Final Submittal

(Blue Paper)

OCONEE JUNE 2003 EXAM
50-269/2003-301

JUNE 16 - 27, 2003

1. Final RO/SRO Written Examination and References

QUESTIONS REPORT
for Oconee 2003-301 fnl

1. 000003 GEN 2.4.1 001

Unit 1 plant conditions:

- Reactor power = 50%
- ICS is in AUTOMATIC

Which one of the following events will require the operating crew to enter the EOP?

A. Steam Generator Tube Leak of 13 gpm.

B. Inadvertent ES Channels 1, 3 and 5 actuation.

C. "A" SG level is 43% and "B" SG level is 37%. Both are stable in the operating range

D. Control Rods 1 and 5 in Group 3 drop into the core, actuating the in-limit for both rods.

BANK Answer 161

A. Incorrect - SGTL EOP entry is 25 gpm.
B. Incorrect - Inadvertent ES action is not an EOP entry.
C. Incorrect - SG level that causes EOP entry is < 15 inches on the SU Level.
D. Correct - 2 CR drop into the core requires a manual reactor trip and entry into the EOP.

No utility comments

Tier:	1	Group:	2
Keyword:	DROP ROD	Cog level:	M 4.3/4.6
Source:	B	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

2. 000008AA2.22 001
From a 100% FP condition, which one of the following describes the expected response of pressurizer level to a Small Break in the STEAM SPACE of the pressurizer (PZR)? (Assume no operator actions are taken and HPI stabilizes RCS pressure slightly higher than secondary system pressure.)

PZR level initially:

A. increases rapidly, then slowly increases until the PZR is completely filled by HPI.

B. decreases rapidly and drops off scale low during depressurization until HPI initiates, then level returns on scale during repressurization.

C. decreases slowly, then decreases more rapidly when a reactor trip occurs, then completely fills after the RCS hot leg flashes.

D. increases, then decreases when a reactor trip occurs, then completely fills after the RCS hot leg flashes.

1992/01/25
REFERENCE
OP-OC-TA-AT, Section E.5, pg 14, EO 1.b.5 & SRO Objective 1.b.5
Changed correct answer to "C". Modified "C" and "B" to ensure only one correct answer. Verified response on simulator. Changed to RO question.

Tier:	1	Group:	1
Keyword:	STEAM SPACE	Cog level:	C/A 3.8/4.2
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

3. 000009 GEN 2.1.31 001
A Small Break LOCA has occurred inside containment. Which one of the following describes the status of the SG XSUR level indication?

The indicated level will be:

A. LOWER than actual, a correction factor based on REACTOR BUILDING temperature must be applied.

B. HIGHER than actual, a correction factor based on REACTOR BUILDING temperature must be applied.

C. LOWER than actual, a correction factor based on REACTOR COOLANT SYSTEM temperature must be applied.

D. HIGHER than actual, a correction factor based on REACTOR COOLANT SYSTEM temperature must be applied.

*REFERENCE
OP-OC-EAP-E25, Revision 05, page 11; LRO 7, LSO 7
Oconee bank EAP-74 (fully modified)
(3.8/4.0) #116

No utility comments.

Tier:	1	Group:	I
Keyword:	SBLOCA	Cog level:	C/A 4.2/3.9
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

4. 000009EA2.15 001
Unit 1 plant conditions:

- SB LOCA has occurred due to a Seismic event
- Inspections reveal some minor damage to HPI components and piping

- EOP Enclosure 5.1, ES Actuation has been performed
- EOP Enclosure 5.12, ECCS Suction Swap to RBES is in progress
- EOP Enclosure 5.37, Isolation of the HPI Pump Recirc has been completed

- 1LP-19 and 1LP-20 (1A & 1B RX BLDG SUCTION) are OPEN
- 1LP-21 and 1LP-22 (1A & 1B LPI BWST SUCTION) are CLOSED
- 1LP-16 (1B LPI TO HPI & RBS) FAILED CLOSED

