1.

Plant conditions are as follows:

- The plant is operating at 85% power.
- Control Bank D group step counters indicate 192 steps.
- Control Bank D rod B8 DRPI indicates 206 steps.
- Rod B8 was found to be movable.

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

A. ✔ With Rod Control Bank Selector Switch in BANK D, disconnect the lift coils of the unaffected rods and insert rod B8 to 192 steps.

B. With Rod Control Bank Selector Switch in MAN, disconnect the lift coils of the unaffected rods and insert rod B8 to 192 steps.

C. With Rod Control Bank Selector Switch in MAN, disconnect the lift coil of the affected rod, and withdraw Bank D to 206 steps.

D. With Rod Control Bank Selector Switch in BANK D, disconnect the lift coil of the affected rod, and withdraw Bank D to 206 steps.

Feedback

DISTRACTORS:

A CORRECT

B INCORRECT

C INCORRECT

D INCORRECT

REFERENCES:
1. AOP-403.5, "Stuck or Misaligned Control Rod," Step 15a thru 15f on page 7.

K/A CATALOGUE QUESTION DESCRIPTION:
- Control Rod Drive System; Ability to (a) predict the impacts of the following malfunction or operations on the CRDS- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Effect of stuck rod or Misaligned rod.

Question was written to the second part of this K/A in accordance with the guidance provided in NUREG 1021 Rev.9 Section 401.

Categories

Tier:	2	Group:	2
Key Word:	CRDS	Cog Level:	C/A(3.5/4.2)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

2.

The crew is increasing power from 50% to 100% when the following annunciator actuates:

- Annunciator Point 3-2, OTΔT, on Panel XCP-615

No other annunciators have actuated.

Given the above conditions, which ONE of the following describes the expected plant conditions and operator response?

A. A reactor trip failed to occur. Operators should enter ATWS and take actions IAW EOP-1.0, "Reactor Trip/Safety Injection Actuation."

B. A reactor trip failed to occur. Operators should trip the reactor and go to EOP-1.0, "Reactor Trip/Safety Injection Actuation."

C. A Turbine Runback and Rod Withdrawal Stop failed to occur. Operators should take actions IAW AOP-214.02, "Response to Load Rejection/Runback. "

D✔ The turbine load increase was excessive, operators should stop the power increase.

Feedback

DISTRACTORS:

A INCORRECT — A reactor trip has NOT occurred. Panel XCP-615, 3-2 only requires 1 out of 3 channels to cause it to actuate. For a reactor trip to have occurred, 2 out of 3 channels would have had to trip which would have also caused Annunciator Point 3-5, OTΔT, on Panel XCP-626 to actuate. Additionally, operators would not enter ATWS until after taking manual actions to trip the reactor and those actions had failed as well.

B INCORRECT — A reactor trip should NOT have occurred. Panel XCP-615, 3-2 only requires 1 out of 3 channels to cause it to actuate. For a reactor trip to have occurred, 2 out of 3 channels would have had to trip which would have also caused Annunciator Point 3-5, OTΔT, on Panel XCP-626 to actuate.

C INCORRECT — A Turbine Runback and Rod Withdrawal Stop should not have occurred. While Panel XCP-615, 3-2 only requires 1 out of 3 channels to cause it to actuate, for a Turbine Runback and Rod Withdrawal Stop to have occurred, 2 out of 3 channels would have had to trip which also could not have happened without causing both Annunciator Points 1-4 & 1-5, OPΔT AUTO TURB RUNBCK W/DRWL BLCK, on Panel XCP-621 to actuate.

D CORRECT — An excessive load increase would have caused this annunciator to actuate. Although a number of other probable causes could have actuated this annunciator, each would have actuated other annunciators.

REFERENCES:

1. ARP-001, XCP-615, Annunciator Point 3-2, page 24.
2. ARP-001, XCP-626, Annunciator Point 3-5, page 18.
3. ARP-001, XCP-621, Annunciator Points 1-4 & 1-5, pages 6 & 7.
4. IC-9, "Reactor Protection and Safeguards Actuation System;" Table IC9.1, "Reactor Trip Signals," page 65; Table IC9.3, "Control Interlocks," page 70.
5. AOP-403.3, "Continuous Control Rod Motion," pages 1 & 2.

K/A CATALOGUE QUESTION DESCRIPTION:

- Reactor Coolant (RCS); Ability to manually operate and/or monitor in the control room: Safety parameter display systems.

Categories

Tier:	2	Group:	2
Key Word:	RCS	Cog Level:	C/A(3.4/3.7)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

3.

The plant is operating at steady state, 100% power conditions when the following indications are observed for RCP "A":

- Seal injection flow has increased.
- Seal leak off flow has decreased, annunciator RCP A #1 SL LKOFF FLO HI/LO is in alarm.
- Annunciator RCP A STNDPIP LVL HI/LO has alarmed, the operators have filled the standpipe and the alarm has not cleared.

Which ONE of the following is a probable cause for the indications on RCP "A"?

A. The No. 1 and No. 2 seals have failed.

B. Only the No. 1 seal has failed.

C. ✔ Only the No. 2 seal has failed.

D. Only the No. 3 seal has failed.

Feedback

DISTRACTORS:

A INCORRECT Seal return flow would have increased in this condition.

B INCORRECT Seal return flow would have increased in this condition.

C CORRECT These are all indications of No. 2 seal failure.

D INCORRECT RCP standpipe low level, not a high level, is indicative of a No. 3 seal failure.

REFERENCES:

1. AB-4, REACTOR COOLANT PUMP, rev 10, 05/01/00, pages 43 - 46

K/A CATALOGUE QUESTION DESCRIPTION:

- Reactor Coolant Pump; Ability to manually operate and/or monitor in the control room: Seal Injection.

Categories

Tier:	2	Group:	1
Key Word:	SEAL INJECTION	Cog Level:	C/A(3.3/3.2)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

4.

The plant is operating in Mode 1 at 100% power when a rod drop occurs.

Which ONE of the following describes the correct effect?

A. ✔ Fuel temperature coefficient becomes more negative.

B. Fuel temperature coefficient becomes less negative.

C. Control rod worth increases.

D. Power defect becomes more negative.

Feedback

DISTRACTORS:

A CORRECT — Negative reactivity is added to the core with the rod drop causing the fission rate to decrease and produce less heat in the fuel. The fuel temperature coefficient is the reactivity change that results from a change in the resonance cross section of the fuel due to a change of fuel temperature. As the temperature of the fuel decreases, the resonance peaks increase and the base of the peaks become more narrow. Although the total area under the curve stays the same, the number of neutrons in this region decreases. This results in less neutrons being lost to the fission process through resonance absorption.

B INCORRECT — Fuel temperature coefficient becomes more negative.

C INCORRECT — Control rod worth decreases.

D INCORRECT — Power defect becomes less negative.

REFERENCES:
1. Westinghouse Technology Manual

K/A CATALOGUE QUESTION DESCRIPTION:
- Dropped Control Rod; Knowledge of the operational implications of the following concepts as they apply to Dropped Control Rod: Fuel temperature coefficient.

Categories

Tier:	1	Group:	2
Key Word:	DROPPED ROD	Cog Level:	M(2.9/3.1)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

5.

The plant is operating at 100% power with all CVCS controls in AUTO when the following annunciator actuates:

- VCT TEMP/PRESS HI

The crew has verified that the alarm is valid due to high VCT temperature.

Given the above indications, which one of the following describes the correct crew response to reduce VCT temperature IAW the ARP?

A. Increase charging and increase letdown

B. Reduce charging and isolate letdown

C. ✔ Increase charging or reduce letdown

D. Reduce charging or increase letdown

Feedback

DISTRACTORS:

A INCORRECT

B INCORRECT

C CORRECT IAW ARP-001, Panel XCP-613, Annunciator Point 3-2, the crew should increase charging or reduce letdown flow to reduce letdown temperature and VCT level.

D INCORRECT

REFERENCES:

1. ARP-001, PANEL XCP-613, ANNUNCIATOR POINT 3-2, VCT TEMP/PRESS HI, page 14.

K/A CATALOGUE QUESTION DESCRIPTION:

- Chemical and Volume Control; Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

Categories

Tier:	2	Group:	1
Key Word:	CVCS	Cog Level:	M(4.0/4.0)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

6.

The Unit is at 73% reactor power with a power increase to 100% in progress with the following conditions:

- Turbine load is being slowly increased
- Rod 'B8' indicates 144 steps
- Rod 'K6' indicates 156 steps
- Control Bank 'D' indicates 168 steps
- Control Bank 'D' is being moved as required to maintain Delta I
- Niether Rod 'B8' or Rod 'K6' move when the Rod Bank is moved 'OUT' or 'IN'

Which ONE of the following describes the action to be taken within one hour?

A. Be in Mode 3, Hot Standby.

B. Reduce trubine load to < 55% or RTP and insert Control Bank 'D' to 155 steps.

C. Immediately trip the reactor and perform EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION.

D. ✓ Determine that the shutdown margin is within the limits specified in the COLR.

Feedback

DISTRACTORS:

A INCORRECT Must be in Mode 3 in 6 hours.

B INCORRECT This will place the stuck rod within the 12 step limit but will not correct the K6 rod.

C INCORRECT This is the correct action for unexplained rod motion or for a dropped rod.

D CORRECT Rod 'B8' could be considered to be untrippable. Therefore, TS 3.1.3.1, ACTION item "a" requires verification of adequate SDM within one hour. TS 3.1.4 also requires the verification of adequate SDM if more than one rod is not withing the alignment limit.

REFERENCES:

1. TS 3.1.3.1 and 3.2.1
2. AOP 403.5, STUCK OR MISALIGNED CONTROL ROD, rev 3, 04/07/04
3. IC-5, ROD CONTROL, rev 8, 06/07/04, fig IC5.3
4. Lesson Plan AOP-403.5, STUCK OR MISALIGNED ROD, rev 4, 11/21/00

K/A CATALOGUE QUESTION DESCRIPTION:

- Inoperable/Stuck Control Rod; Ability to determine and interpret the following as they apply to the Inoperable/Stuck Control Rod: Required actions if more than one rod is stuck or inoperable.

Categories

Tier:	1	Group:	2
Key Word:	MISALIGNED RODS	Cog Level:	M(3.5/4.4)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

7.

Which one of the following would prevent the RHR heat exchangers from performing their design function?

A. A loss of air to Heat Exchanger outlet valves HCV-603A(B).

B. Manually closing RH-25, inlet to RHR letdown valve HCV-142.

C. A loss of air to Heat Exchanger bypass valves FCV-605A(B).

D. ✔ Manually closing the Component Cooling outlets from the RHR heat exchangers.

Feedback

DISTRACTORS:

A INCORRECT

B INCORRECT

C INCORRECT

D CORRECT

REFERENCES:
1. AB-7, RESIDUAL HEAT REMOVAL SYSTEM, rev 15, 09/27/04, fig AB7.2

K/A CATALOGUE QUESTION DESCRIPTION:
- Residual Heat Removal System; Knowledge of the effect of a loss or malfunction on the following will have on the RHRS: RHR heat exchanger.

Categories

Tier:	2	Group:	1
Key Word:	RHR	Cog Level:	M(2.5/2.6)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

8.

Plant conditions are as follows:

- A small-break LOCA has occurred.
- Containment pressure is 5 psig.
- Pressurizer pressure is 1850 psig.
- Steam generator pressures are:
  A - 850 psig
  B - 775 psig
  C - 825 psig
- The control room operators have carried out the required immediate actions, transitioned to EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT, and are ready to secure the RHR pumps.

The operators attempt to reset SI but it does not reset.

Which ONE of the following explains why the SI signal could not be reset?

A. ✔ The time-delay timer has failed to actuate and/or supply the proper output.

B. Containment pressure has not decreased to the bistable reset point.

C. PZR pressure is still less than the PZR low-pressure SI setpoint.

D. A steamline low pressure SI signal exists.

Feedback

DISTRACTORS:

A CORRECT

B INCORRECT

C INCORRECT

D INCORRECT

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- Emergency Core Cooling System (ECCS); Knowledge of ECCS design feature(s) and/or interlock(s) which provide for the following: Reset of SIS.

Categories

Tier:	2	Group:	1
Key Word:	ECCS	Cog Level:	M(3.9/4.2)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

9.

The Unit is shutdown in Mode 4.

- RCS cooldown is in progress using Train "A" RHR only
- Train "B" RHR is in standby with boron concentration equalized per SOP-115
- RCS pressure is 375 psig
- RCS temperature is 300 ^{o}F

The crew is performing SOP-115 to shift from RHR Train A to RHR Train B. XVT-8720B, "B" RHR Letdown Isolation valve is opened in preparation for putting "B" Train RHR in service. After it is reported by the Auxiliary Operator that XVT-8720B is OPEN, annunciator PRT LVL LO/TEMP/LVL/PRESS HI actuates.

Operators note the following:

- PRT Temperature: 105 ^{o}F
- PRT Level: 69%
- PRT Pressure: 12 psig

Which ONE of the following identifies the correct operator response?

A. This is an expected alarm and operators should continue placing the RHR Train B in service, then restore the PRT parameters using SOP-101.

B. Operators should secure from placing the RHR Train B in service since PRT temperature limits have been exceeded, operators should cool the PRT using SOP-101.

C. Operators should secure from placing the RHR Train B in service since PRT level limits have been exceeded, operators should lower PRT level using SOP-101.

D. Operators should secure from placing the RHR Train B in service since PRT high pressure limits have been exceeded, operators should vent the PRT using SOP-101.

Feedback

DISTRACTORS:

A INCORRECT This is not an expected alarm.

B INCORRECT PRT LVL LO/TEMP/LVL/PRESS HI annunciator actuates when PRT temperature reaches 113 degrees F. Although temperature is somewhat elevated, it has not reached that temperature yet.

C INCORRECT PRT LVL LO/TEMP/LVL/PRESS HI annunciator actuates when PRT level reaches 83%. Although level is somewhat elevated, it has not yet reached that level.

D CORRECT PRT LVL LO/TEMP/LVL/PRESS HI annunciator actuated when pressure reached 8 psig.

REFERENCES:

1. AB-02, REACTOR COOLANT SYSTEM, rev 10, 04/18/02, page 49, fig AB2.4
2. SOP-101, REACTOR COOLANT SYSTEM, rev 25, 07/23/04, pages 70 - 74.
3. ARP-001, PANEL XCP-616, rev 6, page 29.

K/A CATALOGUE QUESTION DESCRIPTION:

- Pressurizer Relief Tank/Quench Tank System (PRTS); Ability to (a) predict the impacts of the following malfunctions or operatios on the P S; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Exceeding PRT high-pressure limits.

Categories

Tier:	2	Group:	1
Key Word:	PRT	Cog Level:	C/A(3.2/3.6)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

10.

Following a trip from 100% power, the source range detectors should begin to come on scale about _____ minutes after the trip.

A. 5 - 7

B. 10 - 12

C. ✓ 15 - 17

D. 20 - 22

Feedback

DISTRACTORS:

A INCORRECT

B INCORRECT

C CORRECT

D INCORRECT

REFERENCES:
1. RT series lesson plans not forwarded to NRC.

K/A CATALOGUE QUESTION DESCRIPTION:
- Reactor Trip; Knowledge of the operational implications of the following concepts as they apply to the reactor trip: Decay power as a function of time.

Categories

Tier:	1	Group:	1
Key Word:	REACTOR TRIP	Cog Level:	M(3.3/3.8)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

11.

