lift. Basis: Waste Gas Decay Tank Discharge

References: 55.41:12,13 55.43:5 / SD-14B, OI-17 KA1: 14AK10.02KA2: A2.01 1/99 exam

58. CRO-122-1-3-42 042

During preparations for initiating Containment Purge, it is discovered that the Radiation Monitors associated with securing the system have their fuses pulled.

What effect will this have on the Containment Purge CVs?

- A. The Containment Purge CVs will not open because they receive a CRS.
- B. The Containment Purge CVs will not open because they receive a CIS.
- C. The Containment Purge CVs will open, but would not shut on a valid CRS.
- D. The Containment Purge CVs will open, but will immediately shut.

A. is incorrect, with the RMS de-energized, a false low signal is fed to ESFAS

B is incorrect, the RMS channels do not feed CIS, and same as above, also, Purge valves do not receive CIS signals.

C. is correct, a false low signal is sent to CRS at ESFAS

D. is incorrect, no signal is present to shut the CVs

References: 55.41.7, 55.43.2. Related to Calvert Cliffs LER involving refueling with one channel of CRS inoperable -2001 refueling outage

59. CRO-107-1-3-51 051

Given the following:

- Unit-1 in Mode-3 at 532°F
- Letdown flow indicates 0 GPM
- Waste processing RMS alarm
- Letdown pressure low alarm
- Chemical Volume Control Isolation Signal (CVCIS)
- B/U charging pump running

- High outlet temperature on the Regenerative HX
- PZR level --140" and rising

Which area of the plant would contain the highest personnel contamination and safety risks for this situation?

- A. East Penetration Room
- B. 1C63 Room
- C. Charging Pump Room
- D. West Penetration Room

correct answer is location of letdown containment penetration. Distractors are other locations within the Auxiliary Building, but are not affected by the letdown piping. Basis: Location of Leak  
References: 55.41:7 55.43:5KA1: 006K5.13KA2: K4.05,6

60. CRO-203-5A-3-03 003

What instrumentation provides the best indications for monitoring RCS level when draining from 47 ft. to 37.6 ft.?

- A. RVLMS, LIC-110X, LT-4138 (narrow range) and LT-4139 (wide range).
- B. Refueling level Tygon hose, LT-4138 (narrow range) and LT-4139 (wide range).
- C. LT-4140 (d/p transmitter), GEMS sightglass and LI-103.
- D. LT-4138 (narrow range), LT-4140 (d/p transmitter), LT-4139 (wide range).

A. is incorrect, RVLMS will most likely be unavailable, and only provides gross level indication. RCS level is below the indicating range for LIC-110X.

B. is incorrect, industry experience has shown tygon level indicators are subject to unreliabilities associated with kinked hoses, improper vent paths and irregular routing (tygon is no longer used at CCNPP)

C. is incorrect, RCS level is below the indicating range for LI-103 D is correct, all listed indications are available for midloop level monitoring. Basis: Draining RCS From 47 ft. to 37.5 ft  
References: 55.41.3 55.43.1 OP-7 Table 1KA1: 05K4.01KA2: A1.05

61. SRO-301-15-1-05 007

As pressurizer temperature lowers, pressurizer level instruments LI-110X and 110Y are expected to be:

- A. Indicating less than actual level.
- B. Indicating greater than actual level.
- C. Pegged high due to draining reference legs.
- D. Tracking actual level due to density compensation.

B is correct, 110-X and Y are calibrated for NOP, NOT and are not density compensated. As RCS temperature lowers, the density rises and actual level decreases. Actual mass stays the same, so the indication would be higher than actual level. Basis: Pressurizer Level Indication  
References: 55.41.3,5, 7 KA1: K15.07KA2:

62. CRO-5-2-3-39 039

Given the following conditions in the Quench Tank:

- 1) Pressure is 8 psig
- 2) Temperature is 122°F

3) Level is 28 inches

What action should be taken to restore normal operating conditions to the quench tank?

- A. Drain the Quench Tank.
- B. Fill the Quench Tank.
- C. Add Nitrogen to raise pressure.
- D. Perform a bleed and feed to cool the Quench Tank .

D is correct per ARM E-01. A and B are incorrect, normal level is 27.5- 29.5" C is incorrect, normal pressure band is 1 to 9 psig. Basis: Restoring Normal Operating Conditions to Quench Tank

References: 55.41:10 55.43.5 / OI-1BKA1: 005K5.08KA2: 007000K4.01

63. CRO-62-1-3-22 023

Which of the following signals will energize all Pressurizer Backup heaters?

(Assume heater control H/Ss are in AUTO)

- A. Key switches HS-100-4A & 100-6A on 1(2)C43 in ON.
- B. +13 inches level deviation above level setpoint.
- C. PZR level lowers to 101 inches.
- D. PZR pressure lowers to 2225 PSIG.