- RCS pressure is 1700 psig as read on ICCM indication
- 1HP-410 (1HP-26 BYPASS) was inadvertently opened and remains open
- 1HP-120 (RC VOLUME CONTROL) is closed

Which one of the following sets of flowrates meets acceptable HPI flow for the above conditions? (Assume zero seal injection flow)

SEE ATTACHMENT

A.
"A" HPI HDR Flow	270 gpm
"B" HPI HDR Flow	165 gpm
"A" Crossover Flow	200 gpm
"B" Crossover Flow	0 gpm
RCS Makeup Flow	0 gpm

B.
"A" HPI HDR Flow	379 gpm
"B" HPI HDR Flow	374 gpm
"A" Crossover Flow	0 gpm
"B" Crossover Flow	0 gpm
RCS Makeup Flow	30 gpm

C.
"A" HPI HDR Flow	440 gpm
"B" HPI HDR Flow	0 gpm
"A" Crossover Flow	0 gpm
"B" Crossover Flow	317 gpm
RCS Makeup Flow	30 gpm

D.
"A" HPI HDR Flow	140 gpm
"B" HPI HDR Flow	360 gpm
"A" Crossover Flow	245 gpm
"B" Crossover Flow	0 gpm
RCS Makeup Flow	0 gpm

A. INCORRECT: total HPI flow is less than 750 gpm (635) but the flow from the "C" HPIP is less than 170 gpm. Encl 5.12 closed the HPIP minimum recirc valves (completion of encl.5.37) so the pump must have at least 170 gpm flow.
B. INCORRECT: flow is limited to less than 750 gpm total HPI flow with only one LPI/HPI header operable when suction is from the RBES. The 30 gpm flow that shows on RCS Makeup flow should not be indicated as HP-120 is closed (possible leak flow due to seismic damage)
C. INCORRECT: total HPI flow is 757 gpm (plus the 30 gpm possible damage flow)
D. CORRECT: total HPI flow is 745 gpm.

Attachment required:
EOP Encl. 5.1 Page 5, Figure 1 (Required HPI Flow Per Header)

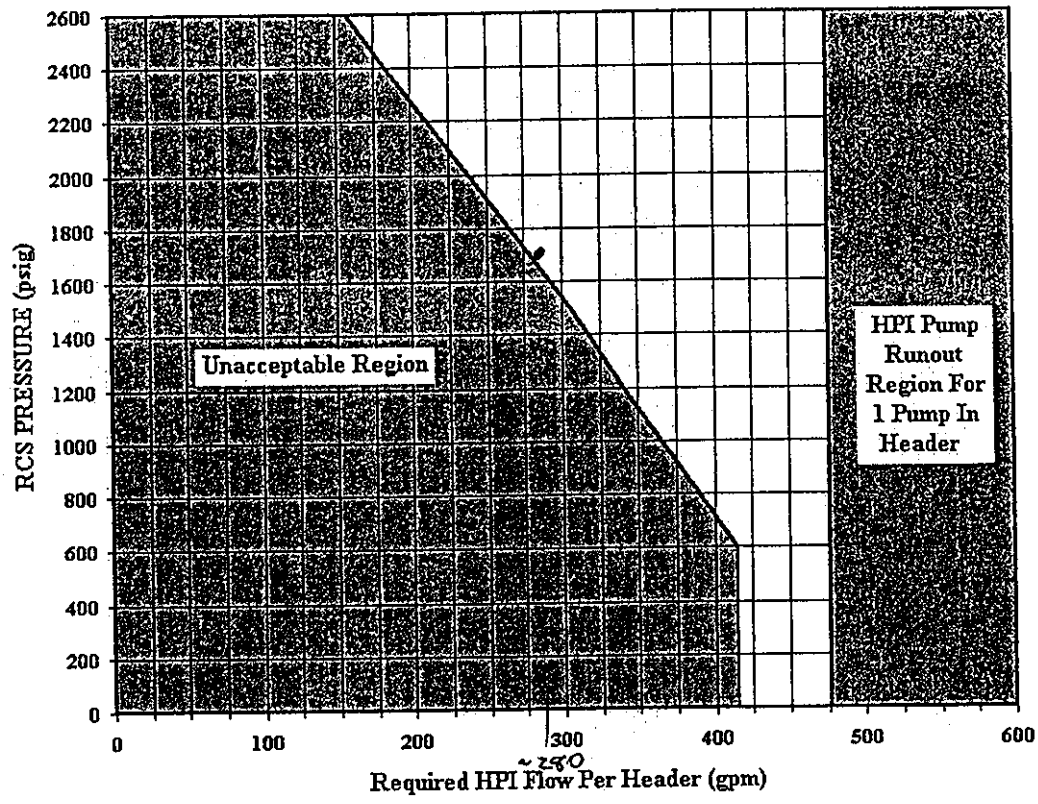
Tier:	1	Group:	1
Keyword:	SBLOCA	Cog level:	C/A 3.3/3.4
Source:	M	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