A small break LOCA has occurred. Pressurizer PORVs are being used to reduce RCS pressure per EOP-2.1, "Post-LOCA Cooldown and Depressurization."

- Containment pressure is 14 psig.

Which ONE of the following represents the maximum pressure that could be reached inside the Pressurizer Relief Tank (PRT) before the PRT rupture disc ruptures?

A. 91 psig

B. 100 psig

C. ✓ 114 psig

D. 128 psig

Feedback

DISTRACTORS:

A INCORRECT — With the RB at atmospheric pressure, the rupture discs are set to release within the range of 86 - 100 psig (nominal release pressure is 91 psig). Plausible since this is the nominal pressure.

B INCORRECT — With the RB at atmospheric pressure, the rupture discs are set to release within the range of 86 - 100 psig (nominal release pressure is 91 psig). Plausible since this is the minimum pressure plus containment pressure and also the max pressure with normal containment parameters.

C CORRECT — With the RB at 14 psig, the rupture discs set pressure would subsequently be affected causing the release range to increase to between 100 - 114 psig (nominal release pressure is 105 psig).

D INCORRECT — With the RB at 14 psig, the rupture discs set pressure would subsequently be affected causing the release range to increase to between 100 - 114 psig (nominal release pressure is 105 psig). Plausible if the applicant tries to take into account psig and psia adding 14 psi.

REFERENCES:
1. AB-2, "Reactor Coolant System," page 46.

K/A CATALOGUE QUESTION DESCRIPTION:
- Pressurizer Relief Tank/Quench Tank System (PRTS); Knowledge of the physical connections and/or cause-effect relationships between the PRTS and the following systems: Containment system.

Categories

Tier:	2	Group:	1
Key Word:	PRTS	Cog Level:	C/A(2.9/3.1)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

12.

Plant conditions are as follows:

- "A" CCW Pump is running in the ACTIVE train, "C" CCW Pump is in Standby.
- "B" CCW Loop in the **INACTIVE** Train.
- Discharge pressure for "A" CCW Pump drops to 40 psig and amps are increasing.
- CCW LOOP 'A' PP DISCH PRRESS LO annunciator has activated.
- Annunciator CCW LOOP A ESSENTIAL LOAD FLO LO is in alarm with flow of 4400 gpm.
- Thermal barrier flow to the RCPs is 80 gpm and the RCP A/B/C THERM BAR & BRG FLO LO annunciator is activated.
- CCBP discharge pressure is 85 psig.
- CCW Surge Tank is at 55%.

Which ONE of the following describes the status of the CCW System given these conditions?

A. CCW flow to essential and non-essential loads will be restored to nominal values following automatic start of the standby CCW pump.

B. CCW flow will be reduced to essential and non-essential loads; neither CCW or CCBP standby pumps will automatically start.

C. CCW flow will be reduced to essential loads; MOST non-essential loads will be restored to nominal values following automatic start of the standby CCW pump.

D. CCW flow to essential and **MOST** non-essential loads will be restored to nominal values following automatic start of the standby CCW pump; thermal barriers are isolated.

Feedback

DISTRACTORS:

A CORRECT — The standby pump does not automatically start until pressure reaches 45 psig.

B INCORRECT — The standby pump starts.

C INCORRECT — Pressure to the CCBPs is still enough to prevent the CCBPs from tripping on low CCBP pressure of 30 psig.

D INCORRECT — RCP thermal barriers have an automatic closure of the thermal barrier return flow valve on high flow (vs. low flow).

REFERENCES:

1. IB-2, COMPONENT COOLING WATER SYSTEM, rev 11, 05/04/05, pages 49 - 51, figs IB2.1 - 2.5

K/A CATALOGUE QUESTION DESCRIPTION:

- Component Cooling Water System (CCWS); Ability to monitor automatic operation of the CCWS, including: Typical CCW pump operating conditions, including vibration and sound levels and motor current.

Categories

Tier:	2	Group:	1
Key Word:	CCW	Cog Level:	C/A(2.5/2.5)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

13.

Plant conditions are as follows:

- Reactor power and turbine load are stable
- PZR PRESS is 2180 psig and decreasing
- PZR LVL is stable
- VCT level is stable
- PZR Liquid and Vapor temperatures are approximately 645°F and decreasing
- PZR Surge Line temperature is increasing

Given the above information, which ONE of the following describes the event in progress?

A. The controlling PZR pressure control pressure transmitter has failed low.

B. ✔ A PZR Spray Valve has failed open.

C. The PZR Surge Line has developed a leak.

D. A PZR PORV has developed a leak.

Feedback

DISTRACTORS:

A INCORRECT If the controlling PZR pressure control pressure transmitter failed low, heaters would energize and PZR Liquid and Vapor temperatures, as well as pressure, would increase.

B CORRECT If the spray valve failed open, pressurizer temperature and pressure would decrease,

C INCORRECT If the surge line were leaking, level in the PZR and/or the VCT would be affected.

D INCORRECT If a PORV was leaking, level would be dropping in either the VCT or PZR.

REFERENCES:

1. ARP-001, Panel XCP-616, Annunciator Points 2-2, 2-3, 3-6, pages 12, 14, 22.
2. AOP-401.5, "Pressurizer Pressure Control Channel Failure," pages 2 - 4.
3. AOP-401.4, "Pressurizer Pressure Protection Channel Failure," page 2.
4. SOP-101, "Reactor Coolant System," pages 16, 18, 93.

K/A CATALOGUE QUESTION DESCRIPTION:

- Pressurizer Vapor Space Accident; Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Categories

Tier:	1	Group:	1
Key Word:	PRESSURIZER	Cog Level:	C/A(4.0/4.3)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

14.

The plant is at 100% power when the following occurs:

- All P-11 Status Lights are lit.
- PZR Control and BOTH Backup PZR Heater groups are off.
- One PWR RELIEF is open
- Both PZR Spray valves are open.

Which ONE of the following describes the event that has occurred and the procedure required to mitigate the event?

A. ✔ PT-444 has failed, perform the actions of AOP-401.5, "Pressurizer Pressure Control Channel Failure."

B. PT-445 has failed, perform the actions of AOP-401.5, "Pressurizer Pressure Control Channel Failure."

C. PT-444 has failed, perform the actions of AOP-401.4, "Pressurizer Pressure Protection Channel Failure."

D. PT-445 has failed, perform the actions of AOP-401.4, "Pressurizer Pressure Protection Channel Failure."

Feedback

DISTRACTORS:

A CORRECT — PT-444 failing high will cause (1) PCV-444B, PWR Relief, to open if in auto (2) both PCV-444C & D, PZR Spray valves, to open if in auto and (3) Control and both Backup PZR Heater groups to deenergize. The P-11 trip status lights will light when pressure reaches 1985 psig. This failure is an entry condition for AOP-401.5.

B INCORRECT — If PT-445 failed (high) it would cause (1) Both PCV-445A & B, PWR Reliefs, to open if in auto. It would not cause either of the PZR Spray valves to open nor would it cause Control or Backup PZR Heater groups to deenergize.

C INCORRECT — Although responding using this procedure would not be correct because none of the other entry conditions are present that would indicate a failure of a "protection" channel. An operator might select AOP-401.4 since one of the entry conditions for this procedure is an abnormal indication on PI-444.

D INCORRECT — This choice is incorrect for the reasons given in the distractor analysis for choices B and C.

REFERENCES:

1. AOP-401.5, "Pressurizer Pressure Control Channel Failure," page 1.
2. AOP-401.4, "Pressurizer Pressure Protection Channel Failure," page 1.
3. IC-9, "Reactor Proctection and Safeguards Actuation System," Table IC9.1, page 68.

K/A CATALOGUE QUESTION DESCRIPTION:

- Pressurizer Pressure Control; Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Categories

Tier:	2	Group:	1
Key Word:	PRZ PRESS CONT	Cog Level:	C/A(4.0/4.3)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

15.

A Main Steam line Break has occurred inside containment resulting in automatic actuation of the Reactor Building Spray Pumps. EOP-1.0, "Reactor Trip/Safety Injection Actuation," is in progress. PZR pressure is 1500 psig.

Which ONE of the following describes the reason for RCP trip criteria under the above conditions?

A. To prevent damage to RCP #1 seals.

B. ✔ To prevent overheating RCP motor bearings on loss of Component Cooling Water.

C. To prevent delaying two-phase flow in the RCS.

D. To prevent a deeper and longer core uncovery.

Feedback

DISTRACTORS:

A INCORRECT

B CORRECT

C INCORRECT

D INCORRECT This would be correct for a SBLOCA.

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- Large Break LOCA; Knowledge of the interrelations between a large break LOCA and the following: Pumps.

Categories

Tier:	1	Group:	1
Key Word:	LARGE BREAK LOCA	Cog Level:	M(2.6/2.7)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

16.

The unit was operating at 80% power when a spurious low steamline pressure SI signal was received. The cause of the spurious signal was corrected and the SI signal has been reset.

During preparations to return the unit to power operations, the MSIVs fail to open when their control switches are taken to OPEN. The unit is currently in MODE 3 with steam pressure downstream of the MSIVs at 1080 psig and Tavg at 557°F.

Which one of the following is the cause for the MSIVs' failure to open?

A. The differential pressure across the MSIVs is excessive.

B. The MSIV bypass valves are CLOSED.

C. The Instrument Air header pressure is 75 psig.

D. ✓ The MSIV isolation signal has not been reset.

Feedback

DISTRACTORS:

A INCORRECT — With pressure downstream of the MSIVs at 1080 psig and Tavg at 557°F (a SG saturation pressure of about 1104 psia), pressure across the MSIVs is essentially equal.

B INCORRECT — MSIVs will not open unless the differential pressure across their seats is equalized. Although the bypass valves are normally opened in order to equalize pressure across the seats of the MSIVs, there is not an interlock between the two. The distractor is plausable in that an operator might confuse the operational aspect with an assumed interlock.

C INCORRECT — The valves fail close when instrument air header pressure (or pressure felt on the MSIV actuator diaphram) drops to a certain level. While the actual value at which the valves will shut is probably < 60 psig, a value of 75 psig was chosen since it is lower than normal and will have caused both the standby Station Instrument Air Compressor to start as well as the Supplemental Instrument Air Compressor but is above 70 psig which may confuse operators as it places the plant in AOP-220.1, "Loss of Instrument Air."

D CORRECT — To open a MSIV after it has received an isolation signal, the signal must be reset by operating the trains A and B RESET pushbuttons.

REFERENCES:

1. Lesson Plan TB-2, "Main Steam System," pages 30 & 31.
2. TB-12, "Station Service & Instrument Air System," pages 24 25.
3. AOP-220.1, "Loss of Instrument Air," page 1.
4. ARP-001, Panel XCP-607, Annunciator Point 2-5, pages 17 & 18.

K/A CATALOGUE QUESTION DESCRIPTION:

- Reactor Protection; Ability to manually operate and/or monitor in the control room: Channel blocks and bypasses.

Categories

Tier:	2	Group:	1
Key Word:	REACTOR PROTECTION	Cog Level:	M(3.6/3.6)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

17.

The reactor is critical at 10^{-3}% power. Inverter XIT-5902 output breaker trips open causing a loss of APN-5902.

Which one of the following will result?

A. The loss of Power Range NI-42, with no change in reactor power.

B. A reactor trip due to the deenergization of Intermediate Range Channel N-35.

C✓ A reactor trip due to the deenergization of Intermediate Range Channel N-36.

D. A low power rod block (C-1) signal, with no change in reactor power.

Feedback

DISTRACTORS:

A N-42 does lose power, however, the reactor will trip due to loss of power to the IR channel.

B N-35 does not lose power.

C Correct

D Reactor will trip.

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- Reactor Protection System; Knowledge of bus power supplies to the following: RPS channels, components, and interconnections.

Categories

Tier:	2	Group:	1
Key Word:	REACTOR PROTECTION	Cog Level:	M(3.3/3.7)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

18.

A large-break LOCA occurs combined with a malfunction of the ESF sequencers which results in delaying the energizing of ESF components. Which ONE of the following is correct concerning the effects on the fuel during this situation?

A. Cladding failure can occur as the core experiences an uncontrolled cooling due to vaporization of reactor coolant.

B. ✔ Structural integrity can be lost as delayed cooling can lead to fuel temperatures in excess of ECCS acceptance criteria, resulting in excessive clad oxidation and weakening.

C. Minimal effects will be seen as reflux cooling is sufficient to cool the core for up to ten minutes after the onset of a large break LOCA.

D. A natural circulation cooldown of the fuel can be adversely impacted due to excessive reactor coolant blowdown.

Feedback

DISTRACTORS:

A INCORRECT

B CORRECT Failure to provide ESF flow to the core will result in increasing fuel temperatures resulting in structural integrity loss

C INCORRECT

D INCORRECT

REFERENCES:

1. AB-9, "Introduction to Engineered Safety Features."

K/A CATALOGUE QUESTION DESCRIPTION:

- Engineered Safety Features Actuation System (ESFAS); Knowledge of the physical connections and/or cause effect relationships between the ESFAS and the following systems: ECCS.

Categories

Tier:	2	Group:	1
Key Word:	ESF	Cog Level:	C/A(4.2/4.4)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

19.

Plant conditions are as follows:

- The plant is operating at 45% power
- 'C' RCP #1 seal d/p is 190 psig
- 'C' RCP #1 seal leakoff flow is 5.0 gpm
- P-8, REACTOR TRIP BLOCKED, is not lit

Which ONE of the following is correct?

A. ✔ Trip the reactor, trip the 'C' RCP, and enter to EOP-1.0, "Reactor Trip/Safety Injection Actuation."

B. Trip the 'C' RCP, and commence shutdown in accordance with GOP-4B, "Power Operation (Mode 1-Descending)."

C. Trip the 'C' RCP, trip the reactor and go to EOP-1.0, "Reactor Trip/Safety Injection Actuation."

D. Ensure PVT-8141C, C RCP SEAL LKOFF, is open, and increase seal injection flow to the 'C' RCP.

Feedback

DISTRACTORS:

A CORRECT — Since power is above P-8, reactor power is > 38% and a reactor trip is required.

B INCORRECT — Since power is above P-8, reactor power is > 38% so a reactor trip is not required. This is the action is if power less than P-8.

C INCORRECT — Reactor trip criteria is met.

D INCORRECT — Correct action would be to close PVT-8141 and increase seal injection flow.

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- Reactor Coolant Pump (RCP) Malfunctions; Knowledge of the operational implications of the following concepts as they apply to Reactor Coolant Pump Malfunctions (Loss of RC Flow): Consequences of an RCPS failure.

Categories

Tier:	1	Group:	1
Key Word:	RCP MALFUNCTION	Cog Level:	C/A(3.7/4.1)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

20.

With the Core Subcooling Monitor in the "DEG. F MAR" mode, which of the following is used to calculate the subcooling margin?

A. The average of the four highest core exit thermocouples or median-selected RTD temperature.

B. The average of the highest core exit thermocouples in each core quadrant or highest RTD temperature.

C. The highest core exit thermocouple or median-selected RTD temperature.

D. ✓ The highest core exit thermocouple or highest RTD temperature.

Feedback

DISTRACTORS:

A INCORRECT;

B INCORRECT

C INCORRECT

D CORRECT

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- In-Core Temperature Monitor System (ITM); Knowledge of the physical connections and/or cause-effect relationships between the ITM system and the following systems: Plant computer.

Categories

Tier:	2	Group:	2
Key Word:	ITM	Cog Level:	M(3.2/3.2)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

21.

