Final Submittal

BROWNS FERRY
EXAM 2002-301
50-259, 50-260, & 50-296

DECEMBER 13, 16-19, 2002

1. Senior Operator Written Examination

QUESTIONS REPORT
for SRO 2002-301LXRBank

1. 201001A2.01 001

While operating at 25% power the Unit Operator reports the following:

- CRD Pump A Breaker Disagreement White Light.
- Motor Trip Out Annunciator and Horn Received.
- 1B CRD Pump in Standby.

Which ONE of the following describes the IMMEDIATE actions to be taken for the above conditions?

A. Start CRD pump 1B and open the CRD PUMP DISH TO UNIT 2. Adjust the CRD SYS FLOW CONTROLLER tapeset to adjust CRD cooling water header differential pressure to 20 psid and CRD system flow to approximately 60 gpm.

B. Place CRD SYS FLOW CONTROLLER in MAN at MAXIMUM setting. Start CRD pump 1B. Open CRD PUMP DISCH TO UNIT 2. When CRD cooling water header differential pressure reaches 20 psid, and CRD system flow reaches between 45 and 75 gpm, balance CRD SYS FLOW CONTROLLER and place in AUTO.

C. Start CRD pump 1B. Place CRD SYS FLOW CONTROLLER in MAN at MINIMUM setting. Open CRD PUMP DISCH TO UNIT 2. Adjust CRD SYS FLOW CONTROLLER to establish 20 psid cooling water header differential pressure. Balance CRD SYS FLOW CONTROLLER and place in AUTO.

D. Place CRD SYS FLOW CONTROLLER in MAN at MINIMUM setting. Start CRD pump 1B. Open CRD PUMP DISCH TO UNIT 2. Adjust CRD SYS FLOW CONTROLLER to establish 20 psid CRD cooling water header differential pressure and CRD system flow between 40 and 65 gpm. Balance CRD SYS FLOW CONTROLLER and place in AUTO.

RO Tier:	T2G1	SRO Tier:	T2G2
Keyword:	CRD SYSTEM	Cog Level:	MEM 3.2/3.3
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

2. 201006K3.01 001

The following conditions exist on Unit 3:

Control Rod 22-35 at position 18 (group limit 00-12)
Core Power level is above the Low Power Setpoint
The RWM program has NOT been initialized after being unbypassed

Which ONE of the following is the reason that control rod 22-35 cannot be moved?

A. Withdraw Block is in effect.

B. Insert Block is in effect.

C.✓ Select Block is in effect.

D. Withdraw Error has occured.

References: OPL171.024 Rev. 10 pg 13-16

A, B and D are incorrect since a Select Block is in effect due to RWM Bypass Switch in NORMAL and the RWM program has not been initiated.

C. Correct answer.

RO Tier:	T2G2	SRO Tier:	T2G2
Keyword:	RWM	Cog Level:	C/A 3.2/3.5
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

3. 202002G2.2.3 002

Which ONE of the following choices correctly describes the response of the Unit 2 and Unit 3 reactor recirculation pump (RRP) speed control (Speed Feedback is enabled) to an increase in core differential pressure?

A. On Unit 2 the RRP speed must be manually adjusted by the operator but Unit 3 will automatically reposition the scoop tube to bring speed back to the setpoint if generator speed has changed by more than 5 rpm.

B. Both Unit 2 and Unit 3 must be manually adjusted by the operator to bring speed back to the setpoint.

C. Unit 2 will automatically reposition the scoop tube to bring speed back to the setpoint but on Unit 3 the RRP speed must be manually adjusted by the operator if generator speed has changed by more than 5 rpm.

D. Both Unit 2 RRP and Unit 3 will automatically reposition the scoop tube to bring speed back to the setpoint if generator speed has changed by more than 5 rpm.

References: OPL171.007 Rev.20 pg 44

A, B and C are incorrect since both units recirc pumps will change speed automatically if generator speed has changed by more than 5 rpm.

D. Correct answer.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	RECIRC SYSTEM	Cog Level:	MEM 3.1/3.3
Source:	B	Exam:	BF02301
Test:	C	Misc:	

4. 203000A4.01 001

During a level transient on Unit 2 the following events occurred:

- RPV water level decreased to -125 inches during the transient
- ADS actuated
- RHR Pump 2A and 2B started and injected to the reactor vessel
- RPV water level is now +25 inches and increasing
- No operator actions have been taken

Which ONE of the following statements describes the RHR system response if RHR Pump 2A control switch is placed to the STOP position?

A. RHR Pump 2A will stop and the amber auto-start lockout light will light.

B. RHR Pump 2A will stop and the amber auto-start lockout light will extinguish.

C. No change; RHR Pump 2A will continue to run until the LOCA initiation signal is reset.

D. RHR Pump 2A will stop and then restart when the switch is released. The amber auto-start lockout light will not change indication.

References: OPL171.044 Rev. 10 pg 61
Enabling Objective #13
2-OI-74 Rev. 0107 pg 8

A. Correct answer.

B. Incorrect since the RHR system is designed to allow a pump to be secured and auto-initiation lock-out.

C. Incorrect since the amber light is the auto-init. lockout indication and will not extinguish until the LOCA signal is reset.

D. Incorrect since both sentences are incorrect.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	RHR	Cog Level:	C/A 4.3/4.1
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

5. 203000K3.02 001

Gross fuel failure is suspected on Unit 3. The crew is in *3-EOI Appendix 18 - Suppression Pool water Inventory Removal and Makeup* and have just closed *3-FCV-74-63, RHR RADWASTE SYS FLUSH VALVE*. Suppression Pool level is -2.5 inches and steady.

Which ONE of the following are the appropriate actions?

A. Exit *3-EOI Appendix 18 - Suppression Pool water Inventory Removal and Makeup* since Suppression Pool water level is within acceptable limits.

B. Open *3-FCV-74-63, RHR RADWASTE SYS FLUSH VALVE* and direct Suppression Pool water to Radwaste ONLY.

C. Open *3-FCV-74-62, RHR MAIN CNDR FLUSH VALVE* and direct Suppression Pool water to the Main Condenser ONLY.

D. Open *3-FCV-74-62, RHR MAIN CNDR FLUSH VALVE* and direct Suppression Pool water to the Main Condenser or open *3-FCV-74-63, RHR RADWASTE SYS FLUSH VALVE* and direct Suppression Pool water to Radwaste.

References: 3-EOI Appendix 18

WHEN Suppression Pool level can be maintained between -1 in. and -5.5 in. THEN EXIT this procedure.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	SUPPRESSION CHAMBER	Cog Level:	C/A 3.5/3.5
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

6. 204000K5.05 001

Which ONE of the following sets of signals will cause the RWCU Blowdown Valve (FCV 69-15) to close automatically?

A. Low Reactor Water Level +2", Standby Liquid Control initiation.

B. High downstream pressure 140 psig, low upstream pressure 5 psig.

C. High RWCU Pump Rm temp 140°F, high temp on outlet of NRHX 140°F.

D. High flow 250 gpm, high differential pressure across valve 25 psid.

References: OPL171.013 Rev.12 pg 22-24

A,C and D Incorrect since these signals do not close the blowdown valve.

B. Correct answer.

RO Tier:	T2G2	SRO Tier:	T2G2
Keyword:	RWCU SYSTEM	Cog Level:	MEM 2.6/2.6
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

7. 205000A4.05 001

Unit 2 is in a refueling outage with Loop II of RHR in shutdown cooling. The RHR SYSTEM II MIN FLOW INHIBIT switch is in the INHIBIT position. The Unit Operator then places the RHR Loop II Minimum Flow Valve (2-FCV-74-30) Control Switch to the OPEN position.

Which ONE of the following describes the effect on the Minimum Flow Valve?

A. Valve would not open.

B.✓ Valve would open then immediately go back closed.

C. Valve would open regardless of RHR flow and remain open.

D. Valve would open only if RHR flow was less than min flow closing setpoint.

References: OPL171.044 Rev. 10 pg 33 and 34
2-OI-74 Rev. 107 pg 73
Enabling Objective OPL171.044 #10

A. Incorrect since valve would open and immediately close.

B. Correct answer.

C. Incorrect since valve would not remain open.

D. Incorrect since valve would open regardless of min flow signal.

RO Tier:	T2G2	SRO Tier:	T2G2
Keyword:	RHR SYSTEM	Cog Level:	MEM 3.2/3.2
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

8. 206000A3.05 001

HPCI is operating in the pressure control mode (suction from the CST and return to the CST through FCV 73-35 and 36) when reactor water level lowers to -50".

Which ONE of the following describes HPCI response?

A. HPCI will be unaffected and continue to operate in the pressure control mode.

B. FCV 73-44 (inboard injection valve) opens; FCVs 73-35 and 36 remain open; HPCI does not inject to the reactor.

C. FCV 73-44 (inboard injection valve) opens: FCVs 73-35 and 36 close; HPCI injects to the reactor.

D. FCV 73-44 (inboard injection valve) opens; FCV 73-35 closes; FCV 73-36 remains open; HPCI injects to the reactor.

Reference: OPL171.042 Rev. 16 pg 42

A. Incorrect since HPCI has received an initiation signal from low water level. Setpoint is -45".

B. Incorrect since FCV's 73-35 and 36 receive a closed signal if they were open.

C. Correct answer.

D. Incorrect since both FCV's 73-35 and 36 receive a closed signal.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	HPCI	Cog Level:	C/A 4.3/4.3
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

9. 209001K5.05 001

A PMT is required on the vent system of Core Spray System I. The WO requires the Loop I Core Spray vent valves to be opened to verify the solenoid operated valve works as expected after replacement of the electrical solenoid.

Which ONE of the following describes the effect of opening the vent valves on the Core Spray system?

A. Core Spray System I will be inoperable as a result of venting however System II will not be affected.

B. Both Core Spray system will be inoperable as a result of venting.

C. Core Spray System operability will not be affected as long as CS & S is the ONLY source aligned to the Core Spray system.

D. Core Spray System operability will not be affected as long as discharge pressure meets the requirements of the TRM.

References: Tech Spec 3.5.1, ECCS-Operating
2-SR-3.5.1.1 (CS 1) Rev. 1 pg 4 and 6

A. Incorrect since the grace period for the surveillance hasn't expired.

B. Incorrect since the grace period for the surveillance is 7.75 days and not 24 hours.

C. Incorrect since by the time that the 7.75 days expire then HPCI will be OPERABLE and a 7 day LCO entered.

D. Correct answer since HPCI will be OPERABLE by the time the 7.75 days has expired.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	CORE SPRAY	Cog Level:	C/A 2.5/2.5
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

10. 211000K1.01 001

Which ONE of the following describes the relationship between the SLC System and the Core Spray System?

A. ✓ The SLC sparger provides a sensing point for the Core Spray Break Detection logic.

B. The SLC sparger provides a sensing point for the Core Spray flow indication.

C. The Core Spray System is totally independent of the SLC System.

D. The same Shutdown Board powers the 2B SLC Pump and the 2B Core Spray Pump.

References: OPL171.045 Rev.11 pg 13
OPL171.039 Rev.13 pg 14,26 and 27
Enabling Objective OPL171.039 #4

A. Correct answer.

B. Incorrect since the sparger has no input to Core Spray flow.

C. Incorrect since Core Spray does interact with SLC through the sparger.

D. Incorrect since 2B Core Spray is powered from SD BD "C" and 2B SLC pump is powered from SD BD "B".

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	SLC	Cog Level:	MEM 3.0/3.3
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

11. 211000K6.03 001

Which ONE of the following describes the power supply and interlocks of the SLC pumps?

A. One pump is powered from 250V RMOV Board A and one from 480V Shutdown Board B. The pumps are electrically interlocked so that both pumps run, if available.

B. One pump is powered from 480V Shutdown Board A and one from 480V Shutdown Board B. The pumps are electrically interlocked so that only one pump will run at a time.

C. One pump is powered from 250V RMOV Board A and one from 480V Shutdown Board B. The pumps are electrically interlocked so that only one pump will run at a time.

D. One pump is powered from 480V Shutdown Board A and one from 480V Shutdown Board B. The pumps are electrically interlocked so that both pumps run, if available.

250 VDC is control power for the valves.

Two 100% capacity, triplex, positive displacement piston pumps powered from 480V Shutdown Bds A and B respectively are installed in parallel. The pumps are electrically interlocked so that only one pump can be run at a time to prevent overpressurization of the system.. This is accomplished by B-finger contacts in the start circuit of the running pump, opening contacts in the start circuit of the idle pump.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	SBLC	Cog Level:	MEM 3.2/3.3
Source:	B	Exam:	BF02301
Test:	C	Misc:	

12. 212000A1.08 001

Unit 3 scrammed due to a spurious Group 1 isolation. The Mode Switch is in Shutdown and all rods are inserted. Reactor water level has been restored to the normal operating band. The Unit Supervisor has ordered the Reactor Operator to reset the scram.

Which ONE of the following describes the status of the Backup Scram Valves when the Reactor Operator moves the "Reset" switch to the right?

Both Backup Scram Valves should be...

A. energized and OPEN.

B.✓ de-energized and CLOSED.

C. energized and CLOSED.

D. de-energized and OPEN.

References: OPL171.028 Rev.13 pg 22

A,C and D are incorrect since the Backup Scram Valves should be de-energized and CLOSED.

B. Correct answer.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	RPS	Cog Level:	MEM 3.4/3.4
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

13. 214000K4.01 001

Which ONE of the following statements is describes the operation of the Rod Position Information System (RPIS)?

A.✓ If both of the S52 and S00 normal full-in reed switches are closed the full core display will be backlit green and display 00.

B. The S48 full-out digital display reed switches also supply rod position input signals to the "CONTROL ROD OVERTRAVEL" alarm.

C. On an uncoupled control rod, the full core display will show position 49 and no red backlight if the rod is withdrawn to the overtravel position.

D. When a CRD is driven beyond the full-in position the S51 over-travel reed switch will be actuated. The full-core digital display for that rod will display 00 and be backlit green.

References: OPL171.029 Rev. 9 pg 19 and 20.

A. Correct answer.

B. Incorrect since the S50 switch provided indication for Rod Overtravel.

C. Incorrect since there is no position indication for an uncoupled control rod.

D. Incorrect since overtravel beyond full-in is --.

RO Tier:	T2G2	SRO Tier:	T2G2
Keyword:	RPIS SYSTEM	Cog Level:	MEM 3.0/3.1
Source:	B	Exam:	BF02301
Test:	C	Misc:	

14. 215004K4.01 001

A reactor startup is in progress on Unit 2 with the following conditions:

Mode Switch is in START/HOT STBY
IRM A is on range 2 with all other IRM's on range 3
The SRM's are partially withdrawn
SRM count rate ranges between 80 and 90 cps

The Reactor Operator attempts to withdraw control rod 24-33 but it will not move.

Which ONE of the following is the reason why the rod cannot be withdrawn?

A. SRM Downscale rod block.

B.✓ SRM Detector Wrong Position rod block.

C. SRM Hi rod block.

D. SRM Inop rod block.

References: OPL171.019 Rev.6 pg 21 and 22
Enabling Objective OPL171.019 #8

A. Incorrect since the SRM downscale rod block is <5 cps.

B. Correct answer.

C. Incorrect since the SRM Hi rod block is 6.8 X 10^4

D. Incorrect since SRM's are not INOP.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	SRM	Cog Level:	C/A 3.7/3.7
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

15. 215005K3.01 001

Which ONE of the following Mode Switch position and Nuclear Instrumentation signal combinations will cause ONLY a REACTOR CHANNEL "A" AUTO SCRAM?

A.✓ RUN; 2/4 Voter A1 in TEST.

B. STARTUP; 2/4 Voter B2 in TEST.

C. RUN; IRM "G" Upscale.

D. STARTUP; Channel 2 OPRM PBA Trip and Channel 4 OPRM PBA Trip.

References: Tech Specs 3.3.1.1-1 pg 3.3-7 and 3.3-8
OPL171.148 Rev.7 pg 24-56

A. Correct answer.

B. Only required in Mode 1.

C. Incorrect since IRM Hi does not generate trip with Mode Switch in Run.

D. Only required in Mode 1.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	APRM	Cog Level:	MEM 4.0/4.0
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

16. 216000A2.14 001

During a startup the operators begin to raise recirculation pump flow.

Which ONE of the following describes the effect on Panel 9-5 RPV level indicators when raising recirc flow from 50% to 65%?

A. Emergency range indicated level will trend downward.

B. Narrow range indicated level will trend upward.

C. Emergency range indicated level will trend upward.

D. Narrow range indicated level will trend downward.

References:

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	LEVEL INSTRUMENTS	Cog Level:	C/A 2.9/2.9
Source:	B	Exam:	BF02301
Test:	C	Misc:	

17. 217000K2.02 001

Unit 2 is operating at 100% RTP when the 250VDC Reactor MOV Board B Logic Bus A de-energizes. An operator has been sent to investigate and reports that the feed breaker has failed.

Which ONE of the following describes the operation of HPCI and RCIC if reactor water level decreases to -45" under these conditions?

A. HPCI and RCIC will both automatically initiate but will not auto isolate if needed.

B. HPCI will automatically initiate but will not auto isolate if needed and RCIC will not automatically initiate.

C. Both HPCI and RCIC will not initiate automatically but may be operated manually.

D. HPCI will not automatically initiate and RCIC will automatically initiate but will not auto isolate if needed.

References: 2-ARP-9-3F pg 4
2-ARP-9-3C pg 2

A. Incorrect since RCIC initiation logic will not work.

B. Correct answer.

C. Incorrect since HPCI will still initiate automatically.

D. Incorrect since HPCI will automatically initiate and RCIC will NOT automatically initiate.

NOTE: RCIC and HPCI recieve an initiation signal when RWL reaches -45".

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	RCIC SYSTEM	Cog Level:	C/A 2.8/2.9
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

18. 218000K6.06 001

Various electrical malfunctions have occurred on Unit 2. Existing conditions are as noted:

- 480V S/D Bd 2A deenergized
- 480V RMOV Bd 2C deenergized
- 250V RMOV Bd 2B deenergized
- No boards have been transferred

Which ONE of the following identifies the systems that are still available?

A. ADS, HPCI, RCIC

B. CS Loop I, RHR I, RCIC

C. RHR Loop I, ADS, HPCI

D. CS Loop II, RHR Loop II, HPCI

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	480V DISTRIBUTION	Cog Level:	C/A 3.4/3.6
Source:	B	Exam:	BF02301
Test:	C	Misc:	

19. 223001A2.11 001

Units 2 and 3 are operating at 100% RTP when a loss of Offsite power occurs. This condition is expected to exist for the next 6 hours.

Which ONE of the following predicts the response of suppression pool level over the next 6 hours?

A. Suppression pool water level will rise due to operation of SRV's, HPCI and/or RCIC.

B. Suppression pool water level will be controlled within the normal operating band due to the RHR drain pumps being used to control level.

C. Suppression pool water level will lower, makeup can be provided by opening the minimum flow valves on RCIC and HPCI from the CST's.

D. Suppression pool water level will remain stable except for heating by the use of SRV's, HPCI and/or RCIC causing indicated level to read high.

References:

A. Correct answer since MSIV's close on loss of off site power and all 3 systems are needed to control reactor pressure and reactor water level.

B. Incorrect since the drain pumps do not have a power supply.

C. Incorrect since suppression pool level will increase due to operation of SRV's and HPCI and/or RCIC.

D. Incorrect since suppression pool level will increase due to operation of SRV's and HPCI and/or RCIC.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	SUPPRESSION CHAMBER	Cog Level:	C/A 3.6/3.8
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

20. 223002K3.16 001

Unit 3 is in a refueling outage with Shutdown Cooling in operation on RHR Sys II. A spurious Group II isolation is initiated by the Instrument Techs while performing a surveillance. All isolations occurred as designed.

Which ONE of the following describes the actions to take to allow re-opening *3-FCV-74-67, RHR SYS II LPCI INBD INJECT VLV*?

A. Isolation signal has been reset AND either Shutdown Cooling Suction Valve is fully closed.

B. RHR SYS II SD CLG INBD INJECT ISOL RESET pushbutton is depressed followed by the group II isolation signal being reset.

C. Either Shutdown Cooling Suction Valve fully closed followed by the RHR SYS II SD CLG INBD INJECT ISOL RESET pushbutton being depressed.

D. RHR SYS II SD CLG INBD INJECT ISOL RESET pushbutton is depressed followed by either Shutdown Cooling Suction Valve being fully closed.

References: 3-OI-74 Rev.52 pf 12
Enabling Objective OPL171.044 Rev.10 #B10

A. Incorrect since RHR SYS II SD CLG INBD INJECT ISOL RESET pushbutton must be depressed after either of the listed conditions clears.

B. Incorrect since RHR SYS II SD CLG INBD INJECT ISOL RESET pushbutton must be depressed AFTER the condition clears.

C. Correct answer.

D. Incorrect since RHR SYS II SD CLG INBD INJECT ISOL RESET pushbutton must be depressed AFTER the condition clears.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	RHR SYSTEM	Cog Level:	C/A 3.2/3.3
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

21. 226001K1.09 001

Unit 3 is at 90% RTP when a LOCA occurs. The following conditions are present in the Containment:

Drywell Pressure	12.5 psig
Drywell Temperature	260°F
Suppression Pool Level	16 ft
Suppression Pool Temperature	150°F

The Unit Supervisor has ordered Drywell Sprays to be initiated per *EOI-2, Primary Containment Control.*

Which ONE of the following describes the affect on Containment when Drywell Sprays are initiated? (Assume Suppression Chamber sprays have been initiated)

A. A large rapid reduction in Drywell pressure followed by the opening of the Reactor Building to Suppression Chamber vacuum breakers followed by the opening of the Suppression Chamber to Drywell vacuum breakers.

B. A slow reduction in Drywell pressure followed by the opening of the Reactor Building to Suppression Chamber vacuum breakers followed by the opening of the Suppression Chamber to Drywell vacuum breakers.

C. A slow reduction in Drywell pressure followed by the opening of the Suppression Chamber to Drywell vacuum breakers.

D. ✓ A large rapid reduction in Drywell pressure followed by the opening of the Suppression Chamber to Drywell vacuum breakers.

References: OPL171.044 Rev.10 pg 59

A. Incorrect since the Suppression Chamber to Drywell vacuum breakers open first.

B. Incorrect since the pressure reduction is rapid due to mainly steam in the Drywell.

C. Incorrect since the pressure reduction is rapid due to mainly steam in the Drywell.

D. Correct answer.

RO Tier:	T2G2	SRO Tier:	T2G1
Keyword:	SUPPRESSION CHAMBER	Cog Level:	C/A 3.0/3.1
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

22. 233000K1.02 001

Which ONE of the following is CORRECT regarding RHR Supplemental Fuel Pool Cooling?

A. The RHR pumps are preferred for use in this mode over the RHR drain pumps.

B. RHR Drain Pump B cannot be used to provide flow.

C. Should only be used when required to maintain Fuel Pool temperature below 125°F.

D. RHR pump suction is taken from the fuel pool cooling pump discharge line.

References: OPL171.052 page 25
2-OI-74 Rev. 107 pg 94
Enabling Objective #6

A. Incorrect since the drain pumps are preferred for use over the RHR pumps.

B. Incorrect since RHR Drain Pump B can be used for this function.

C. Correct answer.

D. Incorrect since the suction is taken from the Skimmer Surge Tank outlet.

Changed the correct answer to a totally different answer.

RO Tier:	T2G3	SRO Tier:	T2G3
Keyword:	FUEL POOL COOLING	Cog Level:	MEM 2.9/3.0
Source:	M	Exam:	BF02301
Test:	C	Misc:	TCK

23. 239001K5.08 001

DC power has been lost to a MSIV solenoid valve.

Which ONE of the following describes the effect on the MSIV?

A. The valve will close if open.

B. The valve will remain open if open.

C. The valve cannot be opened if closed.

D. The slow closure capability of the valve is lost.

References: OPL171.009 Rev.8 pg 26
NOTE: Modified the stem slightly and reordered answers.

A. Incorrect since the AC and DC solenoids must de-energize to close the valve.

B. Correct answer.

C. Incorrect since only ONE of the solenoid valves must be energized to operate the valve.

D. Incorrect since the solenoid valves do not affect the testing circuit.

RO Tier:	T2G2	SRO Tier:	T2G3
Keyword:	MAIN STEAM	Cog Level:	MEM 2.6/2.7
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

24. 239002K5.04 001

The following plant conditions exist:

Reactor Power	100% RTP
Reactor Pressure	1000 psig

Safety Relief Valve (SRV) 1-4 has lifted and failed to reseat.

Which ONE of the following SRV tailpipe temperatures would you expect to see on the SRV that failed to close? (Steam Tables attached)

A. 212°F

B. 290°F

C. 345°F

D. 545°F

JUSTIFICATION

A. Incorrect since this is saturation temperature for steam at tailpipe pressure (atmospheric).

B. Correct answer. This is a throttling process and is therefore isenthalpic.

C. 340°F would be incorrectly determined if the candidate considered the process to be isenthalpic to the saturation line, then followed the constant superheat line to atmospheric pressure.

D. Incorrect since this is saturation temperature for reactor pressure.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	RELIEF VALVE	Cog Level:	C/A 3.3/3.5
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

25. 241000A4.11 001

Which ONE of the following is the controlling parameter that is illuminated on the Turbine Control Panel during a turbine roll to 1800 rpm?

A. Valve position.

B. Pressure.

C. Speed.

D. Load.

References: OPL171.228 Rev. 0 pg
Enabling Objective OPL171.228 #9

A, B and D are incorrect since SPEED is the controlling parameter until the turbine reaches "AT SET SPEED".

C. Correct answer.

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	EHC SYSTEM	Cog Level:	C/A 3.1/3.1
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

26. 245000K5.03 001

The main turbine shell is being warmed in accordance with GOI-100-1A, Unit Startup and Power Operation and OI-47, Turbine Generator System.

Which one of the following is the correct turbine valve configuration?

	CONTROL VALVES	STOP VALVES	INTRCPT STOPS	INTRCPT CONTROL
A.	Full open	1,3 & 4 closed (# 2 BP open)	Full closed	Full open
B.✓	Full open	1,3 & 4 closed (#2 BP open)	Full closed	Full closed
C.	Full closed	Full closed	Full open	Full open
D.	Full open	Full open	Full open	Full closed

Taskno: U-047-NO-02

RO Tier:	T2G2	SRO Tier:	T2G2
Keyword:	TURBINE CONTROLS	Cog Level:	C/A 2.6/2.6
Source:	B	Exam:	BF02301
Test:	C	Misc:	

27. 259001A1.01 001

Unit 2 is at 100% RTP. A heater tube leak activates alarm *2-LA-6-4, HEATER A2 LEVEL HIGH.* The Operator checks the ICS screen and verifies a valid HIGH HIGH (Red) level. Heater level continues to rise.

Which ONE of the following describes the required Operator action and the response of the plant?

A.✓ The Operator should be directed to reduce Core Thermal Power and verify 2A2 heater high level dump valve to the main condenser OPENS.

B. The Operator should be directed to hold power constant and verify the 2A2 high level dump valve to the heater drain cooler OPENS.

C. The Operator should be directed to reduce Core Thermal Power and verify HP Heater 2A1 extraction isolation valve is OPEN.

D. The Operator should be directed to hold power constant and verify the drain inlet flow from the 2A2 heater to the 2A1 heater is isolated.

References: 2-ARP-9-6A Rev.16 pg 10
Note: Modified from a question on the last exam.