B is correct per FSAR figure 7-13 and RCS Instrumentation lesson plan materials A is incorrect, only 2 banks of heaters can be operated from 1C43. C is incorrect, 101" de-energizes the heaters. D is incorrect, setpoint for backup heaters is 2200 (50psia below setpoint)

Basis: Signal Energizing the Backup Heaters References: 55.41:7 55.43KA1: 005K11.05KA2: K11.06

64. CRO-59-1-5-03 004

Match the reactor trip in column A with the trip basis in column B. (Basis in column B may be used once, more than once, or not at all)

COLUMN A (REACTOR TRIP)

COLUMN B (BASIS)

- \_\_\_\_\_ TM/LP
- \_\_\_\_\_ Loss of Load
- \_\_\_\_\_ Power Level High

- 1. S/G tube rupture
- 2. Uncontrolled CEA Withdrawal
- 3. Excess Steam Demand
- 4. Loss of Load Without Reactor Trip
- 5. Extending S/G Safety Valve Service Life

- A. 3,4,5
- B. 2,2,3
- C. 1,5,2
- D. 1,4,2

C is correct per the TS basis and FSAR Distractors are listed as the basis for other RPS trips. Basis: Match Reactor Trip with Trip Basis

References: 55.41:7,10 55.43:2 / Tech Spec 2.2.1KA1: 059GK.04KA2: 012000K4.02

65. CRO-60-1-58A 059

While inserting group 5 CEAs from ARO during a power decrease, PRIMARY CEA POSITION DEVIATION +/- 4" alarm annunciates. CEA 34 computer position indication is 130", indication by CEAPDS is 125". All other group 5 CEA position indications are 124.5" to 125.5"

What action is required?

- A. Align CEA 34 to the rest of group 5 CEAs per AOP-1B.
- B. Declare CEA 34 primary position indication inoperable and refer to the TRM (TNC15.1.4).
- C. Declare CEA 34 inoperable and refer to Technical Specifications (LCO 3.1.4).
- D. Declare CEA secondary position indication inoperable and refer to the TRM (TNC 15.1.4).

A is incorrect, if it were an actual misposition, secondary position indication would agree with primary. B is correct, primary indication is higher than secondary while inserting CEAs, indicating that pulses are not being counted. C is incorrect, no indication of an untrippable CEA is evident. D is incorrect, all secondary indications are normal.

Basis: Tech Spec Requirements

References: 55.41:2,6,10 55.43:2KA1: 060K9.01KA2: 0014000GEN5

66. CRO-58-1-13 001

Which control signals are supplied by the Reactor Regulating System?

- A. PZR level control, Main turbine runback, Turbine Bypass Valve (TBV) analog demand, and SG level control modes for Digital Feedwater Control System (DFWCS).
- B. Atmospheric dump valve (ADV) analog demand, TBV quick open, Main turbine runback, and SG level control modes for the DFWCS.
- C. PZR Level control, Pressurizer Heater Cutout, ADV quick open, and SG level control modes for the DFWCS.
- D. ADV analog demand and quick open, TBV quick open, PZR level control, and SG level control modes for the DFWCS.

D is correct per FSAR section 7.4.1 A is incorrect, RRS does not supply turbine runback or an analog signal to TBVs. B is incorrect, does not supply turbine runback signal. C is incorrect, it does not supply heater cutoff signals. Basis: Control Signals Supplied by RRS

References: 55.41:7 KA1: 058K4.01KA2: K6.01, K6.02

67. CRO-7-1-5-17A 001

Which combination of Containment Spray pumps and/or Containment Air Coolers will be unable to maintain the pressure and temperature of the containment within design parameters for the most limiting UFSAR analyzed accident?

- A. Four (4) Containment Air Coolers
- B. Two (2) Containment Spray Pumps
- C. One (1) Containment Spray Pump and One (1) Containment Air Cooler
- D. One (1) Containment Spray Pump and Two (2) Containment Air Coolers

C is correct per TS 3.6.6 basis Basis: Ensure Design Pressure and Temperature of Containment

References: 55.41:7 55.43 / UFSAR Chapter 14.20KA1: 07K12.05KA2: 43BK8.07

68. CRO-134-1-5-44 044

Unit-2 is in mode 6, refueling in progress with Containment Purge in service.

A momentary loss of power causes the operating Main Exhaust Fan to trip.

What is the most likely effect on parameters in containment?

- A. Containment pressure rises 1 to 2 PSIG.
- B. Refueling pool level changes.
- C. Area radiation monitors indicate higher.

D. Containment temperature rises 5 to 10 degrees.

OI-36 precaution F.

A. is incorrect, pressure may increase or decrease, and would most likely not be observable on available indications.

B. is correct per OI-36 precautions

C. is incorrect, these are area monitors and would not be affected unless a fuel handling incident occurred.

D. Any temperature change would be small, and most likely, temperature would fall, if plant heating were aligned to purge.