Given the following:

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

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

A. Reactor Building Sump level.

B. Reactor Building Radiation level.

C. Reactor Building Temperature.

D. ✓ Reactor Building Cooling Unit condensate drain flow.

Feedback

DISTRACTORS:

A INCORRECT Sump level would provide indications of leaks >10GPM.

B INCORRECT Radiation level will cause an alarm when leakage exceeds 1 gpm.

C INCORRECT Temperature may not increase until leakage is excessive.

D INCORRECT Condensate drain flow will alarm when leakage exceeds 0.5 GPM.

REFERENCES:
1. GS-7, "Leak Detection."

K/A CATALOGUE QUESTION DESCRIPTION:
- Containment Cooling (CCS); Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCS controls including: Cooling water flow.

Categories

Tier:	2	Group:	1
Key Word:	CCS	Cog Level:	M(3.2/3.3)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

22.

The following plant conditions exist on Unit 1:

- The plant is at 90% rated thermal power
- All controls are in their normal configuration
- VCT level is at 50%

Which ONE of the following correctly describes how the plant would respond if VCT Level Transmitter LT-115 were to fail high with no operator intervention?

A. ✔ VCT level would lower until the VCT was approximately empty.

B. VCT level would lower to approximately 5% and stabilize.

C. VCT rate of level decrease would remain unchanged from the preevent rate of decrease.

D. VCT level would lower to approximately 20% and then begin to rise.

Feedback

K/A MATCH ANALYSIS:
The K/A requires testing knowledge of VCT level monitoring skills in conjunction with a loss of VCT makeup. LT-115 failing high would create a situation where L/D would be diverted and auto makeup would not occur. The question is testing knowledge of how VCT level would respond in this situation; therefore, the K/A is met.

ANSWER CHOICE ANALYSIS:

A. Correct. Due to the failure, L/D would be diverted and auto makeup to the VCT would not occur. The VCT level would continue to drop (CCPs would eventually lose suction).
B. Incorrect. At 5% on LT-112 AND 115 the CCP suctions would auto swap to the RWST, thus making this answer choice incorrect. This swapover would close the VCT outlets, which would cause the VCT level to stabilize at approximately 5%. Plausible because the applicant must know that it takes a 2/2 coincidence to initiate the auto swapover.
C. Incorrect. Same reasons as B above. Plausible because at 10% the auto swapover signal clears. The applicant may associate the level at which the signal clears with the level at which auto swapover occurs.
D. Incorrect. Same reasons as B above. Plausible because this would be the correct answer if LT-112 were to fail high.

REFERENCES:
1. Braidwood exam question from 09/14/1998 (022AA1.08 same K/A).
2. VCSummer Training Material, Auxiliary Building System AB-3, Chemical and Volume Control System, Rev. 10, 05/03/2004.

K/A CATALOGUE QUESTION DESCRIPTION:
022 Loss of Reactor Coolant Makeup
AA1.08 Ability to operate and/or monitor the following as they apply to the loss of Reactor Coolant ~~Pump~~ Makeup: VCT Level.

Categories

Tier:	1	Group:	1
Key Word:	VCT MAKEUP VCT LEVEL	Cog Level:	C/A(3.4/3.3)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MAB/SDR

23.

The Unit is operating at 100% power. A failure of a Containment Fan Cooler Unit occurred while the system was aligned to maximum cooling mode. Containment temperature has increased from 119 °F to 126 °F.

Which ONE of the following describes how Pressurizer level indication changes due to this increase in Containment temperature and why?

A. ✔ Level indicates higher than actual due reference leg density decreasing.

B. Level indicates lower than actual due to reference leg density decreasing.

C. Level indicates higher than actual due to reference leg density increasing.

D. Level indicates lower than actual due to reference leg density increasing.

Feedback

DISTRACTORS:

A CORRECT

B INCORRECT

C INCORRECT

D INCORRECT

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
-

Categories

Tier:	2	Group:	1
Key Word:	CCS	Cog Level:	M(3.0/3.3)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

24.

The reactor has failed to automatically trip when required and cannot be manually tripped. The turbine is tripped, the EFW pumps are running, and emergency boration is in progress. PZR pressure is 2385 psig. A malfunction in the control circuitry has caused PZR PORVs, PCV-445A and PCV-444B to fail to open. PZR PORV, PCV-445B, BLOCK valve is closed with its breaker open (pre-event condtion due to the PORV leaking). The crew has just closed the PORV BLOCK valve breaker and plan to open the PORV BLOCK valve.

Under the above conditions, which ONE of the following describes when the crew should open the PORV BLOCK valve and the reason?

A. Immediately open the valve to prevent a rapid RCS overpressurization transient expected with most ATWS events.

B. Open the valve just prior to the code safety lifting in order to prevent the code safety from lifting and thus preventing the possibility of the code safety valve sticking open.

C. ✔ Immediately open the valve to allow enough borated water to flow into the RCS to ensure the addition of negative reactivity to the core.

D. Immediately open the valve to begin a slow, controlled cooldown and depressurization, thereby minimizing positive reactivity feedback via a negative MTC.

Feedback

DISTRACTORS:

A INCORRECT Overpressure limited by safeties. Opening PORVs won't prevent overpressure; they are assumed to operate for best estimate ATWS analysis.

B INCORRECT SGTR is not limiting (loss of FW is).

C CORRECT Requires trainee to analyze all conditions given and determine the limiting parameter.

D INCORRECT Depressurization doesn't affect + reactivity from negative MTC (procedure discusses allowing heat-up).

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- Emergency Boration; Knowledge symptom based EOP mitigation strategies.

Categories

Tier:	1	Group:	2
Key Word:	EMERGENCY BORATION	Cog Level:	C/A(3.1/4.0)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

25.

In EOP-14.0, "Response to Inadequate Core Cooling," the operator is cautioned that the "RHR Pumps should NOT be run longer than 90 minutes without CCW flow to the RHR Heat Exchangers."

Which ONE of the following is the reason for this caution?

A. To prevent a subsequent loss of the CCW system upon restart.

B.✔ To prevent causing RHR pump bearing damage.

C. To ensure an alternate heat sink is maintained.

D. Extended operation without CCW flow could cause boiling on the CCW side of the RHR heat exchangers.

Feedback

DISTRACTORS:

A INCORRECT This is credible since the RHR HX could be damaged due to thermal shock or cavitation of the CCW pump and its subsequent loss when the water from the RHR HX reached its suction.

B CORRECT Per Instructor's Lesson Plan, EOP-14.0, page 7, para IV.A.2.a.3).

C INCORRECT This is credible since using RHR as a heat sink would be lost if RHR system temperature continued to rise.

D INCORRECT This is credible since this may occur but is not the reason for securing the RHR pumps.

REFERENCES:
1. EOP-14.0, "Response to Inadequate Core Cooling," page 2.
2. Instructor's Lesson Plan, EOP-14.0, page 7.

K/A CATALOGUE QUESTION DESCRIPTION:
- Loss of Residual Heat Removal System (RHRS); Ability to explain and apply all system limits and precautions.

Categories

Tier:	1	Group:	1
Key Word:	LOSS OR RHR	Cog Level:	M(3.4/3.8)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

26.

Plant conditions are as follows:
- A plant event occurred simultaneously with a Component Cooling System malfunction.
- ALL ESF and ALL Reactor Coolant pumps are running.
- Component Cooling System temperature is going UP.

- RCP A seal water outlet temperature is 230 °F.
- CHG pump A oil cooler outlet temp is 155 °F.
- RHR pump A seal water heat exchanger temperature is 185 °F
- Spent Fuel Pool temperature is 106 °F

Which ONE of the above components has exceeded a MAXIMUM temperature LIMIT per AOP-118.1, Total Loss of Component Cooling Water, or System Operating Procedures?

A. RCP A

B. ✔ CHG pump A

C. RHR pump A

D. Spent Fuel Pool

Feedback

DISTRACTORS:

A Incorrect. The maximum temperature limit for RCP seal water outlet is 235 °F per AOP-118.1, Step 1 caution. Plausible because the maximum temperature limit for RCP lower seal water bearings is 225 °F.

B Correct. The maximum temperature for CHG pump oil cooler outlet is 150 °F per AOP-118.1, Total Loss of Component Cooling Water, Attachment 3.

C Incorrect. Could not find a temperature limit associated with RHR pump seal water HX in SOP-115, Residual Heat Removal or AOP-118.1 (step 17). Note that CCW Loop A Essen Load Temp Hi does not alarm on high CC temp until 205 °F. Plausible because other setpoints, below 185 °F, are associated with this alarm.

D Incorrect. The SFP administrative temperature limit per SOP-123 is 120 °F. Plausible because the CCW supply temp to the SFP HX is limited to 105 °F during refueling operations.

REFERENCES:
1. AOP-118.1, Total Loss of Component Cooling Water.
2. SOP-123, Spent Fuel Cooling System
3. SOP-115, Residual Heat Removal

K/A CATALOGUE QUESTION DESCRIPTION:
- Loss of Component Cooling Water (CCW); Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: CCW temperature indications.

Categories

Tier:	1	Group:	1
Key Word:	CCW TEMPERATURE	Cog Level:	MEM(3.1/3.1)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	FJE/SDR

27.

The Unit was at 100% with the 'A' D/G is tagged out for maintenance.

- A LOCA occurred in conjunction with a Loss of Off-site Power.
- EOP-1.0, "Reactor Trip or Safety Injection Actuation" is in progress.
- Reactor Building Pressure peaked at 15 psig.

Which ONE of the following describes how the MVG-3004 A(B) valves will respond when the RWST LVL LO-LO XFER TO SUMP annunciator is received and why?

A. MVG-3004B will be open, because it is powered from 1DB2Y.

B. MVG-3004A will be open, because it is powered from 1DB2Y.

C. MVG-3004B will be open, because it is powered from 1DA2Y.

D✔ MVG-3004A will be open, because it is powered from 1DA2Y.

Feedback

DISTRACTORS:

A INCORRECT The B train does not have power to the MOV.

B INCORRECT This is the correct valve that will open but not the correct power supply.

C INCORRECT The B train does not have power to the MOV.

D CORRECT This valve will be open and it is powered from 1DA2Y.

REFERENCES:

1. AB-08, "Reactor Building Spray System," pages 13 & 18, figs AB-8.1, 8.3, 8.4, and 8.5.
2. GS-2, "Safeguards Power," fig GS-2.3 thru 2.5.
3. ES-3, "Electrical Component Control," page 8.

K/A CATALOGUE QUESTION DESCRIPTION:

- Containment Spray System (CSS); Knowledge of bus power supplies to the following: MOVs.

Categories

Tier:	2	Group:	1
Key Word:	RB SPRAY	Cog Level:	C/A(2.7/2.9)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

28.

The following plant conditions exist:

- The plant was initially at 100% power.
- A DBA LOCA has caused a 'B' Train SI actuation only. ('A' Train SI has failed to actuate.)
- 'B' ESFLS has failed to operate. ('A' ESFLS has operated as designed.)
- An XTF-4 Lockout has actuated with the DG reenergizing the ESF Bus.
- Prior to the event, the RBCUs were in a normal, at power lineup.
- RB pressure is 25 psig.

Assuming NO operator action, which ONE of the following describes the operating systems that are actually providing cooling to the Reactor Building (RB)?

A. TWO RB Spray Pumps delivering flow each to the RB, and ONE RBCU running in SLOW.

B. ✓ ONE RB Spray Pump delivering flow to the RB and ONE RBCU running in SLOW.

C. ONE RB Spray Pump delivering flow to the RB, and ONE RBCU running in SLOW and TWO RBCUs running in FAST.

D. TWO RB Spray Pumps delivering flow each to the RB, and ONE RBCU running in SLOW and TWO RBCUs running in FAST.

Feedback

DISTRACTORS:

A INCORRECT

B CORRECT; With the loss of one train of Containment Spray the RB will still be cooled by one RB spray and one RCBU in SLOW.

C INCORRECT

D INCORRECT

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- Knowledge of the effect that a loss or malfunction of the CSS will have on the following: CCS

Categories

Tier:	2	Group:	1
Key Word:	CSS	Cog Level:	C/A(3.9/4.1)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

29.

Ten minutes ago the crew completed a 6% per hour power ascention from 75% to 90% rated thermal power. A Pressurizer Safety Valve has just been identified as leaking to the PRT.

Which ONE of the following describes the affect on RCS temperature and Pressurizer water temperature, associated with the above events?

A. RCS temperature will initially rise. Pressurizer water temperature will initially rise.

B. ✓ RCS temperature will initially rise. Pressurizer water temperature will initially lower.

C. RCS temperature will initially lower. Pressurizer water temperature will initially rise.

D. RCS temperature will initially lower. Pressurizer water temperature will initially lower.

Feedback

K/A MATCH ANALYSIS

The K/A requires the testing of knowledge of operational implications of a PCS malfunction, which is accomplished with the safety valve leaking. The safety valve has a pressure control function to keep the RCS from encroaching on the RCS pressure safety limit. The K/A also requires testing the implications of expansion of liquids as temperature increases. Therefore, the K/A is met because the RCS temperaure goes up, causing the liquid volume to expand. The safety valve leaks, reducing the pressure in the pressurizer. Both of these items cause an insurge into the pressurizer, which lowers the pressurizer temperature (operational implication).

ANSWER CHOICE ANALYSIS:

A. Incorrect. Xenon is burning out due to the power ascention, which will cause RCS temperature to increase. The rise in RCS temperature will cause the RCS volume to expand coupled with the Safety Valve leaking causes an above average insurge into the Pzr, which will drop the average water temperature in the Pzr initially beyond the heaters capacity to compensate.
B. Correct. See analysis for A above.
C. Incorrect. See analysis for A above.
D. Incorrect. See analysis for A above.

REFERENCES:

1. NONE

K/A CATALOGUE QUESTION DESCRIPTION:

027 Pressurizer Pressure Control System (PZR PCS) Malfunction
Knowledge of the operational implications of the following concepts as they apply to Pressurizer Pressure Control Malfunctions: Expansion of liquids as temperature increases.

Categories

Tier:	1	Group:	1
Key Word:	PRESSURIZER PCS	Cog Level:	C/A(2.8/3.1)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MAB/SDR

30.

Operators are filling the refueling cavity using Spent Fuel Cooling Pump B per SOP-123, Spent Fuel Cooling System.

In order to move irradiated fuel per Technical Specification 3.9.9, Refueling Cavity level must be maintained GREATER than _____, however, Refueling Cavity level must be maintained BELOW _____, otherwise water may enter the Refueling Cavity ventilation intakes.

A. 461' 461' 6"

B. ✔ 461' 461' 8"

C. 461' 6" 461' 8"

D. 461 8" 462'

Feedback

Notes
436' 7.43": is RV level for shielding considerations during head lift.
457' 6": is Fuel Transfer Canal miminum level to minimize airborne activity.
461': equals 23' above RV flange. Is Fuel Xfer Canal Lvl Hi/Lo low alarm setpoint
461' 3.5": Is Refuel Cav Lvl Hi/Lo low alarm setpoint
461' 6": Is normal refueling cavity skimmer trough level
461' 7": Is Refuel Cav Lvl Hi/Lo high alarm setpoint
461' 8": Is location of Refueling Cavity ventilation intakes
462' 0": Is Fuel Xfer Canal Lvl high alarm setpoint.

DISTRACTORS:

A INCORRECT 1. RC level is at the minimum required to move irradiated fuel (must be 23' above the top of the reactor pressure vessel flange = Reactor Cavity level of 461'). 2. RC level is **less** than the level of the RC ventilation intakes (461' 8").