A. Correct answer.

B. Incorrect since core thermal power should be lowered.

C. Incorrect since the drain for the 2A2 heater to the 2A1 heater should be open.

D. Incorrect since core thermal power should be lowered.

RO Tier:	T2G1	SRO Tier:	T2G2
Keyword:	FEEDWATER HEATERS	Cog Level:	C/A 3.3/3.3
Source:	M	Exam:	BF02301
Test:	C	Misc:	TCK

28. 259002G2.2.22 001

Unit 2 experienced a Group 1 isolation with a failure to scram. Rx steam dome pressure increased to 1320 psig which caused a break in the Recirc Suction piping. The following conditions exist at this time:

Rx Power	8% RTP
Reactor Water Level	-165 inches
Reactor Pressure	185 psig
Core Flow	5% of rated
Drywell Pressure	13 psig

Which ONE of the following describes the Safety Limit violated and the corrective action?

A. Reactor steam dome pressure; insert all insertable control rods within 2 hours.

B. Core Flow vs. Thermal Power; insert all insertable control rods and restore Thermal Power to within limits within 4 hours.

C. Reactor Vessel Water Level; restore level above -162" and insert all insertable control rods within 2 hours.

D. Drywell Pressure; restore to within limits and be in Mode 4 within 12 hours.

References: Tech Spec Section 2.0, Safety Limits
Tech Spec Bases pg B 2.0-6

A. Incorrect since Reactor steam dome safety limit was not exceeded (limit is 1325 psig)

B. Incorrect since the safety limit is ≥ 25% RTP and core flow < 10% rated.

C. Correct answer.

D. Incorrect since Drywell Pressure is not a safety limit.

RO Tier:		SRO Tier:	T2G1
Keyword:	SAFETY LIMIT	Cog Level:	C/A 3.4/4.1
Source:	N	Exam:	BF02301
Test:	S	Misc:	TCK

29. 261000K2.03 001

The SGT "A" master control switch (HS-65-18A on Unit 1) is in the pull-to-lock position.

Which ONE of the following conditions would still cause the SGT "A" to start even though the control switch is in the pull-to-lock position?

A. Unit 3 SGT "A" start pushbutton is depressed.

B. Unit 2 drywell pressure rises to 2.5 psig and continues to rise.

C. The local (SGT Building) SGT "A" start pushbutton is depressed.

D. SGT TRAIN "A" INBD ISOL TEST SIG keylock switch (HS-65-48A) is placed in the TEST position.

RO Tier:		SRO Tier:	T2G1
Keyword:	SBGT	Cog Level:	C/A 2.3/2.5
Source:	B	Exam:	BF02301
Test:	S	Misc:	

30. 262001K4.06 001

Unit 2 is operating at 100% RTP.

-A combination of errors cause an inadvertent Group 1 and Group 4 isolation.
-A loss of I&C 2A also occurs. Panel 9-9 cabinet 2 does not transfer.
-Reactor Water Level is currently at 22".
-The causing event for the group isolations is quickly corrected, however I&C cannot be restored.

Which ONE of the following lists the systems that can be utilized immediately to restore reactor water level?

A. RCIC and CRD only.

B. HPCI , RCIC and CRD.

C. Core Spray, HPCI, and RCIC.

D. Reactor Feed Pumps, RCIC and CRD.

References: 2-AOI-57-5A, Rev. 37 pg 2 and 3
Bank question - Revised answers slightly and reworded last portion of stem.

A. Incorrect since HPCI is also available for injection since the Group 4 isolation is able to be reset even with a loss of I&C A.

B. Correct answer.

C. Incorrect since Core Spray cannot be used with reactor at normal operating pressure.

D. Incorrect since Reactor Feedwater Pumps are not available due to Group 1 isolation not being able to be reset until I&C A is restored.

RO Tier:	T2G2	SRO Tier:	T2G1
Keyword:	AC DISTRIBUTION	Cog Level:	C/A 3.6/3.9
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

31. 262002K6.02 001

Unit 2 UPS Distribution Bus Battery Board 2 Panel 11 has just de-energized.

Which ONE of the following describes the effect this has on the equipment that is supplied by Panel 9-9 Cabinet 6?

A. The equipment is de-energized until power to Panel 9-9 Cabinet 6 is manually transferred to Batt Bd 3 Panel 11.

B. The equipment is de-energized until power is restored to Batt Bd 2 Panel 11.

C. The equipment remains energized due to power supply to Panel 9-9 Cabinet 6 auto transfers to Batt Bd 3 Panel 11.

D. The equipment remains energized due to MMG power supply automatically transferring to its 250VDC supply.

References: OPL171.102 Rev.4 pg 14 and 15
Enabling Objective OPL171.102 #2a and 2b

A. Incorrect since the equipment remains energized due to auto transfer.

B. Incorrect since the equipment remains energized due to auto transfer.

C. Correct answer.

d. Incorrect since the MMG set power supply does not affect the power to Panel 9-9.

RO Tier:	T2G2	SRO Tier:	T2G2
Keyword:	480V DISTRIBUTION	Cog Level:	MEM 2.8/3.1
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

32. 263000K1.04 001

The Unit 2 Unit Operator receives alarm *BAT BD 2 BKR TRIPOUT/FUSE BLOWN OR GROUND.*

Which ONE of the following describes where the Field Operator would be sent to check for a ground?

A. Battery Board Room No. 2, 250V Charger 2A panel.

B. 250V DC Distribution Panel SBA.

C.✓ Battery Board Room No. 2, Panel 1.

D. 4KV Shutdown Bd 250V DC Distribution Panel SD-3EB.

References: 2-ARP-9-8C Page 8 Tile #7
0-OI-57D Rev.62 Pg 42, 46 and 47.

C. Correct answer.

A, B and D. Plausible distractors.

RO Tier:	T2G2	SRO Tier:	T2G2
Keyword:	GROUND DETECTION	Cog Level:	MEM 2.6/2.9
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

33. 264000A1.03 001

Diesel Generator 3A is synchronized to 4KV Shut Down Board 3A. The instrumentation readings for the diesel generator are as follows:

voltage: 4160 VAC
frequency = 59.8
current = 340 amps
vars = 1600 Kvars
watts = 2585 KW
oil temp = 145°F

Which ONE of the following actions are required if the diesel is expected to be operated for an extended period? (Supply OI-82 illustration #1)

A. The operator must take the voltage regulator control switch to raise to reduce field current.

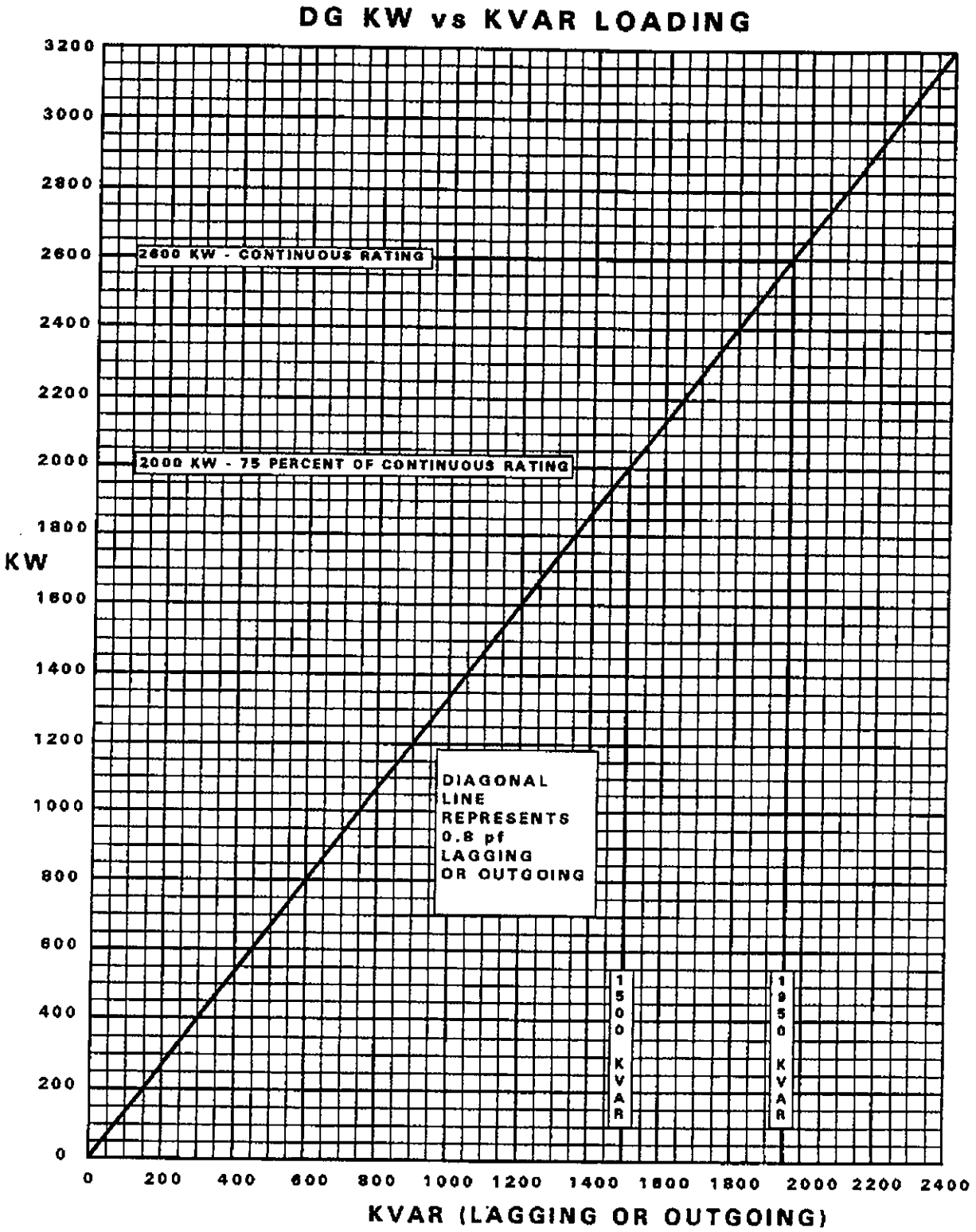
B. The operator must take the voltage regulator control switch to lower to reduce field current.

C. ✓ The operator must take the governor control switch to lower to reduce stator amps.

D. The operator must take the governor control switch to raise to reduce stator amps.

References: OI-82
OPL171.038 Rev. 9, page 31

RO Tier:	T2G1	SRO Tier:	T2G1
Keyword:	DIESEL GENERATOR	Cog Level:	C/A 2.8/2.9
Source:	B	Exam:	BF02301
Test:	C	Misc:	


DG KW vs KVAR LOADING
KW
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2600 KW - CONTINUOUS RATING
2000 KW - 75 PERCENT OF CONTINUOUS RATING
DIAGONAL LINE REPRESENTS 0.8 pf LAGGING OR OUTGOING
1500 KVAR
1950 KVAR
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
KVAR (LAGGING OR OUTGOING)

34. 268000A4.01 001

Given the following information:

Unit 2 has been at 100% RTP for 3 weeks.	
Current 2-FQ-77-6 Reading at 0800	63624.3
Previous Days 2-FQ-77-6 Reading at 0800	63125.4
Previous Days Leakrate	.34 gpm
Current calculated Leakrate	3.12 gpm

Which ONE of the following describes the status of the LEAKAGE limits?

A. No limits are being exceeded.

B. Increase in unidentified LEAKAGE limit is being exceeded.

C. Unidentified LEAKAGE limit is being exceeded.

D. Increase in unidentifed LEAKAGE and unidentified LEAKAGE limit are both being exceeded.

References: 2-SR-2 Rev.29 pg 20

A. Incorrect since increase in LEAKAGE limit is being exceeded at 3.12 gpm. Limit is ≤ 2 gpm. If use decimal point when subtracting readings then this would be the answer that the student would get. Procedure says to ignore decimal point.

B. Correct answer. Increase in LEAKAGE is at 3.12 gpm and limit is ≤ 2 gpm.

C. Incorrect since the increase in LEAKAGE is the only limit not met.

D. Incorrect since the increase in LEAKAGE is the only limit not met.

RO Tier:	T2G3	SRO Tier:	T2G3
Keyword:	LEAKAGE LIMITS	Cog Level:	C/A 3.4/3.6
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

35. 271000K3.02 001

Which ONE of the following describes the effect on offsite release rates if the Off-Gas System Glycol pumps fail?

A. Offsite Release Rates will INCREASE due to the Charcoal Adsorbers becoming less efficient.

B. Offsite Release Rates will DECREASE due to better H_2O_2 Recombination.

C. Offsite Release Rates will INCREASE due to the Off-Gas Condenser becoming less efficient.

D. Offsite Release Rates will DECREASE due to the Charcoal Adsorbers becoming more efficient.

References: OPL171.030 Rev. 13 Pg 29 and 31

A. Correct answer. The glycol cools the Cooler Condenser which is used to remove moisture from the gases entering the Charcoal Adsorbers. Water is a poison to the adsorbers so if the gases contain more moisture then the adsorbers are less efficient.

B. Incorrect since the glycol system has no affect on the Recombiners.

C. Incorrect since the Condensate System supplies cooling to the Off-Gas condenser.

D. Incorrect since the Charcoal Adsorbers become less efficient.

RO Tier:	T2G2	SRO Tier:	T2G2
Keyword:	OFF-GAS SYSTEM	Cog Level:	C/A 3.3/3.9
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

36. 286000A3.01 001

The following conditions currently exist on Unit 2:

- A fire at one station service transformer has actuated the water spray system.
- Fire header pressure has been 115 psig for 35 seconds after the spray system actuated.
- All system controls are in a normal lineup.

Based on these conditions, the diesel fire pump....

A. and all three electric fire pumps are operating.

B. and two of the three electric fire pumps are operating.

C. is in standby and all three electric fire pumps are operating.

D. and two electric fire pumps are in standby; the selected electric fire pump is operating.

References: OPL171.049 Rev. 12 pg 43
Enabling Objective (HLT) 5
0-OI-26 Rev. 55 pg 10

A. Incorrect since the diesel fire pump doesn't start until 45 seconds after pressure is below 120#.

B. Incorrect since the diesel fire pump doesn't start until 45 seconds after pressure is below 120#.

C. Correct answer.

D. Incorrect since all of the electric fire pumps should be running.

RO Tier:	T2G2	SRO Tier:	T2G2
Keyword:	FIRE PROTECTION	Cog Level:	C/A 3.4/3.4
Source:	M	Exam:	BF02301
Test:	C	Misc:	TCK

37. 290001A3.01 001

Which ONE of the following conditions will cause the Reactor Bldg ventilation fans to trip and isolate?

A. A scram which results in reactor water level reaching +14 inches.

B. Drywell pressure reaches 2.3 psig before the Drywell can be vented.

C. Reactor Bldg static pressure reaches +.6 inches of water due to high winds.

D. Reactor Zone exhaust duct radiation level reaches 62 mR/hr due to a steam leak.

References: OPL171.016 Rev.12 pg 62 and 63

A. Incorrect since the isolation setpoint for RWL is +11.2".

B. Incorrect since the isolation setpoint for Drywell High pressure is +2.45 psig.

C. Correct answer.

D. Incorrect since the isolation setpoint for exhaust duct hi rads is 72 mR/hr.

RO Tier:	T2G2	SRO Tier:	T2G1
Keyword:	SECONDARY CONTAINMEN	Cog Level:	MEM 3.9/4.0
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

38. 290002K4.03 001

Which ONE of the following describes the design and purpose of the orificing in the lower section of the reactor core?

A. All orifices are the same size to ensure all bundles have the same flow.

B. The interior bundles have more orifices to ensure equalized core flow at high power levels.

C. Center portions of the core have smaller orifices to ensure the neutron thermalization is equalized across the core.

D.✓ The outer portions of the core have smaller orifices to ensure adequate cooling in the interior fuel bundles at high power levels.

References: OPL171.002 Rev.5 pg 24-26
Enabling Objective OPL171.002 #2

A. Incorrect since all orifices are not the same size.

B. Incorrect since more orifices are not provided but larger orifices are provided.

C. Incorrect since center orifices are larger than outer orifices.

D. Correct answer.

RO Tier:	T2G3	SRO Tier:	T2G3
Keyword:	VESSEL INTERNALS	Cog Level:	MEM 3.2/3.3
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

39. 290003G2.1.12 001

Unit 2 is at 100% power. Two Unit 1 & 2 Control Room Air Conditioning Subsystems are inoperable. Actions to restore one subsystem to OPERABLE status are in progress.

Which ONE of the following states the actions/limitations imposed by Tech Specs?

A. Unit 2 must be in MODE 3 in 12 hours and MODE 4 in 36 hours.

B. Place an alternate method of cooling in service within 24 hours and restore one subsystem to OPERABLE status within 7 days.

C. Restore one subsystem to OPERABLE status within 30 days.

D. Place an alternate method of cooling in service within 24 hours and restore one subsystem to OPERABLE status within 30 days.

References: Tech Spec 3.7.4 Condition B
Revised answers from Bank question to prevent having more than one correct answer since you are in Condition A until you return BOTH systems to OPERABLE status.

A. Incorrect since this is the action to take if Condition B completion time cannot be met.

B. Correct answer.

C. Incorrect since at least ONE subsystem must be restored to OPERABLE status within 7 days along with other actions.

D. Incorrect since one subsystem must be returned to operable status within 7 days.

RO Tier:		SRO Tier:	T2G2
Keyword:	TECH SPECS	Cog Level:	C/A 2.9/4.0
Source:	B	Exam:	BF02301
Test:	S	Misc:	TCK

40. 295001AA2.01 001

Unit 3 is in the process of starting up
A 100% rod line has been established
Currently raising recirc flow
A fault in the 3B Recirc MG set occurs causing a trip of the MG set.
The operator notes the following conditions after the pump trip:

- MWE = 560
- MWT = 1745
- Core Flow = 32%
- OPRM's are INOPERABLE

Using the attached Illustration 1 from 3-OI-68 determine which ONE of the following describes the appropriate action to take?

A. Region 2 has been entered, scram the reactor immediately.

B. Region 1 has been entered, scram the reactor immediately.

C. Region 2 has been entered, and must be exited within 2 hours.

D. Region 1 has been entered, insert control rods to less than a 95.2% rod line.

Task no: U-068-AB-01

RO Tier:		SRO Tier:	T1G2
Keyword:	PWR/FLOW MAP	Cog Level:	C/A 3.5/3.8
Source:	B	Exam:	BF02301
Test:	S	Misc:	

41. 295002AA1.05 001

The following plant conditions exist on Unit 2:

- Reactor mode switch: STARTUP/HOT STANDBY
- Main turbine: Shell warming
- Feedwater lineup: RFP A maintaining level in single element

Which ONE of the following statements describes the expected sequence of actions as a condensate system leak causes condenser vacuum to decrease from 27 inches Hg Vacuum to atmospheric pressure?

A. The RFP turbine trips, then later, the turbine bypass valves close, followed by a reactor scram on low condenser vacuum.

B. The RFP turbine trips and the main turbine bypass valves close at the same time, then later, the Main Turbine trips.

C.✓ The Main Turbine trips, then later, the RFP turbine trips and the main turbine bypass valves close at the same time.

D. The Main Turbine trips and the reactor scrams in response to the turbine trip, then later, the RFP turbine trips and Main Turbine bypass valves close at the same time.

JUSTIFICATION

a. There is no reactor scram on low main condenser vacuum.
b. A true statement at 7" Hg Vac; however, this is preceded by a main turbine trip at 21" Hg Vac.
c. Correct answer.
d. The reactor won't trip on a turbine trip below 30% RTP.

RO Tier:	T1G2	SRO Tier:	T1G2
Keyword:	MAIN TURBINE	Cog Level:	C/A 3.2/3.2
Source:	B	Exam:	BF02301
Test:	C	Misc:	

42. 295003AK1.02 001

Unit 2 is at 100% power and has a special test in progress with the C D/G tied to 4KV SD Bd C as the sole source. The following occurs:

MSIVs go closed due to high steam tunnel temperature.
All rods do not insert.
Reactor pressure is 800 psig.
Reactor power is 2.5%.
Reactor level is -45".

If reactor water level decreased to -122 inches, which ONE of the following describes the effect this would have on the RBCCW system?
(Assume no operator actions)

A. Both pumps trip, 2A will auto restart in 40 seconds.

B. RBCCW pump 2B will trip, pump 2A not effected.

C. Both pumps trip and auto restart in 40 seconds.

D. No effect on the system.

References: OPL171.072 Rev. 8 pg 7 & 15
Enabling Objective OPL171.072 #4
Bank Question - Comment: 480V load shed will occur due to C diesel, only 2A pump auto restarts.

A. Correct answer since the D/G is the sole power supply to the Shutdown Board and water level reaches 122".

B. Incorrect since both pumps trip and the 2A restarts after 40 seconds.

C. Incorrect since the 2B pump restarts automatically only if the 2A pump fails to start.

D. Incorrect since the RBCCW pumps trip due to D/G tied to the Shutdown Board and water level reaches -122".

RO Tier:	T1G2	SRO Tier:	T1G1
Keyword:	LOAD SHED	Cog Level:	C/A 3.1/3.2
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

43. 295003G2.1.12 001

Unit 2 is at 100% RTP. Core Spray Pump 2B has just been tagged for maintenance when 250V DC Reactor MOV Board 2B trips.

Which ONE of the following describes the Tech Spec required actions for Unit 2?

A. Enter LCO 3.0.3 immediately.

B. Restore the 250V DC Reactor MOV Board 2B OR Core Spray Pump 2B to OPERABLE status within 72 hours.

C. Restore Core Spray Pump 2B AND 250V DC Reactor MOV Board 2B to OPERABLE status within 7 days.

D. Be in MODE 3 within 12 hours AND be in MODE 4 within 36 hours.

References: Tech Spec 3.5.1

Refer to OPDP-8. The 250V Board is a support system for Core Spray, and there is a LOSF since the 250V Board is Division I logic. Therefore both Core Spray systems are inoperable, requiring entering LCO 3.0.3 per 3.5.1.H. If 250V Rx MOV Board 2B is placed on its alternate supply the board is still considered inoperable per BASES B 3.8.7.

A. Correct answer since two low pressure ECCS spray subsystems are INOPERABLE. LCO 3.0.3 is entered per 3.5.1.G.

B. Incorrect since this assumes that HPCI is also INOPERABLE.

C. Incorrect since the 7 day clock is for 1 low pressure spray subsystem being INOPERABLE.

D. Incorrect since this action is required only if the required actions or completion time for Condition A is not met.

RO Tier:		SRO Tier:	T1G1
Keyword:	CORE SPRAY	Cog Level:	C/A 2.9/4.0
Source:	B	Exam:	BF02301
Test:	S	Misc:	TCK

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS - Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of six safety/relief valves shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3, except high pressure coolant injection (HPCI) and ADS valves are not required to be OPERABLE with reactor steam dome pressure ≤ 150 psig.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable. OR One low pressure coolant injection (LPCI) pump in both LPCI subsystems inoperable.	A.1 Restore low pressure ECCS injection/spray subsystem(s) to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. HPCI System inoperable.	C.1	Verify by administrative means RCIC System is OPERABLE.	Immediately
	AND		
	C.2	Restore HPCI System to OPERABLE status.	14 days
D. HPCI System inoperable. AND Condition A entered.	D.1	Restore HPCI System to OPERABLE status.	72 hours
	OR		
	D.2	Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours
E. One ADS valve inoperable.	E.1	Restore ADS valve to OPERABLE status.	14 days
F. One ADS valve inoperable. AND Condition A entered.	F.1	Restore ADS valve to OPERABLE status.	72 hours
	OR		
	F.2	Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Two or more ADS valves inoperable. OR Required Action and associated Completion Time of Condition C, D, E, or F not met.	G.1 Be in MODE 3. AND G.2 Reduce reactor steam dome pressure to ≤ 150 psig.	12 hours 36 hours
H. Two or more low pressure ECCS injection/spray subsystems inoperable for reasons other than Condition A. OR HPCI System and one or more ADS valves inoperable.	H.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	31 days
SR 3.5.1.2	----------NOTE---------- Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) low pressure permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. ---------- Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.1.3	Verify ADS air supply header pressure is ≥ 81 psig.	31 days
SR 3.5.1.4	Verify the LPCI cross tie valve is closed and power is removed from the valve operator.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.5	----------NOTES---------- 1. Only required to be performed when in MODE 4 > 48 hours. 2. Not required to be performed if performed within the previous 31 days. ---------- Verify each recirculation pump discharge valve cycles through one complete cycle of full travel.	Once prior to entering MODE 2 from MODE 3 or 4
SR 3.5.1.6	Verify the following ECCS pumps develop the specified flow rate against a system head corresponding to the specified pressure.	In accordance with the Inservice Testing Program

SYSTEM	FLOW RATE	NO. OF PUMPS	SYSTEM HEAD CORRESPONDING TO A VESSEL TO TORUS DIFFERENTIAL PRESSURE OF
Core Spray	≥ 6250 gpm	2	≥ 105 psid

SYSTEM	FLOW RATE	NO. OF PUMPS	INDICATED SYSTEM PRESSURE
LPCI	≥ 12,000 gpm	2	≥ 250 psig
LPCI	≥ 9,000 gpm	1	≥ 125 psig

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.7	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with reactor pressure ≤ 1040 and ≥ 950 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	92 days
SR 3.5.1.8	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	24 months
SR 3.5.1.9	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	24 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.10	----------NOTE---------- Valve actuation may be excluded. ---------- Verify the ADS actuates on an actual or simulated automatic initiation signal.	24 months
SR 3.5.1.11	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify each ADS valve opens when manually actuated.	24 months
SR 3.5.1.12	Verify automatic transfer of the power supply from the normal source to the alternate source for each LPCI subsystem inboard injection valve and each recirculation pump discharge valve.	24 months

44. 295004AA1.03 001

Unit 2 was operating at 100% power when a reactor scram occurs. The following plant conditions exist:

Main turbine is tripped.
Position indication for DC powered RCIC valves is out.
CORE SPRAY SYS I LOGIC POWER FAILURE annunciator is lit.

Which ONE of the following is the likely cause of this event?

A. Loss of 250 VDC RMOV Bd "A".

B. Loss of 250 VDC RMOV Bd "B".

C. Loss of 250 VDC RMOV Bd "C".

D. Loss of 250 VDC Turb Bldg Dist. Bd 2.

References: 2-ARP-9-8C #11
0-OI-57D Rev.

This is a bank question. B is the correct answer. Not verified yet.

RO Tier:	T1G2	SRO Tier:	T1G2
Keyword:	250 VDC	Cog Level:	MEM 3.21/3.5
Source:	B	Exam:	BF02301
Test:	C	Misc:	

45. 295005AA2.02 001

Unit 3 is at 24% RTP during a startup from a refueling outage. The Control Room Operator reports that the vibrations for the turbine are at 12 mils and continuing to increase slowly.

Which ONE of the following describes the actions you should take as Control Room Supervisor?

A. Order the Control Room Operator to Trip the Turbine immediately and verify a reactor scram.

B. Order the Control Room Operator to monitor the Turbine vibrations and to Trip the Turbine if the vibrations continue for greater than 15 minutes.