References: 55.41.4,5,7,11

69. CRO-113-4-3-07 007

High Spent Fuel Pool temperature can be caused by:

A. Throttling shut SFP CLR DISCH HDR stop valve.

B. Shutting the spent fuel pool heat exchanger Component Cooling outlet valve.

C. Opening the 21A SRW HXR bypass valve.

D. Raising the setpoint of the spent fuel pool temperature controller on 1C13.

A is correct per the OI and ARM. B is incorrect, the system is cooled by SRW water. C is incorrect, 22 header supplies a SFP cooler, 21 does not. D is incorrect, there is no controller for SFP cooling.

References: 55.41.4

70. CRO-103-2-4-61A 001

Given the following:

Unit-1 is at 100% power. 11 MSIV is being partial stroke tested per the Surveillance Test Procedure. A system failure results in 11 MSIV shutting completely.

How will the plant respond?

A. RCS pressure will rise due to less steam demand, a High Pressure reactor trip will occur and the PORVs will open.

B. 12 S/G level will lower due to the steam demand imbalance, causing a Low S/G level reactor trip.

C. 11 S/G pressure will rise, 12 S/G pressure will lower due to the steam demand imbalance, resulting in an ASGT reactor trip.

D. RCS pressure will lower due to the increased steam demand from 12 S/G, resulting in a TM/LP reactor trip.

Distractors A. and B. are possible RPS trips which could result from this event, however, ASGT is designed specifically for this event.

D. is incorrect, the overall effect is lowering steam demand which raises RCS pressure. Basis: Test MSIV

References: 55.41:7 55.43 /

71. CRO-122-1-3-04 005

Which radiation monitor detects noble gas releases from the Atmospheric Dump Valves?

A. Wide Range Noble Gas Monitor (RIC-5415)

B. Main Vent Gaseous Monitor (RE-5415)

C. Main Steam Line Radiation Monitor (RE-5421)

D. Condenser Off-Gas Radiation Monitor (RE-5414)

A. and B are incorrect, these only monitor the ventilation stack which does not interface with the dumps.

C. is the correct answer, the detector is located as close to containment as possible to detect releases from the dumps, steam safeties and AFW exhaust.

D is incorrect, steam that exits via the ADVs does not reach the condenser, so would not be seen by Off-gas. Basis: Detecting Noble Gas Releases

References: 55.41:11 55.43.4 / SD-15KA1:

72. AOP-7G-05 005

Unit-1 is initially at 100% power, 870 MWe, water box inlet temperature is 48°F. The RO reports that MWe load is lowering, and 11 CAR has tripped. What are the initial operator actions?

- A. Implement AOP-7G and verify condenser differential temperature is less than 12°F.
- B. Reduce generator VARs to 0, verify a standby CAR starts.
- C. Reduce turbine load to maintain condenser vacuum greater than 25".
- D. Start a standby CAR and monitor condenser vacuum.

A. is incorrect, differential temperature would be affected by a circulating water pump trip, not a loss of a CAR.

B. is incorrect, reducing reactive load will have no effect on vacuum.

C. is incorrect, this step may be required, but should not be the initial reaction to a loss of vacuum, especially if the cause is known and correctable from the control room.

D. is the correct answer and allowed by operations procedures for plant stabilization prior to implementing an abnormal operating procedure.

73. CRO-54-1-1-12A 01A

Using provided references:

Both units are in Mode 1. 24B 480V bus is lost due to a fault on the bus, de-energizing #24 battery charger.

Select the most appropriate response.

- A. Verify #12 battery charger is in operation.
- B. Restore #24 battery charger to operation in 2 hours.
- C. Unit-2 in Mode 3 within 6 hours and Mode 5 in 36 hours.
- D. Place 1Y03 and 2Y03 on the inverter backup bus.

A. is correct, this ensures the bus remains operable and batteries are not discharging.

B. is incorrect, only one charger is required per TS basis.

C. is incorrect, either battery charger can be credited as long as the EDG remains operable, the LCO is met.

D. is incorrect, the inverters and associated instrument buses will have normal power available.

References: 55.41.8, 55.43.2

74. CRO-54-1-1-24 024

Using provided references:

An electrician performing a surveillance requirement reports that #11 battery has one cell with its electrolyte level less than the minimum level indication mark.

What action is required? Assume both units operating at 100% power.

- A. Verify pilot cell(s) electrolyte level and individual cell float voltage meet Table

3.8.6-1 Category C limits within 1 hour.

- B. Replace #11 Battery with the reserve battery within 4 hours.
- C. Verify the battery cell voltage is greater than or equal to 2.13 volts within 1 hour.
- D. Restore battery cell parameters to Category A and B limits of Table 3.8.6-1 within 24 hours.