B CORRECT RC level must be a minimum of 461' but should not exceed 461'8".

C INCORRECT 1. RC level is **above** the minimum needed to move fuel. 2. RC level is at the level of the RC ventilation intakes..

D INCORRECT 1. RC level is **above** the minimum needed to move fuel. 2. RC level is **above** the level of the RC ventilation intakes..

REFERENCES:
1. SOP-123, Spent Fuel Cooling System
2. GOP-7, Core Refueling
3. XCP-609, 2-6, Refuel Cav Lvl Hi/Lo
4. XCP-612, 1-6, Fuel Xfer Canal Lvl Hi/Lo
5. Summer Tech Spec 3.10

K/A CATALOGUE QUESTION DESCRIPTION:
- Fuel Handling Equipment System (FHES); Ability to predict and / or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Fuel Handling System controls including: Water level in the refueling canal.

Categories

Tier:	2	Group:	2
Key Word:	FHES	Cog Level:	M(2.9/3.7)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	FJE/SDR

31.

The plant is operating at 100% power, with all control switches in their normal positions, when PT-2000, Steamline Pressure Transmitter for Loop 'A' fails high.

Assuming NO operator action, which ONE of the following describes the response of the 'A' S/G PORV?

A. The 'A' S/G PORV will open and remain open until P-12 is received.

B. ✔ The 'A' S/G PORV will open and remain open until the reactor trips.

C. The 'A' S/G PORV will open and remain open until actual 'A' S/G pressure reaches the PORV controller setpoint.

D. The 'A" S/G PORV will remain closed.

Feedback

DISTRACTORS:

A Incorrect. The PORV I/P converter (overpressure protection mode) bypasses the P-12 blocking solenoid valves.

B Correct. With no operator action, actual 'A' S/G pressure will decrease until a Low Steamline Pressure SI (and reactor trip) occurs.

C Incorrect. With PT-2000 failed high, indicated 'A' S/G pressure never goes below the PORV controller setpoint.

D Incorrect. S/G PORV control transfer switches are placed in the AUTO position during normal operation and will respond to a failure of their associated pressure transmitters.

REFERENCES:
1. TB-2, "Main Steam System."

K/A CATALOGUE QUESTION DESCRIPTION:
- Steam Generator System (S/GS); Knowledge of the effect of a loss or malfunction on the following will have on the S/GS: Secondary PORV.

Categories

Tier:	2	Group:	2
Key Word:	STEAM GENERATOR	Cog Level:	C/A(3.1/3.5)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC & FJE/SDR

32.

Plant conditions are as follows:

- The unit experienced a Steam Generator Tube Rupture.
- The crew is performing the actions of EOP-4.0, "Steam Generator Tube Rupture."
- The "target" core exit TC temperature for RCS cooldown was determined to be 498°F based on the ruptured SG pressure.
- A cooldown to the "target" TC temperature using the Steam Dump is in progress.

- An RCS depressurization using Normal PZR Spray at the maximum rate is also in progress when the following plant parameters are observed:

    - FI-943 indicates 200 gpm injection flow.
    - Pressurizer level is 17% and going DOWN.
    - RCS pressure is 1375 psig and going DOWN.

Which ONE of the following is the correct response, and the correct reason for the response, for the plant conditions given above?

A. Trip all RCPs because pressurizer level can not be maintained greater than 18%.

B. Trip all RCPs because EOP-4.0, Step 1 criteria for stopping RCPs has been met.

C. Leave the RCPs running because the cooldown must be stopped and they will be needed to prevent saturated conditions during the recovery.

D. Leave the RCPs running because they will be needed while the depressurization is continued until the "target" RCS temperature is reached.

Feedback

DISTRACTORS:

A INCORRECT The given conditions AND the subcooling of the RCS does not constitute trip criteria.

B INCORRECT SI flow AND RCS pressure < 1400 psig is trip criteria UNLESS a controlled cooldown is in progress. A controlled cooldown is in progress.

C INCORRECT EOP-4.0 does not direct stopping the cooldown to restore parameters. Recieving a "color" from monitored Critical Safety Functions related to inventory directs the crew to EOP-18.1, "Response to Low Pressurizer Level" which directs a transition to either EOP-1.0 or EOP-2.0. None of these procedures calls for stopping the depressurization to restore pressurizer level.

D CORRECT IAW EOP-4.0.

REFERENCES:

1. EOP-4.0, "Steam Generator Tube Rupture," pages 2, 10, 11, and Reference Page.
2. Lesson Plan for EOP-4.0, "Steam Generatir Tube Rupture," pages 12 - 14, and 24.
3. EOP-12.0, "Monitoring of Critical Safety Functions," Attachment 6, "Inventory."
4. EOP-18.1, "Response to Low Pressurizer Level," pages 4 & 5.
5. EOP-1.0, "Reactor Trip/Safety Injection Actuation," page 13 and the Reference Page.
6. EOP-2.0, "Loss of Reactor or Secondary Coolant," page 6 and the Reference Page.

K/A CATALOGUE QUESTION DESCRIPTION:

- Steam Generator Tube Rupture (SGTR); Knowledge of the reasons for the following responses as they apply to the SGTR: Criteria for securing RCP.

Categories

Tier:	1	Group:	1
Key Word:	SGTR	Cog Level:	C/A(4.1/4.2)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

33.

The Unit is operating at 100% power.

- The 'A' SG develops a tube leak

Which ONE of the following describes the indications the crew should expect to see?

A. Initially, the crew would expect to see elevated radiation readings appear first on RM-G19A and then on RM-A9. If a reactor trip is required as a result of the tube leak, the crew should expect the reading on RM-A9 to slowly decrease and the reading on RM-G19A to drop sharply immediately after the trip.

B. ✓ Initially, the crew would expect to see elevated radiation readings appear first on RM-A9 and then on RM-G19A. If a reactor trip is required as a result of the tube leak, the crew should expect the reading on RM-A9 to slowly decrease and the reading on RM-G19A to drop sharply immediately after the trip.

C. Initially, the crew would expect to see elevated radiation readings appear first on RM-A9 and then on RM-G19A. If a reactor trip is required as a result of the tube leak, the crew should expect the reading on RM-A9 to drop sharply and the reading on RM-G19A to slowly decrease immediately after the trip.

D. Initially, the crew would expect to see elevated radiation readings appear first on RM-G19A and then on RM-A9. If a reactor trip is required as a result of the tube leak, the crew should expect the reading on RM-A9 to drop sharply and the reading on RM-G19A to slowly decrease immediately after the trip.

Feedback

DISTRACTORS:

A INCORRECT See distractor 'B' analysis.

B CORRECT As per GS-9, "RM-A9 (Condenser off gas) is the most sensitive indicator of a SG Tube Leak . . . expect the readings on RM-G19 to drop sharply immediately after a reactor trip because the production of short-lived N-16 drastically drops off after the trip."

C INCORRECT See distractor 'B' analysis.

D INCORRECT See distractor 'B' analysis.

REFERENCES:

1. AOP-112.2, "Steam Generator Tube Leak Not Requiring SI."
2. GS-9, "Radiation Monitoring System," pages 42, 48, & 52.
3. ARP-019, XCP-645, Annunciator Point 1-3, page 4.
4. ARP-019, XCP-646, Annunciator Point 2-1, page 8
5. TS 3.4.6.2

K/A CATALOGUE QUESTION DESCRIPTION:

- Main and Reheat Steam System (MRSS); Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MRSS controls including: Air ejector PRM.

Categories

Tier:	2	Group:	1
Key Word:	MRSS	Cog Level:	C/A(2.9/3.0)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

34.

Given the following conditions:

- The plant was operating at 100% power.
- A Safety Injection has just occurred due to high Reactor Building pressure.

Which ONE of the following identifies the two parameters that can BOTH be INDEPENDENTLY used to distinguish between a steamline rupture inside containment and a LOCA inside containment?

A. RCS temperature and RCS pressure.

B. RCS pressure and Reactor Building high range gamma radiation.

C. Reactor Building high range gamma radiation and Pressurizer level.

D. RCS temperature and Reactor Building high range gamma radiation.

Feedback

DISTRACTORS:

A INCORRECT. While RCS temperature will decrease significantly for a SLR but not for a LOCA, RCS Pressure will decrease significantly for both.

B INCORRECT While RB high range gamma will be significantly higher for a LOCA, RCS pressure will decrease significantly for both.

C INCORRECT While RB high range gamma radiation will be significantly higher for a LOCA pressurizer level will decrease significantly for both.

D CORRECT. BOTH RCS temperature and RB high range gamma will differ significantly for a SLR and for a LOCA (RCS temp and RB gamma BOTH be lower for the SLR).

REFERENCES:

1. EOP-2.0LP, Loss of Reactor or Secondary Coolant
2. GS-9, Radiation Monitoring System

K/A CATALOGUE QUESTION DESCRIPTION:

- Steam Line Rupture; Knowledge of the interrelations between the Steam Line Rupture and the following: Sensors and detectors.

Categories

Tier:	1	Group:	1
Key Word:	STEAM LINE RUPTURE	Cog Level:	C/A(2.6/2.6)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	FJE/SDR

35.

The reactor is operating at 95% power with steady-state conditions, equilibrium Xenon, and a negative MTC.

Assume NO change in control rod position and disregard the effects of Xenon.

In order to maintain the current RCS Tavg, an increase in turbine load will require a _____ boron concentration, causing moderator temperature coefficient to become _____.

A. ✔ lower; more negative (less positive)

B. lower; less negative (more positive)

C. higher; more negative (less positive)

D. higher; less negative (more positive)

Feedback

DISTRACTORS:

A CORRECT — As power in increased, Tavg will decrease. A higher boron concentratin causes a more pronounced increase in thermal utilization when coolant temperature increases, tending to make MTC positive. So in this instance, the opposite would be true.

B INCORRECT — A higher boron concentratin causes a more pronounced increase in thermal utilization when coolant temperature increases, tending to make MTC positive.

C INCORRECT — Tavg will decrease.

D INCORRECT — Tavg will decrease.

REFERENCES:

Note: Licensee did not include the following training material with their exam material submittal:

RT-10, Reactivity and Fuel Temperature Effects
RT-11, Moderator Temperature Coefficient and Total Power Defect
RT-17, Reactivity Control During Pwr Operation

K/A CATALOGUE QUESTION DESCRIPTION:
- Main Turbine Generator (MT/G) System; Knowledge of the operational implications of the following concepts as they apply to the MT/G System: Relationship between moderator temperature coefficient and boron concentration in RCS as T/G load increases.

Categories

Tier:	2	Group:	2
Key Word:	MAIN TURBINE	Cog Level:	C/A(2.5/2.7)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

36.

Given the following conditions:

- The plant is stable at 90% power
- The main turbine is on the load limiter
- T_{avg} - T_{ref} mismatch is -0.8°F
- Bank D rods are at 200 steps with the Rod Control Bank Selector switch in AUTO
- No plant evolutions are in progress.

Which ONE (1) of the following describes the effect on rod control if a loss of condenser vacuum started to occur? (Assume **NO** operator action and the turbine trip setpoint is <u>not</u> reached.)

A. Bank D rods would step IN since T_{ref} would be decreasing.

B. Bank D rods would step OUT since T_{ref} would be increasing.

C✓ Bank D rods would remain at 200 steps because a T_{avg}/T_{ref} mismatch would not occur.

D. Bank D rods would remain at 200 steps because the main turbine is on the load limiter.

Feedback

<u>DISTRACTORS</u>:

A INCORRECT

B INCORRECT

C CORRECT

D INCORRECT

<u>REFERENCES</u>:
1. AOP-206.1, "Decreasing Main Condenser Vacuum."

<u>K/A CATALOGUE QUESTION DESCRIPTION</u>:
- Loss of Condenser Vacuum; Ability to operate and / or monitor the following as they apply to the Loss of Condenser Vacuum: Rod position.

Categories

Tier:	1	Group:	2
Key Word:	CONDENSER VACUUM	Cog Level:	C/A(2.5/2.5)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

37.

The following conditions exist:

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

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

A. Verify Rod all bottom lights lit, OR RCS Temperature trending down; to ensure an RCS over pressurization event will not occur.

B. ✔ Verify all reactor trip AND bypass breakers open, AND SUR decreasing at -0.33 dpm; to ensure only decay and RCP heat are being added to the RCS.

C. Verify all reactor trip AND bypass breakers open, AND RCS Temperature trending down; to ensure an RCS over pressurization event will not occur.

D. Verify Reactor Power trending down OR All rod bottom lights lit; to ensure only decay heat and RCP heat is being added to the RCS.

Feedback

DISTRACTORS:

A INCORRECT RCS temperature trending down is not an indication of a Reactor trip,and this is the wrong reason according to the WOG and lesson plan.

B CORRECT These are indications that a reactor trip has occured, and this is the correct reason for performing the trip IAW the WOG, and Lesson Plan.

C INCORRECT Reactor Power trending down is one indication that a trip may have occured, but is also an indication of just a down power condition, and temperature can be indications of the same thing, and this is not the corrrect reason for verifying the reactor tripped.

D INCORRECT The procedure requires both of these actions to be performed to verify that the reactor is tripped.

REFERENCES:
1. EOP 1.0 "Reactor Trip and Safety Injection."
2. EOP-13.0 "RESPONSE TO ABNORMAL NUCLEAR POWER GENERATION."
3. Lesson Plan EOP-13.0 objective 2040.

K/A CATALOGUE QUESTION DESCRIPTION:
- Loss of Main Feedwater (MFW); Knowledge of the reasons for the following responses as they apply to the Loss of Main Feedwater (MFW): Reactor and/or turbine trip, manual and automatic.

Categories

Tier:	1	Group:	1
Key Word:	MFW	Cog Level:	C/A(4.1/4.4)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

38.

Which ONE of the following reflects the minimum voltage at which operators may maintain full load on the 1A and 1B batteries and the approximate time they would expect to reach this voltage under a Loss of ALL AC power condition (assuming full load is maintained)?

A. 111 VDC; 4 hours

B. 111 VDC; 2 hours

C. ✓ 108 VCD; 4 hours

D. 108 VDC; 2 hours

Feedback

DISTRACTORS:

A INCORRECT; This is the minimum voltage per STP-501.004 for performing a battery capacity test. This is the correct length of time with both batteries available and fully loaded.

B INCORRECT; This is the minimum voltage per STP-501.004 for performing a battery capacity test. The length of time is incorrect.

C CORRECT; 108 VDC is the value given per EOP-6.0. The time is the correct length of time with both batteries available and fully loaded.

D INCORRECT; 108 VDC is the value given per EOP-6.0. The length of time is incorrect.

REFERENCES:

1. EOP-6.0, "Loss of All ESF Power," fold-out page.
2. STP-501.004, "Battery Capacity Test."

K/A CATALOGUE QUESTION DESCRIPTION:

- Loss of Offsite and Onsite Power (Station Blackout); Ability to determine or interpret the following as they apply to a Station Blackout: When battery is approaching fully discharged.

Categories

Tier:	1	Group:	1
Key Word:	LOOP	Cog Level:	M(3.4/3.7)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

39.