C. Enter EOI-1 since a scram should have occured due to Turbine Trip from High vibrations.

D. Order the Control Room Operator to Trip the Turbine immediately. Verify Generator output breaker trips.

References: OPL171.147 Rev. 3 pg 10, 19, 22

A. Incorrect since a reactor scram should not occur from the turbine trip due to Rx power <30%.

B. Incorrect since the turbine must be tripped immediately if vibrations reach 12 mils.

C. Incorrect since an entry condition does not exist at this time.

D. Correct answer.

RO Tier:		SRO Tier:	T1G2
Keyword:	TURBINE CONTROLS	Cog Level:	C/A 2.4/2.7
Source:	N	Exam:	BF02301
Test:	S	Misc:	TCK

46. 295006AA2.03 001

Unit 3 is operating at 100% RTP when the unit scrams. The following conditions exist after the scram:

All rods are in

Reactor Pressure	510 psig lowering slowly
Reactor Water Level	-155" steady
Drywell Pressure	11 psig

All systems operating as designed

Which ONE of the following lists ALL the systems that may be used and are capable of injecting and maintaining vessel level greater than -162"?

A. Feedwater, HPCI, RCIC, CRD and SLC.

B. Feedwater, HPCI, CRD and Core Spray.

C. Feedwater, HPCI, RCIC, and CRD.

D. Feedwater, HPCI, RCIC, CRD, SLC, Core Spray and RHR.

References: EOI-1 Rev 5

A. Correct answer.

B. Incorrect since Core Spray is not able to inject at this pressure.

C. Incorrect since SLC is also able to be used to maintain level >-162".

D. Incorrect since Core Spray and RHR cannot inject at this time.

RO Tier:		SRO Tier:	T1G1
Keyword:	LEVEL CONTROL	Cog Level:	C/A 4.0/4.2
Source:	N	Exam:	BF02301
Test:	S	Misc:	TCK

47. 295007AK1.01 001

Unit 2 has scrammed with the following conditions present:

All rods inserted.
Reactor pressure 475 psig
Reactor water level +53"
4KV Shutdown Board "A" de-energized
MSIVs open

Which ONE of the following lists the systems capable of injecting at this time?

A. HPCI, RCIC, 2A CRD Pump.

B. Reactor Feedwater Pumps, 1B CRD Pump, SLC.

C. SLC, Reactor Feedwater Pumps, 2A CRD Pump.

D. Core Spray, RHR, HPCI.

References: OPL171.026 Rev.11 pg 25
OPL171.040 Rev.18 pg 27
OPL171.042 Rev.16 pg 41
OPL171.044 Rev.10 pg 26
OPL171.045 Rev.11 pg 15

A. Incorrect since HPCI and RCIC are isolated due to reactor high water level.

B. Incorrect since 1B CRD Pp does not have power.

C. Correct answer.

D. Incorrect since Core Spray and RHR injection permissive is 450# and HPCI is isolated due to high reactor water level.

RO Tier:	T1G1	SRO Tier:	T1G1
Keyword:	REACTOR LEVEL	Cog Level:	C/A 2.9/3.2
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

48. 295008AK1.02 001

Unit 2 scrammed from high Drywell pressure with the following conditions present:

Reactor pressure	920 psig
Reactor water level	+ 53 inches and increasing
Drywell pressure	3.8 psig
Feedwater pumps	running
HPCI injecting	5000 gpm
RCIC in standby	

Which ONE of the following describes the action to be taken and the reason for the action?

A. Trip HPCI **only** to prevent moisture carryover into the steam lines.

B. Take manual control of HPCI and reduce flow to prevent reaching feedwater high level trip setpoint.

C. Trip HPCI and Feedwater pumps to prevent overflowing the main steam lines while pressurized.

D. Trip HPCI and Feedwater pumps to prevent violating MCPR and LHGR during a feedwater controller minimum demand failure.

References: OPL171.003 Rev.15 pg 26 and 27
Enabling Objective OPL171.003 B#7

A. Incorrect since feedwater pumps should also be tripped since they are approaching the high level trip setpoint. Also, RCIC should be tripped since it exceeded the trip setpoint of 51 inches.

B. Incorrect since HPCI should be tripped due to exceeding high level trip setpoint.

C. Correct answer.

D. Incorrect since the reason for tripping the equipment is to prevent exceeding MCPR and LHGR limits during a feedwater controller failure to maximum demand.

RO Tier:	T1G2	SRO Tier:	T1G2
Keyword:	MSIV	Cog Level:	C/A 2.8/2.8
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

49. 295009AK2.01 001

Unit 2 is making preparations to perform a startup after a maintenance outage. Reactor vessel level is being maintained at +33" with Loop I RHR in Shutdown Cooling. 2A Recirc Pump is operating at minimum speed.

Which ONE of the following instruments provide the most accurate level indication under these conditions?

A. LI 3-53 (0 to +60) on the 9-5 panel.

B. LI 3-58A (-155 to +60) on the 9-5 panel.

C. LI 3-208B (0 to +60) on the 9-3 panel.

D. LI 3-52 (-268 to +32) on the 9-3 panel.

References: OPL171.003 Rev. 15 pg 19-21

A. Correct since instrument is pressure compensated.

B. Incorrect since instrument is calibrated at normal operating temperatures and pressures.

C. Incorrect since this instrument is calibrated under hot conditions.

D. Incorrect since level band does not reach +33 inches.

RO Tier:	T1G1	SRO Tier:	T1G1
Keyword:	LEVEL INSTRUMENTS	Cog Level:	C/A 3.9/4.0
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

50. 295010AA1.01 001

During a loss of offsite power, which ONE of the following conditions would prevent the Drywell Air Cooler fans from operating?

A. Drywell pressure at 2.25 psig with reactor pressure at 435 psig.

B. Reactor water level at -110" with reactor pressure at 425 psig.

C. Reactor water level at +1" with reactor pressure at 475 psig.

D. ✓ Drywell pressure at 2.55 psig with reactor pressure at 440 psig.

References: OPL171.016 Rev.12 pg 70
OPL171.045 Rev.11 pg 12

A. Incorrect since Drywell pressure is below 2.45 psig.

B. Incorrect since Reactor water level is greater than -122".

C. Incorrect since Reactor water level is greater than -122" and pressure is greater than 450 psig.

D. Correct answer since Drywell pressure is greater than 2.45 psig and Reactor pressure is less than 450 psig.

RO Tier:	T1G1	SRO Tier:	T1G1
Keyword:	DRYWELL COOLING	Cog Level:	MEM 3.8/4.0
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

51. 295012AK2.01 001

The Unit 2 Reactor Operator notices that the Drywell Temperature is increasing slowly as reactor power is increased. He verifies the normal Drywell Cooling Units are in operation on Panel 2-9-25.

Which ONE of the following indicates the normal lineup of the Drywell Cooler Fans and the Drywell temperature that should be maintained?

A. 3 of 5 cooling units in each train should be operating and attempting to maintain Drywell temperature less than or equal to 135°F.

B. 4 of 5 cooling units in each train should be operating and attempting to maintain Drywell temperature less than or equal to 150°F.

C. ✓ All the Drywell cooling units should be in operation and attempting to maintain Drywell temperature less than or equal to 135°F.

D. 4 of 5 cooling units in each train should be operating and attempting to maintain Drywell temperature less than or equal to 150°F.

References: 2-OI-64 Rev.74 pg 13

A. Incorrect since 4 of 5 coolers should be operating in each train trying to maintain temp less than 135°F.

B. Incorrect since 4 of 5 coolers should be operating in each train trying to maintain temp less than 135°F.

C.Correct answer.

D. Incorrect since the coolers should be trying to maintain temp less than 135°F.

RO Tier:	T1G2	SRO Tier:	T1G2
Keyword:	DRYWELL COOLING	Cog Level:	MEM 3.4/3.5
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

52. 295013AK3.02 001

Which ONE of the following describes why the reactor must be shutdown immediately if the Suppression Pool temperature reaches >110°F?

A. To ensure that the design pressure of 56 psig is not reached during a Design Basis Accident.

B. To ensure that the pool is not heated beyond design limits by the steam generated if the reactor is not shutdown.

C. To maintain HPCI and RCIC OPERABLE since they exhaust into the suppression pool.

D. This ensures that the non-condensibles will remain in the suppression pool air space following a Design Basis Accident.

References: Tech Spec Bases 3.6.2.1, Suppression Pool Average Temperature pg B 3.6-57.

A. Incorrect since the design pressure that is being protected is 62 psig.

B. Correct answer.

C. Incorrect since pool temperature does not affect the operation of HPCI and RCIC.

D. Incorrect since the temperature limit also ensures that complete steam condensation occurs.

RO Tier:	T1G2	SRO Tier:	T1G1
Keyword:	SUPPRESSION CHAMBER	Cog Level:	MEM 3.6/3.8
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

53. 295014AA1.03 001

A startup is in progress with the RWM bypassed. A shift turnover has just been completed when the on coming peer check notices that two rods in RWM Group 6 (16-48) are at position 16 and the operator is pulling rods in Group 16.

Which ONE of the following describes the proper action to take?

A. Insert a manual scram.

B. Verify no indications of fuel damage and continue withdrawal of rods.

C. Stop rod withdrawal and notify the Shift Manager, Shift Technical Advisor, Operations Superintendent, and Reactor Engineer.

D. With the concurrence of the Reactor Engineer and Shift Manager withdraw the control rods to their required position and continue the startup.

References: 2-AOI-85-7, Section 4.2.1-4.2.3, rev. 14

A. Incorrect since this is not a required action.

B. Incorrect since must recover mispositioned control rods prior to normal rod withdrawal.

C. Correct answer. Operator must determine that control rod is mispositioned otherwise he doesn't notify the Operations Superintendent.

D. Incorrect since must notify other individuals prior to withdrawing mispositioned control rods to their correct position.

Note: Reworded stem slightly and reordered answers.

RO Tier:	T1G1	SRO Tier:	T1G1
Keyword:	REACTIVITY ADDITION	Cog Level:	MEM 3.5/3.5
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

54. 295014AA2.03 001

Which ONE of the following is a symptom of an inadvertent HPCI injection with the Unit at 100% RTP?

A. APRM flow comparator alarm.

B. Decrease in reactor pressure.

C. Recirc pump runback.

D. Positive reactor period.

RO Tier:		SRO Tier:	T1G1
Keyword:	HPCI	Cog Level:	C/A 4.0/4.3
Source:	B	Exam:	BF02301
Test:	S	Misc:	

55. 295015AK2.09 001

Unit 3 has received a Scram signal and all of the control rods fully inserted except one rod is still at position 48.

Per *3-AOI-100-1, Reactor Scram* which ONE of the following actions would detect this condition?

A. Verifying the "REFUEL MODE ONE ROD PERMISSIVE" light is lit with the Mode Switch in Shutdown.

B. Verifying the "REFUEL MODE ONE ROD PERMISSIVE" light is out with the Mode Switch in Refuel.

C. Pausing in START/HOT STBY for 5 seconds when moving the Mode Switch to Refuel.

D. Move the Mode Switch to Shutdown and back to Refuel to look for the "REFUEL MODE ONE ROD PERMISSIVE" light to be lit.

References: 3-AOI-100-1 Rev.29 pg 2

A. Incorrect since the ONE ROD PERMISSIVE light should only light with all rods in and the Mode Switch in Refuel.

B. Correct answer.

C. Incorrect since this action is taken if the scram is due to a loss of RPS.

D. Incorrect since there is no direction to move the Mode Switch back to Refuel once it is in Shutdown.

RO Tier:	T1G1	SRO Tier:	T1G1
Keyword:	REACTOR SCRAM	Cog Level:	MEM 3.5/3.6
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

56. 295016AA1.08 002

The control room has been abandoned.
All MSRV transfer switches at panel 25-32 have been placed in EMERGENCY.
All MSRV control switches at panel 25-32 have been checked in CLOSE.

Which ONE of the following statements below describes the operation of these MSRVs?

A. The associated ADS valves will open upon receipt of an ADS initiation signal.

B. Any associated ADS valve will open **only** when its control switch is placed in OPEN.

C. The associated ADS valves will open if their respective pressure relief setpoints are exceeded.

D. The associated ADS valves will open if their respective control switches on panel 9-3 are placed in OPEN.

References: OPL171.009 Rev.8 pg 22
Enabling Objective OPL171.009 #3

A. Incorrect since automatic operation of ADS is prevented with transfer switches in EMERGENCY.

B. Incorrect since valves will open when the pressure setpoint is reached.

C. Correct answer.

D. Incorrect since function from the 9-3 Panel is prevented with transfer switches in EMERGENCY.

RO Tier:	T1G2	SRO Tier:	T1G1
Keyword:	ADS	Cog Level:	MEM 4.0/4.0
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

57. 295016G2.2.3 001

The following conditions exist at Browns Ferry Nuclear Station:

- Both Unit 2 and 3 are in Hot Shutdown
- U1/2 4 KV Shutdown Board "A" supplied by Diesel Generator as sole source
- U3 4 KV Shutdown Board "3ED" supplied by Diesel Generator as sole source
- All other electrical equipment aligned normal

Which ONE of the following describes the effects on Unit 1/2 and U3 480 Volt Load Shed as a result of water level lowering to -130" on Unit 3 only (U2 water level remains normal)?

A. Unit 2 — Both Divisions 480 Volt Load Shed occurs
Unit 3 — Only Division II 480 Volt Load Shed occurs

B. Unit 2 — No 480 Volt Load Shed occurs
Unit 3 — Both Division 480 Volt Load Shed occurs

C. Unit 2 — No 480 Volt Load Shed occurs
Unit 3 — No 480 Volt Load Shed occurs

D. Unit 2 — Only Division I 480 Volt Load Shed occurs
Unit 3 — No 480 Volt Load Shed occurs

References: OPL171-072 Rev. 8

A,B and D are incorrect because, the accident signal is generated from unit 3 which does not initiate 480 volt load shed on unit 2. However would trip the DG output breakers on unit priority retrip but no 480 load shed received. Unit 3 480 load shed is divisionalized and senses which DG is supplying the 480 volt MCCs. 3ED is the only DG on U3 that is not capable of supplying the 480 volt system, thus has no input into load shed on unit 3 even though the accident signal is from that unit.

C. Correct answer.

RO Tier:		SRO Tier:	T1G1
Keyword:	CONTROL ROOM	Cog Level:	MEM 3.1/3.3
Source:	N	Exam:	BF02301
Test:	S	Misc:	TCK

58. 295017AA2.04 001

A release of radioactivity is in progress. The following radiological conditions are present:

Stack Gas Rad Monitors RM-90-147 & 148	rising radiation levels
Reactor Bldg/Refuel Zone Rad Monitors	reading normal levels
Turbine Bldg Exhaust Rad Monitor RM 90-250	rising radiation levels
Drywell Rad Monitors	rising radiation levels
Torus Rad Monitors	reading normal levels

Which ONE of the following describes the probable source of the release?

A. Main Steam leakage outside the Primary Containment.

B. Reactor Water Cleanup leakage outside the Primary Containment.

C. Fuel clad failure release thru the Offgas System.

D. Major airborne activity in the Radwaste Bldg.

References: OPL171.067 Rev.10 pg 19 - 22

A. Incorrect since the steam release is only through Primary Containment. Secondary Containment is still in tact.

B. Incorrect since the RWCU leak is through Primary Containment.

C. Correct answer. Turbine Bldg Vents take a suction from the Offgas Areas and the offgas also goes to the main stack. These are the only areas with increased rad levels other than the Drywell.

D. Incorrect since the Radwaste Bldg Ventilation has its own exhaust stack.

RO Tier:		SRO Tier:	T1G1
Keyword:	OFF SITE RELEASE	Cog Level:	C/A 3.6/4.3
Source:	M	Exam:	BF02301
Test:	S	Misc:	TCK

59. 295018AK3.03 001

Unit 2 is operating at 100% RTP. Alarm "RECIRC PUMP A COOLING WATER FLOW LOW" is received at 8:07 am on 10/22/02. It is confirmed that RBCCW Seal Cooling is lost to the 2A Recirc Pump but CRD seal purge is still in operation.

Which ONE of the following describes the actions that should be taken and the reason for that action?

A. ✓ Monitor seal temperatures and no further action is required; the Recirc Pump can be operated indefinitely under these conditions.

B. Restore RBCCW seal cooling by 8:14 am or Trip the 2A Recirc Pump; Recirc seal temperatures will exceed 200°F after 7 minutes.

C. Trip the 2A Recirc Pump immediately; Recirc seal temperatures will exceed 200°F in a short period of time.

D. Reduce 2A Recirc Pump speed to minimum by 8:14 am; the Recirc Pump can be operated indefinitely at minimum speed under these conditions.

References: 2-OI-68 Rev 91 pg 11
2-ARP-9-4A Rev. 18 pg 37

A. Correct answer.

B. Incorrect since the 7 minute time frame is when both CRD and RBCCW are lost to the Recirc Pump seals.

C. Incorrect since the Recirc Pump only needs to be tripped if seal cavity temperatures exceed 200°F.

D. Incorrect since the speed of the Recirc Pump doesn't need to be reduced.

RO Tier:	T1G2	SRO Tier:	T1G2
Keyword:	RECIRC SYSTEM	Cog Level:	C/A 3.1/3.3
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

60. 295020AA1.03 001

Unit 2 is holding load at 24% RTP after starting up from a refueling outage. Drywell inerting is in progress per *2-OI-76, Containment Inerting System.* A Scram occurs from Scram Air Header Low Pressure with the following conditions present:

- Oxygen concentration at 7% by volume and decreasing.
- Leak has been isolated.
- Mode Switch is in Shutdown.
- All rods are inserted.
- No entry conditions have been met for the EOI's.

Concerning the Drywell, which ONE of the following describes the status of inerting the containment?

A. Drywell inerting has been isolated due to a containment isolation when reactor water level decreased to +0" on the scram.

B. Drywell inerting has been isolated due to the Mode Switch being taken out of Run on the scram.

C. Drywell inerting is still in progress since there has not been an isolation signal processed for this event.

D. Drywell inerting is still in progress but will isolate when the PC PURGE DIV I AND II RUN MODE BYPASS switches are taken to NORMAL.

References: OPL171.032 Rev.10 pg 14-17
Enabling Objective OPL171.032 #4
2-OI-76 Rev.46 pg 10

A. Incorrect since reactor water level did not reach 0". Stem says no EOI's have been entered.

B. Incorrect since valves do not close when Mode Switch is taken out of Run.

C. Correct answer.

D. Incorrect since Mode Switch is no longer in Run.

RO Tier:	T1G2	SRO Tier:	T1G2
Keyword:	CONTAINMENT	Cog Level:	C/A 2.9/3.1
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

61. 295021AA2.04 001

The following conditions exist on Unit 3:

Reactor Water Level	+46"
Reactor Coolant Temp.	185°F
Reactor Pressure	0 psig
Rx Vessel Head bolted and torqued	
RHR loop 1 in shutdown cooling	
Both Recirculation Pumps off	

Which ONE of the following describes the operational consequence of the Inboard Shutdown Cooling Valve (FCV 74-48) failing closed?

A. Transition boiling will occur immediately causing fuel cladding damage.

B. Damage could occur to the running RHR pump since it no longer has a suction path.

C. Coolant temperature may rise unmonitored and change the reactor condition from MODE 4 to MODE 3.

D. Since the valve is a failed PCIV then the Outboard Shutdown Cooling Valve (FCV 74-47) must be closed and deactivated.

References: 3-AOI-74-1 Rev. 25 pg 1 and 4
Tech Specs 3.6.1.3, Primary Containment Isolation Valves (PCIVs)

A. Incorrect since transition boiling may not occur for a long period of time.

B. Incorrect since the RHR pump will trip if it loses its suction path.

C. Correct answer.

D. Incorrect since the outboard isolation valve does not need to be closed. The failed valve can be used as the isolation valve.

RO Tier:		SRO Tier:	T1G2
Keyword:	SHUTDOWN COOLING	Cog Level:	C/A 3.2/3.3
Source:	B	Exam:	BF02301
Test:	S	Misc:	TCK

62. 295022G2.1.20 001

The following conditions exist on Unit 2 when the 2A CRD Pump trips on overcurrent:

Mode Switch position	START/HOT STBY
Reactor Pressure	800 psig
Reactor Temperature	485°F
1B CRD Pump	Out-of-Service
Plant heatup in progress	

Which ONE of the following should the Unit Supervisor direct the Reactor Operator to perform ?

A. Scram the reactor if 2 or more scram accumulator alarms are received AND charging water pressure cannot be restored to 940 psig within 20 minutes.

B. Monitor CRD temps and attempt to return 1B CRD Pp to service. Scram the reactor if CRD temps exceed 350°F.

C. Manually Scram the reactor and place the Mode Switch in Shutdown immediately.

D. Attempt to restart the 2A CRD Pump. If the pump fails to start then commence a normal shutdown.

References: 2-AOI-85-3 Rev.20 pg 3 and 4

A. Incorrect since these actions are taken if Rx pressure is >900 psig.

B. Incorrect since you do not wait to return a CRD Pp to service.

C. Correct answer.

D. Incorrect since you do not perform a normal shutdown and you do not try to restart a pump on overcurrent.

RO Tier:		SRO Tier:	T1G2
Keyword:	CRD SYSTEM	Cog Level:	C/A 4.3/4.2
Source:	N	Exam:	BF02301
Test:	S	Misc:	TCK

63. 295023AK3.02 001

Interlocks or limit switches on the refueling equipment are provided for specific protective functions.

Which ONE of the following describes these protection devices?

A. The Refueling Interlocks are not required during fuel handling as long as there is a second qualified individual performing the functions of the interlocks.

B. Jumpering a refueling interlock should not cause the refuel bridge operator any concern as long as a TACF tag is clearly visible at the controls.

C. Switches and interlocks act as a backup protection rather than principle means for stopping travel of the refueling equipment.

D. Fuel handlers may rely on limits and interlocks to terminate refuel equipment travel, as long as they are within their surveillance frequency.

References: 0-GOI-100-3A Rev. 29 pg 14

A. Incorrect because Tech Specs do not allow for a second qualified individual to take the place of the refueling interlocks.

B. Incorrect since jumpering interlocks is a concern.

C. Correct answer.

D. Incorrect since the operators should not rely on the interlocks.

RO Tier:	T1G3	SRO Tier:	T1G1
Keyword:	REFUELING	Cog Level:	MEM 3.4/3.8
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

64. 295024EK1.01 001

Given the following conditions:

- Suppression Chamber pressure 53.0 psig
- Drywell temperature 350°F
- RPV pressure 425 psig

Which ONE of the following is the reason why the Drywell or the Suppression Chamber is vented under these conditions irrespective of offsite release rates?

A. Pressure capability of the containment will be reached if Suppression Chamber pressure reaches 55 psig.

B. The maximum containment pressure that the vent valves can be opened and closed to reject decay heat will be reached at 55 psig.

C. The maximum containment pressure that the MSRV's can be opened and remain open will be reached at 55 psig.

D. Chugging is prevented if the containment is vented prior to reaching 55 psig.

References: OPL171.203 Rev. 5 pg 29 and 36
Enabling Objective OPL171.203 #8

A. Incorrect since the pressure capability of the containment is approx. 100 psig.

B. Correct answer.

C. Incorrect since the pressure limit for the MSRV's is 65 psig.

D. Incorrect since chugging depends on the amount of non condensibles in the containment.

RO Tier:	T1G1	SRO Tier:	T1G1
Keyword:	CONTAINMENT	Cog Level:	MEM 4.1/4.2
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

65. 295025EA2.03 001

The following conditions exist on Unit 3:

Reactor scrammed due to stuck open relief valve.

Reactor pressure	500 psig
Suppression Pool level	15 FT
Suppression Pool temperature	200°F increasing 1°F/min

Which ONE of the following actions should the Unit Supervisor direct the RO to perform?
(Refer to 3-EOI-1 and 2)

A. Emergency Depressurize the reactor.

B. Lower reactor pressure to 300 psig without exceeding 100°F cooldown rate.

C. Exit pressure control and enter steam cooling.

D. Lower reactor pressure to 300 psig irrespective of cooldown rate.

References: 3-EOI-1 Rev.5

A. Incorrect since procedure directs lowering reactor pressure to within curve 3 limits irrespective of cooldown rates.

B. Incorrect since procedure directs lowering reactor pressure to within curve 3 limits irrespective of cooldown rates.

C. Incorrect since steam cooling is not required.

D. Correct answer per Curve 3 and override RC/P-7.

RO Tier:		SRO Tier:	T1G1
Keyword:	HEAT CAPACITY	Cog Level:	C/A 3.9/4.1
Source:	N	Exam:	BF02301
Test:	S	Misc:	TCK

66. 295025EK1.06 001

The Unit 2 Mode Switch is in the S/U position with the Unit at normal operating pressure and temperature following a short maintenance outage. The RVLIS system is out-of-service at this time. The Wide Range level instruments (+60 to -155") are reading approximately +34" at this time.

Which ONE of the following describes the accuracy of the instruments under these conditions?

A. The instruments are showing accurate level indication due to being calibrated for normal operating pressure and temperature.

B. The instruments are NOT showing accurate level indication due to being calibrated for cold shutdown conditions.

C. The instruments are showing accurate level indication because they are within the level range of the instruments.

D. The instruments are NOT showing accurate level indication because the RVLIS system is not providing flow to the reference leg fill lines.

Reference: OPL171.003 Rev. 15 pg 20

A. Correct answer.

B. Incorrect since the instruments are calibrated for hot conditions.

C. Incorrect since being within the indicated range doesn't mean that the instrument is accurate.

D. Incorrect since RVLIS has no affect on how the instrument reads. It does have an affect on the indication when a rapid depressurization occurs.

RO Tier:	T1G1	SRO Tier:	T1G1
Keyword:	LEVEL INSTRUMENTS	Cog Level:	C/A 3.9/4.0
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

67. 295026G2.1.12 001

Unit 2 is conducting a plant startup per 2-GOI-100-1A, "Unit Startup and Power Operation", and surveillance 2-SR-3.5.1.8, "HPCI Main and Booster Pump Set Developed Head and Flow Rate Test at 150 psig" is in progress. The following conditions exist:

Suppression Pool water temperature is 98°F and rising.
Both loops of Suppression Pool cooling are in service.

The Unit Supervisor is implementing the actions of EOI-2,"Primary Containment Control".

In accordance with Unit 2 Technical Specifications, which ONE of the following actions is required once Suppression Pool temperature exceeds 105°F?

A. Place the Reactor Mode Switch in SHUTDOWN.

B. Suspend all testing that adds heat to the Suppression Pool.

C. Reduce THERMAL POWER to range 7 on IRM's within 12 hours.

D. Depressurize the reactor vessel to less than 200 psig within 12 hours.

References: Tech Specs 3.6.2.1, Suppression Pool Average Temperature

A. Incorrect since the Mode Switch doesn't need to be placed in Shutdown until average Suppression Pool temperature exceeds 110°F.

B. Correct answer.

C. Incorrect since this is done if cannot meet Required Action and associated Completion time of Condition A.

D. Incorrect since this is performed if average Suppression Pool temperature exceeds 120°F.

RO Tier:		SRO Tier:	T1G1
Keyword:	SUPPRESSION CHAMBER	Cog Level:	MEM 2.8/3.1
Source:	B	Exam:	BF02301
Test:	S	Misc:	

68. 295028EK3.01 001

Which ONE of the following describes the reason why Emergency Depressurization is required if Drywell Temperature cannot be maintained below 280°F?

A. At this temperature all of the RPV level instruments are affected such that there is no reliable level indication and RPV flooding is required.

B. ✓ Primary Containment has reached the structural design limit and actions are required to minimize further release of energy from the RPV.

C. Ensures the increase in Drywell pressure does not result in exceeding the Heat Capacity Temperature Limit.

D. Above 280°F containment failure is emminent which would cause the release rates at the site boundary to reach 10 CFR 100 limits.