A. is correct, per TS 3.8.6

B. is incorrect, this distractor reflects a condition B and LCO 3.8.4 would then apply

C. is incorrect, the category C limit is 2.08 volts which must be verified within an hour.

D is incorrect, you have 31 days to restore battery parameters.

References: 55.41.4, 55.43.2

75. CRO-48-1-2-28 028

2A Diesel Generator is running fully loaded when the operator monitoring the diesel reports that the "FUEL-OIL LEVEL LOW IN DAY TANK" alarm has annunciated and the fuel oil transfer pump will not run.

With no operator action, how long will 2A Diesel Generator continue to operate?

- A. 30 to 45 minutes
- B. 1 to 2 hours
- C. 5 to 6 hours
- D. 7 to 8 days

A. is incorrect minimum time by design is one hour at a load of 3500KW.

B. is correct for loads assumed by CCNPP procedures.

C. is incorrect, more than twice the design time

D. is incorrect but reflects a possible correct answer for design of the fuel oil storage tanks.

References: 55.41.7 55.43.2 system description 24A, TS 3.8.3 basis

76. CRO-122-1-3-38A 38A

Unit-1 has tripped and EOP-0 is being implemented. The Condenser Off-Gas (RE-1752) and S/G Blowdown Recovery (RE-4014) Radiation Monitors meter indications are pegged low and all lights on their panels are out.

What action should be performed to support the Radiation Levels External to Containment safety function?

- A. Report to the CRS "Radiation Levels External to Containment is complete".
- B. Restart the RMS sample pumps and re-evaluate the indications.
- C. Shut the Steam Generator Blowdown Control Valves.
- D. Attempt to clear all RMS alarms and re-evaluate the indications.

A. is incorrect, the Safety function is "not met".

B. is incorrect, sample pump controls are not locally available for the B/D recovery RMS, there is no sample pump for off-gas and the low indications are more indicative of an instrument or power supply failure than a sample flow problem.

C. is correct per EOP-0.

D. is incorrect, if meter indications support the low alarm condition, it will not clear, the instrument has failed.

references: 55.41.7, 55.43.5 EOP-0 basis, NO-1-201

77. CRO-113-1-5-14 014

Which of the following conditions will automatically trip an operating circulating water pump?

- A. 2 of 4 Intake structure level switches sensing 3.5" of water
- B. Low current trip of the exciter breaker
- C. High condenser back pressure
- D. High traveling screen differential pressure of 40"

A is correct based on pump logic diagram and 1E81 sheet 2C. Distractors are non existant trip conditions. Basis: Conditions to Trip a Running Circulating Water Pump

References: 55.41.4,7,10 55.43.5:

78. CRO-113-7-1-09 009

The \_\_\_\_\_ system is designed to act as a backup supply to the Instrument Air system and will automatically supply air to the header at \_\_\_\_\_.

- A. Salt Water System air compressors, 88 PSI
- B. Aux Feedwater System air amplifier, 80 PSI
- C. Plant Air System, 88 PSI
- D. Aux Feedwater System air accumulator, 85 PSI

C is correct per AOP-7D. Distractors are other backup systems for individual but have no automatic actions associated with them.

References: 55.41.10, 55.43.5

79. FIRE PROTECTION 002

A smoke detector for the Unit-1 27' Switch Gear Room malfunctions, causing an alarm.

Which one of the following describes the effect on the system?

- A. "FIRE PROT PANEL 1C24B" alarm actuates and after a time delay, Halon system discharges.
- B. "FIRE PROT PANEL 1C24B" alarm actuates and immediately results in Halon system discharge.
- C. "FIRE SYS" alarm actuates and after a time delay, Halon system discharges.
- D. "FIRE SYS" alarm actuates but does not result in Halon system discharge.

A and B are incorrect, circuitry problems cause FIRE SYS alarms

C is incorrect, circuitry problems do not result in Halon system discharges additionally, it requires 2 smoke detector outputs to cause a Halon discharge.

D is correct.

References: 55.41.8, 55.43.5

80. AOP-3B-05A 006

A Unit-1 plant cooldown is in progress with the following conditions:

- Plant was shutdown 30 hours ago following an extended full power run.
- Shutdown cooling is in service using 11 LPSI pump.
- RCS temperature is 180°F.
- RCS pressure is 120 psia with a bubble in the pressurizer.
- A component cooling leak has developed such that neither shutdown cooling heat exchanger is available.

Which one of the following options should be taken to control RCS temperature?

- A. Allow RCS to heat up then control RCS temperature by bleeding steam from the steam generators.
- B. Verify RCS pressure is less than 170 PSIG and align a containment spray pump for shutdown cooling.

- C. Start a HPSI pump and open the PORVs to provide core cooling via RCS blowdown to containment.
- D. Start a charging pump and open the PORVs to provide core cooling via RCS blowdown to containment.