With the plant operating at 55% power, the Deaerator Storage Tank (DST) Level switch that actuates at 11'0" (LS-3130) in the DST directly _____ in order to _____

A. ✓ trips all operating Condensate Pumps;
protect against a flow controller failure that overfills the DST.

B. trips all but one Condensate Pump;
protect against a flow controller failure that overfills the DST.

C. starts only the 'A' Exhaust Hood Spray Pump;
protect against loss of water to the Feedwater Pump seals.

D. starts both Exhaust Hood Spray Pumps;
protect against loss of water to the Feedwater Pump seals.

Feedback

DISTRACTORS:

A CORRECT As per TD-6, "Condensate System," page 29.

B INCORRECT This would be correct for the trip that occurrs at the 10'6" level.

C INCORRECT This pump is started automatically if discharge pressure at the pump decreases to 160 psig as sensed by pressure sensor PS-3056A. The low pressure of 160 psig indicates that inadequate condensate pump discharge pressure exists to supply the feedwater pump seals. The purpose of the Exhaust Hood Spray Subsystem is as stated in this distractor.

D INCORRECT The 'B' Exhaust Hood Spray Pump is automatically started when discharge pressure at the pump drops to 150 psig as sensed by pressure sensor PS-3056B. The purpose of the Exhaust Hood Spray Subsystem is as stated in this distractor.

REFERENCES:
1. TD-6, "Condensate System," pages 29, 38, 39, 40, and 50.

K/A CATALOGUE QUESTION DESCRIPTION:
- Condensate System; Knowledge of the purpose and function of major system components and controls.

Categories

Tier:	2	Group:	2
Key Word:	CONDENSATE	Cog Level:	C/A(3.2/3.2)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

40.

The following plant conditions exist:

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

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

A. EOP-6.2, 'Loss of All ESF AC Power Recovery with SI Required'; no specific actions are required for DC power supplies. Auxiliary Building batteries are designed for this condition.

B. EOP-1.5, 'Rediagnosis'; actions serve to maintain DC voltage.

C✔ EOP-6.0, 'Loss of All ESF AC Power'; actions serve to maintain DC voltage.

D. SAMG's; conditions are outside design bases and actions will be dictated by TSC.

Feedback

DISTRACTORS:

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

B INCORRECT Operators would remain in EOP-6.0.

C CORRECT EOP-6.0 provides direction to maintain DC voltage above 1.8 VDC.

D INCORRECT Direction to minimize DC loads is provided in EOP-6.0.

REFERENCES:
1. EOP-6.0, "Loss of All ESF AC Power."
2. GS-3, "DC Power."

K/A CATALOGUE QUESTION DESCRIPTION:
- Loss of Vital AC Instrumentation; Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Categories

Tier:	1	Group:	1
Key Word:	VITAL AC	Cog Level:	C/A(4.0/4.3)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

41.

The Unit is operating in Mode 1 when the following annunciator actuates:

- INV 1/2 TROUBLE

Which ONE of the following correctly describes the the cause and that automatic features have actuated?

A. Bus volts on DCB-1-XIT-5901 dropped to 120 VDC;
Power is now being supplied from alternate source 1FA

B. ✔ Bus volts on DCB-1-XIT-5901 dropped to 110 VDC;
Power is now being supplied from alternate source 1FA

C. Bus volts on DCB-1-XIT-5903 dropped to 110 VDC;
Power is now being supplied from alternate source 1FB

D. Bus volts on DCB-1-XIT-5903 dropped to 120 VDC;
Power is now being supplied from alternate source 1FB

Feedback

DISTRACTORS:

A INCORRECT Bus volts on DCB-1-XIT-5901 would have had to have dropped below 110VDC.

B CORRECT Per ARP-001, XCP-636, Annunciator Point 1-5, page 7. Since no other annunciators have actuated this one annunciator alone serves as indication that substitute power sources have come on line.

C INCORRECT This would be correct if annunciator INV 3/4 had actuated.

D INCORRECT This would be correct if annunciator INV 3/4 had actuated AND volttage had dropped to 110 VDC.

REFERENCES:

1. ARP-001, Panel XCP-636, Annunciator Point 1-5, page 7.
2. ARP-001, Panel XCP-637, Annunciator Point 1-5, page 7.

K/A CATALOGUE QUESTION DESCRIPTION:

- Loss of DC Power; Ability to determine and interpret the following as they apply to the Loss of DC Power: That a loss of dc power has occurred; verification that substitute power sources have come on line.

Categories

Tier:	1	Group:	1
Key Word:	DC POWER	Cog Level:	M(3.7/4.1)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

42.

Following a small break LOCA, which of the following describes the actions that would be necessary to start a Main Feedwater Pump?

A. ✔ SI will have to be reset, then the pump can be started.

B. Feedwater Isolation (FWI) will have to be reset, then the pump can be started.

C. SI will have to reset, the reactor trip breakers will have to be shut, then the pump can be started.

D. SI will have to be reset, FWI will have to be reset, then the pump can be started.

Feedback

DISTRACTORS:

A CORRECT

B INCORRECT

C INCORRECT

D INCORRECT

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- Main Feedwater (MFW) System; Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Categories

Tier:	2	Group:	1
Key Word:	MFW	Cog Level:	C/A(3.9/4.0)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

43.

Currently, all three EFW pumps are operating supplying feed to all three steam generators.

Which of the following describes the affect on pump head for each of the pumps as the air signal to flow control valve IFV-3536, is increased?

	MDEFW 'A' Pump Head	MDEFW 'B' Pump Head	TDEFW Pump Head
A.✔	decreases	decreases	increases
B.	increases	increases	decreases
C.	increases	increases	increases
D.	unaffected	unaffected	increases

Feedback

DISTRACTORS:

A CORRECT — All six EFW flow control valves are identicle, air-operated, globe valves that fail open on a loss of air signal. As the air signal to any of the valves is increased, the valve moves in the closed position. The MDEFW pumps have a cross-connect line on the upstream side of their flow control valves. Any movement by their associated flow control valves will affect pump head equally for these two pumps. The downstream lines from each of these valves join a common discharge header. The discharge of the TDEFW pump joins this common header AFTER passing through its flow control valve.

B INCORRECT

C INCORRECT

D INCORRECT

REFERENCES:

1. IB-3, "Emergency Feedwater System," page 30 & fig IB-3.1.

K/A CATALOGUE QUESTION DESCRIPTION:

- Auxiliary/Emergency Feedwater (AFW) System; Knowledge of the operational implications of the following concepts as they apply to the AFW: Pump head effects when control valve is shut.

Categories

Tier:	2	Group:	1
Key Word:	EFW	Cog Level:	C/A(2.6/2.9)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

44.

The unit is stable in Mode 3 with a full load test of diesel generator A in progress. A loss of offsite power to XSW1DA occurs, followed by a trip of diesel generator A. Alternate offsite power is available and it is decided to energize XSW1DA from its alternate feed per AOP-304.1(A), "Loss of bus 1DA with the Diesel Not Available."

Which ONE of the following describes the consequences of closing the alternate feeder breaker to XSW1DA before de-energizing the train A ESF load sequencer and the subsequent actions the crew will need to take to mitigate those consequences?

A. ✔ The alternate feeder breaker will fail to close.
The crew will need to go back and de-energize the train A ESF load sequencer.

B. The 'A' diesel generator will receive an immediate start signal.
The crew will not need to take any subsequent actions.

C. The components in load block 1 of the ESF load sequencer will immediately start.
The crew will not need to take any subsequent actions.

D. 1DA loads will fail to shed.
The crew will need to go back and de-energize the train A ESF load sequencer.

Feedback

DISTRACTORS:

A CORRECT

B INCORRECT EDG starts on low volts or SI.

C INCORRECT Requires voltage.

D INCORRECT Should have already happened on loss of bus.

REFERENCES:
1. AOP-304.1(A)
2. Lesson Plan GS-2, pages 21, 25, 27, 42, 51, 54.

K/A CATALOGUE QUESTION DESCRIPTION:
- AC Electrical Distribution System; Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Keeping the safeguards buses electrically separate.

Categories

Tier:	2	Group:	1
Key Word:	AC DISTRIBUTION	Cog Level:	C/A(3.4/3.9)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

45.

Inverter XIT5901 is being returned to service after power to the inverter had been lost. All initial conditions required to return the inverter to service have been met.

Step 2.1 of SOP-310, 120 VAC INSTRUMENT AND CONTROL SYSTEM, requires the operator to "Close the NORMAL AC SOURCE Breaker on the inverter front."

Which ONE of the following describes the status of the DC BUS CHARGED light as it relates to the operation of the above breaker?

A. It should light immediately upon closing the breaker and indicates charged capacitors.

B. It should extinguish immediately upon closing the breaker and indicates that the DC bus in no longer supplying power to the inverter.

C✓ It should light within 5 to 10 seconds of closing the breaker and indicates charged capacitors.

D. It should extinguish within 5 to 10 seconds of closing the breaker and indicates that capacitors have completed charging.

Feedback

DISTRACTORS:

A INCORRECT It should initially be dim. Upon closing the breaker, it should light within 5 to 10 seconds and indicates charged capacitors.

B INCORRECT It should light within 5 to 10 seconds after closing the breaker to indicate charged capacitors.

C CORRECT The light should initially be extinguished. After closing the breaker, "5 to 10 seconds should be allowed for the capacitors to fully charge and the battery charger to stabilize. Illumination of the red indicator lights indicates charged capacitors."

D INCORRECT It should light within 5 to 10 seconds.

REFERENCES:

1. SOP-310, "120 VAC Instrument and Control System," pages 22 - 24 and page 1 of Enclosure A.
2. SOP-311, "125 VDC System," page 21.

K/A CATALOGUE QUESTION DESCRIPTION:

- AC Electrical Distribution System; Ability to monitor automatic operation of the ac distribution system, including: Operation of inverter (e.g. precharging synchronizing light, static transfer).

Categories

Tier:	2	Group:	1
Key Word:	AC DISTRIBUTION	Cog Level:	M(2.7/2.9)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

46.

Which of the following will **NOT** send an auto start signal to the Service Water pumps?

A. ✔ A low flow on FI-4468, -4498, Service Water from RBCU flow instruments (<2000 GPM).

B. A Condensate Storage Tank low level (2/4) which opens XVG-1037 A/B, SW to EFW Isolation valves.

C. A Loss of Site Power followed by a SI.

D. A SI followed by a Loss of Site Power.

Feedback

DISTRACTORS:

A CORRECT

B INCORRECT

C INCORRECT

D INCORRECT

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- Loss of Nuclear Service Water; Ability to operate and / or monitor the following as they apply to the Loss of Nuclear Service Water)SWS): Flow rates to the components and systems that are serviced by the SWS; interactions among the components.

Categories

Tier:	1	Group:	1
Key Word:	SWS	Cog Level:	C/A(2.9/3.0)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

47.

Which one of the following is the source of power for safety-related 125 VDC distribution panel DPN-1HB if the DC output breaker on Battery Charger XBC-1B is inadvertently opened (assume NO operator action)?

A. 1DB2Y through Battery Charger XBC 1A-1B.

B. 125 VDC Battery through a 10 KVA inverter.

C. 1DA2Y through Battery Charger XBC 1A-1B.

D. ✔ 125 VDC Battery 1B.

Feedback

DISTRACTORS:

A INCORRECT

B INCORRECT

C INCORRECT

D CORRECT

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- DC Electrical Distribution System; Knowledge of DC electrical sytem design features(s) and/or interlock(s) which provide for the following: Manual/automatic transfers of control.

Categories

Tier:	2	Group:	1
Key Word:	DC POWER	Cog Level:	M(2.7/3.0)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

48.

A plant trip and loss of all AC has occurred.

- The 'B' D/G failed to start automatically and **CANNOT** be started from the Control Room.
- An operator has attempted to start the 'B' D/G locally by manually depressing only one of the manual air start valves for 'B' D/G, but the D/G does **NOT** start.

Which ONE of the following is a possible cause of the 'B' D/G **NOT** starting?

A. Only one main air start valve was overridden.

B. The Local-Remote switch is in MAINTENANCE.

C. Pressure in the "B" D/G air receivers is less than 175 psig.

D. The barring device interlock is failed in the "ENGAGED" position.

Feedback

DISTRACTORS:

A INCORRECT — Overiding only one main air start valve is all that is necessary to start the D/G since the two air start valves are in parallel.

B INCORRECT — The MAINTENANCE position allows a test start but blocks generator actuation by blocking closure of the D/G breaker. The diesel will start, but will not load electrically.

C CORRECT — Factory testing with air receiver pressure less than 225 psig resulted in prolonged diesel start times. 175 psig was selected as it is sufficiently low to be "a possible cause" of the D/G not starting and the 75 is similar to the 75 in the DG START AIR PRESS LO annunciator setpoint of 275 psig.

D INCORRECT — "If the diesel must be emergency started manually by using the provided tool to open the main air start valves, the barring device interlock is bypassed" and the diesel would have started.

REFERENCES:

1. IB-6, "Diesel Generator System," pages 18 - 20, 62, & 63.

K/A CATALOGUE QUESTION DESCRIPTION:

- Emergency Diesel Generator (ED/G) Systems; Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Air receivers.

Categories

Tier:	2	Group:	1
Key Word:	EDG	Cog Level:	C/A(2.7/2.9)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

49.

Given the following conditions:

- A loss of offsite power has occurred.
- Both DGs are running at full load.
- Due to problems with the 'B' fuel oil transfer pumps, the B DG day tank is unable to be replenished.
- The DG B OIL DAY TK LVL LO-LO annunciator is received on the MCB.

If the conditions given above remain unchanged, which ONE of the following is true regarding the operation of the EDG?

A. The crew should unlock and open the fuel oil transfer cross-connect valve to allow the 'A' fuel oil transfer pumps to refill the B DG Day Tank while monitoring the B DG Day Tank level to prevent overfilling the tank.

B. The crew should make up the ALT FILL connection, then unlock and open the B DG fuel oil transfer pump bypass valve to allow the engine driven fuel oil pump to take a suction directly from the discharge of the DG Fuel Oil Un-loading Pump.

C✔ The crew should allow the B DG to continue to run until it runs out of fuel.

D. The crew should immediately secure the B DG, the loss of fuel oil is imminent.

Feedback

DISTRACTORS:

A INCORRECT The only fuel oil transfer system cross-connect valve is located on the suction side of the transfer pumps.

B INCORRECT The ALT FILL connection does not align to the suction of the engine driven fuel oil pump and the Fuel Oil Un-loading Pump can only discharge directly to either of the Fuel Oil Storage Tanks or back to the Truck Un-load connection.

C CORRECT Per IB-5, "the low-low alarm indicates that approximately 30 minutes of full-load running time remains." Since this alarm actuates at a Day Tank level of 235 gallons and the diesel uses 5 pgm at full load (235/5=47), a band of 30 to 45 minutes was used.

D INCORRECT The EDG should not be immediately securred. The EDG should be allowed to run until the fuel is gone.

REFERENCES:

1. IB-5, "Diesel Generator System," pages 30 - 32, 86, and Figure IB5.8.

K/A CATALOGUE QUESTION DESCRIPTION:

- Emergency Diesel Generator (ED/G) System; Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Fuel oil storage tanks.

Categories

Tier:	2	Group:	1
Key Word:	EDG FUEL OIL	Cog Level:	M(3.2/3.3)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

50.

The plant is at 100% power with the "B" RB Instrument Air compressor tagged out. The "A" RB Instrument Air compressor just tripped on high discharge temperature.

Assuming no operator action, which ONE of the following describes the response of the RB Instrument Air System and why?

A. RB air header pressure decreases until Air Valve, IPV-2659 automatically opens at 90 psig. This will supply Service Air to maintain a sufficient supply of air.