References: OPL171.203 Rev.5 pg 26

A. Incorrect since these conditions do not make all of the level instruments unreliable.

B. Correct answer.

C. Incorrect since the containment is threatened and not the EQ equipment.

D. Incorrect since containment failure is not emminent and it would not cause the 10 CFR limits to be exceeded.

RO Tier:	T1G2	SRO Tier:	T1G2
Keyword:	EOI INSTRUCTIONS	Cog Level:	MEM 3.6/3.9
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

69. 295029EK1.01 001

Unit 2 is operating at 100% RTP. The Suppression Pool water level is required to be maintained at ≥ -6.25 inches and ≤ -1.0 inches.

Which ONE of the following is available to protect the containment against overpressurization if Suppression Pool water level is allowed to go above the maximum level?

A. Drywell Cooling.

B. Reactor Building-to-Suppression Chamber Vacuum Breakers.

C. ✓ Drywell Spray system.

D. Residual Heat Removal (RHR) Suppression Pool Cooling System.

References: Tech Spec Bases Section B 3.6.2.2 pg B 3.6-66

A. Incorrect since these valves protect the Drywell from negative pressure upon inadvertent operation of the Drywell Spray system.

B. Incorrect since these valves protect the Suppression Chamber from negative pressure upon inadvertent operation of the Suppression Pool Spray system.

C. Correct answer.

D. Incorrect since this system is needed to maintain the containment within design temperature limitations.

RO Tier:	T1G2	SRO Tier:	T1G2
Keyword:	PRIMARY CONTAINMENT	Cog Level:	C/A 3.4/3.7
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

70. 295030EA1.02 002

The following conditions exist on Unit 2:

Reactor Water Level	-60" and steady
Reactor Pressure	920 psig
Suppression Chamber Level	9 ft
Drywell Pressure	1.3 psig
Suppression Pool Temperature	98°F
RCIC Pump Room Temperature	150°F

CST Suction not available
Operator reports leak on suction header of Torus.

The Reactor Operator informs the Unit Supervisor that the RCIC turbine has tripped.

Which ONE of the following is the most likely cause of the turbine trip?

A. High RCIC Pump room temperature.

B. High RCIC exhaust pressure.

C. ✓ Low suction pressure.

D. High Reactor Water Level.

References: OPL171.040 Rev.18 pg 29 and 30
Enabling Objective OPL171.040 #5

A. Incorrect since the High RCIC Room Temperature isolation is at 160°F.

B. Incorrect since high exhaust pressure can't happen if Drywell pressure is low.

C. Correct answer based on low Drywell pressure and low torus level.

D. Incorrect since the High Reactor Water Level trip is +51".

RO Tier:	T1G2	SRO Tier:	T1G1
Keyword:	RCIC SYSTEM	Cog Level:	C/A 3.4/3.5
Source:	N	Exam:	BF02301
Test:	C	Misc:	

71. 295030EK2.01 001

Unit 3 EOI-2, "Primary Containment Control", has the operators perform the following action if suppression pool water level CANNOT be maintained above 12.75 feet.

Secure HPCI irrespective of adequate core cooling.

Which ONE of the following HPCI system responses will this action prevent?

A. Overpressurization of the primary containment.

B. Loss of back pressure on the exhaust line.

C. HPCI exhaust check valve chatter.

D. Unstable HPCI operation.

References: OPL171.203 Rev 5 pg 50 & 51
Enabling Objective OPL171.203 #7

A. Correct answer.

B. Incorrect since the exhaust line will still have the backpressure from the torus airspace.

C. Incorrect since water level in the torus doesn't affect the HPCI exhaust check valve.

D. Incorrect since torus water level doesn't affect HPCI operation.

Note: Reordered answers.

RO Tier:	T1G2	SRO Tier:	T1G1
Keyword:	HPCI	Cog Level:	MEM 3.8/3.9
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

72. 295031EA2.04 001

The following conditions exist on Unit 2 after a scram from 100% power:

Reactor Power	6%
SLC	INJECTING
Reactor Water level	UNKNOWN
Suppression pool temp	105 degrees F
Suppression Pool Pressure	3.0 psig
Drywell Pressure	3.0 psig
Six ADS valves	OPEN
RPV injection	Stopped and Prevented per Appx. 4

Which ONE of the following indicates the reactor pressure at which injection to the vessel should be reestablished?
(Supply copy of EOI-1 and C-4)

A. When reactor pressure is below 65 psig.

B. When reactor pressure is below 68 psig.

C. When reactor pressure is below 180 psig.

D. When reactor pressure is below 220 psig.

References: 2-EOI-1 Rev. 8
C-4 Rev. 6

A. Incorrect since this is the pressure that needs to be above Suppression Chamber if the reactor will stay shutdown under all conditions.

B. Incorrect since this pressure added to Suppression Chamber pressure is the pressure required to be maintained if the reactor will stay shutdown under all conditions.

C. Correct answer with 6 or more MSRV's open.

D. Incorrect since this is the pressure with only 5 MSRV's open.

RO Tier:		SRO Tier:	T1G1
Keyword:	RPV FLOODING	Cog Level:	C/A 4.6/4.8
Source:	B	Exam:	BF02301
Test:	S	Misc:	TCK

73. 295031EK3.05 001

A loss of all high pressure injection systems has resulted in RPV level lowering to TAF. An emergency RPV depressurization has been directed.

Which ONE of the following states the reason that a minimum of 4 MSRVs must be opened?

A. ✓ Ensures that sufficient steam flow will exist to remove decay heat at low enough pressure for the lowest head ECCS pump to make up for steam flow.

B. Ensures that at the worst case in core life, the APLHGR thermal limit will not be exceeded and inhibit adequate radiant heat transfer.

C. Ensures that the reactor will be depressurized to below ECCS shut off head before the RPV level reaches two thirds core height.

D. Prevents exceeding 1% plastic strain on the hottest fuel pin in the core allowing fuel cladding failure to release radioactive fission products.

References: OPL171.205 Rev. 4 pg 29

A. Correct answer.

B,C and D are incorrect since 4 relief valves open do not affect these conditions.

RO Tier:	T1G1	SRO Tier:	T1G1
Keyword:	EMERG DEPRESS	Cog Level:	MEM 4.2/4.3
Source:	B	Exam:	BF02301
Test:	C	Misc:	

74. 295032EK3.03 001

Which ONE of the following is the basis for the Main Steam Line (MSL) Tunnel high temperature isolation?

A. Protect the integrity of the secondary containment and ensure the continued operability of safe shutdown equipment.

B. Prevent exceeding the Environmental Qualification temperature limits on the MSIV control air solenoids.

C. Minimize radioactive releases to the environment and limit the inventory loss from the reactor under all accident conditions.

D. Limit the escape of radioactivity from the MSL Tunnel to the Reactor Building HVAC system.

PCIS purpose

BSEP BANK LOI-CLS-LP-012A*017001

RO Tier:	T1G3	SRO Tier:	T1G2
Keyword:	MAIN STEAM	Cog Level:	MEM EK3.03
Source:	B	Exam:	BF02301
Test:	C	Misc:	

75. 295033EK2.01 002

Unit 2 is in a Refueling outage with work in progress on the Turbine Floor. When the High Pressure Turbine casing is removed the radiation levels increase significantly.

Which ONE of the following describes the indications available to the Control Room Operator due to the increased radiation levels and the actions required to be taken?

A. Turbine Bldg ventilation trips and isolates. The Control Room Operator announces evacuation of turbine floor and contacts RADCON.

B. Reactor Bldg ventilation trips and isolates. SGT starts automatically. The Control Room Operator announces evacuation of the turbine floor and contacts RADCON.

C. TURBINE BLDG AREA RADIATION HIGH Alarm sounds. The Control Room Operator announces evacuation of the turbine floor, contacts RADCON and monitors other alarms with inputs to this annunciator.

D. TURBINE BLDG AREA RADIATION HIGH Alarm sounds. The Control Room Operator notifies Unit Supervisor this is an expected alarm since the turbine casing is being removed.

References: OPL171.034 Rev.8 pg 16
2-ARP-9-3A Rev.18 pg 31
Enabiling Objective OPL171.034 B5

A. Incorrect since Turbine Building vents do not trip.

B. Incorrect since Reactor Building vents do not trip.

C. Correct answer.

D. Incorrect since this is not an expected alarm. The ARP actions should be followed.

RO Tier:	T1G2	SRO Tier:	T1G2
Keyword:	RAD MONITORS	Cog Level:	C/A 3.8/4.0
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

76. 295034EK1.01 001

Which ONE of the following describes why the Reactor Zone and Refueling Floor Exhaust Radiation - High allowable values are set at their current levels?

A.✓ They provide timely detection of system process barrier leaks inside containment but are far enough above background levels to avoid spurious isolations.

B. They provide positive indication of system leaks but they are low enough to ensure proper instrument indications.

C. The values are set to ensure the isolation function is fast enough to prevent exceeding the 10 CFR 20 exposure limits at the site boundary.

D. The values are set such that trends are able to be determined before the isolations occur.

References: Tech Spec Section 3.3 Bases pg B 3.3-251

A. Correct answer.

B,C and D. Incorrect per Bases statement.

RO Tier:	T1G2	SRO Tier:	T1G2
Keyword:	SECONDARY CONTAINMEN	Cog Level:	MEM 3.8/4.1
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

77. 295036EK2.03 001

A relief valve is leaking on the Unit 2 RBCCW system which is causing the Reactor Building Equipment Drain Sump to fill up. The Reactor Building Equipment Drain Sump Pump has started.

Which ONE of the following identifies the first indication that Radwaste will see due to the increased leakage?

A. Chemical Waste Tank level will increase.

B. Floor Drain Collector Tank level will increase.

C. Waste Collector Tank level will increase.

D. Waste Surge Tank level will increase.

References: OPL171.084 Rev.3 pg 17

A. Incorrect since the water from the Reactor Bldg Equipment Drain Sump goes to the Waste Collector Tank first.

B. Incorrect since the water from the Reactor Bldg Equipment Drain Sump goes to the Waste Collector Tank first.

C. Correct answer.

D. Incorrect since the water from the Reactor Bldg Equipment Drain Sump goes to the Waste Collector Tank first.

RO Tier:	T1G3	SRO Tier:	T1G2
Keyword:	RADWASTE	Cog Level:	C/A 2.8/3.1
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

78. 295037EA1.04 001

The reactor has experienced an ATWS and you have been directed to initiate SLC injection. SLC Pump A was started at 0700 with the tank level at 65%. The following conditions exist at 0730 for SLC Pump A:

* Red Light On
* Squib Continuity Lights Off
* Flow Light On
* Alarm "SLC Injection Flow to Reactor"
* Alarm "SLC Squib Valve Continuity Lost"
* SLC Pressure 1200 psig
* Reactor Pressure 1000 psig
* Tank Level 55%

Which ONE of the following is the appropriate action to take?

A. Start SLC Pump B and continue running SLC Pump A.

B. Stop SLC Pump A and start SLC Pump B.

C. Initiate Alternate SLC Injection.

D. Continue running SLC Pump A.

References: OPL171.039 Rev. 13 pg 17, 26 and 27
2-OI-63 Rev. 26 pg 4
Enabling Objective OPL171.039 # 4

A. Incorrect since an interlock is installed to prevent running both pumps at the same time.

B. Correct answer since tank level should be down to 55% if SLC Pump A was operating properly.

C. Incorrect since B SLC Pump should be started first.

D. Incorrect since A SLC Pump is pumping at a degraded rate.

RO Tier:	T1G1	SRO Tier:	T1G1
Keyword:	SLC	Cog Level:	C/A 4.5/4.5
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

79. 295038EK3.01 001

An accicent has happened on Unit 2 which causes radiation levels at the site boundary to reach 11 mRem/Hr. An ALERT has been declared by the Shift Manager.

Which ONE of the following describes why the Emergency Plan was implemented for this condition?

A. Ensures that all individuals are accounted for at the time of the accident.

B. Provides protective measures only for TVA employees and contractors located on the site at the time of the accident.

C. Ensures lines of communication are established between the site and the NRC.

D. Provides protective measures for TVA employees and the public.

References: OPL171.075 Rev.17 pg 9
Enabling Objective OPL171.075 #B1

A. Incorrect since implementing the Emergency Plan does not ensure all people are accounted for.

B. Incorrect since it also provides protective measures for the public.

C. Incorrect since implementing the Emergency Plan does not mean that communication lines are open with the NRC.

D. Correct answer.

RO Tier:	T1G2	SRO Tier:	T1G1
Keyword:	EMERGENCY PLAN	Cog Level:	MEM 3.6/4.5
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

80. 295038G2.3.4 001

Unit 2 has experienced a severe accident.

Which ONE of the following conditions would require EMERGENCY DEPRESSURIZATION per *EOI-4, Radioactivity Release Control*?

A. Release rates above an ALERT due to fuel failure and a leak from the suppression pool.

B. Release rates exceeding an Unusual Event classification and there is an unisolable leak from the HPCI steam line.

C. Release rates approaching a General Emergency and there is an unisolable steam leak in the turbine building.

D. Release rates exceeding a General Emergency but no indications of a primary system discharging outside of containment.

References: EOI-4, Radioactive Release Control, Rev.5

A. Incorrect since lowering reactor pressure would not slow down the leak.

B. Incorrect since release rate is below the alert level and not approaching the General Emergency level.

C. Correct answer.

D. Incorrect since nothing is being discharged outside of primary or secondary containment.

RO Tier:		SRO Tier:	T1G1
Keyword:	RADIATION CONTROL	Cog Level:	MEM 2.5/3.1
Source:	B	Exam:	BF02301
Test:	S	Misc:	TCK

81. 300000K4.03 001

The Raw Cooling Water regulating valve to the "A" Control Air Compressor has failed closed.

Which ONE of the following conditions would trip the "A" Control Air Compressor?

A. Air discharge temperature reading 312°F.

B. Air discharge temperature reading 128°F.

C. Lube oil temperature reading 175°F.

D. Seal Air Pressure reading 8 psig.

References: OPL171.054 Rev.4 pg 13, 41 and 45
Learning Objective OPL171.054 #2

A. Correct answer.

B. Incorrect but it is correct for the G Compressor.

C. Incorrect since Lube Oil Hi Temp trip is 180°F.

D. Incorrect but it is correct for the G Compressor.

RO Tier:	T2G2	SRO Tier:	T2G2
Keyword:	CONTROL AIR	Cog Level:	MEM 2.8/2.8
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

82. 500000EK2.07 001

An event has occurred on Unit 3 with the following conditions present:

Drywell Pressure	30 psig
Drywell Temperature	275°F
SGT Systems	"A" out of service, "B" and "C" fail to start
SGT Inlet pressure	+0.5 psig
CAD System	Shutdown

The Unit Supervisor has ordered the Drywell to be vented due to high H2 concentrations per Appendix 12.

Which ONE of the following describes the reason why the Drywell CANNOT be vented at this time?

A. SGT System is NOT in operation.

B. SGT System inlet pressure is too high.

C. Drywell pressure is too high.

D. Drywell temperature is too high.

References: 3-OI-83 Rev. 17 pg 5
OPL171.032 Rev.10 pg 21
Enabling Objective OPL171.032 #B.4

A. Correct answer.

B. Incorrect since the pressure for the SGT inlet is .79 psig.

C. Incorrect since High Drywell pressure prevents nitrogen purge.

D. Incorrect since Drywell Temp does not affect venting the containment.

RO Tier:	T1G1	SRO Tier:	T1G1
Keyword:	DRYWELL VENTING	Cog Level:	C/A 3.2/3.7
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

83. 600000G2.4.27 001

A fire rated door that is required to be OPERABLE is found to be propped open with work in progress on one side of the door. There is no fire detection equipment available to protect either side of the fire door. The door is located in a contamination zone.

Which ONE of the following is the MINIMUM action that must be taken to compensate for having the fire door propped open per BFNP FIRE PROTECTION PLAN?

A. Establish a roving hourly fire watch to monitor the both areas until the door is restored to an operable status.

B. If hot work is to be performed in either of the adjacent rooms, establish a continuous fire watch on either side of the open door.

C. No compensatory actions are required as long as the fire door is verified to be closed at least one time daily.

D. Establish a continuous/dedicated fire watch to monitor the impaired fire door area until the door is restored to an operable status.

References: Fire Protection Plan Vol.1 Rev.17 pg 25
Modified so that the examinee must determine that the door is inoperable.

A. Incorrect since a continuous/dedicated fire watch is required until the door is restored to operable status.

B. Incorrect since a continuous/dedicated fire watch is required until the door is restored to operable status.

C. Incorrect since the fire door is inoperable and compensatory actions are required.

D. Correct answer.

RO Tier:		SRO Tier:	T1G2
Keyword:	FIRE PROTECTION	Cog Level:	C/A 3.0/3.5
Source:	M	Exam:	BF02301
Test:	S	Misc:	TCK

9.3/9.4 FIRE PROTECTION SYSTEMS LIMITING CONDITION FOR OPERATING AND SURVEILLANCE REQUIREMENTS (continued)

9.3.11.G FIRE-RATED ASSEMBLIES	9.4.11.G FIRE-RATED ASSEMBLIES
1. All fire barrier assemblies, including walls, floor/ceilings, conduit wraps, and other fire barriers; separating fire areas or separating systems important to safe shutdown within a fire area; and all sealing devices in fire rated assembly penetrations, including fire doors shown in Table 9.3.11.E, fire dampers shown in Table 9.3.11.F, and fire-rated cable and piping penetration seals, shall be OPERABLE at all times. Fire barriers are identified by compartmentation drawings 47W216-51 through 62. [NRC/C] a. With one or more of the required fire-rated assemblies and/or sealing devices inoperable, a.1 Establish a continuous fire watch on one side of the affected assembly if no fire detection (as listed in Table 9.3.11.A) is available to protect either side of the inoperable barrier. or a.2 Establish a roving fire watch on one side of the affected assembly if fire detection (as listed in Table 9.3.11.A) is OPERABLE to protect at least one side of the inoperable barrier. [NCO 880210002]	1. Each of the required fire-rated assemblies and penetration sealing devices shall be verified OPERABLE: a. At least once per 18* months by performing a visual inspection of the exposed surfaces of each fire-rated assembly**, b. At least once per 12 months by performing a visual inspection of 20% of the fire damper and the associated hardware. Dampers shall be selected, such that each damper will be inspected at least once per 5 years. * (Once per operating cycle for areas inside the Steam Tunnel and top of torus areas of Unit(s) 2 and/or 3 Reactor Building(s). ** (Includes walls, floors, ceilings, fire wraps, structural fireproofing, and penetration seals.)

9.3/9.4 **FIRE PROTECTION SYSTEMS LIMITING CONDITION FOR OPERATING AND SURVEILLANCE REQUIREMENTS** (continued)

9.3.11.G FIRE-RATED ASSEMBLIES (contd.)	9.4.11.G FIRE-RATED ASSEMBLIES (contd.)
a.3 No compensatory measures required if fire detection (as listed in Tables 9.3.11.A) is OPERABLE to protect both sides of the inoperable barrier.	2. Each of the required fire doors shall be verified OPERABLE by inspecting the automatic hold-open, release, and closing mechanisms and latches at least semiannually and by verifying: a. The OPERABILITY of the fire door supervision system for each electrically supervised fire door by performing a CHANNEL FUNCTIONAL TEST at Least monthly. b. That each locked-closed fire door is verified closed at least weekly. c. That doors with automatic hold-open and release mechanisms are free of obstructions at least daily and perform a FUNCTIONAL TEST of these mechanisms at least once per 18 months. d. That each unlocked normally closed fire door without electrical supervision is verified close at least daily.

9.3.11.H OPEN FLAMES, WELDING AND BURNING IN THE CABLE SPREADING ROOM

Hot work activities during plant operation, shall only be permitted on a case by case basis, after a satisfactory evaluation by Fire Operations and Site Engineering (Mechanical). The evaluation will specifically address accessibility to the area by site fire brigade, accessibility of manual fire fighting equipment, ventilation, and exposure protection. In addition, a member of the fire brigade shall be present in the area and a continuous fire watch shall be provided during performance of any hot work activity.

TABLE 9.3.11.E
FIRE RATED DOORS

DOOR NO.	LOCATION	DETECTION PANEL	DOOR NO.	LOCATION	DETECTION PANEL
30	R7-N 519	NONE	500	R14-P 593	0-LPNL-25-555
31	R7-R 519	NONE	501	R14-T 593	2-LPNL-25-546
34	R8-R 519	2-LPNL-25-545	506	R16-T 593	3-LPNL-25-546
35	R8-N 519	2-LPNL-25-545	510	R21-P 593	0-LPNL-25-555
36	R14-N 519	2-LPNL-25-545	514	R21-R 593	0-LPNL-25-555
37	R14-R 519	2-LPNL-25-545	531	R2-N 606	0-LPNL-25-556
40	R15-R 519	NONE	539	R1-S 593	NONE
41	R15-N 519	NONE	541	R14-S 593	0-LPNL-25-555
42	R7-T 541	NONE	600	R2-N 617	0-LPNL-25-557
43	R8-T 541	2-LPNL-25-545	630	R1-P 621	0-LPNL-25-557
44	R14-T 541	2-LPNL-25-545	631	R1-S 621	NONE
45	R15-T 541	NONE	632	R2-S 621	NONE
221	R7-N 565	1-25-286	632A	R1-S 621	NONE
*235	R8-M 565	2-LPNL-25-545	635	R6-T 621	1-25-303
*237	R9-M-565	2-LPNL-25-545	637	R2-S 621	NONE
240	R8-T 565	2-LPNL-25-545	640	R8-T 621	2-LPNL-25-547
242	R14-T 565	2-LPNL-25-545	642	R13-P 621	0-LPNL-25-557
244	R14-N 565	2-LPNL-25-545	643	R13-S 621	0-LPNL-25-557
*248	R15-M 565	3-LPNL-25-545	644	R14-S 621	0-LPNL-25-557
*250	R16-N 565	3-LPNL-25-545	644A	R14-S 621	0-LPNL-25-557
298	R1-Q 583	0-LPNL-25-544	647	R15-T 621	2-LPNL-25-547
455	R2-N 593	0-LPNL-25-555	649	R13-S 621	0-LPNL-25-557
460	R3-N 593	0-LPNL-25-555	651	R16-T 621	3-LPNL-25-547
462	R4-N 593	0-LPNL-25-555	654	R21-P 621	0-LPNL-25-557
462A	R4-N 593	0-LPNL-25-555	655	R21-R 621	0-LPNL-25-557
466	R9-N 593	0-LPNL-25-555	656	R20-R 621	0-LPNL-25-557
466A	R10-N 593	0-LPNL-25-555	658	R20-R 621	0-LPNL-25-557
468	R10-N 593	0-LPNL-25-555	672	R8-T 639	2-LPNL-25-547
476	R18-N 593	0-LPNL-25-555	673	R14-T 639	2-LPNL-25-547
476A	R19-N 593	0-LPNL-25-555	810	U3DGB 565	3-LPNL-25-543
479	R19-N 593	0-LPNL-25-555	811	U3DGB 565	3-LPNL-25-543
482	R20-N 593	0-LPNL-25-555	812	U3DGB 565	3-LPNL-25-543
485	R1-P 593	0-LPNL-25-555	824	U3DGB 583	3-LPNL-25-543
490	R6-T 593	1-25-287	825	U3DGB 583	3-LPNL-25-543
497	R8-T 593	2-LPNL-25-546	827	R21-P 593	0-LPNL-25-555

[NRC/C] Fire doors and associated fire detection panels [NRC NCO 890198001]

The following list of doors must be breached simultaneously in order to have a fire protection assembly out of service requiring compensatory measures to be taken: Door(s) 30/35, 31/34, 36/41, 37/40, 42/43, 44/45.

NOTE: In accordance with SER-Appendix R Exemptions A02-881027-003, Section 3.1.2.1 fire doors of the main steam and feedwater piping tunnels, door nos. 220, 239 and 252 are exempt from surveillance, testing and the administrative control program.

In accordance with the Fire Hazard Analysis for Fire Areas 1 and 3, Fire Zone Doors 490 and 635 are not required within Fire Area 1 when Unit 2 and/or Unit 3 is the only operating unit. Fire Zone Doors 506 and 651 are not required within Fire Area 3 when Unit 2 and/or Unit 1 is the only operating unit.

*Credit will be taken for detection capabilities within the Reactor Building due to lack of any combustibles within the air locks.