A is correct per AOP-3B. B is incorrect, LTOP controls are in effect at this pressure and the LPSI are aligned for SDC, this will not provide RCS cooling long term. C and D are incorrect, this will unnecessarily contaminate containment and for D will not provide adequate cooling less than 100 hours after shutdown Basis: OPERATOR ACTION FOR LOSS OF SDC

References: 55.41.7,10 AOP-3BKA1: 000025EK3.01KA2:

81. CRO-5-2-3-46 046

A loss of load transient resulted in a plant trip with PORVs lifting.

What would indicate that the quench tank rupture disk has ruptured?

- A. RCS pressure lowers more rapidly.
- B. RCS pressure lowers less rapidly.
- C. "QUENCH TK TEMP LVL PRESS" alarm clears.
- D. "CNTMT NORMAL SUMP LVL HI" alarm actuates.

A and B are incorrect, the relieving capacity of the PORVs is not appreciably affected by the range of back pressure associated with the quench tank. C is incorrect, the level and temperature will remain high and cause the alarm to stay in. D is correct, a rapid decrease in quench tank pressure along with the sump alarm are indications of a blown quench tank rupture disk.

References: 55.41.3,7

82. CRO-113-5-5-03 003

The normal power supply and header lineup of #13 and (23) Component Cooling pumps is:

- A. Powered from bus 14A(21B) and aligned to 11(22) CCW headers respectively.
- B. Powered from bus 14 B(24B) and aligned to both CCW headers respectively.
- C. Powered from bus 11A(24A) and aligned to 12(21) CCW headers respectively.
- D. Powered from bus 11B(21B) and aligned to both CCW headers respectively.

B. is correct per OI-16, The distractors are all possible combinations of power supplies and lineups for Component Cooling Pumps. Basis: Power Supply and Header Lineup of #13 and 23 CC Pumps

References: 55.41.4,10 ?KA1: ?KA2: 1/99 exam

83. CRO-134-1-5-40B 001

U-1 is in Mode 6 with fuel handling in progress when the refueling machine operator notices the refueling pool level is rapidly lowering.

Per the applicable plant procedure, which statement summarizes the control room actions required to ensure containment and atmosphere activity levels are kept to a minimum and the general public will be protected?

- A. Start all Containment Air Coolers in high with maximum SRW flow, start Penetration Room Exhaust fans, and ensure the SFP charcoal filters are in service.
- B. Isolate containment purge, start all Containment Air Coolers in low with maximum SRW flow, and start Penetration Room Exhaust fans.
- C. Start all Containment Air Coolers in low with minimum SRW flow, start all Iodine Filter Fans, and ensure the SFP charcoal filters are in service.

- D. Isolate containment purge, start all Containment Air Coolers in high with maximum SRW flow, start all Iodine Filter Fans, and ensure the SFP charcoal filters are in service.

D is correct per AOP-6E and basis. A is incorrect, purge must be isolated, and starting Pen room exhaust fans is not required B is incorrect, Pen room exh. fans are not required, cntmt air cooler alignment is wrong. C is incorrect, purge must be isolated and cntmt air cooler alignment is wrong Basis: U-1 in Mode 6 with Fuel Handling in Progress  
References: 55.41:4,10 55.43:5 / SD 43BKA1: 43BK9.02KA2: K10.03

84. CRO-113-6-4-17 001

While raising a fuel assembly for a core to upender sequence, the hoist position is approximately 127 inches and being raised. The load increases from 1230 pounds to 2530 pounds. What is causing the weight change?

- A. A grid-to-grid hangup with adjacent fuel assemblies is occurring.
- B. The fuel assembly is bowed and contacting reactor vessel internals.
- C. The hoist box is off the down stop, and the weight gain is normal.
- D. The camera has contacted the core support barrel.

C is correct, OI-25C references picking up the weight of the hoist box at about 126.5". A is incorrect, at this height, the fuel is inside the hoist box and above other fuel assemblies. B is incorrect, same as above. D is incorrect, interlocks should prevent this condition and the weight gain couldn't be attributed to camera interference.

References: 55.41.2 55.43.7

85. CRO-58-1-07 007

Following a reactor trip from 100% power, how do the ADVs respond?

- A. Initially they quick open and as RCS temperature lowers they ramp shut and when Thot is 532°F they are fully shut.
- B. Initially they quick open and as RCS temperatures lower they ramp shut and when Tave is 535°F they are fully shut.
- C. Initially they ramp fully open and as RCS temperature lowers they ramp shut and when Thot is 535°F the ADVs are fully shut.
- D. As RCS temperature lowers they remain open until the control room operator places the ADV controller in MANUAL with 0% signal to shut them.

B is correct per instrumentation section of FSAR and setpoint manual.