SRO

00009EA2.15

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. __IAAT at least two HPI pumps are operating, AND HPI flow in any header is in the Unacceptable Region of Figure 1, THEN open the following in the affected header: ☒ 1A Header ☒ 1B Header ☐ 1HP-410 ☐ 1HP-409	

Figure 1
Required HPI Flow Per Header



5. 000009EK101 001

Unit 1 plant conditions:

- RCS is saturated
- All EFDWPs are INOPERABLE
- '1A' Main FDWP is operating
- '1A' OTSG pressure = 600 psig
- '1B' OTSG pressure = 705 psig
- Rx Bldg pressure = 10 psig
- Rx Bldg dome temperature = 200°F

Which one of the following describes the correct SG level?

SEE ATTACHMENT

A. 'A' XSUR = 320"; 'B' XSUR = 315"

B. 'A' XSUR = 315"; 'B' XSUR = 310"

C. 50% Operating Range (50% acc)

D. 95% Operating Range (95% acc)

D

A. Incorrect: Uses EFDW/XSUR table 5, wrong RB temp column (>200 to 250). Table 5 not used with MFDW feeding.
B. Incorrect: Uses EFDW/XSUR table 5, correct values if using EFDW. Table 5 not used with MFDW feeding.
C. Incorrect: 50% used if SCM > 0
D. Correct: EOP Rule 7, SG Feed Control SG levels are raised to 95% Operating Range (acc) if using Main FWPs when EFWPs are not available. This is the LOSCM setpoint level with Main FWPs. XSUR levels are only used with EFDW.

EOP has changed and ONS no longer bumps RCPs.
Attachment:Rule 7
Replaced with Bank question 164.

Tier:	1	Group:	1
Keyword:	SBLOCA	Cog level:	C/A 4.2/4.7
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

09 EK 101

ENTIRE RULE CHG 3

Table 1 Maximum Feed Rates To Be Established To Available SGs When All SCMs are > 0°F		
SG Condition	**Flow Instrument**	**Maximum Feed Rate**
Dry SG w/o Heat Transfer	EFDW flow indicator	100 gpm to affected SG
	S/U FDW flow indicator	0.05 x 10^6 lbm/hr to affected SG
	SSF ASW flow indicator	100 gpm total to Unit 1
Non-dry SG **OR** Dry SG with Heat Transfer	EFDW flow indicator	1000 gpm per header
	S/U FDW flow indicator	0.5 x 10^6 lbm/hr per header
	SSF ASW flow indicator	500 gpm total to Unit 1

Table 2 Feed Rates To Be Established When Any SCM is ≈ 0°F and Rapid Cooldown NOT in Progress			
NOTE After initial feed rates are established, flow should be throttled to maintain cooldown rate within Tech Spec limits but SG levels must continue to increase until LOSCM setpoint is reached.			
FDW source	**Flow Instrument**	**Initial Feed Rates**	
Emergency FDW	EFDW total flow indicator	1 SG	450 gpm
		2 SGs	300 gpm each
	S/U FDW flow indicator	1 SG	0.23 x 10^6 lbm/hr
		2 SGs	0.15 x 10^6 lbm/hr each
Main FDW	S/U FDW flow indicator	1 SG	0.33 x 10^6 lbm/hr
		2 SGs	0.22 x 10^6 lbm/hr each
SSF ASW AND NO SSF Event *	SSF ASW flow indicator	400 gpm total to Unit 1	
SSF ASW AND SSF Event *	SSF ASW flow indicator	AP/25 controls feed rate	