TABLE 9.3.11.F

FIRE RATED DAMPERS

DAMPER NO.	UNID NO.	ROOM LOCATION	COORDINATE LOCATION	DAMPER NO.	UNID NO.	ROOM LOCATION	COORDINATE LOCATION
				102	1-31-2631	4KV SDBR 1A	R2-P 631
103	2-31-2645	4KV SDBR 2C	R13-P 631	104	2-31-2636	4KV SDBR 2C	R14-P 631
106	1-31-2633	480V SDBR 1A	R2-S 631				
108	1-31-2634	480V SDBR 1B	R2-S 631				
110	2-31-2643	480V SDBR 2A	R13-S 631	111	2-31-2644	480V SDBR 2B	R14-S 631
112	2-31-2641	480V SDBR 2B	R 14-S 635	113	2-31-2642	480V SDBR 2A	R14-T 635
114	0-39-805	CBL SPR RM A	R8-N	115	1-XFD-31-2652	BATT RM 1	R3-N
116	1-XFD-31-2651	BBR 1	R4-N	117	1-XFD-31-2650 A&B	MG SET RM1 (upper & lower)	R4-N
119	0-39-804	TB 1	T4-N	120	0-39-803	TB 1	T8-N 604
121	0-39-802	TB 2	T7-N 604	122	1-30-642	RW BLDG EQ RM	W7-WF 585
127	3-31-2640	4KV SDBR 3E	R20-P 631	128	3-31-2639	480V SDBR 3A	R20-R 633
131	0-39-800	TB 3	T13-M 604	132	0-39-801	TB 3	T14-M 603
133	3-31-2539	BBR 3	R 18-P 604	134	3-31-2504	BBR 3	R19-N 602
135	3-31-2569	BBR 3	R 19-N 602	136	3-31-2584	MG SET RM 3	R19-N 602
137	3-31-2505	BBR 3	R18-N 602	138	3-31-2583	MG SET RM 3	R18-N 602
139	3-31-2582	RECORD STORAGE RM	R20-N 602				
140	3-31-2648	RECORD STORAGE RM	R1-P 602	141	3-31-2503	BATT RM 3	R20-N 602

TABLE 9.3.11.F (continued)

FIRE RATED DAMPERS

DAMPER NO.	UNID NO.	ROOM LOCATION	COORDINATE LOCATION	DAMPER NO.	UNID NO.	ROOM LOCATION	COORDINATE LOCATION
144	DELETED			145	0-31-2520	BATT RM 2	R3-P 631
146	1-31-2578	AUX INST RM 1	R2-S 602	147	1-31-2518	MG SET RM 1	R4-N 602
148	1-31-2525	MG SET RM 1	R4-N 602	149	1-31-2519	BBR 1	R4-N 602
150	2-31-2578	MG SET RM 2	R9-N 602	151	2-31-2647	BBR 2	R10-N 603
152	2-31-2512	MG SET RM 2	R10-N 603	153	DELETED		
154	DELETED			155	0-31-2510	COMM BATT RM	R11-P 602
156	3-31-1307	4KV BBR DGB 3	U3 DGB 580	157	3-31-1308	4KV BBR DGB 3	U3 DGB
158	3-31-1309	4KV SDBR 3ED DGB 3	U3 DGB 579	159	3-31-1310	4KV SDBR 3ED DGB 3	U3 DGB 578
160	3-31-1313	4KV SDBR 3ED DGB 3	U3 DGB 581	161	3-31-1311	4KV SDBR 3EA DGB 3	U3 DGB 583.5
162	3-31-1312	4KV SDBR 3 EC DGB 3	U3 DGB 583.5	163	2-XFD-31-2653 A&B	MG SET RM 2	R9-N
164	2-XFD-31-2654	BBR 2	R10-N	165	2-XFD-31-2655	BATT RM 2	R10-N
167	3-31-1314	STAIRWAY U3 CB	U3 DGB 590	168	0-39-808	CBL SPRD RM B	R19-N 611
169	3-31-2649	480V SDBR 3A	R20-R 632				
171	3-31-2576	480V SDBR 3B	R21 -R 635	172	3-31-2577	480V SDBR 3B	R21-R 632
173	1-31-2000	U1 RB/250V B/BB RM	R2-4 630	174	1-31-2001	U1 RB 250V B/BB RM	R2-R 630
177	2-31-2006	U2 RB 250V B/BB RM	R20-N 630	178	2-31-2007	U2 RB 250V B/BB RM	R13-R 630
181	2-31-2017	U2 CABLE SPRD RMA	R10-P 606	182	1-31-2016	U1 PREF MG	R4-P 606

TABLE 9.3.11.F(continued)

FIRE RATED DAMPERS

DAMPER NO.	UNID NO.	ROOM LOCATION	COORDINATE LOCATION	DAMPER NO.	UNID NO.	ROOM LOCATION	COORDINATE LOCATION
183	1-31-2002	U1 4KV SDBR A	R1-Q 621	184	1-31-2003	U 1 4KV SDBR A	R1-Q 621
185	2-31-2008	U2 4KV SDBR C	R14-Q 621	186	2-31-2540	U2 4KV SDBR C	R14-R 621
187	3-XFD-31-2656 A&B	MG SET RM 2 (upper & lower)	R19-N	188	3-XFD-31-2657	BBR 3	R19-N
189	3-XFD-31-2658	BATT RM 3	R19-N	191	1-31-2540	U1 4KV SDBR B	R1-Q 604
192	1-31-2541	U1 KV SDBR B	R1 -Q 604	193	2-31-2018	U2 RB 4KV SDBR	R11-P 604
194	2-31-2019	U2 RB 4KV SDBR D ROOF	R14-Q 604	195	3-31-2011	U3 SDBR E	R21-Q 621
196	3-31-2010	U3 SDBR E	R21 -Q 621				
199	3-31-2012	U3 SDBR F	R21-Q 604	200	3-31-2013	U3 SDBR F	R21-Q 604
201	1-30-643	U1 4KV SDBR A	R1-Q 621	202	1-30-644	U1 RX BLDG	R1-Q 639
203	1-30-645	U1 RB 4KV SDBR B ROOF	R1-P 604	204	1-30-646	U1 4KV SDBR B	R1-P 593
205	0-31-2626	U 1CONTROL BAY CORRIDOR	R2-N 604	206	0-31-2625	U1 CONTROL BAY CORRIDOR	R2-N 602
207	0-31-2627	TB 2	T10-M 604	208	0-31-2629	TB 2	T11-N 602
209	0-31-2628	TB 2	T11-M 604	210	0-31-2630	U2 CBL SPR RM B	R11-N 611
				211	0-30-2280	U1/2 DGB	DGB 595
217	2-64-600	U2 RX BLDG	R12-U 593	218	2-64-601	U2 RX BLDG	R13-U 593
219	2-64-602	U2 RX BLDG	R13-P 593	220	2-64-603	U2 RX BLDG	R9-P 593

TABLE 9.3.11.F(continued)

FIRE RATED DAMPERS

DAMPER NO.	UNID NO.	ROOM LOCATION	COORDINATE LOCATION	DAMPER NO.	UNID NO.	ROOM LOCATION	COORDINAT- LOCATION
221	2-64-604	U2 RX BLDG	R9-P 606	222	3-64-600	U3 RX BLDG	R19-U 593
223	3-64-602	U3 RX BLDG	R20-P 593	224	3-64-603	U3 RX BLDG	R16-P 593
225	3-64-604	U3 RX BLDG	R16-P 593	230	2-64-605	U2 RX BLDG	R13-P 621
231	2-64-606	U2 RX BLDG	R9-P 621	232	2-64-607	U2 RX BLDG	R13-U 621
233	2-64-608	U2 RX BLDG	R12-U 621	234	3-64-608	U3 RX BLDG	R19-U 621
235	3-64-605	U3 RX BLDG	R20-P 621	236	3-64-606	U3 RX BLDG	R16-P 621
241	2-64-609	U2 RX BLDG	R14-T 639	242	2-64-610	U2 RX BLDG	R13-U 639
243	2-64-611	U2 RX BLDG	R13-U 639	244	2-64-612	U2 RX BLDG	R12-S 639
245	2-64-613	U2 RX BLDG	R12-S 639	246	3-64-610	U3 RX BLDG	R20-U 639
247	3-64-609	U3 RX BLDG	R21-S 639	248	3-64-613	U3 RX BLDG	R19-S 639
249	3-64-612	U3 RX BLDG	R19-S 639	252	2-64-614	U2 RX BLDG	R12-Q 621
253	3-64-614	U3 RX BLDG	R19-Q 621	256	2-64-615	U2 RX BLDG	R12-P 593
257	3-64-615	U3 RX BLDG	R19-P 593	268	2-64-616	U2 RX BLDG	R12-P 621
269	2-64-617	U2 RX BLDG	R12-Q 621	270	2-64-618	U2 RX BLDG	R12-Q 621
271	2-64-619	U2 RX BLDG	R8-S 621	272	2-64-620	U2 RX BLDG	R10-S 621
273	2-64-621	U2 RX BLDG	R14-T 621	274	2-64-625	U2 RX BLDG	R10-P 621
275	2-64-623	U2 RX BLDG	R10-P 621	276	2-64-624	U2 RX BLDG	R10-P 621

TABLE 9.3.11.F (continued)

FIRE RATED DAMPERS

DAMPER NO.	UNID NO.	ROOM LOCATION	COORDINATE LOCATION	DAMPER NO.	UNID NO.	ROOM LOCATION	COORDINATE LOCATION
277	2-64-622	U2 RX BLDG	R10-P 621	278	2-64-626	U2 RX BLDG	R11-U 621
279	3-64-616	U3 RX BLDG	R19-P 621	280	3-64-617	U3 RX BLDG	R19-Q 621
281	3-64-618	U3 RX BLDG	R19-Q 621	282	3-64-619	U3 RX BLDG	R15-T 621
283	3-64-620	U3 RX BLDG	R17-S 621	284	3-64-621	U3 RX BLDG	R21-S 621
285	3-64-625	U3 RX BLDG	R17-P 621	286	3-64-623	U3 RX BLDG	R17-P 621
287	3-64-624	U3 RX BLDG	R17-P 621	288	3-64-622	U3 RX BLDG	R17-P 621
289	3-64-626	U3 RX BLDG	R17-U 621	296	1-31-2558	480V SDBR 1A	R2-S 633
297	1-31-2632	480V SDBR 1B	R2-S 631	298	3-64-611	U3 RX BLDG	R20-U 639
299	3-64-607	U3 RX BLDG	R20-U 621	300	3-64-601	U3 RX BLDG	R20-U 593

84. G2.1.10 001

You are in the position of SM. There are several NRC personnel in the control area conducting initial reactor operator examinations. You feel these activities are interfering with daily plant activities and you are concerned with the number of people in the control room.

Which ONE of the following actions should be taken to address your concerns per SPP 10.0, Plant Operations?

A. Notify the NRC personnel that they must leave the control room immediately.

B. Contact the NRC Senior Resident Inspector for resolution.

C. Contact the Plant Manager for resolution.

D. Nothing. NRC personnel shall be allowed to enter or be present in the control room for any activity.

SPP10.0, Plant Operations Rev.2 pg 9: Section 3.6 Control Room Activities

A. Incorrect since the NRC have unfettered access to the control room.

B. Incorrect since the Plant Manager should be notified to resolve the issue per SPP 10.0.

C. Correct answer since the SM, US and the UO have the authority to restrict access to or remove personnel from the control room. NRC personnel shall be allowed to enter or be present in the control room. If the SM has concern over the number or activities of NRC personnel, he shall contact the Plant Manager for resolution.

D. Incorrect since the Plant Manager should be contacted to resolve the situation per SPP 10.0.

RO Tier:		SRO Tier:	T3
Keyword:	COMMAND AND CONTROL	Cog Level:	MEM 2.7/3.9
Source:	B	Exam:	BF02301
Test:	S	Misc:	

85. G2.1.12 001

The following plant conditions exist on U-2.

- Mode 5
- Reactor Mode Switch REFUEL
- Spent Fuel Pool Shuffle in progress

The following plant conditions exist on U-3.

- Mode 4
- Reactor Mode Switch SHUTDOWN
- Preparations for startup underway

Which ONE of the following describes the requirements for the SBGT System?
(Tech Spec reference 3.6.4.3 provided)

A. NOT required to be operable

B. required to be operable for U-2.

C. required to be operable for U-3.

D. required to be operable for both units.

References: Technical Specification 3.7.B

A, B, C are incorrect because there are fuel movements in progress within secondary containment which is common to both units.

D. Correct answer.

RO Tier:		SRO Tier:	T3
Keyword:	SBGT	Cog Level:	C/A 2.9/4.0
Source:	B	Exam:	BF02301
Test:	S	Misc:	TCK

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SGT) System

LCO 3.6.4.3 Three SGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of irradiated fuel assemblies in the secondary containment,
During CORE ALTERATIONS,
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One SGT subsystem inoperable.	A.1	Restore SGT subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, or 3.	B.1	Be in MODE 3.	12 hours
	AND		
	B.2	Be in MODE 4.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
	C.1 Place two OPERABLE SGT subsystems in operation.	Immediately
	OR	
	C.2.1 Suspend movement of irradiated fuel assemblies in secondary containment.	Immediately
	AND	
	C.2.2 Suspend CORE ALTERATIONS.	Immediately
	AND	
	C.2.3 Initiate action to suspend OPDRVs.	Immediately
D. Two or three SGT subsystems inoperable in MODE 1, 2, or 3.	D.1 Enter LCO 3.0.3.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. Two or three SGT subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	E.1	----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
		Suspend movement of irradiated fuel assemblies in secondary containment.	Immediately
	AND		
	E.2	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.3	Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 10 continuous hours with heaters operating.	31 days
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	24 months
SR 3.6.4.3.4	Verify the SGT decay heat discharge dampers are in the correct position.	12 months

86. G2.1.28 001

Which ONE of the following describes the purpose and function of the TIP Shear Valves?

A. Provides an automatic emergency means to seal the TIP guide tube should the guide tube leak with the TIP probe extended and unable to be retracted. The shear valve cuts the cable and closes off the guide tube.

B. Provides a manual emergency means to seal the TIP guide tube should the guide tube leak with the TIP probe extended and unable to be retracted. The shear valve cuts the cable and closes off the guide tube.

C. Provides the normal means to seal the TIP guide tube should the guide tube leak with the TIP probe extended and unable to be retracted. The shear valve is held closed by a fail-safe spring.

D. Provides a manual emergency means to seal the TIP indexer should the indexer leak nitrogen. The shear valve closes off the index mechanism for the leaking Tip guide tube.

References: OPL171.023 Rev.4 pg 10 and 11
Enabling Objective OPL171.023 B2

A. Incorrect since the shear valve does not operate automatically.

B. Correct answer.

C. Incorrect since the shear valve is not a normal means to isolate the guide tube.

D. Incorrect since the shear valve does not isolate the index mechanism.

RO Tier:	T3	SRO Tier:	T3
Keyword:	SYSTEM STATUS	Cog Level:	MEM 3.2/3.3
Source:	B	Exam:	BF02301
Test:	C	Misc:	

87. G2.1.3 001

The on-coming Unit 3 Board Unit Operator (BUO) has been on vacation for 7 days. The BUO is preparing to assume shift at 0700 on 12/30/2002.

Which ONE of the following is the date, at a minimum, that the BUO must review back to concerning the Unit 3 Narrative Log?

A. 0700 on 12/29/2002.

B. 1500 on 12/27/2002.

C.✓ 0700 on 12/25/2002.

D. 1500 on 12/23/2002.

References: SSP-12.1, Section 3.12.2, page 64

C. Correct answer.

A, B and D are incorrect since the operator must only review the previous 5 days in the narrative log.

Note: Did not have a copy of the procedure to verify answer.

RO Tier:	T3	SRO Tier:	T3
Keyword:	ADMIN	Cog Level:	C/A 3.0/3.4
Source:	M	Exam:	BF02301
Test:	C	Misc:	

88. G2.2.12 001

The Unit Operator has just completed the required readings for his shift and documented them in *2-SR-2, Instrument Checks and Observations.*

Which ONE of the following lists the individuals that are qualified to perform an independent review of the readings performed by the Unit Operator?

A. RO or SRO.

B. RO or STA.

C. Ops Manager or SRO.

D. STA or SRO.

References: 2-SR-2, Rev.29 pg 8

A. Incorrect since RO cannot perform independent review.

B. Incorrect since RO cannot perform independent review.

C. Incorrect since Ops Manager cannot perform independent review unless he is an SRO or qualified STA.

D. Correct answer.

RO Tier:	T3	SRO Tier:	T3
Keyword:	SURVEILLANCE REQUIRE	Cog Level:	MEM 3.0/3.4
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

89. G2.2.14 001

Unit 3 is in a Refueling Outage with a 24 month Group 2 PCIS surveillance in progress. The Test Director assigned to coordinate the surveillance is in the control room monitoring the test when the SGT system receives an actual Auto Start signal. The Test Director stops the surveillance until the conditions that caused SGT to auto start are corrected.

Which ONE of the following describes the actions the Test Director must perform to complete the surveillance?

A.✓ Re-verify the Initial conditions with Operations and ensure equipment performance will not be jeopardized by completing the remainder of the procedure.

B. Discard the surveillance test that was interupted and repeat the surveillance from the beginning.

C. Verify with Operations that they are able to support the remainder of the surveillance test and continue the surveillance by re-performing the last step that was completed and continuing until the test is complete.

D. The Test Director and Operations can review the procedure to verify all of the Acceptance Criteria is met. If the Acceptance Criteria is met then the surveillance can be signed off as complete.

Reference: SPP-8.1 Rev.2 Pg 9
OPL171.078 Rev.11 Pg 14
Enabling Objective OPL171.078 #B11

A. Correct answer.

B. Incorrect since the previous procedure is not discarded.

C. Incorrect since the Test Director and Operations must re-verify the initial conditions prior to restarting the test and there is no direction to repeat a step.

D. Incorrect since the surveillance cannot be signed off as complete until all steps are completed or N/A'd.

RO Tier:		SRO Tier:	T3
Keyword:	TESTING	Cog Level:	MEM 2.1/3.0
Source:	N	Exam:	BF02301
Test:	S	Misc:	TCK

90. G2.2.3 001

Assume that one of the 48V DC inverters that supplies 120V AC to the Control Room annunciators has failed.

Which ONE of the following describes the effects this will have?

A.✓ If the failure is on Unit 1 a buzzer will sound and a white light will illuminate.

B. If the failure is on Unit 1,2 or 3 a buzzer will sound and a red light will illuminate.

C. If the failure is on Unit 2 the power supply will auto swap to Battery Board 2.

D. If the failure is on Unit 3 the power supply will auto swap to Battery Board 3.

References: OPL171.037 Rev.8 pg 16
Enabling Objective OPL171.037 #B8
Note: Taken from 2001 Exam.

A. Correct answer.

B. Incorrect since a red light will not illuminate on Unit 1 but it will illuminate on Units 2 and 3.

C. Incorrect since the power supply does not swap.

D. Incorrect since the power supply does not swap.

RO Tier:	T3	SRO Tier:	T3
Keyword:	DC SYSTEMS	Cog Level:	MEM 3.1/3.3
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

91. G2.2.5 001

The System Engineer for the RHR System has performed an Evaluation for a Temporary Alteration to the system. The temporary alteration is not Quality Related. The Systems Engineering Manager has approved the temporary alteration.

Which ONE of the following lists the individuals that are required to give approval prior to installing the temp alt?
(Supply copy of SPP)

A. Shift Manager, PORC, and Plant Manager.

B. Regulatory Assurance Manager and Plant Manager.

C. ✓ Shift Manager and Plant Manager.

D. Shift Manager, Regulatory Assurance Manager, and PORC.

References: OPL171.079 Rev.11 pg 9

A. Incorrect since PORC is not required since the temp alt is not quality related.

B. Incorrect since the Regulatory Assurance Manager is not a required signature.

C. Correct answer since temp alt is not Quality related.

D. Incorrect since Regulatory Assurance Manager and PORC are not required signatures.

RO Tier:		SRO Tier:	T3
Keyword:	TEMP ALT	Cog Level:	C/A 1.6/2.7
Source:	N	Exam:	BF02301
Test:	S	Misc:	TCK

Tennessee Valley Authority TVAN STANDARD PROGRAMS AND PROCESSES	TITLE TEMPORARY ALTERATIONS	SPP-9.5 Rev. 4 Page 1 of 21 Quality Related ☒ Yes ☐ No PORC Required ☒ Yes ☐ No 10CFR50.59 Review ☐ Yes ☒ No Effective Date 6/29/2001

RESPONSIBLE PEER TEAM: Engineering & Technical Services
Organization

CONCURRENCES

Doug F. Helms ** Primary Sponsor*	6/13/01 *Date*
Jon R. Rupert for JAB *Peer Team Mentor*	6/25/01 *Date*

APPROVAL

For Nuclear Assurance Sponsored SPPs

N/A *General Manager, NA*	 *Date*
Karl W. Singer ** Senior Vice President, Nuclear Operations*	6/27/01 *Date*

* Site-specific changes are approved by Site Sponsor and Site Vice President (see PCF)

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	12/19/97 (BFN, COC, WBN) 4-3-98 YSO (SQN) 4/2/98	All	Initial issue. This SPP replaces SSP-12.4 (SQN and BFN) and SSP-12.04 (WBN).
1	07/31/98	2, 9, 10, 18	Changed 3.4.D to 3.4.C. Changed the reference of NEDP-3 to EAI-3.10 for WBN. Also changed "Chemistry" to "Environmental Section" on Form SPP-9.5-1. (Minor/editorial changes).
2	12-31-98	2, 3, 5, 6, 9, 12, 13, 19, 22	Added TPS Temporary Alteration Order (TAO) process to exclusions, Section 2.2.L. Reference CHPER970040. Changed quarterly reviews to semi-annual reviews for BFN and SQN. Clarified paragraph 3.1.B.1.g. Remove step to provide copy of review sheet to plant manager on review form.
3	7/17/00	2, 4, 5, 7, 11, 13, 22	These changes were made as a result of revisions to SPP-9.3 and 9.4. The safety assessment was eliminated in SPP-9.4. SPP-9.3 was revised to add a technical evaluation and a determination that a change was safe. The wording in this SPP was revised to eliminate references to the safety assessment and to identify SPP-9.3 as the procedure to look at for guidance on performing a technical evaluation. Minor/editorial changes.
4	6/29/01	2, 4, 6-14, 16, 17, 18, 20, 21	Revised to incorporate changes per BFPER 00-009052-000, Corrective Action 3 and BFPER 00-009447-000, Corrective Action 5. Added Maintenance Rule evaluation. Incorporated recommendations per Self Assessments SA-98-14 and SA-WBP-00-017-01.

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1.0 PURPOSE

This SPP provides the requirements for controlling temporary alterations (TA) to the systems, structures, and components of TVA's Nuclear Plants in a manner which ensures operator awareness, conformance with design basis and operability requirements, and preservation of plant safety and reliability.

2.0 SCOPE

2.1 Applicability

A. This SPP shall be used for quality and non quality-related systems, structures, and components and provides requirements for installing, controlling, returning to normal, and documenting TAs. The TA process should not be used to circumvent the permanent design change process and TAs are intended to be minor in scope, of short duration, and few in number.

B. TAs and Temporary Alteration Control Forms (TACFs) are quality-related when the affected equipment is designated as safety related or quality-related on the site Q-list.

2.2 Exclusions

The following TAs are excluded from this SPP provided the programs which govern them require consideration of effect, limitations, any special actions, tests demonstrating return to normal, the need for a 10CFR50.59 review per SPP-9.4, and time frame which the TA may remain installed.

A. TAs positively identified and controlled in procedures or Work Orders (WO) which meet the following requirements.

1. Procedures or WO shall be approved.

2. Operations notification at procedure or WO initiation and completion unless the TA is controlled by an Operation Instruction.

3. Documentation of installation and Return to Normal (RTN) of the TA, or identification of the Work Initiating Document (WID) that performs installation and RTN of the TA is contained in the procedure or WO.

4. Tagging of lifted leads or tagging of other TAs when using Information Tags when the TA is to remain in place unattended beyond the end of shift unless controlled by a WID.

B. TAs performed by WIDs on equipment that has been removed from service for maintenance, repair, lay up, calibration, or troubleshooting and are RTN prior to equipment being returned to service.

C. Temporary connection of sample monitoring equipment to sample system piping provided the connection does not circumvent any automatic isolation features. Hoses to system vents and drains for the purpose of draining or filling and venting. Hoses to normal service connections such as service air or breathing air. These connections are excluded provided the flow path is not changed.

D. Temporary annunciator disabling/enabling performed in accordance with applicable procedures.

E. Breaches performed in accordance with applicable procedures.

F. Fire Protection Impairment Permits.

G. Scaffolding erection performed in accordance with applicable procedures.

H. Temporary shielding and catch containment installation performed in accordance with applicable procedures.

I. Furmanite repairs on non-quality-related components which do not affect component function.

J. TAs installed by and evaluated under WIDs for the purpose of troubleshooting in-service equipment and are removed at completion of troubleshooting.

K. Equipment outside configuration control as defined by the Design Change Process Program.

L. TPS Temporary Alteration Orders issued by the Power System Dispatcher in accordance with TPS-ESO-Operating Letter.

Any temporary alteration to a transmission system component that adversely affects the site's offsite power requirements, or that could challenge safety systems by creating transients that could decrease the margin of nuclear safety, or increase the potential for a unit trips are not exempt from this SPP.

In maintaining configuration control of the transmission system for maintenance activities, temporary alterations of transmission system components, such as circuit breakers, air compressors, transformers, relays, indicating devices, and communication equipment, such as microwave systems, power line carrier, and supervisory control and data acquisition (SCADA), may be necessary. Before a transmission component is placed under a TPS Temporary Alteration Order, the Power System Dispatcher must first make a predetermination of the impact on the transmission system and offsite power requirements delineated in TPS Operating Guides/Instructions for each nuclear site. TPS-ESO-Operating Letter, Temporary Alteration Order process, has been evaluated by a 10CFR50.59 review. All TPS Temporary Alteration Orders are coordinated with Plant Operations prior to being placed.

3.0 INSTRUCTIONS

NOTE The TACF process is delineated in Appendix A, TACF Flowchart.

3.1 Initiation and Evaluation

A. Any individual who has the need to install a TA requests initiation of a TACF from the appropriate System Engineer or Design Engineer.

B. The System Engineer or Design Engineer shall perform the following:

1. Perform the "Initiation" and "Evaluation" sections of the TACF by completing the following. Use the Temporary Alteration Control Form, Form Number SPP-9.5-1.

NOTE The site TACF log book is maintained by the TACF Coordinator.

a. Obtain a TACF number from the site TACF Log Book. The numbering system shall be as follows:

   Unit number - year - numerical sequence - system no. (e.g., 2-96-001-065).

b. Equipment altered.

c. Quality-related.

d. Mode restraint and mode number, if required.

e. Affected systems.

f. Description, need, location, and materials. For material requirements, see Appendix C.

g. Reason/justification.

h. Drawings (dwg) affected.

   1. Prepare markup of affected Category 1 drawings and/or sketches reflecting the TA for drawing updates, if required, and attach with original TACF.

   2. Prepare markup of secondary drawings and/or sketches needed to provide any fabrication/installation requirements, if required, and attach with original TACF.

   3. List secondary drawings for Curator update, if required. Drawings to which this applies are those that would be revised via a DCN for the same permanent change.

i. Coordinates with plant organizations any procedure, instruction or document [including operating procedures, Preventative Maintenance Instructions (PM), Instrument Data Packages (IDP), Scaling Setpoint Documents (SSD), Master Equipment List (MEL)] revisions, if required.

j. Estimated RTN date and milestone.

k. System Engineer or Design Engineer, phone, section of System Engineer or Design Engineer, and date.

2. Obtain an environmental evaluation by the Environmental Section, if required. Sign and record date.

3. Complete effects, limitations, actions, system status required as a result of the TA. This should include an evaluation of effect on the Maintenance Rule, if applicable.

4. Identify post implementation and post RTN testing, if required.

5. Obtain a reactivity management evaluation by Reactor Engineering. If Reactor Engineering is not available, the reactivity management evaluation may be performed by the on-shift Senior Reactor Operator (SRO). Sign and record date.

6. Perform/obtain a technical evaluation per Section 3.1.4 and Appendix C of SPP-9.3, a 10CFR50.59 review per SPP-9.4, and reference necessary administrative controls in effects, limitations, actions, and system status. Obtain Design Engineering review or approval of the technical evaluation and 10CFR50.59 review, if not prepared by Design Engineering. Sign and record date.

   a. TAs affecting the protected and vital area barriers or alter security or safeguards measures can not be initiated without coordinating with Security to determine proper compensatory measures.

   b. TAs that could alter the calculated flood level from pipe breaks must be evaluated by Design Engineering (DE). Examples include the addition, removal, or modification of curbs; door seals or weather-stripping; blocking of vents in doors; pipe rerouting or mechanical jumpers in operable systems; wall or floor bores; covering or blocking of floor drains; or changes in pipe wall thickness.

   c. To prevent contamination of breathing air, the breathing air system or service air system must not be cross connected (mechanical jumper) to any system in a way which could possible cause radioactive or chemical contamination to the breathing air supply.

d. TAs that could result in material falling on or impacting safety-related systems, structures, and components in a seismic event must be evaluated by DE.

7. Obtain DE concurrence with the TACF. Sign and record date.

8. Design Engineering to evaluate the TACF and consider if a FSAR update is required based on the temporary modification expected to be in place throughout the next required periodic FSAR update cycle or when no schedule for TACF return to normal has been established. Sign and record date.

9. Record tag number, location, and description on TACF Tag List for tags to be installed, if required. Refer to Appendix B for correct usage.

C. The System Engineer evaluates and concurs with TACF initiation. Sign and record date.

3.2 Recommendations and Approval

A. Normal TA Approval.

1. System Engineer or Design Engineer obtains review and concurrence from System Engineering Manager/Designee. Sign and record date.

2. System Engineer or Design Engineer obtains a Shift Manager (SM) or Unit Manager [licensed Senior Reactor Operator (SRO)], Plant Operating Review Committee (PORC) review (quality-related TAs only), and Plant Manager or designee approval prior to implementation. Sign and record date for each.

3. System Engineer or Design Engineer sends a copy of the TACF including marked up drawings to the applicable data entry group coordinator for data entry and status update. Secondary drawings are entered into Curator but are not updated. Sign and record date.