B. RB air header pressure decreases until Air Valve, IPV-2659 automatically opens at 93 psig. This will supply Service Air to maintain a sufficient supply of air.

C. ✔ RB air header pressure decreases until Air Valve, IPV-2659 automatically opens at 90 psig. This will supply Station Instrument Air to maintain a consistant supply of dry, clean air.

D. RB air header pressure decreases until Air Valve, IPV-2659 automatically opens at 93 psig. This will supply Station Instrument Air to maintain a consistant supply of dry, clean air.

Feedback

DISTRACTORS:

A INCORRECT; Backup air supply is from the Station Instrument air system to ensure a dry air supply.

B INCORRECT; Backup air supply is from the Station Instrument air system to ensure a dry air supply.

C CORRECT

D INCORRECT; This pressure is the pressure at which the standby RB instrument aircompressor would have started if available.

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- Loss of Instrument Air; Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Cross-over to backup air supplies.

Categories

Tier:	1	Group:	1
Key Word:	INSTRUMENT AIR	Cog Level:	M(3.0/3.2)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

51.

The following conditions exist:

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

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

A. The release will be monitored by RM-G10 Auxiliary Building Waste Gas Decay Tank Area, if its setpoint is exceeded, RM-G10 will alarm and close HCV-014 and terminate the release.

B. The release will be monitored by RM-G10 Auxiliary Building Waste Gas Decay Tank Area, if its setpoint is exceeded, RM-G10 will alarm but no automatic actions will occur.

C. The release will be monitored by RM-A3 Main Plant Vent Exhaust monitor, if its setpoint is exceeded, RM-A3 will alarm and close HCV-014 and terminate the release.

D. The release will be monitored by RM-A3 Main Plant Vent Exhaust monitor, if its setpoint is exceeded, RM-A3 will alarm but no automatic actions will occur.

Feedback

DISTRACTORS:

A INCORRECT RM-G10 monitors the waste gas decay tank area and would not indicate upscale conditions unless a leak was in progress, and has no automatic actions.

B INCORRECT RM-G10 monitors the area but should not upscale unless a leak occurs.

C CORRECT If its setpoint is exceeded, RM-3A will close HCV-014.

D INCORRECT The release will be monitored by RM-3A, however it does have automatic functions.

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

K/A CATALOGUE QUESTION DESCRIPTION:
- Waste Gas Disposal System (WGDS); Knowledge of the effect that a loss or malfunction of the Waste Gas Disposal System will hae on the following: ARM and PRM system.

Categories

Tier:	2	Group:	2
Key Word:	WGDS	Cog Level:	M(3.2/3.2)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

52.

The following plant conditions exist:

- A core offload is in progress during a refueling outage (fuel being moved from core to SFP).
- Ventilation systems are in their normal configuration for these activities.
- RM-G17A (RB Manipulator Crane) annunciates.
- No other alarms annunciate.

Which ONE of the following correctly describes the automatic actions that result from the above conditions?

A. ✔ Reactor Building Purge Supply valve (XVB-1A) and Reactor Building Purge Exhaust valve (XVB-2A) receive a close signal; Reactor Building Purge Supply valve (XVB-1B), Reactor Building Purge Exhaust valve (XVB-2B), Alternate Purge Supply Isolation valves (XVG-6056 and XVG-6057) and Alternate Purge Exhaust Isolation valves (XVG-6066 and XVG-6067) do not receive a close signal.

B. Reactor Building Purge Supply valves (XVB-1A and XVB-1B), Reactor Building Purge Exhaust valves (XVB-2A and XVB-2B), Alternate Purge Supply Isolation valves (XVG-6056 and XVG-6057) and Alternate Purge Exhaust Isolation valves (XVG-6066 and XVG-6067) all receive a close signal.

C. Reactor Building Purge Supply valves (XVB-1A and XVB-1B) receive a close signal; Reactor Building Purge Exhaust valves (XVB-2A and XVB-2B), Alternate Purge Supply Isolation valves (XVG-6056 and XVG-6057) and Alternate Purge Exhaust Isolation valves (XVG-6066 and XVG-6067) do not receive a close signal.

D. Reactor Building Purge Supply valve (XVB-1A), Reactor Building Purge Exhaust valve (XVB-2A), Alternate Purge Supply Isolation valve (XVG-6056) and Alternate Purge Exhaust Isolation valve (XVG-6066) all receive a close signal; Reactor Building Purge Supply valve (XVB-1B), Reactor Building Purge Exhaust valve (XVB-2B), Alternate Purge Supply Isolation valve (XVG-6057) and Alternate Purge Exhaust Isolation valve (XVG-6067) do not receive a close signal.

Feedback

NOTE:
The figure (GS 9.23) and the table (Table GS9.1) and text of the lesson plan (Page 21 of 53) do not appear to provide consistent information. The figure implies that RM-G17A/B will isolate both Purge and Alternate Purge, but the table and text do not state that Alternate Purge is isolated. Licensee will need to clear up this issue and question may need to be revised accordingly.

K/A MATCH ANALYSIS
The question tests knowledge of design features in the ARM system which will isolate ventilation when radiation is detected, thus matching the K/A.

ANSWER CHOICE ANALYSIS:
A. Correct. See Page 21 and 48 of referenced text.
B. Incorrect. See Page 21 and 48 of referenced text. This is action if high radiation on the area rad monitors. Plausible due to memory nature of the item and the fact that the choice is partially correct.
C. Incorrect. See Page 21 and 48 of referenced text. This is action if high radiation on both RM-G17A and B. Plausible due to memory nature of the item and the fact that the choice is partially correct.
D. Incorrect. See Page 21 and 48 of referenced text. This ia the action if high radiation on area monitor A train. Plausible due to memory nature of the item and the fact that the choice is partially correct.

REFERENCES:
1. VC Summer Training Material, General Systems GS-9, Radiation Monitoring System, Rev. 7, 02/28/2000.

K/A CATALOGUE QUESTION DESCRIPTION:
072 Area Radiation Monitoring (ARM) System
K4.03 Knowledge of ARM System design feature(s) and/or interlock(s) which provide for the following: Plant ventilation systems.

Categories

Tier:	2	Group:	2
Key Word:	ARM RB MANIPULATOR	Cog Level:	M(3.2/3.6)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MAB/SDR

53.

The Unit is operating at 100% power. The operating crew entered SAP-154, "Failed Fuel Action Plan," when annunciator RC LTDN HI RNG RM-L1 HI RAD alarms. One of the procedure steps within SAP-154 specifies that Radiation Protection initiate surveys of plant areas.

Which ONE of the following is the primary reason for performing those surveys?

A. Radiation levels may have changed access requirements.

B. Confirmation of RM-L1 response.

C. The surveys are used to determine the extent of the failed fuel.

D. Auxiliary Building radiation levels are used to determine the need for additional letdown flow or a change in demineralizer alignment.

Feedback

DISTRACTORS:

A CORRECT — Most of the actions taken in SAP-154, such as step 7.3.4, are for the purpose of determining and revising radiation postings and RCA boundaries.

B INCORRECT — The alarm is verified IAW ARP-019, XCP-642, AP 1-5 by ovserving RM-L1 and R/R-6 for increasing radiation.

C INCORRECT — Extent of failed fuel is determined through analysis of RCS samples.

D INCORRECT — RCS activity levels are used to determine the need to change CVCS configuration.

REFERENCES:
1. ARP-019, XCP-642, page 7 and 8.
2. SAP-154, "Failed Fuel Action Plan," pages 6 - 10.
3. GS-9, "Radiation Monitoring System," pages 21 - 23.

K/A CATALOGUE QUESTION DESCRIPTION:
- Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: Relationship between radiation intensity and exposure limits.

Categories

Tier:	2	Group:	1
Key Word:	PRM	Cog Level:	M(2.9/3.4)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

54.

Which ONE of the following busses provides power to Service Water Pump C (XPP-0039C) when aligned to Service Water Loop B per SOP-117, Service Water System?

A. 7200 V bus 1EA

B. ✔ 7200 V bus 1EB

C. 7200 V bus 1DB

D. 7200 V bus 1C

Feedback

DISTRACTORS:

A Incorrect. Plausible because this is the power supply to the C Service Water Pump when aligned to the A Service Water Loop.

B Correct per SOP-117, Attachment VI.

C Incorrect. Plausible because this is is the power supply for Component Cooling Water Pump C when aligned to Component Cooling Loop B.

D Incorrect. Plausible because this is the power supply for Circulating Water Pump C.

REFERENCES:
1. SOP-117, Service Water System
2. IB-1, Service Water System

K/A CATALOGUE QUESTION DESCRIPTION:
- Circulating Water System; Knowledge of bus power supplies to the following: Emergency/essential SWS pumps.

Categories

Tier:	2	Group:	2
Key Word:	SERVICE WATER POWER	Cog Level:	MEM2.6/2.7
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	FJE/SDR

55.

The crew is performing actions per EOP-17.0, *Response to High Reactor Building Pressure,* following a plant event. While verifying Service Water flow to the RBCUs the crew observes the following:

- Annunciator RBCU 2A DISCH TEMP HI/SMOKE is lit and has been determined that it is NOT due to smoke.

- Flow oscillations are observed on FI-4466, SWBP 'A' DISCH FLOW GPM.

Given the above conditions, which ONE of the following describes the actions the crew should take to correct this situation and why?

A. The crew should open MVB-3109B, RBCU 2A Outlet Isolation Valve, to increase cooling water flow through RBCU 2A.

B. The crew should shut MVB-3109B, RBCU 2A Outlet Isolation Valve, to reduce bulk temperature at the orifice.

C✓ The crew should open MVB-3109A, RBCU 1A Outlet Isolation Valve, to reduce bulk temperature at the orifice.

D. The crew should shut MVB-3109A, RBCU 1A Outlet Isolation Valve, to increase cooling water flow through RBCU 2A.

Feedback

DISTRACTORS:

A INCORRECT This is the on-service cooler and MVB-3109B is already open.

B INCORRECT This action will take RBCU 2A off service effectively removing SWBP Train 'B' from service.

C CORRECT Per SOP-117, page 34, "Another special consideration for post accidnet operation is the high temperatures (~214^{O}F) of the SW leaving the RBCUs. This temperature could result in flashing across the orifices in the RBCU discharge line. Flow should be checked to ensure that flow oscillations from flashing do not limit RBCU heat removal. One way to reduce flashing would be to initiate flow through the parallel (idle) RBCU to reduce the bulk temperature at the orifice."

D INCORRECT MVB-3109A should already be shut. Per IB-1 "Post accident operation only requires the operation of one RBCU per train. The cooler, which will operate, is selected using the 'RBCU TRAIN A/B/EMERG' switches on the MCB. The normally open outlet valves from the non-selected RBCU closes on an SI signal to maximize SW flow through the coils of the running RBCU. In the event of a Safety Injection, all eight valves receive an 'S' signal to opoen; but, the non-selected RBCUs' 3109 valves' open signal will be overridden and these 3109 valves will remain closed or will close, if open."

REFERENCES:

1. AB-17, "Reactor Building Ventillation System," pages 14 & 15.
2. IB-1, Service Water System, pages25 & 34, figures IB-1.1 - IB-1.3.
3. ARP-001-XCP-606, Annunciator Point 1-4, page 6.
4. EOP-17.0, "Response to High Reactor Building Pressure," Steps 3 & 4, page 4.

K/A CATALOGUE QUESTION DESCRIPTION:

- Service Water System (SWS); Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including reactor and turbine building closed cooling water temperatures.

Categories

Tier:	2	Group:	1
Key Word:	SWS	Cog Level:	C/A(2.6/2.6)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

56.

The unit is in MODE 3. Maintenance was just completed on the 'A' Train of the Service Water (SW) system with conditions as follows:

- The SW maintenance required pump 'A' and pump 'C' to be tagged.
- The SW pump breakers 'A' and 'C' have just been racked up on the 'A' train bus with both switches in NORMAL-AFTER-STOP following the maintenance.
- A Loss of Off-Site Power occurs.

Which ONE of the following describes the automatic operation of the SW in relation to providing cooling water to the 'A' Diesel Generator (DG) under these conditions?

A. ✔ Neither SW pump 'A' or 'C' will be supplying cooling water to the 'A' DG.

B. Only SW pump 'A' will be supplying cooling water to the 'A' DG.

C. Only SW pump 'C' will be supplying cooling water to the 'A' DG.

D. Both SW pumps 'A' and 'C' will be supplying cooling water to the 'A' DG.

Feedback

DISTRACTORS:

A CORRECT — If both SW pump 'A' and 'C' breakers are racked up on the train 'A' bus and neither pump was running (neither MCB handswitch in after-start) the neither SW pump will start on a LOSP or a SI signal. The statement in the stem that both switches are "in NORMAL-AFTER-STOP following maintenance" provides information that neither MCB handswitch is in "after-start."

B INCORRECT — SW pump 'A' will not be running. See distractor 'A' analysis.

C INCORRECT — SW pump 'C' will not be running. See distractor 'A' analysis.

D INCORRECT — See distractor 'A' analysis.

REFERENCES:
1. IB-1, "Service Water System," pages 24, 25, 31 - 34, 38, 39, Figures IB-1.2, 1.3, 1.5, 1.6.
2. SOP-117, "Service Water System," rev 18, page 1 precaution 2, pages 22 & 23.
3. Tech Spec 3.7.4, "Service Water System."

K/A CATALOGUE QUESTION DESCRIPTION:
- Service Water System; Ability to monitor automatic operation of the SWS, including: Emergency heat loads.

Categories

Tier:	2	Group:	1
Key Word:	SWS	Cog Level:	C/A(3.7/3.7)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

57.

Given the following conditions:

- Insturment Air Compressor "A" (XAC-3A) is running, its MCB switch is in NORMAL-AFTER-START.
- Insturment Air Compressor "B" (XAC-3B) is NOT running, its MCB switch is in NORMAL-AFTER-STOP.
- The supplemental (Breathing Air) compressor is aligned to the Instrument air header but is not running.
- The supply breaker to Instrument Air Compressor "A" trips due to overload and the operator IMMEDIATELY takes the MCB hand switch to STOP.
- No other operator action is taken and Instrument Air header pressure is now 67 psig.

Which one of the following describes the expected status of the air compressors?

A. ✔ No instrument air compressors are running. Manual action must be taken to start the instrument air compressors.

B. Only the "B" instrument air compressor is running.

C. Only the supplemental instrument air compressor is running.

D. Both the "B" instrument air compressor and the supplemental air compressor are running.

Feedback

DISTRACTORS:

A CORRECT. See B and C. The B IA compressor or supplemental IA compressor must be manually started.

B INCORRECT. The "B" IA compressor will not start in standby with the "A" IA compressor control switch in STOP.

C INCORRECT. The supplemental IA compressor will not start in standby with none of the IA compressor control switches in N-A-S.

D INCORRECT. See B and C.

REFERENCES:

1. TB-12, Revision 7, pages 13,14,22

K/A CATALOGUE QUESTION DESCRIPTION:

- Instrument Air System (IAS); Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: Manual/automatic transfers of control.

Categories

Tier:	2	Group:	1
Key Word:	INSTRUMENT AIR	Cog Level:	C/A(2.7/2.9)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

58.

Which one of the following conditions represents a loss of containment integrity per Technical Specifications?

A. With the reactor at 20% power, an electrician opens the outer airlock door without prior pressure equalization.

B. ✔ With RCS temperature at 280°F, an audit of the completed work package to replace the equipment hatch determines that the seal O-rings will not perform their design function.