A is incorrect, wrong setpoint and referenced from Thot instead of Tave

C is incorrect, the ADVs receive a quick open signal above 63% power snf ttThot is referenced instead of Tave

D is incorrect, the valves will ramp in auto. Basis: Temp. of ADVs Fully Shut

References: 55.41:7 55.43:5 KA1: 058K4.01KA2: K4.02

86. CRO-102-1-43 044

The following plant conditions exist on Unit 1:

Main Generator output breaker is shut

"Loss of Load Ch Trip Bypass" annunciator is illuminated

11 SGFP pump is in service

Which one of the following describes initial plant response to a Unit 1 turbine trip?

- A. Main feed regulating valves close, bypass valves open to 56% output signal, ADVs and TBVs receive a quick open signal.
- B. Main feed regulating valves remain closed, bypass valves open 5%, ADVs and TBVs operate to maintain Tave and steam header pressure.
- C. Main feed regulating valves remain closed, bypass valves control as necessary to maintain SG levels, ADVs and TBVs operate to maintain Tave and steam header pressure.
- D. Main feed regulating valves close, bypass valves control as necessary to maintain SG levels, ADVs and TBVs receive a quick open signal.

A is incorrect, bypass valves open to 56% on a rx trip, since loss of load by pass is in, the reactor will not trip. Also, since power is less than 63%, no quick open signal is generated. B is incorrect for the same reason on the feed bypass valves.

C is correct as referenced in AOP-7E. D is incorrect, no quick open signal is generated. Basis: Turbine trip effect on Main Feed and RRS

References: 55.41:4,10 55.43:5 / SD 23A, OI-43AKA1: 21AA6KA2: 23AA4.04

87. CRO-113-3-5-23 023

Unit 1 is operating at 5% power when the following alarm is received -- "11 and 12 SERV WATER HEAD TANK LEVEL". Both SRW Head Tank levels are decreasing rapidly and ABO reports that the floor drains on the 5 FT Aux Building are overflowing.

What actions are required by the applicable AOP?

- A. Reduce MVARs to zero, commence a rapid power reduction, align make-up to SRW from Condensate and verify head tank levels recover.
- B. Stop both SRW pumps, isolate SRW to the Turbine Building, start SWACs, trip the reactor and enter EOP-0.
- C. Secure any operating DGs and CACs, isolate SRW to the Turbine Building, verify makeup to the SRW head Tanks and monitor levels.
- D. Stop one SRW pump. Verify that SRW head tank level control valves are open and DW Transfer pump discharge pressure is greater than 30 PSIG, dispatch operators to locate and isolate the leak.

A. is incorrect, per AOP-7B, the actions of B are correct for a large leak.

C is incomplete, shutting turbine bldg isloations will require a trip due to loss of generator cooling in a short time.

D is incorrect, these are actions for a small leak. Basis: Alarm Response to "11 and 12 SRW Head Tank Level"

References: 55.41.4,10 KA1: ?KA2:

88. CRO-202-9A-2-23 023

When operating the controls at 1C43, what is the effect on any AFW controller output signal if the operating lever is moved past its detent pin when placed toward the "MIN" position ? (assume output signal is presently at 20%)

- A. Signal goes to 0% output.
- B. Signal goes to 50% output.
- C. Signal stays at 20% output.
- D. Signal goes to 100% output.

C is correct. Distractors are possible controller output signals. Basis: Effect on any AFW controller output signal

References: 55.41.4 KA1: KA2:

89. SRO-204-1-1-22 022  
Given electrical drawing 61-076-B sh 14J rev 2:

With no SIAS present, when 1HS5467 is placed in OPEN with HS5467A in NORMAL, what is the initial current flowpath?

- A. Through 1HS5467A contact 9-10, through relays 1SV5467 and 5467A, through relay 94.
- B. Through contact 94, through 1HS5467 contact 1-2, through 1HS5467A contact 3-4, through relays 1SV5467 and 5467A.
- C. Through 1HS5467 contact 7-8, through contact SIAS A4, through relays 1SV5467 and 5467A.
- D. Through contact 94, through 1HS5467 contact 1-2, through contact SIAS A4, through relays 1SV5467 and 5467A.

C is the correct answer.

A is incorrect, current does not go backwards through the relays.

B is incorrect, the 94 contact is initially open until closed by the 94 relay being energized when C is completed and 1HS5467A contact 3-4 is open with the HS in NORMAL.

D is incorrect, is incorrect, the 94 contact is initially open until closed by the 94 relay being energized when C is completed .

References: 55.41.7

90. SRO-204-1-1-12 012  
Under which of the following circumstances may you depart from a procedure as written?

- A. With GS-NPO approval, to prevent damage to plant equipment or if safety functions are not being met.
- B. With Shift Manager, or in his absence, CRS approval, to prevent conditions adverse to personnel safety, plant safety, plant stability or safety of the public.
- C. With CRS approval, in the event that safety functions are not being met, or unexpected alarms/plant responses are being received.
- D. With shift manager approval, if safety functions are not being met.