4. System Engineer or Design Engineer forwards a copy of the TACF to the TACF Coordinator. Sign and record date.

5. System Engineer or Design Engineer forwards a copy of the TACF to the Training Section to ensure training impacts are addressed. Sign and record date.

6. System Engineer or Design Engineer transmits 10CFR50.59 to record storage per SPP-9.4. Sign and record date.

B. Canceling TACFs

NOTE TACFs can only be canceled prior to installation.

1. If a TACF is no longer needed, prior to installation, the requester voids the TACF number in the site TACF Log Book.

2. The requester provides the original TACF to the TACF Coordinator for canceling.

3.3 Installation

NOTE Refer to Appendix C for material requirements.

A. Precautions and Limitations

1. Ensure lifted leads are suitably insulated and jumpers securely attached.

2. Verify the affected component is properly identified and in the correct circuit.

3. De-energize electrical circuits prior to the installation of jumpers or the removal of leads, whenever possible.

4. Ensure Category 1 drawings are updated and in the Control Room.

5. Ensure secondary drawings are listed and referenced in Curator.

6. Ensure materials (cables, jumpers, etc.) are equal to or better than the quality engineered into the host component or system.

7. If the original TACF is removed, a copy of the TACF should replace the original TACF while it is removed.

B. Concerning installation, the SM or designee is responsible for the following:

1. Review the TACF to ensure required reviews and documentation have been completed and that the TA can be performed without adverse effect on plant operation.

2. Authorize installation of the TA and maintain control of the approved TACF. Sign and record date.

C. The System Engineer shall perform the following:

1. Ensure the WID number is recorded.

2. Verify all post installation testing has been successfully completed, if required. Sign and record date.

3. Verify TA installation and TACF tags, if required, have been properly placed. Sign and record date.

4. Forward a copy of the TACF to the TACF Coordinator. Sign and record date.

5. In urgent situations, when Category 1 drawing updates cannot support operability, the applicable drawings may be manually marked up (red-lined) with SM concurrence. Requests for mark up must be kept to a minimum. Obtain SM concurrence to Red Line drawings. All drawing markups shall be performed in accordance with NEDP-3, "Drawing Control." Sign and record date.

6. Forward a copy of the TACF to Engineering Drawing Services (EDS) for Category 1 drawing updates, if required. Sign and record date.

7. Verify TA is marked on affected Category 1 drawings, if required. Sign and record date.

8. Verify procedure/instruction/document (including operating procedures, PMs, SSDs, IDPs, MEL) revisions required to support the TA have been made, if required. Sign and record date.

9. Obtain SM or designee signature designating notification of installation completion. Sign and record date.

3.4 Return to Normal

A. Concerning RTN, the SM or designee is responsible for the following:

1. Reviewing the request for RTN of the TA and determining that RTN can be performed without adverse affect on plant operation.

2. Authorize RTN of the TA. Sign and record date.

B. The System Engineer shall perform the following:

1. Request RTN of the TA in accordance with an approved WID. Sign and record date.

2. Ensure the WID number is recorded.

3. Ensure all post RTN testing has been successfully completed, if required. Sign and record date.

4. Verify that equipment has been RTN and all TACF tags, if required, are removed. Sign and record date.

5. Forward a copy of the TACF to EDS for Category 1 drawings update, if required. Sign and record date.

6. Verify TA removed from affected Category 1 drawings, if required. Sign and record date.

7. Forward a copy of the TACF to the applicable data entry group coordinator for Category 1 and secondary drawings status update. Sign and record date.

8. Verify procedure/instruction/document (including operating procedures, PMs, SSDs, IDPs, MEL) revisions required to support RTN of the TA have been made, if required. Sign and record date.

9. Obtain SM or designee signature designating notification of RTN completion. Sign and record date.

10. Forward original TACF to TACF Coordinator. Sign and record date.

11. Transmit a copy of the TACF to the Training Section to ensure training impacts are addressed. Sign and record date.

C. TACF RTN by Transferring TAs to Other Tracking Documents

NOTE The intent of transferring TAs to other tracking documents is to relax the requirements for maintaining TACFs on systems/components that have appropriate documentation (WOs, DCNs, etc.) that can control the TA as long as the system/component is out-of-service or placed in lay-up.

1. The System Engineer ensures the appropriate tracking document (WO, DCN, etc.) exists with instructions to RTN the TA.

2. The System Engineer enters "Transferred to (appropriate document)" under the WID number in the RTN Documentation section.

3. The System Engineer removes TAOs associated with the TACF and replaces these with "Information Only" tags.

4. The SM or Designee removes MCPTs associated with the TACF.

5. The System Engineer processes the TACF in accordance with Sections 3.4.A, 3.4.B and 3.4.C and marks the appropriate signature lines "N/A".

3.5 Revisions

A. Minor editorial changes

1. Made by the Reviser provided the intent and scope of the TA will not change, the change is documentation only, and the 10CFR50.59 review is not impacted.

2. Made by the reviser indicating the changes on the original TACF and initialing and dating the changes.

3. Concurred with by Systems Engineering Manager/Designee by initialing and dating the changes.

B. Prior to installation

1. Reviser revises and obtains review and approval in accordance with original initiation, evaluation, and approval instructions.

C. Changes affecting hardware or impacted documentation

1. Reviser completes a new TACF for the revised TA and uses the next higher revision level (example: 1-96-002-067 R1). Indicate in the "Reason/Justification" that "This TACF supersedes TACF" and list the original TACF number.

2. Reviser verifies that the TACF revision number appears on the Category 1 drawings and the drawings are updated, if required.

3. Reviser re-performs or revises the technical evaluation and the 10CFR50.59 review, if needed.

4. Reviser processes the revised TACF in accordance with the initiation, evaluation, approval, and installation sections of this SPP.

5. Reviser closes the original TACF by performing the following:

a. State on the Return to Normal WID, "This TACF has been superseded by TACF" and list the new TACF number.

b. Enter N/A on the remaining RTN signature lines.

c. Verify that procedures/instructions/documents (including operating procedures, PMs, SSDs, IDPs, MEL) have been changed to include the affects of the revision including the new revision level, if required.

3.6 Reviews

A. Semi-Annual reviews as a minimum.

Document the review on the TACF Review Form, Form Number SPP-9.5-2.

NOTE TACFs on unit(s) in layup, when affected equipment is not needed to support the operating unit(s), may be reviewed annually.

1. Performed by the System Engineer to determine:

a. TACF is free of administrative errors.

b. TA is in good material condition.

c. TA needs to remain in effect.

d. If TA is configured as described by the TACF.

e. If TA should be revised or converted to a plant modification.

f. If an extension of the RTN date is required and justification for the extension.

g. If the environmental evaluation is still accurate, if required.

h. TACF tags, if required, and barriers are in good condition.

i. TAO/MCPT are correctly installed and legible, if required.

j. Category 1 drawings are correctly marked, if required.

k. Procedures/instructions/documents are correctly revised, if required.

2. Performed by DE if 10CFR50.59 review is needed to confirm validity:

a. Review 10CFR50.59 to determine validity.

B. Other reviews

Each site must ensure the following reviews are addressed.

1. Changes to the status of TAs will be reviewed by Operations during shift turnover.

2. TACFs will be reviewed by Operations prior to return from a scheduled outage to verify documentation and physical integrity.

3.7 Tracking

A. The TACF Coordinator is responsible for the following:

1. Ensuring that TACFs are tracked to minimize duration and to ensure reviews are performed as required.

2. Site TACF Log Book.

3. Maintaining a status report which is periodically reviewed by Site Management personnel.

4.0 RECORDS

4.1 Quality Assurance (QA) Records

Completed quality-related TACF including the form, Category 1 drawings and procedures/instructions/documents, TACF Review Form and 10 CFR 50.59 review.

4.2 Non-QA Records

Completed non quality-related TACFs.

5.0 DEFINITIONS

Applicable Data Entry Group Coordinator - The individual who is responsible for updating Curator.

Main Control Point Tag (TVA 6265A) - A tag installed at the main point of control for a component with a TA to supply needed information to the operator or identify affect on operational characteristics.

Mechanical Jumper - Any device which has not been specifically designed for a particular use, such as a hose, pipe or spool piece, which is installed in a system on a temporary basis. Mechanical jumpers are installed for various purposes including testing, maintenance, repair, modification, habitability, and hygiene.

TACF Coordinator - An individual assigned by the System Engineering Manager to track the activities associated with the installation and return to normal of Temporary Alterations as documented by TACFs.

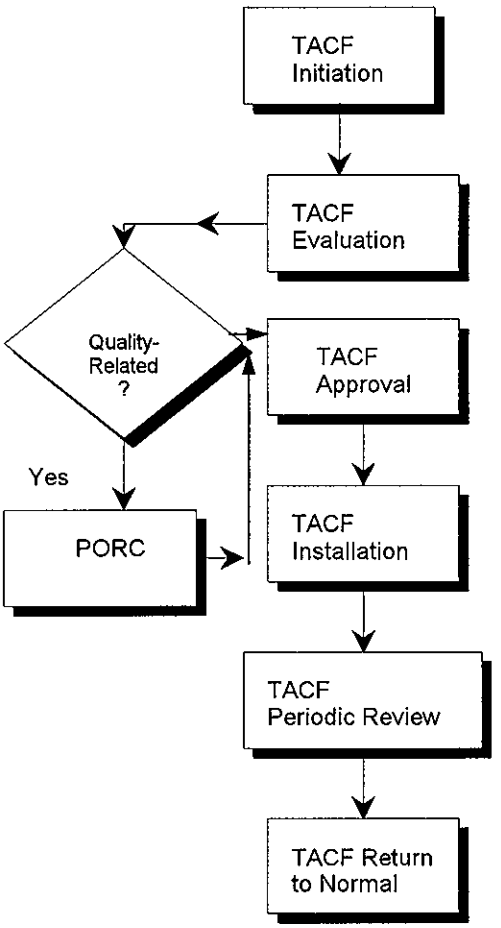
Temporary Alteration - A Temporary Alteration is a temporary modification to systems and/or components which may include temporary bypass lines; temporary electrical jumpers, inhibits, and wire lifts; temporary connections to electrical, pneumatic, or hydraulic systems, instrumentation, or control devices; temporary instrument settings, pulled circuit cards, mechanical jumpers, installed/removed blank flanges, disabled relief or safety valves; or other plant configuration changes that do not conform with approved drawings or other design output documents.

Temporary Alteration Control Form - A Temporary Alteration Control Form is a form used to initiate, document review, and authorize the implementation and RTN of a TA. It is maintained by the SM after approval to document the status of the TA and is maintained as a record after the TA is returned to normal.

Temporary Alteration Order (TVA 6265) - Temporary Alteration Order is the tag which is used in the plant to identify the TA and is used only in conjunction with a TACF.

APPENDIX A
Page 1 of 1

TACF FLOWCHART



APPENDIX B
Page 1 of 1

REQUIREMENTS FOR HANGING TEMPORARY ALTERATION TAGS

A. TAO (TVA 6265) - Determine the number of tags required and their locations, and record this information on the TACF Tag List, Form number SPP-9.5-1. Place one TAO tag on the component affected by the TA. Place additional TAO tags on the components in other systems affected by the TA. Tags are not required inside the primary containment for ALARA and FME considerations. Do not place paper TAO tags in a C-zone. As an alternative, place the TAO tag at the C-zone entrance, and so indicate on the TACF and in the TACF Tag List.

B. Record requested information on TAO (TVA 6265), that is, Temporary Alteration Permit Number; Equipment and Description; Effect, Limitations, and/or Action; and Date Installed.

C. Jumper - Place one TAO tag on each jumper. Place a TAO tag on each end of jumpers where both ends are not visible.

D. Inhibit - Group all inhibits on a device under one TAO tag. For example, if three boots were used on a relay, use one TAO tag. Record the number of inhibits covered by the TAO tag on the TACF Tag List.

E. Wire Lifts - Use one TAO tag per terminal point, considering each side of a terminal block a point or identify, group, and tag all wires removed as a bundle. If all wires can not be bundled in one group, use additional TAO tags. Tape or cover each lifted wire with an insulator to prevent a personnel and equipment hazard.

F. Jumper/Inhibit(s) Removal - Use the "Return to Normal" portion of the TACF.

G. MCPT (TVA 6265A) - When the MCPT is used, place one tag on the main point of control of the system or component affected. Place duplicate tags as required to properly identify the temporary condition. Use the MCPT when the main point of control is the Main Control Room panel. Indicate all MCPTs on the TACF Tag List.

APPENDIX C
Page 1 of 1

MATERIAL REQUIREMENTS FOR TEMPORARY ALTERATIONS

A. TA material or equipment shall be of equal to or better than the quality level engineered in the host component or system. If material quality less than the host component or system is used, justification for use shall be attached to the TACF. The material shall be compatible for this intended use (e.g., size, terminal, type, insulation, pressure rating, material, piping construction, etc.).

B. Install jumpers in a conspicuous manner to be easily distinguished from permanent wiring.

C. Fabricate inhibits from bright colored heat-shrinkable polyvinyl chloride tubing shrunk on one end for holding purposes.

D. Mark printed circuit cards and other miniature devices too small to identify with tags, jumpers, or inhibits. Identify jumpers and inhibits conspicuously.

E. Mark temporary cables with yellow and red striped tape at intervals not to exceed five feet, and intervals not to exceed two inches in an enclosure.

F. Do not install temporary cables in permanent conduits or cable trays unless no other route is available.

G. If a temporary cable for quality-related equipment becomes a permanent plant feature through appropriate means (DCN, etc.), remove the temporary cable and install permanent cable.

H. Ensure temporary cables are sufficiently rated such that the temperature rating of the insulation will not be exceeded under full load conditions. Consider the route, separation criteria, adjacent equipment, and ambient conditions.

I. Route temporary cable such that interference with existing equipment and other temporary cables is minimized.

J. Limit the use of alligator clips to the following:

   1. An urgent situation.

   2. Use of ring tongue or spade type lug is not possible.

   3. Installation of ring tongue or spade type lug presents an undue hazard.

K. Do not use jumpers with alligator clips to complete secondaries of current transformer (CT) circuits. Such circuits are normally found in protective relaying and metering circuits.

TEMPORARY ALTERATION CONTROL FORM

TACF Number _____ Page _____ of _____

INITIATION

Equipment Altered _____

Quality-Related Yes ☐ No ☐ Mode Restraint Yes ☐ No ☐ Mode Number* _____

Affected Systems _____
Description, Need, Location, Materials _____

Reason/Justification _____

Drawings Affected* _____ Drawings/Sketches Attached _____
Procedures/Instructions/Documents Affected (including operating procedures, PMs, SSDs, IDPs, MEL)*

Estimated RTN Date and Milestone _____
Initiated By _____ Phone _____ Section _____ Date _____

EVALUATION

Environmental Evaluation by Environmental Section* _____ Date _____

Effects, Limitations, Actions, System Status _____

Post Implementation Test(s)* _____
Post RTN Test(s)* _____
Reactivity Management Evaluation _____ Date _____
10CFR50.59 Review and Technical Evaluation
Complete _____ Date _____
Design Engineering Concurrence _____ Date _____
System Engineering Concurrence _____ Date _____

RECOMMENDATION AND APPROVAL

System Engineering Manager/Designee _____ Date _____
SM or Unit Manager (Licensed SRO) _____ Date _____
PORC Chairperson (Quality-Related only)* _____ Date _____
Plant Manager/Designee Approval _____ Date _____

DISTRIBUTION

Copy of TACF sent to Applicable Data
Entry Group Coordinator _____ Date _____
Copy of TACF sent to TACF Coordinator _____ Date _____
Copy of TACF sent to Training Section _____ Date _____
10CFR50.59 Review Transmitted to
Record Storage _____ Date _____

* N/A if not required

TEMPORARY ALTERATION CONTROL FORM

TACF TAG LIST

TACF Number _____

Page _____ of _____

TAG NUMBER	LOCATION	DESCRIPTION (Wire number, Terminal Board Number, Valve Number)

TEMPORARY ALTERATION CONTROL FORM

TACF Number _____ Page _____ of _____

INSTALLATION DOCUMENTATION

TACF Authorized (SM)# _____ Date _____ WID _____
Post Installation Testing Complete* _____ Date _____
Installation Verified, TAOs & MCPTs Installed _____ Date _____
Copy of TACF sent to TACF Coordinator _____ Date _____
SM Concurrence to Red Line Drawings#* _____ Date _____

AFFECTED DRAWINGS AND PROCEDURES/INSTRUCTIONS/DOCUMENTS

EDS Notified to Mark Drawings* _____ Date _____
TA Marked on Drawings by EDS* _____ Date _____
Procedures/Instructions/Documents (including operating procedures, PMs, SSDs, IDPs, MEL) Updated* _____ Date _____
TA Installation Completion Notification (SM)# _____ Date _____

RETURN TO NORMAL DOCUMENTATION

Requested By _____ Date _____ WID _____
TA RTN Authorized (SM)# _____ Date _____
Post RTN Testing Complete* _____ Date _____
TA RTN Verified, TAOs and MCPTs Removed _____ Date _____

REINSTATING DRAWINGS AND PROCEDURES/INSTRUCTIONS/DOCUMENTS

EDS Notified to Mark Drawings* _____ Date _____
TA Removed from Drawings by EDS* _____ Date _____
Copy of TACF Sent to Applicable Data Entry Group Coordinator _____ Date _____
Procedures/Instructions/Documents (including operating procedures, PMs, SSDs, IDPs, MEL) Updated* _____ Date _____
TA RTN Completed Notification (SM)# _____ Date _____

DISTRIBUTION

Original TACF Sent to TACF Coordinator _____ Date _____
Copy of TACF sent to Training Section _____ Date _____

* N/A if not required
\# SM or Designee

TACF REVIEW FORM

1. TACF Number _____

2. System Engineer _____ Telephone Number _____

3. Section _____

4. TACF Initiation Date _____ TACF Installation Date _____

5. Latest RTN Milestone/Date _____

6. TACF Status:

a.	TACF is free of administrative errors	YES ☐	NO ☐	
b.	TA is in good material condition	YES ☐	NO ☐	
c.	TA needs to remain in effect	YES ☐	NO ☐	
d.	TA needs to be revised	YES ☐	NO ☐	
e.	TA needs to be converted to a plant modification	YES ☐	NO ☐	
f.	Environmental evaluation is still accurate	YES ☐	NO ☐	N/A ☐
g.	TA configuration is correct	YES ☐	NO ☐	
h.	TAO/MCPT correctly installed	YES ☐	NO ☐	N/A ☐
i.	TAO/MCPT are legible	YES ☐	NO ☐	N/A ☐
j.	Category I drawings are correctly marked	YES ☐	NO ☐	N/A ☐
k.	Procedures/instructions/documents are correctly revised	YES ☐	NO ☐	N/A ☐
l.	Extension of TACF RTN date required If YES, provide justification for extension in comment/corrective actions.	YES ☐	NO ☐	

7. Comments/Corrective Actions _____

_____

_____

8. System Engineer _____ Date _____

9. DE notified to review Technical Evaluation & 10CFR50.59 review YES ☐ NO ☐, If YES, THEN

   Technical Evaluation & 10CFR50.59 review has been reviewed and is valid _____ Date _____
   Design Engineer

10. Current review attached to TACF _____ Date _____
    System Engineer

11. Copy of review sent to System Engineering Manager/Designee _____ Date _____
    System Engineer

12. Copy of review sent to TACF Coordinator _____ Date _____
    System Engineer

92. G2.3.1 001

You are called at home and directed to go to the Hatch Facility to assist in the recovery efforts following a refueling accident. You are informed that you will require a TLD during the assist visit.

Which ONE of the following describes the dosimetry requirement for this emergency visit per *SPP-5.1, RADIOLOGICAL CONTROLS*?

A. You must obtain your BFN dosimetry and wear it along with the dosimetry provided by Hatch. Following your return you must report to RADCON to obtain any required bioassay and update your exposure records.

B. You must inform RADCON of your intended visit and obtain your BFN dosimetry to wear with the dosimetry provided by Hatch. Upon your return you must present copies of your dose records from Hatch.

C. You must turn in your dosimetry and check out prior to leaving BFN, unless exempted by the Shift Manager or Operations Manager.

D. You must turn in your dosimetry and check out prior to leaving BFN, unless exempted by RADCON.

References: SPP-5.1, Radiological Controls Rev.3 pg 9

A. Incorrect since a bioassay is not required and you must also turn in your BFN dosimetry.

B. Incorrect since you must turn in your BFN dosimetry.

C. Incorrect since you can only get exemption from RADCON.

D. Correct answer.

RO Tier:	T3	SRO Tier:	T3
Keyword:	RADIATION CONTROL	Cog Level:	MEM 2.6/3.0
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

93. G2.3.4 001

Given the following exposure history data for an individual:

Lifetime Exposure:	19500 mrem TEDE	(NRC form 4 on file)
Annual Exposure:	4600 mrem TEDE	
Quarterly Exposure:	600 mrem TEDE	
Age:	22	
Sex:	Male	

Which ONE of the following is the maximum additional whole body exposure the individual is allowed to receive in the current calender quarter under Federal (10 CFR 20) exposure limits? (Not a planned special exposure)

A.✓ 400 mrem TEDE.

B. 600 mrem TEDE.

C. 800 mrem TEDE.

D. 1400 mrem TEDE.

References: 10 CFR 20 Subpart C 20.1201

A. Correct answer.

B, C and D. Incorrect since worker is limited to 5000 mRem annually.

Note: Changed annual dose in stem to 4600 instead of 4300. This changed the correct answer.

RO Tier:		SRO Tier:	T3
Keyword:	RADIATION CONTROL	Cog Level:	C/A 2.5/3.1
Source:	B	Exam:	BF02301
Test:	S	Misc:	TCK

94. G2.3.9 001

Unit 2 startup is in progress with the following conditions existing:

Reactor Power	10% RTP
Reactor Pressure	920 psig
Mode Switch Position	START/HOT STBY

Containment is being inerted.
Purge filter fan is in service.

Which ONE of the following describes the results of placing the Reactor Mode Switch to the RUN postion?

A. Initiates a Group 6 PCIS isolation unless Bypass switches are placed in BYPASS on panel 9-3.

B. Automatically closes all valves required for inerting with the purge filter fan unless Bypass switches are placed in BYPASS on panel 9-3.

C. Automatically closes all valves required for inerting with the purge filter fan unless the Drywell/Torus Bypass switch on panel 9-3 is taken to Torus position and any SGT fan is running.

D. Automatically closes the drywell and suppression chamber exhaust isolation valves unless the Drywell/Suppression Chamber Train A/B Vent keylock switches are positioned to DRYWELL.

References: OPL171.032 Rev.10 pg 14 and 15

A. Incorrect since placing the Mode Switch in RUN will not initiate a Group 6 isolation.

B. Correct answer.

C. Incorrect since the Drywell/Torus bypass switch on the 9-3 panel is the incorrect switch.

D. Incorrect since placing the Drywell/Suppression Chamber Train A/B Vent keylock switches to the DRYWELL position does not prevent valve movement.

RO Tier:		SRO Tier:	T3
Keyword:	CONTAINMENT	Cog Level:	C/A 2.5/3.4
Source:	B	Exam:	BF02301
Test:	S	Misc:	TCK

95. G2.4.1 001

Which ONE of the following is NOT an immediate action of 2-AOI-1-1, Relief Valve Stuck Open?

A. Inhibit MSRV Auto Actuation Logic on Panel 2-9-3.

B. PLACE affected relief valve control switch from CLOSE to OPEN to CLOSE several times, and OBSERVE indications to see whether valve closes.

C. IDENTIFY stuck open relief valve by OBSERVING SRV TAILPIPE FLOW MONITOR, 2-FMT-1-4, on Panel 2-9-3.

D. IDENTIFY stuck open relief valve by OBSERVING MSRV DISCHARGE TAILPIPE TEMPERATURE recorder, 2-TR-1-1 on Panel 2-9-47.

4.1 Immediate actions:

4.1.1 IDENTIFY stuck open relief valve by OBSERVING following:

4.1.1.1 SRV TAILPIPE FLOW MONITOR, 2-FMT-1-4, on Panel 293, or

4.1.1.2 MSRV DISCHARGE TAILPIPE TEMPERATURE recorder, 2TR11 on Panel 2947.

4.1.2 PLACE affected relief valve control switch from CLOSE to OPEN to CLOSE several times, and OBSERVE indications to see whether valve closes.

4.2 Subsequent Action

4.2.1 IF ANY EOI entry condition is met, THEN ENTER the appropriate EOI(s).

RO Tier:	T3	SRO Tier:	T3
Keyword:	RELIEF VALVE	Cog Level:	C/A 4.3/4.6
Source:	B	Exam:	BF02301
Test:	C	Misc:	

96. G2.4.10 001

Unit 2 is operating at 70% power, alarm window "Turbine Trip Timer Initiated" on the 2-9-8 Panel is illuminated.

Which ONE of the following describes the required operator action(s)?

A. Immediately scram the reactor.

B. Depress the Core Flow runback PB on 2-9-5, verify recirc runback to 50-60% core flow.

C. Start the standby Stator Cooling Water pump, if alarm does not reset, scram the reactor.

D. Immediately trip the turbine.

References: 2-ARP-9-8A Rev.20

A. Incorrect since the first action is to verify all availble SCW in service.

B. Incorrect since power cannot be reduced to below 30 percent in time.

C. Correct answer.

D. Incorrect since the turbine trip is imminent without starting the standby SCW pump.

RO Tier:	T3	SRO Tier:	T3
Keyword:	RPS	Cog Level:	MEM 3.0/3.1
Source:	N	Exam:	BF02301
Test:	C	Misc:	TCK

97. G2.4.11 001

A diesel fuel oil spill has occurred in the Diesel Generator Building. The On Scene Coordinator requests that absorbent material be delivered to the scene.

Which ONE of the following contains a list of the locations of stored absorbent material?

A. MSDS for diesel fuel oil.

B. Emergency Plan Implementing Procedure.

C. Spill Prevention Control and Countermeasures Plan.

D. Browns Ferry Master Materials Index Data Base (MMIDB).

Reference: OPL171.068 Rev. 4 pg 10
Enabling Objective #5

C is the only answer that provides a table for location of spill cleanup material therefore answers A,B and C are incorrect.

Note: Reordered answers.

RO Tier:	T3	SRO Tier:	T3
Keyword:	ADMIN	Cog Level:	MEM 3.4/3.6
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

98. G2.4.29 001

It is noted by the Unit 2 Supervisor that a Site Area Emergency classification level was exceeded but the present situation indicates that only an Alert classification level is being exceeded,.....

Which ONE (1) of the following is correct concerning the Radiological Emergency Plan?

A. the higher classification should be reported to CECC, if staffed, or ODS, if the CECC is not staffed, and the lower classification reported to NRC.

B. the higher classification shall be reported to NRC and the CECC if staffed, or the ODS, if the CECC is not staffed, but the higher classification should not be declared.

C. only the lower classification should be reported to NRC and the CECC if staffed, or the ODS, if the CECC is not staffed.