*SSF activated per AP/25 with both SSF RC Makeup and SSF Aux Service Water systems required. [31]

Table 3 Emergency FDW Pump and Header Maximum Flow Limits			
		EFDW flow indicator	**S/U FDW flow indicator**
MDEFDWP	**(suction from HW)**	440 gpm/pump	0.22 x 10^6 lbm/hr
	(suction from UST)	600 gpm/pump	0.30 x 10^6 lbm/hr
TDEFDWP (any suction source)		950 gpm	0.45 x 10^6 lbm/hr
Emergency FDW Header Flow		1000 gpm	0.5 x 10^6 lbm/hr

Table 4 SG Level Control Points			
Plant Condition	**Main FDW Pump**	**EFDW Pump**	**SSF ASW Pump**
All SCMs > 0°F AND any RCP on	25″ [55″ acc] S/U level	30″ [60″ acc] XSUR (use MFDW setpoint if feeding via S/U CVs)	30″ [60″ acc] XSUR
All SCMs > 0°F AND all RCPs off	50% [50% acc] Operating Range	240″ [270″ acc] XSUR (use MFDW setpoint if feeding via S/U CVs)	240″ [270″ acc] XSUR
Any SCM = 0°F AND NO SSF Event *	95% [95% acc] Operating Range	LOSCM setpoint (Turn-on code "EFW" or Per Table 5)	LOSCM setpoint (Turn-on code "EFW" or Per Table 5)
Any SCM = 0°F AND SSF Event *	N/A	N/A	Per AP/25
Superheated with CETCs ≤ 1200°F	95% [95% acc] Operating Range	LOSCM setpoint (Turn-on code "EFW" or Per Table 5)	LOSCM setpoint (Turn-on code "EFW" or Per Table 5)
Superheated with CETCs > 1200°F	Per Encl 5.15 (ICC Full Range SG Level)	Per Encl 5.15 (ICC Full Range SG Level)	Per Encl 5.15 (ICC Full Range SG Level)

* SSF activated per AP/25 with both SSF RC Makeup and SSF Aux Service Water systems required. (31)

Table 5
Desired Indicated XSUR Level (inches) To Establish For LOSCM

	RB Press < 3 psig	RB Press ≥ 3 psig						
SG Press (psig) ↓ / RB Temp (°F) →	N/A	≤ 100	> 100 to 150	> 150 to 200	> 200 to 250	> 250 to 300	> 300 to 350	> 350
0 to < 50	360	365	370	375	385	OSH	OSH	OSH
50 to < 100	345	350	355	360	370	380	OSH	OSH
100 to < 150	340	340	345	350	360	370	380	OSH
150 to < 200	330	335	340	345	355	365	375	385
200 to < 300	325	330	335	340	350	360	370	380
300 to < 400	320	320	325	335	340	350	360	375
400 to < 500	310	315	320	325	335	345	355	365
500 to < 600	305	310	310	320	325	335	350	360
600 to < 700	300	305	305	315	320	330	345	355
700 to < 800	295	295	300	310	315	325	335	350
800 to < 900	290	290	295	305	310	320	330	345
900 to < 1000	285	285	290	300	305	315	325	340
1000 to < 1100	280	280	285	295	300	310	325	335
≥ 1100	275	280	280	290	295	305	320	330

6. 000015/017AA2.10 001
Unit 3 is operating at 100 % power.

You observe the following temperatures slowly rising on the 3A RCP.
- Upper oil cooler
- Motor stator coolers
- Lower oil pot

All other temperature and vibration readings do not significantly change.