C. During an operability test of two normally open, redundant containment isolation valves with the RCS temperature at 380°F, one of the valves fails to close automatically.

D. During an Integrated Leakage Rate Test with the RCS at 180°F, containment leakage exceeds the maximum allowable Technical Specification leakage rate.

Feedback

DISTRACTORS:

A INCORRECT

B CORRECT

C INCORRECT

D INCORRECT

REFERENCES:

1. T.S. 3.6.1.1 and definition 1.7, Containment Integrity.

K/A CATALOGUE QUESTION DESCRIPTION:

- Containment System; Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under normal operations.

Categories

Tier:	2	Group:	1
Key Word:	CONTAINMENT	Cog Level:	M(3.8/4.2)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

59.

The plant has just stabilized at 200 °F following a plant heatup. The only two people in the control room are the SS and the NROATC. The SS is monitoring an I&C activity on the NIS Panel. The NROATC momentarily leaves the Area of Continuous Attention (ACA) to verify receipt of an annunciator without first obtaining a qualified individual to relieve him.

Which ONE of the following correctly describes whether the above NROATC actions were conducted in accordance with SAP-200 (Conduct of Operations)?

A. ✔ The NROATC's actions were NOT in violation of SAP-200 because he was only outside of the Area of Continuous Attention momentarily.

B. The NROATC's actions were NOT in violation of SAP-200 because the SS was immediately available, as defined in SAP-200, to manipulate the controls.

C. The NROATC's actions were in violation of SAP-200 because he must be immediately available, as defined in SAP-200, to manipulate the controls.

D. The NROATC's actions were in violation of SAP-200 because he left the Area of Continuous Attention without first obtaining a qualified relief.

Feedback

K/A MATCH ANALYSIS
Knowledge being tested comes directly from SAP-200, Conduct of Operations, under the RO's responsibilities.

ANSWER CHOICE ANALYSIS:
A. Correct. Plant is in Mode 5 at 200F. SAP-200, Step 6.6.8, states that an RO may momenarily enter the Area of Secondary Attention in order to verify receipt of an alarm.
B. Incorrect. In order for the SS to be in a position, as defined by SAP-200, to immediately manipulate the controls he must be in the Green Carpeted area (SAP-200, Step 6.6.6).
C. Incorrect. NROATC's actions were OK, as stated in "A" above. Plausible because this would be correct if in Mode 4.
D. Incorrect. NROATC's actions were OK, as stated in "A" above. Plausible because this would be correct if in Mode 4.

REFERENCES:
1. Technical Specifications Table 1.1, Operational Modes.
2. Station Administrative Procedure, SAP-200, Conduct of Operations, Rev. 8, 08/19/2000.

K/A CATALOGUE QUESTION DESCRIPTION:
G2.1.1
Knowledge of conduct of operations requirements.

Categories

Tier:	3	Group:	
Key Word:	CONDUCT OF OPERATION	Cog Level:	M(3.7/3.8)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MAB/SDR

60.

A manual-handwheel operated, rising stem gate valve through which fluid is NOT flowing is to be verified OPEN as a part of a Routine System Lineup Verification.

- The valve is located in a cubicle designated as a high radiation area, with the highest exposure reading being 225 mRem/hr, occurring on contact with the bonnet of the valve.

- The cycling of the valve (full open - full shut - full open) is known to take 3 minutes in the area.

- The boundary for the high radiation area is located approximately 3 feet from the valve, which is in plain view from the boundary.

Given the above conditions and in accordance with SAP-153, "Independent Verification," which ONE of the following describes how an Independent Verification should be performed this valve?

A. The amount of radiation exposure expected to be recieved is sufficient to allow the Shift Supervisor to waive the requirement for independent verification. The valve position may be verified by initiating flow through the valve and observing system process parameters indicating flow through the valve.

B. The amount of radiation exposure expected to be recieved is sufficient to allow the Shift Supervisor to waive the requirement for independent verification. The valve position may be verified by observing the valve's stem position from the boundary of the high radiation area.

C. The valve handwheel should be turned in the clockwise direction until movement of the stem is detected and then returned to its full open position.

D. Since the valve is located in a high radiation area and this is a Routine System Lineup Verification, the Independent Verification need not be performed.

Feedback

DISTRACTORS:

A INCORRECT — Greater than 10 mrem would have to be received in order for the Shift Supervisor to waive the requirement for independent verification. Under the conditions given, 11.25 mrem would be received if the valve were to be cycled through its full range of travel. IAW section 6.4.1 of SAP-153, "Valves to be verified open will be manipulated in the closed direction only as necessary to remove any slack from the operating mechanism and verify valve stem movement. The valve will then be fully opened, subject to normal precautions on backseating valves." If the operator followed the requirements of SAP-153, the time needed to properly verify the valve's position would require far less than the time stated to perform a complete cycle of the valve.

B INCORRECT — The Shift Supervisor may not waive the requirements (see distractor analysis for 'A' above). The remainder of this distractor is plausible in that it is possible to determine the position of a rising stem valve by visually observing stem position.

C CORRECT — The operator would not expect to receive an exposure exceeding 10 mrem, "Valves to be verified open will be manipulated in the closed direction only as necessary to remove any slack from the operating mechanism and verify valve stem movement. The valve will then be fully opened, subject to normal precautions on backseating valves." This operatiorn should take less than 2 minutes to complete resulting in radiation exposure of only 7.5 mRem or less.

D INCORRECT — During the performance of routine system lineup verifications, the first individual performing the check is considered to be the independent verifier, and an additional SECOND check need not be performed. (SAP-153 Step 6.2.1.)

REFERENCES:

1. SAP-153, "Station Administrative Procedure," pages 6 & 8.

K/A CATALOGUE QUESTION DESCRIPTION:

- Knowledge of how to conduct and verify valve lineups.

Categories

Tier:	3	Group:	
Key Word:	ADMIN	Cog Level:	C/A(3.4/3.3)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

61.

The NROATC desires to leave the control room for approximately 30 minutes to view a training tape in the Operations Manager's Office.

Which ONE of the following describes the **MINIMUM** items that a unexpected or temporary relief should include per SAP-200, Conduct of Operations?

A. Discuss existing plant conditions; anticipated evolutions; and complete a turnover sheet.

B. ✔ Discuss existing plant conditions and anticipated evolutions; review the Main Control board controls, instrumentation and annunciators.

C. Discuss existing anticipated evolutions; review the Main Control board controls, instrumentation and annunciators; and log the turnover in the Station Log Book.

D. Discuss existing plant conditions; review the Main Control board controls, instrumentation and annunciators; and complete a turnover sheet.

Feedback

DISTRACTORS:

A INCORRECT Logging the turnover is only required if the NROATC is leaving the site.

B CORRECT IAW SAP-200 these are the minimum actions required for a temporary relief.

C INCORRECT Logging is not required and all the actions are not listed.

D INCORRECT A turnover sheet is not required and the turnover does not have to be logged.

REFERENCES:
1. SAP-200, pages 7 and 8.

K/A CATALOGUE QUESTION DESCRIPTION:
- Knowledge of shift turnover practices.

Categories

Tier:	3	Group:	
Key Word:	ADMIN	Cog Level:	M(3.0/3.4)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

62.

Which ONE of the following correctly describes the MINIMUM review/approval required for a temporary procedure change, and when final approval is required, per SAP-0139, Document Review and Approval Process?

A. A Qualified Reviewer and responsible Discipline Supervisor; final approval is required to occur any time within 30 days.

B. A Qualified Reviewer and Shift Supervisor; final approval is required to occur any time within 60 days, with the responsible Discipline Supervisor able to grant an additional 30 days.

C. A Qualified Reviewer and responsible Discipline Supervisor; final approval is required to occur any time within 60 days, with the responsible Discipline Supervisor able to grant an additional 30 days.

D. ✓ A Qualified Reviewer and Shift Supervisor; final approval is required to occur any time within 30 days.

Feedback

DISTRACTORS:

A INCORRECT — A shift supervisor is required to approve the temporary change procedure change.

B INCORRECT — The time required for final approval is 30 days, with the responsible Discipline Supervisor able to grant an additional 30 days (for a total of 60 days, NOT 60 + 30 = 90 days per distractor).

C INCORRECT — The time required for final approval is 30 days and the SS is required to approve the temporary change.

D CORRECT — The SS and a qualified reviewer must approve, and final approval is required within 30 days.

REFERENCES:

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

K/A CATALOGUE QUESTION DESCRIPTION:

- Knowledge of the process for controlling temporary changes.

Categories

Tier:	3	Group:	
Key Word:	EQUIPMENT CONTROL	Cog Level:	M(2.5/3.4)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

63.

Which ONE of the following correctly states the basis for the Technical Specification Reactor Core Safety Limit (Applicable in Modes 1 and 2) and parameters that are used with the Technical Specifications to ensure that the Safety Limit is not violated?

A. ✔ Overheating of the fuel cladding is prevented by restricting fuel operation to within the nucleate boiling regime. Parameters used with the Technical Specifications to ensure that the limit is not violated include: Reactor Thermal Power, Highest Operating Loop RCS Average Temperature, and Pressurizer Pressure.

B. Overheating of the fuel cladding is prevented by restricting fuel operation to within the nucleate boiling regime. Parameters used with the Technical Specifications to ensure that the limit is not violated include: Reactor Thermal Power, Highest Operating Loop RCS Hot Leg Temperature, and Pressurizer Pressure.

C. Overheating of the fuel cladding is prevented by restricting fuel operation to within the film boiling regime. Parameters used with the Technical Specifications to ensure that the limit is not violated include: Reactor Thermal Power, Highest Operating Loop RCS Average Temperature, and Pressurizer Pressure.

D. Overheating of the fuel cladding is prevented by restricting fuel operation to within the film boiling regime. Parameters used with the Technical Specifications to ensure that the limit is not violated include: Reactor Thermal Power, Highest Operating Loop RCS Hot Leg Temperature, and Pressurizer Pressure.

Feedback

K/A MATCH ANALYSIS

The question is testing knowledge directly from the TS Bases. The material being tested is of a basic nature that the RO should know. Some of the knowledge is supported by GFE type knowledge and the other part is simply knowing what parameters they monitor to ensure that MNDBR is not violated. Supporting the closed book nature of this question is that it is a one hour or less TS action.

ANSWER CHOICE ANALYSIS:

A. Correct. See TS 2.1 Safety Limits and its associated Basis.
B. Incorrect. Plausible because hot leg temps are higher than ave temps, thus applicant could reason that core limits would be ensured by using this parameter to compare against TSs.
C. Incorrect. Plausible because applicant may confuse film and nucleate boiling.
D. Incorrect. Plausible because of same reasons in B and C above.

REFERENCES:

1. Technical Speficication 2.1 and Basis

K/A CATALOGUE QUESTION DESCRIPTION:

G2.2.25

Knowledge of bases in technical specifications for limiting conditions for operation and safety limits.

Categories

Tier:	3	Group:	
Key Word:	CORE SAFETY LIMITS	Cog Level:	C/A(2.5/3.7)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MAB/SDR

64.

The following plant conditions exist:

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

Which one (1) of the following would require immediate evacuation of the Reactor Building?

A. Low pressure alarm on the SFP gate boot seals.

B. Leaking of the SFP.

C✓ Readings on RMG-17A(B) 25 R/hr.

D. Actuation of the SFP LVL HI/LO annunciator.

Feedback

DISTRACTORS:

A INCORRECT Since corrective actions can be taken to repressurize the seal without evacuation of RB. An initial condition of "SFP gate installed" makes this choice a viable distractor.

B INCORRECT Because SFP can be isolated from RB even if it is leaking.CORE ALTERATIONS was used vs. fuel shuffle to eliminate questions about the credibility of the SFP gate being installed during fuel movement.

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

D INCORRECT Because SFP can be isolated from RB even if it is leaking.CORE ALTERATIONS was used vs. fuel shuffle to eliminate questions about the credibility of the SFP gate being installed during fuel movement.

REFERENCES:

1. AOP-123.1, "Decreasing Level in the Spent Fuel Pool or Refueling Cavity During Refueling."

K/A CATALOGUE QUESTION DESCRIPTION:

- Knowledge of new and spent fuel movement procedures.

Categories

Tier:	3	Group:	
Key Word:	EQUIPMENT CONTROL	Cog Level:	M(2.6/3.5)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

65.

An onshift Reactor Operator (RO) has the following recent dose history (TEDE):

- Year 2004 = 4020 mrem
- Year to date 2005 = 459 mrem

The RO is directed to perform a job on a component (considered a point source) that has a dose rate of 4400 mrem / hour at one foot. The RO will perform all of the work at 18 inches from the component and the work will take 45 minutes to complete.

Which ONE of the following correctly states the highest level of required approval/notification needed prior to beginning work?

A. The RO's Supervisor and the Manager of Health Physics Services

B. ✔ The RO's Department Manager and the HP Manager

C. The General Manager, Nuclear Plant Operations

D. The NRC

Feedback

K/A MATCH ANALYSIS
The question tests knowldge of the facility requirements that are related to the 10CFR20 requirements.

ANSWER CHOICE ANALYSIS:

A. Incorrect. The Dept. Manager must sign. This is a higher level than his Supervisor. Plausible because this would be correct if the applicant does not add the 459 mrem.

B. $(1/1.5)^2$ x (4400 mrem/hr) x (45 minutes) x (1 hr / 60 minutes) = 1467 mrem
1500 mrem + 459 mrem = 1926 mrem. HPP-153, Step 4.1, gives the admin limit as 1000 mrem. HPP-153, Step 3.3.1 and 3.3.2 state that the Manager of HPS must either sign or be notified by phone and approve per telecon. HPP-153, Attachment 1, states that the individual's manager (likely the Operations Manager) and the MP Manager must approve for > 1500 mrem, but < 2000 mrem.

C. Incorrect. Plausible because if the applicant does not account for only working 3/4 of an hour (rather than a full hour), then this answer would be correct due to calculating > 2000 mrem.

D. Incorrect. Plausible because NRC notification (vice approval) would be necessary if the 2004 accumulated dose were added to the current year dose.

REFERENCES:
1. Vogtle 2005-301 Exam Question, G2.3.1
2. Health Physics Procedure, HPP-153, Administrative Exposure Limits, Rev. 14.

K/A CATALOGUE QUESTION DESCRIPTION:
G2.3.1
Knowledge of 10 CFR: 20 and related facility radiation control requirements.

Categories

Tier:	3	Group:	
Key Word:	RADIATION ALARA	Cog Level:	C/A(2.6/3.0)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MAB/SDR

66.

Given the following conditions at a work site:

- Airborne activity - 3 DAC
- Radiation level - 40 mrem/hr.
- Radiation level with shielding - 10 mrem/hr.
- Time to place shielding - 15 minutes.
- Time to conduct task WITH respirator - 1 hour.
- Time to conduct task WITHOUT respirator - 30 minutes.

Assumptions:

- The airborne dose with a respirator will be zero.
- A dose rate of 40 mrem/hr will be received while placing the shielding.
- All tasks will performed by one worker.
- Sheilding can be placed in 15 minutes with or without a respirator.

Which ONE of the following would result in the lowest whole body dose?

A. Conduct task WITHOUT respirator or shielding.

B. Conduct task WITH respirator and WITHOUT shielding.

C. Place shielding while wearing respirator and conduct task WITH respirator.

D✓ Place shielding while wearing respirator and conduct task WITHOUT respirator.

Feedback

DISTRACTORS:

A INCORRECT 20 mrem (conduct task) + 3.75 mrem (airborne) = 23.75 mrem.