D. the higher classification shall be declared.

References: EPIP-1 Rev.29 Pg 3

A. Incorrect since the higher classification should be reported to the NRC.

B. Correct answer.

C. Incorrect since the higher classification should be reported to the NRC.

D. Incorrect since the higher classification should not be declared but should be reported to everyone.

RO Tier:		SRO Tier:	T3
Keyword:	EMERGENCY PLAN	Cog Level:	MEM 2.6/4.0
Source:	B	Exam:	BF02301
Test:	S	Misc:	

EVENT CLASSIFICATION INDEX

SECTION 1.0	REACTOR	1.1 WATER LEVEL 1.2 SCRAM FAILURE 1.3 REACTOR COOLANT ACTIVITY 1.4 MSL/OFFGAS RADIATION 1.5 LOSS OF DECAY HEAT REMOVAL
SECTION 2.0	PRIMARY CONTAINMENT	2.1 PRIMARY CONTAINMENT PRESSURE 2.2 PRIMARY CONTAINMENT HYDROGEN 2.3 DRYWELL RADIATION 2.4 DRYWELL INTERNAL LEAKAGE 2.5 LOSS OF PRIMARY CONTAINMENT
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SECTION 8.0	EMERGENCY DIRECTOR JUDGEMENT	8.1 TECHNICAL SPECIFICATIONS 8.2 LOSS OF COMMUNICATION 8.3 LOSS OF ASSESSMENT CAPABILITY 8.4 OTHER

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REACTOR
1.0

NOTES:

1.1-U1/1.1-A1 Applicable when the Reactor Head is removed and the Reactor Cavity is flooded.

1.1-S1 Applicable in Mode 5 when the Reactor Head is installed.

1.1-G2 The reactor will remain subcritical under all conditions without boron when:

- All control rods are inserted to or beyond position 02
- All control rods except one are inserted to or beyond position 00
- Determined by reactor engineering

CURVES/TABLES:

TABLE 1.1 - G2
MINIMUM ALTERNATE RPV FLOODING PRESS

NUMBER OF OPEN MSRVs	MARFP (PSIG)	
	UNIT 2	UNIT 3
6 or More	180	190
5	220	230
4	280	290

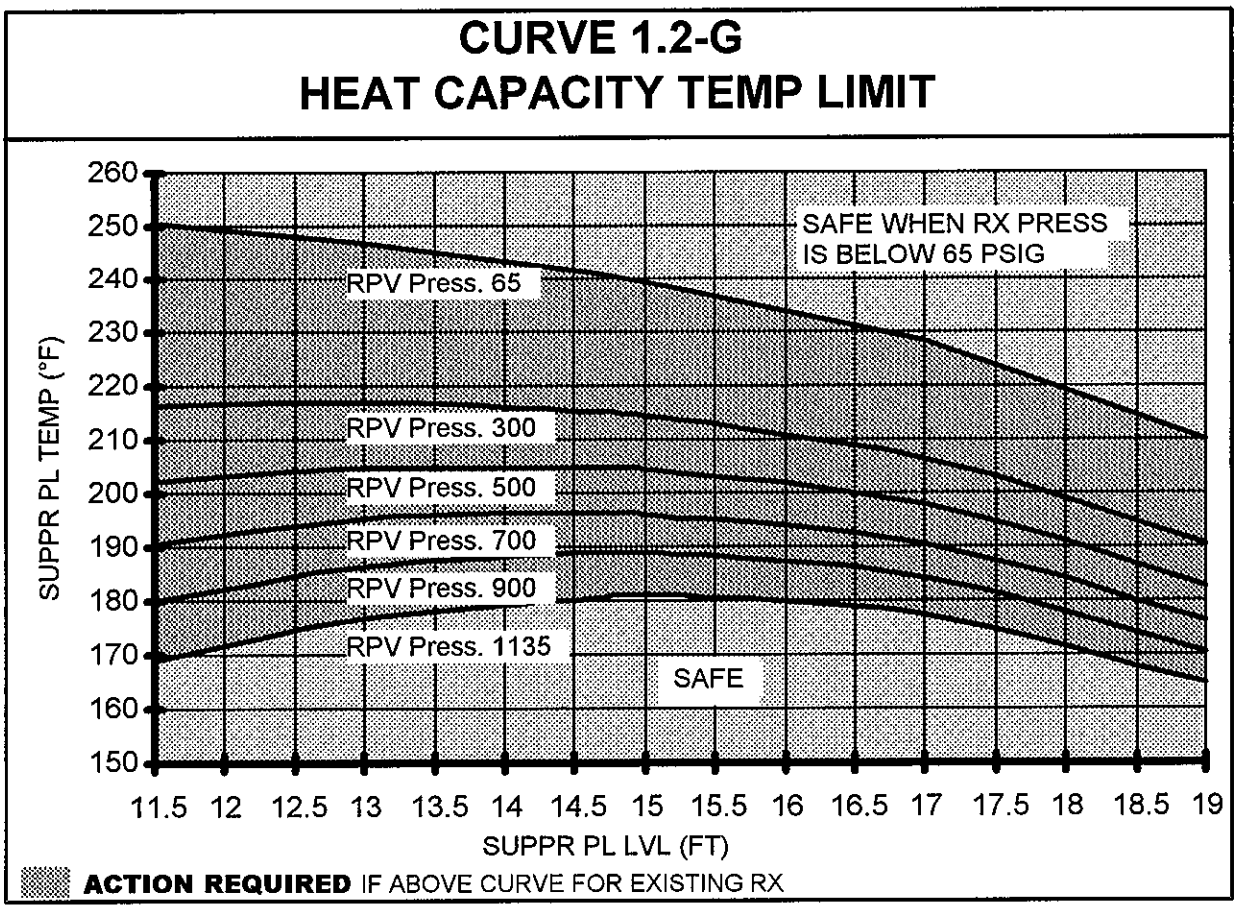
WATER LEVEL

DESCRIPTION	DESCRIPTION	
1.1-U1 N Uncontrolled water level decrease in Reactor Cavity with irradiated fuel assemblies expected to remain covered by water. OPERATING CONDITION: - Mode 5	**1.1-U2** Uncontrolled water level decrease in Spent Fuel Pool with irradiated fuel assemblies expected to remain covered by water. OPERATING CONDITION: - All	UNUSUAL EVENT
1.1-A1 N Uncontrolled water level decrease in Reactor Cavity expected to result in irradiated Fuel assemblies being uncovered. OPERATING CONDITION: - Mode 5	**1.1-A2** Uncontrolled water level decrease in Spent Fuel Storage Pool expected to result in irradiated fuel assemblies being uncovered. OPERATING CONDITION: - All	ALERT
1.1-S1 N Reactor water level CANNOT be maintained above -162 IN. (TAF) OPERATING CONDITION: - All	**1.1-S2** Reactor water level CANNOT be determined. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	SITE EMERGENCY
1.1-G1 Reactor water level CANNOT be restored and maintained above: • UNIT 2 -190 IN. • UNIT 3 -185 IN. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	**1.1-G2** T N Reactor water level CANNOT be determined **AND** EITHER of the following conditions exists: • The reactor will remain subcritical w/o boron under all conditions and Less than 4 MSRVs can be opened, or Reactor pressure CANNOT be restored and maintained at least 65 PSI above Suppression Chamber pressure. • It has NOT been determined that the reactor will remain subcritical w/o boron under all conditions and unable to restore and maintain MARFP in Table 1.1-G2. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	GENERAL EMERGENCY

NOTES:

1.2 Subcritical is defined as Reactor power below the heating range and not trending upward.

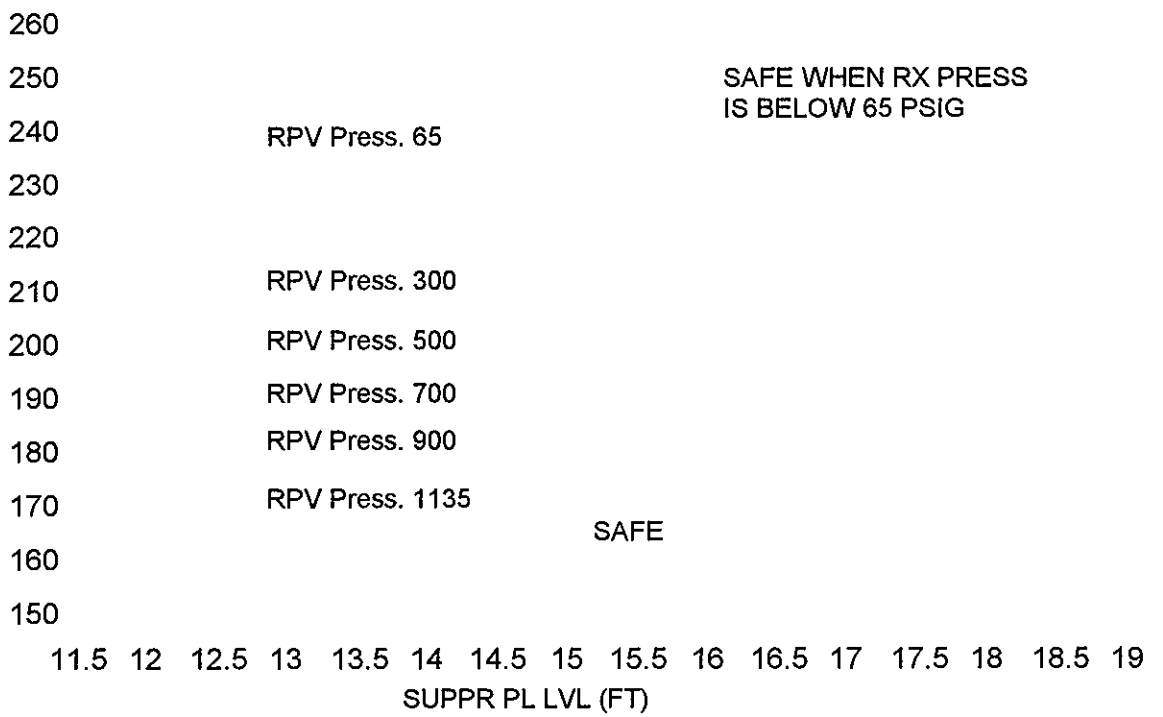
CURVES/TABLES:



SCRAM FAILURE	REACTOR COOLANT ACTIVITY	
DESCRIPTION	DESCRIPTION	
	1.3-U Reactor coolant activity exceeds 26 µCi/gm dose equivalent I-131 (Technical Specification Limit) as determined by chemistry sample. OPERATING CONDITION: - ALL	UNUSUAL EVENT
1.2-A N Failure of automatic scram functions to bring the Reactor subcritical **AND** Manual scram or ARI was successful. OPERATING CONDITION: - Mode 1 - Mode 2	**1.3-A** Reactor coolant activity exceeds 300 µCi/gm dose equivalent Iodine-131 as determined by chemistry sample. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	ALERT
1.2-S N Failure of automatic scram, manual scram, and ARI to bring the Reactor subcritical. OPERATING CONDITION: - Mode 1		SITE EMERGENCY
1.2-G C Failure of automatic scram, manual scram, and ARI. Reactor power >3% **AND** EITHER of the following conditions exists: • Suppression Pool temp exceeds HCTL. Refer to Curve 1.2-G. • Reactor water level CANNOT be restored and maintained at or above: • UNIT 2 -190 IN. • UNIT 3 -185 IN. OPERATING CONDITION: - Mode 1 - Mode 2		GENERAL EMERGENCY

CURVES/TABLES:

CURVE 1.5-S
HEAT CAPACITY TEMP LIMIT



ACTION REQUIRED IF ABOVE CURVE FOR EXISTING RX

MSL/OFFGAS RADIATION	LOSS OF DECAY HEAT REMOVAL	
DESCRIPTION	DESCRIPTION	
1.4-U Valid MAIN STEAM LINE RADIATION HIGH-HIGH alarm, RA-90-135C **OR** Valid OG PRETREATMENT RADIATION HIGH alarm, RA-90-157A. OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3		UNUSUAL EVENT
	1.5A Reactor moderator temperature CANNOT be maintained below 212° F whenever Technical Specifications require Mode 4 conditions or during operations in Mode 5. OPERATING CONDITION: - Mode 4 - Mode 5	ALERT
	1.5-S C Suppression Pool temperature, level and RPV pressure CANNOT be maintained in the safe area of Curve 1.5-S. OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3	SITE EMERGENCY
		GENERAL EMERGENCY

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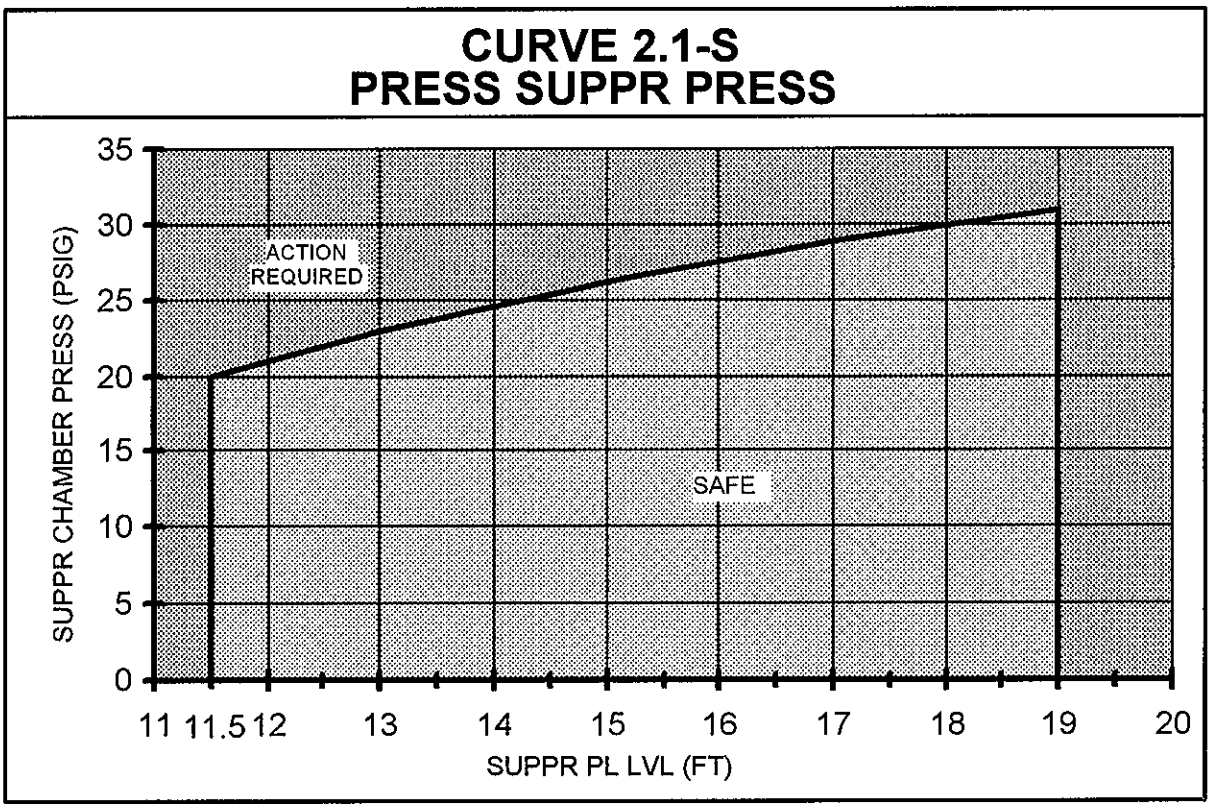
PRIMARY CONTAINMENT 2.0

NOTES:

CURVES/TABLES:

TABLE 2.1-A INDICATIONS OF PRIMARY SYSTEM LEAKAGE INTO PRIMARY CONTAINMENT
PRIMARY CONTAINMENT PRESSURE HIGH ALARM
DRYWELL FLOOR DRAIN SUMP PUMP EXCESSIVE OPERATION
DRYWELL CAM ACTIVITY INCREASING
DRYWELL TEMPERATURE HIGH ALARM
CHEMISTRY SAMPLE RADIONUCLIDE COMPARSION TO RX WATER



PRIMARY CONTAINMENT PRESSURE DESCRIPTION	PRIMARY CONTAINMENT HYDROGEN DESCRIPTION	
		UNUSUAL EVENT
2.1-A T Drywell pressure at or above 2.45 PSIG **AND** Indications of Primary System leakage into Primary Containment. Refer to Table 2.1-A. OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3		ALERT
2.1-S C Suppression Chamber Pressure CANNOT be maintained in the safe area of Curve 2.1-S. OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3	**2.2-S** Drywell or Suppression Chamber hydrogen concentration at or above 4% **AND** Drywell or Suppression Chamber oxygen concentration at or above 5%. OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3	SITE EMERGENCY
2.1-G Suppression Chamber Pressure CANNOT be maintained below 55 PSIG. OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3	**2.2-G** Drywell or Suppression Chamber hydrogen concentration at or above 6% **AND** Drywell or Suppression Chamber oxygen concentration at or above 5%. OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3	GENERAL EMERGENCY

NOTES:

CURVES/TABLES:

TABLE 2.3-A/2.3-S2
DRYWELL RADIATION LEVELS
WITH RCS BARRIER INTACT

UNIT 2		UNIT 3	
RAD MONITOR	R/HR	RAD MONITOR	R/HR
2-RE-90-272A	345	3-RE-90-272A	106
2-RE-90-273A	164	3-RE-90-273A	164

TABLE 2.3/2.5-U
INDICATIONS OF LOSS OF PRIMARY CONTAINMENT

UNEXPLAINED LOSS OF PRESSURE
EXCEEDING SI-4.7.A.2.a LIMITS
INABILITY TO ISOLATE ANY LINE EXITING CONTAINMENT WHEN ISOLATION IS REQUIRED
VENTING IRRESPECTIVE OF OFFSITE RELEASE RATES PER EOIs/SAMGs

DRYWELL RADIATION

DESCRIPTION	DESCRIPTION	
		UNUSUAL EVENT
2.3-A T* Drywell radiation levels at or above the values listed in Table 2.3-A/2.3-S2, with the RCS barrier intact. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2		ALERT
2.3-S1 Drywell radiation levels at or above 4880 R/HR with the RCS barrier not intact. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	**2.3-S2** T* Drywell radiation levels at or above the values listed in Table 2.3-A/2.3-S2, with the RCS barrier intact. **AND** **Either of the following exists:** • **Indications of loss of Primary Containment. Refer to Table 2.3/2.5-U.** • **Primary Containment integrity CANNOT be maintained.** OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	SITE EMERGENCY
2.3-G1 Drywell radiation levels at or above 19500 R/HR with the RCS barrier not intact. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	**2.3-G2** T Drywell radiation levels at or above 4880 R/HR with the RCS barrier not intact. **AND** Either of the following exists: • Indications of loss of Primary Containment. Refer to Table 2.3/2.5-U. • Primary Containment integrity CANNOT be maintained. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	GENERAL EMERGENCY

NOTES:

CURVES/TABLES:

TABLE 2.3/2.5-U
INDICATIONS OF LOSS OF PRIMARY CONTAINMENT

UNEXPLAINED LOSS OF PRESSURE
EXCEEDING SI-4.7.A.2.a LIMITS
INABILITY TO ISOLATE ANY LINE EXITING CONTAINMENT WHEN ISOLATION IS REQUIRED
VENTING IRRESPECTIVE OF OFFSITE RELEASE RATES PER EOIs

DRYWELL INTERNAL LEAKAGE	LOSS OF PRIMARY CONTAINMENT	
DESCRIPTION	DESCRIPTION	
2.4-U Drywell unidentified leakage exceeds 10 GPM **OR** Drywell identified leakage exceeds 40 GPM. OPERATING CONDITION: - Mode 1 -Mode 3 - Mode 2	**2.5-U** T Inability to maintain Primary Containment pressure boundary. Refer to Table 2.3/2.5-U. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	UNUSUAL EVENT
2.4-A Drywell unidentified leakage exceeds 50 GPM. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2		ALERT
		SITE EMERGENCY
		GENERAL EMERGENCY

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SECONDARY CONTAINMENT 3.0

NOTES:

CURVES/TABLES:

TABLE 3.1
MAXIMUM SAFE OPERATING AREA TEMPERATURE LIMITS

AREA	APPLICABLE PANEL 9-21 TEMPERATURE ELEMENTS (UNLESS OTHERWISE NOTED)	MAX SAFE OPERATING VALUE °F	
		UNIT 2	UNIT 3
RHR A/C PUMP ROOM	74-95A	150	155
RHR B/D PUMP ROOM	74-95B	210	215
HPCI TURBINE AREA	73-55A	270	270
RCIC TURBINE AREA	71-41A	190	190
CS PUMP ROOM HIGH HUMIDITY OR TEMP HIGH	(XA-55-3E-29) PANEL 9-3 TI-75-69B	140	150
RCIC STEAM SUPPLY AREA	71-41B, 41C, 41D	200	250
HPCI STEAM SUPPLY AREA	73-55B, 55C, 55D	240	240
RHR A/C PUMP SUPPLY AREA	74-95H	240	240
RHR B/D PUMP SUPPLY AREA	74-95G	240	240
MAIN STEAM LINE LEAK DETECTION HIGH	(XA-55-3D-24) PANEL 9-3 TIS-1-60A	315	315
RHR VALVE ROOM	74-95E	170	175
RWCU ISOL LOGIC CHANNEL A/B TEMP HIGH	(XA-55-5B-32/33) PANEL 9-5 69-835A, B, C, D AUX INST ROOM	170	175
RWCU OUTBD ISOL VLV AREA	69-29F	220	220
RWCU HX AREA	69-29G	220	220
RWCU HX EXH DUCT	69-29H	220	220
RWCU RECIRC PUMP A AREA	69-29D	215	215
RWCU RECIRC PUMP B AREA	69-29E	215	215
RHR A/C HX ROOM	74-95C	195	200
RHR B/D HX ROOM	74-95D	195	200
FPC HX AREA	74-95F	150	155

TABLE 3.2
MAXIMUM SAFE OPERATING AREA RADIATION LIMITS

AREA	RAD MONITOR	MAX SAFE VALUE MR/HR
RHR WEST ROOM	90-25A	1000
RHR EAST ROOM	90-28A	1000
HPCI ROOM	90-24A	1000
CS/RCIC ROOM	90-26A	1000
CORE SPRAY ROOM	90-27A	1000
SUPPR POOL AREA	90-29A	1000
CRD-HCU WEST AREA	90-20A	1000
CRD-HCU EAST AREA	90-21A	1000
TIP DRIVE AREA	90-23A	1000
NORTH RWCU SYSTEM AREA	90-13A	1000
SOUTH RWCU SYSTEM AREA	90-14A	1000
RWCU SYSTEM AREA	90-9A	1000
MG SET AREA	90-4A	1000
FUEL POOL AREA	90-1A	1000
SERVICE FLR AREA	90-2A	1000
NEW FUEL STORAGE	90-1A	1000

TABLE 3.1-G/3.2-G
INDICATIONS OF POTENTIAL OR SIGNIFICANT FUEL FAILURE with the RCS Barrier Intact

DRYWELL RADIATION UNIT 2		DRYWELL RADIATION UNIT 3	
2-RE-90-272A	≥ 345 R/HR	3-RE-90-272A	≥ 106 R/HR
2-RE-90-273A	≥ 164 R/HR	3-RE-90-273A	≥ 164 R/HR
REACTOR COOLANT ACTIVITY ≥ 300 μCI/gm DOSE EQUILAVENT IODINE-131		REACTOR COOLANT ACTIVITY ≥ 300 μCI/gm DOSE EQUILAVENT IODINE-131	

SECONDARY CONTAINMENT TEMPERATURE DESCRIPTION	SECONDARY CONTAINMENT RADIATION DESCRIPTION	
		UNUSUAL EVENT
	3.2-A Any of the following high radiation alarms on Panel 9-3: • RA-90-1A, Fuel Pool Floor Area • RA-90-250A, Reactor, Turbine, Refuel Exhaust • RA-90-142A, Reactor Zone Exhaust • RA-90-140A, Refueling Zone Exhaust **AND** Confirmation by Refuel Floor personnel that irradiated fuel damage may have occurred. OPERATING CONDITION: - All	ALERT
3.1-S T* An unisolable Primary System leak is discharging into Secondary Containment **AND** Any area temperature exceeds the Maximum Safe Operating Temperature limit listed in Table 3.1. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	**3.2-S** T An unisolable Primary System leak is discharging into Secondary Containment **AND** Any area radiation level at or above the Maximum Safe Operating area Radiation limit listed in Table 3.2. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	SITE EMERGENCY
3.1-G T* An unisolable Primary System leak is discharging into Secondary Containment **AND** Any area temperature exceeds the Maximum Safe Operating Temperature limit listed in Table 3.1. **AND** Any indication of potential or significant fuel failure exists. Refer to Table 3.1-G/3.2-G. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	**3.2-G** T* An unisolable Primary System leak is discharging into Secondary Containment **AND** Any area radiation level at or above the Maximum Safe Operating area Radiation limit listed in Table 3.2 **AND** Any indication of potential or significant fuel failure exists. Refer to Table 3.1-G/3.2-G. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	GENERAL EMERGENCY

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RADIOACTIVITY RELEASES 4.0

NOTES:

NOTE 4.1-U Prior to making this emergency classification based upon the WRGERMS indication, assess the release by either of the following:
1. Actual field measurements exceed the limits in Table 4.1-U
2. SI 4.8.B.1.a.1 Release Fraction exceeds 2.0

If neither assessment can be conducted within 60 minutes then the declaration must be made on the valid WRGERMS reading.

NOTE 4.1-A Prior to making this emergency classification based upon the WRGERMS indication, assess the release by either of the following:
1. Actual field measurements exceed the limits in Table 4.1-A
2. SI 4.8.B.1.a.1 Release Fraction exceeds 200

If neither assessment can be conducted within 15 minutes then the declaration must be made on the valid WRGERMS reading.

NOTE 4.1-S Prior to making this emergency classification based upon the Gaseous Release Rate indication, assess the release by either of the following methods:
1. Actual field measurements exceed the limits in Table 4.1-S.
2. Projected or Actual Dose Assessments exceed 100 mrem TEDE or 500 mrem CDE.

If neither assessment can be conducted within 15 minutes then the declaration must be made based on the valid WRGERMS reading.

NOTE 4.1-G Prior to making this emergency classification based upon the Gaseous Release Rate indication, assess the release by either of the following methods:
1. Actual field measurements exceed the limits in Table 4.1-G.
2. Projected or Actual Dose Assessments exceed 1000 mrem TEDE or 5000 mrem CDE.

If neither assessment can be conducted within 15 minutes then the declaration must be made based on the valid WRGERMS reading.