B is correct per NO-1-201 section 5.1.C, all distractors are possible conditions, but not according to administrative requirements. Basis: Procedural Compliance

References: 55.41.10 55.43.5 NO-1-201 5.1.C KA1: KA2:

91. SRO-201-3-1-27 027  
Given the following conditions:

- Unit 1 is shutdown for a maintenance outage
- Shutdown cooling has been lost, AOP-3B has been implemented
- CET temperature is 220°F
- RCS is capable of being pressurized
- S/G levels are -35"
- Main Feedwater was secured 4 hours ago

What is required for the reinitiation of Main Feedwater ?

- A. Raise S/G levels to > -26" with Auxiliary Feedwater.
- B. Place the Feedwater Regulating Bypass Valve controller in Manual with a 95% output.
- C. Purge the gooseneck for at least 10 minutes at 100 to 160 gpm.
- D. Maintain Main Feedwater flow < 80 gpm for at least 10 minutes.

C is correct per AOP-3B. A is incorrect, but is the required action for the original steam generators. B is incorrect, but is similar to the actions for restoring SDC. D is incorrect, there is no basis for this action.

References: 55.45.2,6. 55.43.5 55.43.10

92. EQUIPMENT CONTROL 007

The Principal Plant Operator (PPO) has notified the CRO that both sump pumps in 22 sump (condenser pit west) do not work and he needs to route a portable sump pump to a floor drain that collects in 21 sump (condenser pit east side) which has both pumps operable.

What additional controls are required by plant procedures?

- A. Initiate a Troubleshooting Control Form per MN-1-110.
- B. A Temporary Alteration must be approved by the Shift Manager per MD-100.
- C. Log the installation of the portable pump on the turnover information sheet per NO-1-207.
- D. Initiate a Procedure Controlled Temporary Plant Configuration Change per MN-1-110.

B is correct per plant procedures--MD-1-100. Distractors A and C are plausible answers but are not according to administrative procedures, distractor D references a type of configuration change control that is only applicable if the actions are contained within an approved procedure.

References: 55.41.10 55.43.3

93. SRO-204-200-01 001

Which of the following is a function of the Refueling Control Room Operator (RCRO)?

- A. Approving temporary changes to core alteration procedures, such as CEA or fuel assembly location due to malfunctioning refueling equipment.
- B. Verifying the qualifications of refueling machine, spent fuel handling machine and transfer machine operators prior to commencing core alterations.
- C. Ensuring that all applicable requirements of the Technical Specifications and the TRM are met for the evolution in progress.
- D. Documenting any fuel handling problems and maintaining the Refueling Status board.

D is correct per NO-1-200

references: 55.41.10 55.43.7

94. EQUIPMENT CONTROL 002

A new electric motor has been installed on an existing pump. The MO requires the motor to be checked for proper rotation and not all clearances have been returned.

Which one of the following actions are required to remove the Danger Tag from the motor power supply? (assume the pump suction and discharge valves are to remain tagged out)

- A. Process a Supplementary Clearance.
- B. Process a clearance order to the existing clearance.

- C. Clear all tags and use a "human danger tag" for equipment not ready for operation.
- D. Verbally authorize the "lifting" of the motor tag and re-tag after rotation check.

B is correct per NO 1-112. A is incorrect, supplementary clearances are no longer used. C is incorrect, human danger tags cannot be used for testing equipment. D is incorrect, not allowed per NO-1-112.

55.41.10 09/00 exam

95. CRO-203-2-4-012 012

Per OP-2, Plant Startup from Hot Standby to Minimum Load, 11 and 12 MSIVs may be opened when the differential pressure across the valves is less than 100 PSID.

How could you verify the differential pressure across the MSIVs?

- A. Compare the applicable Steam Generator Header Pressure indication (PI-3991 or PI-4008) with the process variable indication on the Turbine Bypass Controller, (PIC-4056).
- B. Use the computer points of MSIV differential pressure from computer group 4, (11 & 12 Steam Generators).
- C. Compare the process variable indication with the setpoint indication on the Turbine Bypass Controller (PIC-4056).
- D. Compare one of the safety channel S/G pressures PI-1013A-D (1023A-D) with the associated Steam Generator Header Pressure indications on 1C03, PI-3991 (PI-4008).

See OM-35 sheet 1 and 1C03 indications

A is correct, the PDIC indication is down stream of the MSIVs, header pressure is upstream

B is incorrect, there is no computer point for MSIV differential pressure.

C is incorrect, the setpoint is generated by the controller.

D. is incorrect, both of these indications are upstream of the MSIV.

References: 55.41.10 OP-2 OM-35 sh1 1C03

96. RADIATION CONTROL 008

An operator is assigned a task to monitor a resin transfer line for blockage. The operator's current dose for the year is 850 mRem. The task is expected to result in a dose of 100 mRem.