Assume no operator actions. Which one of the following has caused the RCP temperature to increase, and what actions will you take?

A. Loss of Seal Injection to the 3A pump and secure the RCP.

B. Loss of Seal Return and trip the reactor.

C. Loss of LPSW to the 3A pump and secure the RCP.

D. Loss of CC to the 3A pump and trip the reactor.

REACTOR COOLANT PUMP MOTOR (PNS-CPM) LESSON PLAN

PNS-CPMr11a

C. LPSW provides cooling to:
1. Upper oil cooler
2. Motor stator coolers
3.
Lower oil pot

Changed CCW to CC to match ONS system designation. Changed "B" distractor to read "Loss of Seal Return and trip the reactor." to improve plausibility.

Tier:	1	Group:	1
Keyword:	RCP	Cog level:	C/A 3.7/3.7
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM?RFA

7. 000022AK1.03 001
Unit 1 plant conditions:

- Reactor power = 100%
- A leak occurs on the "1A" HPI Injection header
- 1RIA-32 is in alarm
- 1B HPI pump is available

Which one of the following describes how the Pressurizer level will be procedurally controlled while in this condition?

By adjusting...

A. letdown flow and starting 1B HPIP with flow through 1HP-409 (1HP-27 Bypass).

B. letdown flow and starting 1B HPIP with flow through 1HP-410 (1HP-26 Bypass).

C. seal injection flow and starting 1C HPIP with flow through 1HP-409 (1HP-27 Bypass).

D. seal injection flow and starting 1C HPIP with flow through 1HP-410 (1HP-26 Bypass).

Answer 142
A

A. Correct- Step 4.140 has the operator ensure 1B HPI pump is operating and go to step 4.146 which instructs the operator to adjust letdown and throttle 1HP-409 to makeup to the RCS.

B. Incorrect- Seal injection is not adjusted and 1HP-410 is not used since the leak is on the 1A injection header.

C. Incorrect- Seal injection is not adjusted and the 1C pump will not be used since 1B HPI pump is available.

D. Incorrect- Seal injection is not adjusted and the 1C pump will not be used since 1B HPI pump is available. 1HP-410 will not be used since the leak is on the 1A injection header.

No utility comments.

Tier:	1	Group:	1
Keyword:	LOSS OF RC MAKEUP	Cog level:	C/A 3.0/3.4
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

8. 000025 AK3.01 001
Unit 1 plant conditions:

INITIAL CONDITIONS:

- Time = 0200
- A Turbine Building Flood is in progress
- The reactor was manually tripped
- Main and Emergency FDW is unavailable
- The SSF and Station ASW is unavailable

CURRENT CONDITIONS:

- Time = 0400
- HPI Forced Cooling is in progress per Rule 4 (Initiation of HPI Forced Cooling)
- The TSC desires to throttle HPI for long term DHR

Which one of the following is correct?

SEE ATTACHMENT

A. Throttle HPI in both headers to 100 gpm/header.

B. Throttle HPI in both headers to maintain ALL SCMs > 0 F.

C. Isolate flow in one HPI header and throttle remaining header to 200 gpm.

D. Isolate flow in one HPI header and throttle remaining header to maintain ALL SCMs > 0 F.

bank 267

Attachment: Page 23 of 27 of TBF

A. Incorrect, one HPI header is isolated.
B. Incorrect, one HPI header is isolated.
C. Correct, Isolate flow in one HPI header and throttle remaining header to 200 gpm per curve.
D. Incorrect, Isolate flow in one HPI header and throttle remaining header to 200 gpm per curve. SCM may be lost.

Added SEE ATTACHMENT
Attachment: Page 27 of 29 of EOP tab TBF
SRO only.