B INCORRECT 40 mrem (conduct task) + 0 mrem (airborne) = 40 mrem.

C INCORRECT 10 mrem (place shielding) + 10 (conduct task) + 0 mrem (airborne) = 20 mrem.

D CORRECT 10 mrem (place shielding) + 5 mrem (conduct task) + 3.75 mrem (airborne) 18.75 mrem. NOTE: 3 DAC x 2.5 mrem = 7.5 mrem

REFERENCES:
1.

K/A CATALOGUE QUESTION DESCRIPTION:
- Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.

Categories

Tier:	3	Group:	
Key Word:	RADIATION CONTROL	Cog Level:	C/A(2.9/3.3)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

67.

The crew has entered EOP-6.0, "Loss of All ESF AC Power." Plant conditions are as follows:

-Steam Generators must be depressurized by local operation of affected Steamline PORV(s).
-RCS Tavg is > 552°F.
-Personnel are on station to operate PORV(s) locally.

Given the above conditions, should S/Gs be depressurized at the maximum rate? Why or why not?

A. Yes, provided a cooldown rate of 100°F/hr is not exceeded.

B. ✔ Yes, provided local communications have been established.

C. No, Reactor Vessel Head Voiding may occur.

D. No, Tavg is > 552 degrees F.

Feedback

DISTRACTORS:

A INCORRECT IAW LP-EOP-6.0, "Maximum rate means not to be limited to TS limit of 100°F/hr.

B CORRECT

C INCORRECT Per EOP-6.0, Note - Step 19, depressurization should NOT be stopped to prevent this condition.

D INCORRECT This value is above P-12.

REFERENCES:
1. LP-EOP-6.0, "Instructor's Lesson Plan for Loss of All ESF AC Power," pages 10, 20, 31, and 33.
2. EOP-6.0, "Loss of All ESF AC Power," step 19.

K/A CATALOGUE QUESTION DESCRIPTION:
- Knowledge of communications procedures associated with EOP implementation.

Categories

Tier:	3	Group:	
Key Word:	EMERGENCY PROCEDURES	Cog Level:	C/A(3.0/3.5)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

68.

The following conditions exist:

- Unit is at 5% reactor power following a start up.

- A Pressurizer Spray valve fails open.

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

A. Pressurizer Pressure Low Reactor Trip.

B. OT Delta T Reactor Trip.

C. Pressurizer High Water Level Reactor Trip.

D. ✔ Pressurizer Pressure Low Safety Injection.

Feedback

DISTRACTORS:

A INCORRECT This would trip the reactor first if reactor power was greater than 10%.

B INCORRECT With the RCS delta T at a very low power level it would take a very long time and pressure would have to decrease to much less than the 1850 psig setpoint.

C INCORRECT This trip is disabled when less than 10% reactor power (P-7).

D CORRECT With the plant in this condition this will be the first setpoint that will trip the reactor.

REFERENCES:

1. Lesson Plan IC-3, "Instrumentation and Control," Enabling objective IC-3-19, Lesson Material page 18.

K/A CATALOGUE QUESTION DESCRIPTION:

- Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.

Categories

Tier:	3	Group:	
Key Word:	EMERGENCY PROCEDURES	Cog Level:	C/A(3.9/4.1)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

69.

The following conditions exist:

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

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

A. EOP- 2.0 "Loss of Reactor or Secondary Coolant."

B. EOP-3.0 "Faulted Steam Generator Isolation."

C✓ EOP-2.5 "LOCA Outside Containment."

D. EOP-2.1 "Post-LOCA Cooldown and Depressurization."

Feedback

DISTRACTORS:

A INCORRECT — A loss of RCS inventory is occurring, however conditions in containment do not indicate that the leak is in Containment, and S/G conditions are normal for this condition.

B INCORRECT — None of the indications provided in the stem indicate a Faulted S/G.

C CORRECT — In accordance with Step 23 of EOP-1.0, the two alarms, RM-A3 and XCP-631-6-1, provide indication that an RCS leak exists outside containment and support this transition. None of the other indications trigger a transition out of EOP-1.0 either before or after step 23.

D INCORRECT — If a small break LOCA was believed to be in progress this would be the procedure to enter after EOP2.0.

REFERENCES:

1. Lesson Plan EOP-2.5 "LOCA Outside Containment". Objective 3
2. EOP-2.5 "LOCA Outside Containment," Step 23, page 14.

K/A CATALOGUE QUESTION DESCRIPTION:

- LOCA Outside Containment; Ability to determine and interpret the following as they apply to the (LOCA Outside Containment): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Categories

Tier:	1	Group:	1
Key Word:	LOCA	Cog Level:	C/A(3.4/4.3)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

70.

While responding to a plant event with RCS pressure at 300 psig, the crew received a YELLOW condition on the Status Tree for Core Cooling and transitioned to EOP-14.2, "Response to Saturated Core Cooling."

Which ONE of the following correctly describes the basis for making this transition?

A. It will enable the crew to maintain minimum RCS subcooling by verifying RHR is in the cooldown mode.

B. ✔ It will enable the crew to maintain minimum RCS subcooling by verifying/establishing SI flow.

C. It will enable the crew to prevent further degradation of core cooling by starting a RCP.

D. It will enable the crew to prevent further degradation of core cooling by establishing a vent path.

Feedback

DISTRACTORS:

A INCORRECT — The first step in EOP-14.2 is to verify that the RHR system has NOT been placed in service in the cooldown mode. The stem includes a mention of RCS pressure being > 250 psig to preclude this as a possible answer since Step 2 of EOP-14.2 states that "if RCS pressure is < 250 psig, verify RHR flow . . ."

B CORRECT — This is the purpose as stated in the bases and Lesson Plan. Verifying SI flow is the second step in EOP-14.2.

C INCORRECT — While this is the bases, EOP-14.2 does not direct starting RCPs even though having no running RCPs is one of the plant conditions that would result in receiving the Yellow path as mentioned in the stem.

D INCORRECT — While this is the bases, all potential vent paths are checked closed to terminate loss of RCS inventory.

REFERENCES:

1. EOP-14.2, "Response to Saturated Core Cooling."
2. Lesson Plan EOP-14.2, "Response to Saturated Core Cooling."

K/A CATALOGUE QUESTION DESCRIPTION:

- W/E07EK3.2: Normal, abnormal and emergency operating procedures associated with Saturated Core Cooling.

Categories

Tier:	1	Group:	2
Key Word:	CORE COOLING	Cog Level:	C/A(3.2/3.7)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

71.

The crew has entered EOP-1.3, "Natural Circulation Cooldown." The crew is at Step 4, ready to initiate RCS cooldown. The following conditions exist:

-RCP seal cooling had previously been lost to all RCPs.
-RCS subcooling is 29°F and slowly decreasing.
-PZR level is 13% and stable.
-RCP seal cooling was just restored to all RCPs.

Which ONE of the following EOP-1.3 actions should the crew take given the above conditions?

A. Actuate SI and return to EOP-1.0, "Reactor Trip/Safety Injection Actuation."

B. Restart an RCP.

C. Have Engineering perform a seal evaluation and then restart an RCP.

D. Initiate the RCS cooldown per Step 4 of EOP-1.3.

Feedback

DISTRACTORS:

A CORRECT; The reference page for EOP-1.3 directs operators to actuate SI if either RCS subcooling is < 30°F OR PZR level can NOT be maintained > 12%.

B INCORRECT; While the reference page directs starting of a RCP if conditions can be established for starting a RCP during the procedure, the second caution statement of the procedure states that if RCP seal cooling had previously been lost, the affected RCP(s) should not be restarted prior to an Engineering evaluation

C INCORRECT; This is correct action for return of seal cooling, however initiating SI takes presidence.

D INCORRECT; The crew should initiate SI per the reference page due to loss of Subcooling.

REFERENCES:
1. EOP-1.3, "Natural Circulation Cooldown," pages 1, 2, and the reference page.
2. Lesson Plan for EOP-1.3, pages 8 - 10.

K/A CATALOGUE QUESTION DESCRIPTION:
- Natural Circulation Operations; Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

Categories

Tier:	1	Group:	2
Key Word:	NATURAL CIRC	Cog Level:	M(4.0/4.0)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

72.

EOP-1.4, "Natural Circulation Cooldown with Steam Void in Vessel," Step 2 states "Establish PZR level to accommodate void growth." Prior to this step there is a note that states "Saturated conditions in the PZR should be established before decreasing PZR level."

Which ONE of the following choices is correct with respect to the thermodynamic relationship between Pressurizer pressure and Pressurizer level and their effect on the plant?

If the Pressurizer is not saturated, decreasing Pressurizer level (using charging and letdown) will cause the Pressurizer pressure to _____ _____ than if the Pressurizer were saturated. Though Pressurizer pressure still decreases when level is reduced under saturated conditions, the rate of decrease is _____ since vapor is created as the pressure drops.

A. increase slower; faster

B. increase slower; slower

C. decrease faster; faster

D✓ decrease faster; slower

Feedback

DISTRACTORS:

A INCORRECT

B INCORRECT

C INCORRECT

D CORRECT To reduce the PZR level in a controlled manner, saturated conditions should first be established. If the PZR is not saturated, decreasing PZR level (using charging and letdown) will cause PZR pressure to **decrease faster** than if the PZR were saturated. Though the PZR pressure still decreases when level is reduced under saturated conditions, the rate of decrease is **slower** since vapor is created as the pressure drops.

REFERENCES:

1. EOP-1.4, "Natural Circulation Cooldown with Steam Void in Vessel," page 3.
2. Lesson Plan for EOP-1.4, pages 10 & 11.

K/A CATALOGUE QUESTION DESCRIPTION:

- Natural Circulation with Steam Void in Vessel with/without RVLIS; Knowledge of the interrelations between the (Reactor Trip or Safety Injection/Rediagnosis) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Categories

Tier:	1	Group:	2
Key Word:	NATURAL CIRC	Cog Level:	C/A(3.6/3.9)
Source:	B	Exam:	SM05301
Test:	R	Author/Reviewer:	MC/SDR

73.

- EOP-3.1 "Uncontrolled Depressurization Of All Steam Generators" is in progress.
- The crew is at the step: Check if SI flow should be reduced.

Which ONE of the following sets of parameters will be used to determine if SI flow should be reduced in accordance with EOP-3.1?

A. pressurizer level, RCS pressure, EFW flow.

B. RCS pressure, EFW flow, RCS subcooling.

C. pressurizer level, secondary heat sink adequate, RCS subcooling.

D. ✓ RCS subcooling, RCS pressure, pressurizer level.

Feedback

DISTRACTORS:

A Incorrect, the EOP directs the operator to check RCS subcooling, RCS pressure, and Pressurizer level.

B Incorrect, the EOP directs the operator to check RCS subcooling, RCS pressure, and Pressurizer level.

C Incorrect, the EOP directs the operator to check RCS subcooling, RCS pressure, and Pressurizer level.

D Correct, the EOP directs the operator to check RCS subcooling, RCS pressure, and Pressurizer level.

REFERENCES:

1. EOP-3.1

K/A CATALOGUE QUESTION DESCRIPTION:

WE12EK2.1 Knowledge of the interrelations between the (Uncontrolled Depressurization of all Steam Generators) and the following: Facilitys heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Categories

Tier:	1	Group:	1
Key Word:	EOP-3.1	Cog Level:	C/A(3.4/3.7)
Source:	N	Exam:	SM05301
Test:	R	Author/Reviewer:	GWL/SDR

74.

- A reactor trip and loss of off-site power has occurred.
- EOP-15.1 " Response to Steam Generator Overpressure" has been entered to reduce pressure in the "A" S/G.
- "A" S/G narrow range level is 85%.

Which ONE of the following describes the methods available, and the order they should be used to reduce pressure in the "A" S/G, in accordance with EOP 15.1?

A. dump steam to the condenser, dump steam via PORVs to atmosphere, TDEFW pump start, isolate EFW flow.

B. dump steam to the condenser, dump steam via PORVs to atmosphere, isolate EFW flow, RCS cooldown.

C. dump steam via PORVs to atmosphere, TDEFW pump start, isolate EFW flow.

D✓ dump steam via PORVs to atmosphere, isolate EFW flow, RCS cooldown.

Feedback

DISTRACTORS:

A Incorrect, steam dumps are not available with a loss of off-site power, and A S/G does not supply the TDEFW pump.

B Incorrect, steam dumps are not available with a loss of off-site power.

C Incorrect, TDEFW is not supplied by the A S/G.

D Correct, this is the available methods and the correct order IAW EOP-15.1.

REFERENCES:

1. EOP-15.1 " Response to Steam Generator Overpressure".
2. Summer Bank Question EOPS 095.

K/A CATALOGUE QUESTION DESCRIPTION:

WE13EK2.2 Knowledge of the interrealtions between the (Steam Generator Overpressure) and the following: facility's heat removal systems including primary coolant, emergency coolant, the decay heat removal systems, and the relations between the proper operation of these systems to the operation of the facility. (3.0/3.2)

Categories

Tier:	1	Group:	2
Key Word:	S/G OVERPRESSURE	Cog Level:	C/A(3.0/3.2)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	GWL/SDR

75.

- Operators are responding to a Large Break LOCA
- RCS pressure blew down to Reactor Building pressure about 15 minutes ago.
- The crew has completed transferring both the Safety Injection System and RB Spray System to Cold Leg Recirculation mode per EOP-2.2, Transfer to Cold Leg Recirculation.
- The STA reports that reactor building sump level is 423 feet and increasing
- Annunciator XCP-604 point 3-1 **"SW FR RBCU 1A/2A FLO LO"** is illuminated
- Annunciator XCP-604 point 3-2 **"SW FR RBCU 1A/2A PRESS LO"** is illuminated

Which ONE of the following describes the event that has occurred, the action that is required to be performed, and the reason for performing the action?

A. The"A" SW Booster pump has tripped.
Determine and correct the cause and start the "A" SW Booster pump.
To ensure that reactor building integrity is maintained.

B. ✔ The "A" RBCU has ruptured.
Secure and isolate the "A" SW Booster pump.
To prevent flooding of vital equipment.

C. The"A" SW Booster pump has tripped.
Ensure the "B" SW Booster pump is operating.
To ensure that reactor building temperature is maintained within limits.

D. The "A" RBCU has ruptured.
Secure and isolate the "A" SW Booster pump.
To maintain reactor building integrity.

Feedback

DISTRACTORS:

A Incorrect, the RBCU has ruptured, the pump should be secured and isolated to reduce flooding.

B Correct, the RBCU has ruptured, and this is the correct action and reason.

C Incorrect, the RBCU has ruptured, the pump should be secured and isolated to reduce flooding. Sprays along with the other train of RBCU will maintain reactor buildingtemperature.

D Incorrect, the "A" RBCU has ruptured, but the reason for isolation is to stop reactor building flooding and protect vital equipment.

REFERENCES:

1. EOP-17.1 "Response to Reactor Ruilding Flooding".
2. APP-001 XCP-604 3-1
3. APP-001 XCP-604 3-2

K/A CATALOGUE QUESTION DESCRIPTION:

WE15EK3.3 Knowledge of the reasons for the following responses as they apply to the (Containment Flooding) Manipulation of controls required to obtain desired operating results during abnormal, and emergecy situations. (2.9/2.9)

Categories

Tier:	1	Group:	2
Key Word:	LOCA	Cog Level:	C/A(2.9/2.9)
Source:	M	Exam:	SM05301
Test:	R	Author/Reviewer:	GWL/SDR