What actions are required to permit the operator to perform this task?

- A. Normal RCA entry requirements, no administrative dose limit extension is needed.
- B. Dosimeter record review, Shift Manager, GS-NO approvals and a new SWP for extending the administrative dose limit.
- C. Dosimeter record review, GS-NO and GS-RS approvals for extending the administrative dose limit.
- D. Initiate a new SWP for extending the administrative dose limit for this individual.

Correct answer is based on admin limit of 1.25 Rem. Candidates may think the the old admin limit of 900 mR is still applicable. Requirements for dose extensions, distractors are variations on positions or reviews not specified or required.

References: 55.41.12 55.43.4 4/98 SRO makeup exam

97. RADIATION CONTROL 003

Given the following:

- \* Unit 2 is in Mode 5
- \* PAL interlocks are defeated
- \* Containment Equipment hatch is installed
- \* Containment Outage Door is shut
- \* Spent fuel moves are in progress in the SFP area
- \* Containment Purge is being aligned for operation

What actions are required to maintain operability of SFP ventilation and why are they required?

- A. Align Containment Purge with Supply fan OFF and Exhaust Fan ON, SFP ventilation is inoperable until the Exhaust Fan is ON.
- B. Verify the SFP ventilation filters are in service, with Containment Purge in operation, SFP ventilation filters must be in operation to consider the system operable.
- C. Align Containment Purge with both Supply and Exhaust fans ON, SFP ventilation will be inoperable while the Exhaust Fan is ON and the Supply Fan is OFF.
- D. Secure the Containment Purge line up, SFP ventilation is inoperable any time the Containment Purge Supply or Exhaust Valves are OPEN.

Correct answer is based on OI-36 General Precaution L (page 6). Distractors are wrong Containment Purge line-up for SFP ventilation system operability or TS doesn't apply (Equipment hatch) C is correct per OI-36. Distractors are plausible conditions, but false statements.

References: 55.41.4, 7 55.43.1

Modified 3/15/02 to reflect COD modification.

98. RADIATION CONTROL 001

The setpoint for the normal liquid effluent monitor is based on assumptions in the Offsite Dose Calculation Manual (ODCM).

Which one of the following would require the Plant Computer activity setpoint to be decreased?

- A. Decrease in actual release rate from 120 gpm to 90 gpm.
- B. Decrease in operating circ water pumps from 6 to 5.
- C. Decrease in monitor background radiation level.
- D. Decrease in Bay level.

Correct answer is based on setup conditions for a liquid waste discharge, distractors are conditions which have no effect on the conditions specified in the permit.

References: 55.41.13 55.43.1 CP-601, OI-17C and D 4/98 SRO makeup exam

99. CRO-202-9A-2-06 006

Following a Control Room evacuation due to a fire, specific actions are completed to maintain positive control of plant equipment (breakers, motors, pumps, etc..) outside the control room.

Which set of conditions represents the actions taken?

- A. Close fuses pulled and 4KV breakers tripped locally, local/remote keyswitches placed in LOCAL, 480V load centers are stripped, and vital MCCs are stripped of unnecessary loads.
- B. Breakers tripped and racked out, 4KV busses are stripped and close fuses are

- removed, and all vital MCCs are stripped and tied together.
- C. DGs and 4KV breakers with local/remote keyswitches are placed in LOCAL to maintain positive control of operation; all other equipment affected by fire continues to operate.
  - D. DGs placed in LOCAL, 1B DG is used to supply two 4KV busses, 480V load centers are stripped, and vital MCCs are deenergized and stripped then tied together.

A is correct per AOP-9A and Basis. B is incorrect, breakers are not racked out, vital MCCs are not tied. C is very incomplete, D is incorrect, the OC diesel supplies 2 buses  
Basis: Prevent spurious operation of plant equipment

References: 55.41.10 KA1: KA2:

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Unit 1 tripped from 100% due to a turbine trip. EOP-1 has been implemented. The only abnormalities noted in EOP-0 were two stuck CEAs and 11 Charging Pump tripped. All applicable EOP-0 actions were completed. Now a loss of 14 4KV Bus occurs.

What is the appropriate action?

- A. Implement EOP-8 due to not meeting reactivity control.
- B. Implement EOP-2 for the loss of power.
- C. Continue with EOP-1 and implement AOP-7I.
- D. Implement EOP-8 due to not meeting Vital Auxiliaries.

C is correct, EOP basis supports staying in the governing procedure and EOP-1 directs the operator to the proper AOP for any loss of Vital Auxiliaries. A is incorrect, reactivity control can be met with "A" train equipment. B is incorrect, 11 Bus is still powered from its normal source. D is incorrect, Vital Auxiliaries is met with one ESF bus energized.

References: 55.41.10, 55.43.5