Tier:	1	Group:	1
Keyword:	LOSS OF RHR	Cog level:	C/A 3.1/3.4
Source:	B	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

SRO
000025AK3.01

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status NO source of SG feed is available.	
94. __ **PERFORM** Rule 4 (Initiation of HPI Forced Cooling).	
NOTE The potential for loss of SCM exists, however, transition to LOSCM tab is **NOT** required.	
95. __ **IAAT** core SCM is > 0°F, **THEN** throttle HPI to stabilize RCS temperature.	
96. __ **IAAT** RBS actuates, **THEN** stop RBS pumps.	
97. __ **IAAT** HPSW is lost, **THEN** dispatch an operator to perform Encl 5.31(Temporarily Charging the HPSW System).	
98. __ Initiate Encl 5.4 (Makep to the BWST) to refill the BWST.	
NOTE BWST volume is ≈ 350,000 gallons. BWST inventory may be conserved by throttling HPI and securing RBS.	
99. __ Consult TSC for guidance to affect the following: • Conserve BWST inventory • Prolong HPI forced cooling • Preserve RB integrity	
100. __ **IAAT** TSC desires throttling HPI for long term DHR, **THEN GO TO** Step 102.	
101. __ **WHEN** Station Management approves, **THEN EXIT** this procedure.	

• • • END • • •

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE The potential for loss of SCM exists, however, transition to LOSCM tab is **NOT** required.	
102.__ Stop flow through one HPI header.	

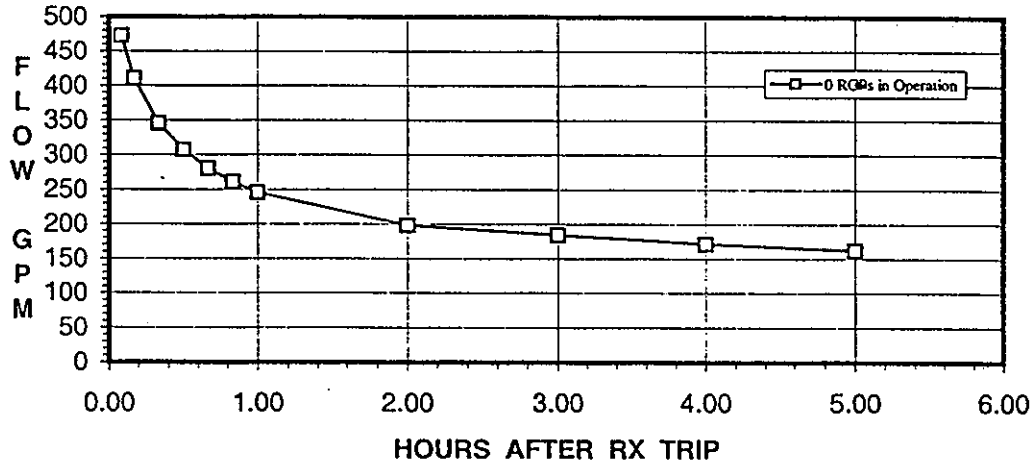
ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

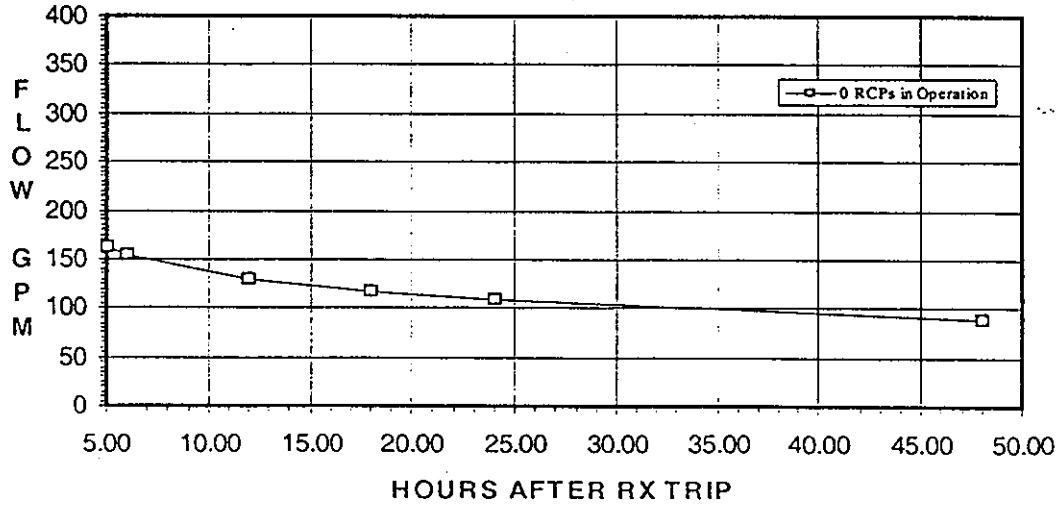
- For the first hour after shutdown, cooling flow from one HPI Pump may **NOT** be sufficient to match decay heat. However, existing RCS inventory should be sufficient to offset this differential and maintain core cooling.
- The potential for loss of SCM exists, however, transition to LOSCM tab is **NOT** required.