CURVES/TABLES:

Table 4.1-U
RELEASE LIMITS FOR UNUSUAL EVENT

TYPE	MONITORING METHOD	LIMIT	DURATION
GASEOUS RELEASE RATE	STACK NOBLE GAS (WRGERMS)	2.88×10^{7} µCi/sec	1 HOUR
GASEOUS RELEASE RATE	SI 4.8.B.1.a.1	RELEASE FRACTION 2.0	1 HOUR
SITE BOUNDARY RADIATION READING	FIELD ASSESSMENT TEAM	0.10 MREM/HR Gamma	1 HOUR

Table 4.1-A
RELEASE LIMITS FOR ALERT

TYPE	MONITORING METHOD	LIMIT	DURATION
GASEOUS RELEASE RATE	STACK NOBLE GAS (WRGERMS)	2.88×10^{9} µCi/sec	15 MINUTES
GASEOUS RELEASE RATE	SI 4.8.B.1.a.1	RELEASE FRACTION 200	15 MINUTES
SITE BOUNDARY RADIATION READING	FIELD ASSESSMENT TEAM	10 MREM/HR Gamma	15 MINUTES

Table 4.1-S
RELEASE LIMITS FOR SITE AREA EMERGENCY

TYPE	MONITORING METHOD	LIMIT	DURATION
GASEOUS RELEASE RATE	STACK NOBLE GAS (WRGERMS)	5.9×10^{9} µCi/sec	15 MINUTES
SITE BOUNDARY RADIATION READING	FIELD ASSESSMENT TEAM	100 MREM/HR Gamma	1 HOUR
SITE BOUNDARY IODINE-131	FIELD ASSESSMENT TEAM	3.9×10^{-7} µCI /cm^3	1 HOUR

Table 4.1-G
RELEASE LIMITS FOR GENERAL EMERGENCY

TYPE	MONITORING METHOD	LIMIT	DURATION
GASEOUS RELEASE RATE	STACK NOBLE GAS (WRGERMS)	5.9×10^{10} µCi/sec	15 MINUTES
SITE BOUNDARY RADIATION READING	FIELD ASSESSMENT TEAM	1000 MREM/HR Gamma	1 HOUR
SITE BOUNDARY IODINE-131	FIELD ASSESSMENT TEAM	3.9×10^{-6} µCI / cm^3	1 HOUR

GASEOUS EFFLUENT	MAIN STEAM LINE BREAK	
DESCRIPTION	DESCRIPTION	
4.1-U T N Gaseous release exceeds ANY limit and duration in Table 4.1-U. OPERATING CONDITION: - All	**4.2-U** Main Steam Line break outside Primary Containment with isolation. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	UNUSUAL EVENT
4.1-A T N Gaseous release exceeds ANY limit and duration in Table 4.1-A. OPERATING CONDITION: - All		ALERT
4.1-S T N EITHER of the following conditions exists: • Gaseous release exceeds or is expected to exceed ANY limit and duration in Table 4.1-S. • Dose assessment indicates actual or projected dose consequences above 100 mrem TEDE or 500 mrem thyroid CDE. OPERATING CONDITION: - All	**4.2-S** Unisolable Main Steam Line break outside Primary Containment. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	SITE EMERGENCY
4.1-G T N EITHER of the following conditions exists: • Gaseous release exceeds or is expected to exceed ANY limit and duration in Table 4.1-G. • Dose assessment indicates actual or projected dose consequences above 1000 mrem TEDE or 5000 mrem thyroid CDE. OPERATING CONDITION: - All		GENERAL EMERGENCY

NOTES:

CURVES/TABLES:

LIQUID EFFLUENT		
DESCRIPTION	DESCRIPTION	
4.3-U Liquid release rate exceeds 20 times ECL as determined by chemistry sample **AND** Release duration exceeds or will exceed 60 minutes. OPERATING CONDITION: - All		UNUSUAL EVENT
4.3-A Liquid release rate exceeds 2000 times ECL as determined by chemistry sample **AND** Release duration exceeds or will exceed 15 minutes. OPERATING CONDITION: - All		ALERT
		SITE EMERGENCY
		GENERAL EMERGENCY

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LOSS OF POWER
5.0

NOTES:

5.1-U Loss of normal and alternate supply voltage implies inability to restore voltage from any qualified source to normal or alternate feeder for at least one of the unit specific boards within 15 minutes. At least two boards must be energized from Diesel power to meet this classification. If only one board can be energized and that board has only one source of power then refer to EAL 5.1-A1 or 5.1-A2.

5.1-A1 Only one source of power (Diesel or Offsite) is available to any one of the listed unit specific 4KV Shutdown Boards. No power is available to the three remaining boards.

5.1-A2 Loss of voltage to all unit specific 4KV Shutdown Boards applies to those boards which normally supply emergency AC power to the affected unit only. Determination of the event classification depends on the affected unit operating mode. For units in operation 5.1-S would apply.

5.1-S Loss of voltage to all unit specific 4KV Shutdown Boards applies to those boards which normally supply emergency AC power to the affected unit only. Determination of the event classification depends on the affected unit operating mode. For units in Shutdown or Refuel 5.1-A2 would apply.

5.1-G Loss of voltage to all unit specific 4KV Shutdown Boards applies to those boards which normally supply emergency AC power to the affected unit only.

CURVES/TABLES:

TABLE 5.1
UNIT 4KV SHUTDOWN BOARD APPLICABILITY

APPLICABLE UNIT	APPLICABLE 4KV SHUTDOWN BOARDS
UNIT 1	A, B, C, and D
UNIT 2	A, B, C, and D
UNIT 3	3A, 3B, 3C, and 3D

LOSS OF AC POWER

DESCRIPTION	DESCRIPTION	
5.1-U T N Loss of normal and alternate supply voltage to ALL unit specific 4KV shutdown boards from Table 5.1 for greater than 15 minutes **AND** At least two Diesel Generators supplying power to unit specific 4KV Shutdown Boards listed in Table 5.1. OPERATING CONDITION: - All		UNUSUAL EVENT
5.1-A1 T N Loss of voltage to ANY THREE unit specific 4KV Shutdown Boards from Table 5.1 for greater than 15 minutes **AND** Only one source of AC power available to the remaining board. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2	**5.1-A2** T N Loss of voltage to ALL unit specific 4KV Shutdown Boards from Table 5.1 for greater than 15 minutes. OPERATING CONDITION: - Mode 4 - Defueled - Mode 5	ALERT
5.1-S T N Loss of voltage to ALL unit Specific 4KV Shutdown Boards from Table 5.1 for greater than 15 minutes. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2		SITE EMERGENCY
5.1-G T N Loss of voltage to ALL unit specific 4KV Shutdown Boards From Table 5.1 **AND** EITHER of the following conditions exists: • Restoration of at least one 4KV Shutdown Board is NOT likely within three hours • Adequate core cooling CANNOT be assured. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2		GENERAL EMERGENCY

NOTES:

5.2 250V DC bus voltage of less than 248 volts on any feeder to any referenced board constitutes a loss of voltage for that feeder; thus, a loss of DC control voltage to the referenced board. The voltage readings are obtained at the 250V Battery Boards feeding the referenced boards.

CURVES/TABLES:

TABLE 5.2-U
UNIT 4KV SHUTDOWN BOARD APPLICABILITY

APPLICABLE UNIT	APPLICABLE 4KV SHUTDOWN BOARDS
UNIT 1	A, B, C, and D
UNIT 2	A, B, C, and D
UNIT 3	3A, 3B, 3C, and 3D

TABLE 5.2-S
CRITICAL DC POWER AND ESSENTIAL SYSTEMS

COMBINATION	CRITICAL 250V DC POWER (UNIT SPECIFIC UNLESS OTHERWISE NOTED)	ESSENTIAL SYSTEMS
I	4KV UNIT BD, A, B, and C CONTROL POWER AND 480V UNIT BOARD A and B CONTROL POWER AND PANEL 9-9 CABINET 1	MAIN CONDENSER AND EHC PUMPS AND REACTOR FEED PUMPS
II	250V DC RMOV BD A	HPCI
III	250V DC RMOV BD C	RCIC
IV	250V DC RMOV BDs A, B, and C AND 4KV SHUTDOWN BDs A, B, C, and D CONTROL POWER (3A, 3B, 3C, and 3D FOR UNIT 3)	> 4 MSRVs AND 1 RHR PUMP OR 1 CORE SPRAY PUMP

LOSS OF DC POWER

DESCRIPTION	DESCRIPTION	
5.2-U T N Unplanned loss of 250V DC control power to ALL unit specific 4KV Shutdown Boards from table 5.2-U for greater than 15 minutes **OR** Unplanned loss of 250V DC control power to unit specific 480V Shutdown Boards A and B for greater than 15 minutes. OPERATING CONDITION: - Mode 4 - Mode 5		UNUSUAL EVENT
		ALERT
5.2-S T N Loss of 250V DC power to ALL combinations (I, II, III, and IV) of essential systems from Table 5.2-S for greater than 15 minutes. OPERATING CONDITION: - Mode 1 - Mode 3 - Mode 2		SITE EMERGENCY
		GENERAL EMERGENCY

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HAZARDS
6.0

NOTES:

CURVES/TABLES:

RADIOLOGICAL

DESCRIPTION	DESCRIPTION	
6.1-U Valid, unexpected increase of ANY in plant ARM reading to 1000 mrem/hr (except TIP Room). OPERATING CONDITION: - All		UNUSUAL EVENT
6.1-A1 Valid, unexpected increase of ANY in plant ARM reading to 1000 mrem/hr (except TIP Room). **AND** Personnel actions required in the affected area(s). OPERATING CONDITION: - All	6.1-A2 Control Room radiation levels >15 mrem/hr. OPERATING CONDITION: - All	ALERT
		SITE EMERGENCY
		GENERAL EMERGENCY

NOTES:

CURVES/TABLES:

CONTROL ROOM EVACUATION DESCRIPTION	TURBINE FAILURE DESCRIPTION	
	6.3-U Turbine failure resulting in casing penetration **OR** Significant damage to turbine or generator seals during operation. OPERATING CONDITION: - Mode 1 - Mode 2	UNUSUAL EVENT
6.2-A Control Room Abandonment from entry into AOI-100-2 or SSI-16 for ANY Unit Control Room. . OPERATING CONDITION: - All	6.3-A Turbine failure resulting in visible structural damage to or penetration of ANY of the following structures from missiles: • Reactor Building • Diesel Generator Building • Intake Structures • Control Bay OPERATING CONDITION: - Mode 1 - Mode 2	ALERT
6.2-S Control Room Abandonment from entry into AOI-100-2 or SSI-16 for ANY Unit Control Room. **AND** Control of Reactor water level, Reactor pressure, and Reactor power (for Modes 1, 2, & 3) or decay heat removal (for Modes 4 & 5) per AOI-100-2 or SSI-16 as applicable CANNOT be established within 20 minutes after evacuation is initiated. OPERATING CONDITION: - All		SITE EMERGENCY
		GENERAL EMERGENCY

NOTES:

CURVES/TABLES:

TABLE 6.4-U1 APPLICABLE PLANT AREA
REACTOR BUILDING
REFUEL FLOOR
4KV SHUTDOWN BOARD ROOMS
4KV SHUTDOWN BOARD BATTERY ROOMS
480V SHUTDOWN BOARD ROOMS
3A and 3B RMOV BOARD ROOMS
4KV BUS TIE BOARD ROOM
CONTROL BAY ELEVATION 593', 606' and 617'
DIESEL GENERATOR BUILDINGS (ALL ELEVATIONS)
TURBINE BUILDING (ALL ELEVATIONS IN OR ADJACENT TO AREAS CONTAINING SAFE SHUTDOWN EQUIPMENT
INTAKE PUMPING STATION (ALL ELEVATIONS)
RADWASTE BUILDING (ALL ELEVATIONS)
CABLE TUNNEL (INTAKE TO TURBINE BUILDING)
STANDBY GAS TREATMENT BUILDING

TABLE 6.4-A APPLICABLE PLANT AREA
REACTOR BUILDING
REFUEL FLOOR
4KV SHUTDOWN BOARD ROOMS
4KV SHUTDOWN BOARD BATTERY ROOMS
480V SHUTDOWN BOARD ROOMS
3A and 3B RMOV BOARD ROOMS
4KV BUS TIE BOARD ROOM
CONTROL BAY ELEVATION 593', 606' and 617'
DIESEL GENERATOR BUILDINGS (ALL ELEVATIONS)
INTAKE PUMPING STATION (ALL ELEVATIONS)
CABLE TUNNEL (INTAKE TO TURBINE BUILDING)
STANDBY GAS TREATMENT BUILDING

FIRE/EXPLOSION

DESCRIPTION	DESCRIPTION	
6.4-U1 T Confirmed fire in ANY plant area listed in Table 6.4-U1 **AND** NOT extinguished within 15 minutes. OPERATING CONDITION: - All	**6.4-U2** Unanticipated explosion within the protected area resulting in visible damage to ANY permanent structure or equipment. OPERATING CONDITION: - All	**UNUSUAL EVENT**
6.4-A T Fire or explosion in ANY plant area listed in Table 6.4-A affecting safety system performance **OR** Fire or explosion causing visible damage to permanent structures or safety systems in ANY area listed in Table 6.4-A. OPERATING CONDITION: - All		**ALERT**
		SITE EMERGENCY
		GENERAL EMERGENCY

NOTES:

CURVES/TABLES:

TABLE 6.5/6.6
APPLICABLE PLANT AREA

REACTOR BUILDINGS
REFUEL FLOOR
CONTROL BAY
DIESEL GENERATOR BUILDINGS
TURBINE BUILDING
INTAKE PUMPING STATION
RADWASTE BUILDING
CABLE TUNNEL (INTAKE TO TURBINE BUILDING)
STANDBY GAS TREATMENT BUILDING

TOXIC GASES

DESCRIPTION	DESCRIPTION	
6.5-U T EITHER of the following conditions exists: • Normal operations impeded due to access restrictions caused by toxic gas concentrations within any building or structure listed in Table 6.5/6.6. • Confirmed report by Local, County, or State Officials that a large offsite toxic gas release has occurred within one mile of the site with potential to enter the site boundary in concentrations at or above the Permissible Exposure Limit (PEL) causing an evacuation of any site personnel. OPERATING CONDITION: -All		UNUSUAL EVENT
6.5-A T ALL of the following conditions exists: • Plant personnel report toxic gas within any building or structure listed in Table 6.5/6.6. • Plant personnel report severe adverse health reactions due to toxic gas (i.e., burning eyes, throat, or dizziness) or Sampling results by Fire Protection or Industrial Safety personnel indicate levels above the Permissible Exposure Limit (PEL). • Determination by the Site Emergency Director that plant personnel would be unable to perform actions necessary to establish and maintain cold shutdown conditions while utilizing appropriate personnel protective equipment. OPERATING CONDITION: -ALL		ALERT
		SITE EMERGENCY
		GENERAL EMERGENCY

NOTES:

CURVES/TABLES:

TABLE 6.5/6.6 APPLICABLE PLANT AREA
REACTOR BUILDINGS
REFUEL FLOOR
CONTROL BAY
DIESEL GENERATOR BUILDINGS
TURBINE BUILDING
INTAKE PUMPING STATION
RADWASTE BUILDING
CABLE TUNNEL (INTAKE TO TURBINE BUILDING)
STANDBY GAS TREATMENT BUILDING

FLAMMABLE GASES

DESCRIPTION	DESCRIPTION	
6.6-U T EITHER of the following conditions exists: • Release of flammable gas within the site boundary in concentrations at or above 25% of the Lower Explosive Limit (LEL) for any three readings obtained in a 10 ft. triangular area as indicated by Fire Protection or Industrial Safety personnel using appropriate monitoring instrumentation. • Confirmed report by Local, County, or State Officials that a large offsite flammable gas release has occurred within one mile of the site with potential to enter the site boundary in concentrations at or above 25% of the Lower Explosive Limit (LEL). OPERATING CONDITION: - All		UNUSUAL EVENT
6.6-A T Release of flammable gases within any building or structure listed in Table 6.5/6.6 in concentrations at or above 25% of the Lower Explosive Limit (LEL) for any three readings obtained in a 10 ft. triangular area as indicated by Fire Protection or Industrial Safety personnel using appropriate monitoring instrumentation. OPERATING CONDITION: - All		ALERT
		SITE EMERGENCY
		GENERAL EMERGENCY

NOTES:

CURVES/TABLES:

SECURITY

DESCRIPTION	DESCRIPTION	
6.7-U ANY of the following conditions exist: • Bomb device discovered within the plant protected area but NOT within a vital area • Attempted or imminent attempt by a hostile force to penetrate the plant protected area barrier • Civil disturbance ongoing on the owner controlled property outside the protected area that threatens to interrupt plant operations • Hostage/Extortion situation that threatens to interrupt plant operations. • A credible site-specific security threat notification. OPERATING CONDITION: - All		UNUSUAL EVENT
6.7-A Bomb device discovered within ANY plant vital area **OR** Actual intrusion into the plant protected area by a hostile force. OPERATING CONDITION: - All		ALERT
6.7-S Intrusion into ANY plant vital area by a hostile force. OPERATING CONDITION: - All		SITE EMERGENCY
6.7-G Intrusion by a hostile force into Control Rooms, backup control areas, or plant vital areas which results in a loss of physical control of equipment or functions required to reach and maintain safe shutdown or remove decay heat from any unit. OPERATING CONDITION: - All		GENERAL EMERGENCY

NOTES:

CURVES/TABLES:

VEHICLE CRASH

DESCRIPTION	DESCRIPTION	
6.8-U Vehicle crash (for example; aircraft or barge) into plant structures or systems within the protected area boundary. OPERATING CONDITION: - All		UNUSUAL EVENT
6.8-A Vehicle crash (for example; aircraft or barge) into ANY Plant vital area. OPERATING CONDITION: - All		ALERT
		SITE EMERGENCY
		GENERAL EMERGENCY

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NATURAL EVENTS
7.0

NOTES:

CURVES/TABLES:

EARTH QUAKE	TORNADO/HIGH WINDS	
DESCRIPTION	**DESCRIPTION**	
7.1-U Valid annunciation in Unit One Control Room, Panel 1-XA-55-4B, Window 29, START OF STRONG MOTION ACCELEROGRAPH **AND** Assessment by Unit One and Two Control Room personnel that an earthquake has occurred. OPERATING CONDITION: - All	**7.2-U** Report by plant personnel of Tornado striking within the protected area boundary. OPERATING CONDITION: - All	UNUSUAL EVENT
7.1-A Any of the following annunciations in Unit One Control Room, Panel 1-XA-55-4B: •Window 22, SEISMIC TRIGGER A •Window 23, SEISMIC TRIGGER B •Window 30, SEISMIC TRIGGER C **AND** Assessment by Unit One and Two Control Room personnel that an earthquake has occurred. OPERATING CONDITION: - All	**7.2-A** Tornado striking plant vital area **OR** Onsite wind speed above 90 MPH as indicated using the meteorological data screen of the Integrated Computer System (ICS). OPERATING CONDITION: - All	ALERT
		SITE EMERGENCY
		GENERAL EMERGENCY

NOTES:

CURVES/TABLES:

FLOOD

DESCRIPTION	DESCRIPTION	
7.3-U Wheeler Lake level greater than elevation 565 FT. **AND** Water entering permanent plant structures due to flooding. OPERATING CONDITION: - All		UNUSUAL EVENT
7.3-A Wheeler Lake level greater than elevation 565 FT. **AND** Either of the following conditions exists: • Breech or failure of any water-tight structure causing flooding of the structure. • Affecting equipment required for safe shutdown. OPERATING CONDITION: - All		ALERT
		SITE EMERGENCY
		GENERAL EMERGENCY

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EMERGENCY DIRECTOR JUDGEMENT 8.0

NOTES:

CURVES/TABLES:

TABLE 8.2-U LOSS OF COMMUNICATIONS	
ONSITE COMMUNICATION	**OFFSITE COMMUNICATIONS**
PLANT PHONE SYSTEM NODE 1	BELL LINES
TWO WAY RADIO (CH F1, F2, F3, F4, and F5)	DIGITAL MICROWAVE
SOUND POWER PHONES	NRC (FTS-2000)
	CELLULAR PHONES (IF AVAILABLE)
	HEALTH PHYSICS RADIO NETWORK

TECHNICAL SPECIFICATIONS	LOSS OF COMMUNICATION	
DESCRIPTION	DESCRIPTION	
8.1-U Inability to reach required shutdown condition (Mode 3 or Mode 4) within Technical Specification Limiting Conditions for Operation (LCO) limits. OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3	**8.2-U** T Unplanned loss of onsite communication listed in Table 8.2-U that defeats the Plant Operations Staff's ability to perform routine operations **OR** Unplanned loss of ALL offsite communication listed in Table 8.2-U. OPERATING CONDITION: - All	UNUSUAL EVENT
		ALERT
		SITE EMERGENCY
		GENERAL EMERGENCY

NOTES:

8.3 Significant Transient is an unplanned event involving one or more of the following: (1) Automatic turbine runback >25% thermal reactor power: (2) Electrical load reduction >25% full electrical load: (3) Reactor scram: (4) Valid ECCS initiation: or (5) thermal power oscillations > 10%..

CURVES/TABLES:

TABLE 8.3-S APPLICABLE SAFETY FUNCTIONS
REACTOR POWER
REACTOR PRESSURE
REACTOR LEVEL
SUBCRITICALLITY
DRYWELL TEMPERATURE
DRYWELL PRESSURE
SUPPRESSION CHAMBER PRESSURE
SUPPRESSION POOL TEMPERATURE
SUPPRESSION POOL LEVEL

LOSS OF ASSESSMENT CAPABILITY

DESCRIPTION	DESCRIPTION	
8.3-U Unplanned loss of most or all safety system annunciators or indicators which causes a significant loss of plant assessment capability for greater than 15 minutes **AND** Compensatory non-alarming safety system indications are available (SPDS, ICS) **AND** In the opinion of the Shift Manager, increased surveillance is required to safely operate the plant. OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3		UNUSUAL EVENT
8.3-A N Unplanned loss of most or all safety system annunciators or indicators which causes a significant loss of plant assessment capability for greater than 15 minutes **AND** In the opinion of the Shift Manager, increased surveillance is required to safely operate the plant **AND** EITHER of the following conditions exists: • Compensatory non-alarming safety system indications are NOT available (SPDS, ICS) • A significant transient is in progress. OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3		ALERT
8.3-S T N Loss of most or all annunciators associated with safety systems **AND** Compensatory non-alarming safety system indications are NOT available (SPDS, ICS) **AND** Indications needed to monitor safety functions are NOT available (Refer to Table 8.3-S) **AND** A significant transient is in progress OPERATING CONDITION: - Mode 1 - Mode 2 - Mode 3		SITE EMERGENCY
		GENERAL EMERGENCY

NOTES:

8.4-U Table 8.4-U contains only example events that may justify Unusual Event classification. This event classification is intended to address unanticipated conditions not explicitly addressed elsewhere, but warrant declaration of an emergency because conditions exists which the Emergency Director believes to fall under the Unusual Event Classification. Additionally this EAL should be considered in making emergency classifications regarding challenges to fission product barriers not specifically address elsewhere in the EAL matrix.

8.4-A This event classification is intended to address unanticipated conditions not explicitly addressed elsewhere, but that warrant declaration of an emergency because conditions exist which the Site Emergency Director believes to fall under the Alert classification. Additionally this EAL should be considered in making emergency classifications regarding challenges to fission product barriers not specifically address elsewhere in the EAL matrix.

8.4-S This event classification is intended to address unanticipated conditions not explicitly addressed elsewhere, but that warrant declaration of an emergency because conditions exist which the Site Emergency Director believes to fall under the Site Area Emergency classification. Additionally this EAL should be considered in making emergency classifications regarding challenges to fission product barriers not specifically address elsewhere in the EAL matrix.

8.4-G This event classification is intended to address unanticipated conditions not explicitly addressed elsewhere, but that warrant declaration of an emergency because conditions exist which the Site Emergency Director believes to fall under the General Emergency classification. Additionally this EAL should be considered in making emergency classifications regarding challenges to fission product barriers not specifically address elsewhere in the EAL matrix.

CURVES/TABLES:

TABLE 8.4-U OTHER
EXAMPLE UNUSUAL EVENTS
PLANT TRANSIENT RESPONSE UNEXPECTED OR NOT UNDERSTOOD
UNANALYZED SAFETY SYSTEM SONFIGURATION AFFECTING, THREATENING SAFE SHUTDOWN
INADEQUATE PERSONNEL TO ACHIEVE OR MAINTAIN SAFE SHUTDOWN
DEGRADED PLANT CONDITIONS BEYOND LICENSE BASIS THREATENING SAFE OPERATION OR SAFE SHUTDOWN
EMERGENCY PROCEDURES NOT ADEQUATE TO MAINTAIN SAFE OPERATION OR ACHIEVE SAFE SHUTDOWN

OTHER

DESCRIPTION	DESCRIPTION	
8.4-U T N Other events are in process or have occurred which indicate a potential degradation in the level of safety of the plant. No radioactive releases are expected which require offsite response. Refer to Table 8.4-U. **OR** Any loss or any potential loss of containment OPERATING CONDITION: - All		UNUSUAL EVENT
8.4-A N Other events are in process or have occurred which involve an actual or potential substantial degradation in the level of safety of the plant. Radioactive releases are expected to be within a small fraction of the EPA guidelines. **OR** Any loss or potential loss of fuel cladding or RCS pressure boundary OPERATING CONDITION: - All		ALERT
8.4-S N Other events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Radioactive releases are NOT expected to result in exposure levels that exceed EPA guidelines except near the site boundary. **OR** Any loss or potential loss of both fuel cladding and RCS pressure boundary **OR** Potential loss of either fuel cladding or RCS pressure boundary and loss of any additional barrier OPERATING CONDITION: - ALL		SITE EMERGENCY
8.4-G N Other events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Radioactive releases are expected to exceed EPA guidelines for exposure levels offsite beyond the site boundary. **OR** Loss of any two barriers and potential loss of third barrier OPERATING CONDITION: - All		GENERAL EMERGENCY

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99. G2.4.3 001

Per Regulatory Guide 1.97 post accident instrumentation must be appropriately identified in control rooms to provide information required by the control room operators during accident conditions.

Which ONE of the following describes how RPV level instruments are designated as post accident monitoring and which instruments are used?

A. Black labels are placed on the Emergency Systems Range instruments only.

B. Blue labels are placed on the Post Accident Flood Range instruments only.

C.✓ Black labels are placed on both the Emergency Systems Range and Post Accident Flood range instruments.

D. Blue labels are placed on both the Post Accident Flood Range and the Shutdown Vessel Flood Range instruments.

References: OPL171.003 Rev.15 pg 24 and 26
Tech Spec Bases B 3.3.3.1 pg B 3.3-84
Note: Modified stem and answers slightly. On last exam.

A. Incorrect since on more than the instruments listed.

B. Incorrect since wrong color and on more than the instruments listed.

C. Correct answer.

D. Incorrect since wrong color and wrong instruments listed.

RO Tier:	T3	SRO Tier:	T3
Keyword:	POST ACCIDENT	Cog Level:	MEM 3.5/3.8
Source:	B	Exam:	BF02301
Test:	C	Misc:	TCK

100. G2.4.41 001

Units 1 and 2 Control Room has become engulfed with smoke and at 1415 the SM orders the control room abandoned. The status of the Units is as follows:

Unit 1 is defueled.
Unit 2 is in Mode 1.
Unit 3 control room is unaffected.

At 1438 control of Unit 2 is established from Panel 2-25-32 with water level at -75" and slowly lowering.

Which ONE of the following describes the Emergency Classification and who is responsible for EPIP implementation?

A. SM declares an ALERT and he implements EPIP.

B. SM declares an ALERT and Unit 1 US implements EPIP.

C. SM declares a SITE AREA EMERGENCY and SSS implements EPIP.

D. SM declares a SITE AREA EMERGENCY and Unit 3 US implements EPIP.

References: 2-AOI-100-2 Rev. 47 pg 3
Enabling Objective OPL171.208 #4

A. Incorrect since this is classified as a Site Emergency due to backup control from Panel 2-25-32 is NOT established within 20 minutes.

B. Incorrect since this is classified as a Site Emergency due to backup control from Panel 2-25-32 is NOT established within 20 minutes.

C. Incorrec since Unit 3 US assumes responsibility for EPIP implementation.

D. Correct answer since control from Panel 2-25-32 is NOT established within 20 minutes.

Note: Changed stem as far as time it takes to establish control from Panel 2-25-32 which changes the answer.

RO Tier:		SRO Tier:	T3
Keyword:	CONTROL ROOM	Cog Level:	C/A 2.3/4.1
Source:	M	Exam:	BF02301
Test:	S	Misc:	TCK