103.__ Throttle HPI flow in operating header to match decay heat per the following:

0 RCPs in Operation



0 RCPs in Operation



9. 000026 GEN 2.4.24 001
Unit 2 is operating at 11% power, when the Standby CC pump auto starts.

- Total CC flow is 575 gpm and is slowly decreasing.
- 1HP-5 closes.
- All RCP seal return valves remain open.
- CRD Stator Temperatures are ~ 155F.

Which one of the following is correct?

A. Enter AP/20 (Loss of Component Cooling)
Do NOT Trip the Reactor
Stop all RCPs
Initiate AP/25 (SSF EOP)

B. Enter AP/25 (SSF EOP)
Trip the Reactor
Stop all RCPs
Initiate AP/20 (Loss of Component Cooling)

C. Enter AP/20 (Loss of Component Cooling)
Do NOT Trip the Reactor
Do NOT stop all RCPs
Do NOT Initiate AP/25 (SSF EOP)

D. Enter AP/25 (SSF EOP)
Trip the Reactor
Do NOT stop all RCPs
Do NOT Initiate AP/20 (Loss of Component Cooling)

3.1 __ IAAT both of the following are lost:
• CC to RCPs
• RCP seal injection
THEN perform the following:
A. __ Trip Rx.
B. __ Stop all RCPs.
C. __ Initiate AP/25 (SSF EOP).
NOTE
If CRD stator cooling is lost, stator temperatures will reach 180...F in ~4 minutes.
3.2 __ IAAT at least two CRD stator temperatures greater than180...F,
THEN trip Rx.

Modified stem to remove reference to Immediate Manual Actions because entering an AP is not an Immediate Manual Action. Reworded distractors to improve readability.

Validation comment:
Added procedure titles to AP/20 and AP/25.

QUESTIONS REPORT
for Oconee 2003-301 fnl

Tier:	1	Group:	1
Keyword:	CCW	Cog level:	C/A 3.3/3.7
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

10. 000027 GEN 2.1.12 001
Unit 1 plant conditions:

- A Unit shutdown was performed following a sudden pressurizer level drop.
- LPI Cooler Outlet temperature = 175° F.
- RCS Low Range Cooldown pressure = 250 psig.
- 1A HPI pump operating
- 1HP-120 travel stops are installed
- Pressurizer level = 120 inches.
- All RCP's are off.
- NO outstanding prior Technical Specification CONDITIONS at this time.

Investigations indicate that the level drop may have been due to a pressurizer level instrument malfunction. The OSM has requested that you consider the possibility of increasing pressurizer level to 260 inches to facilitate trouble shooting the instrument.

Which one of the following is correct?

SEE ATTACHMENT

Pressurizer level:

A. can be increased to 260" with no additional requirements because the PORV is operable.

B. can be increased to 260" if an LTOP operator is established.

C. can NOT be increased to 260" because it will violate the LTOP Tech Spec.

D. can NOT be increased to 260" until Tcold is above 325° F.

Answer 125
REFERENCE ALLOWED - 1108/01, LR CD curve (Encl. 3.31) and LTOP logic diagram (1104/49), TS 3.4.12

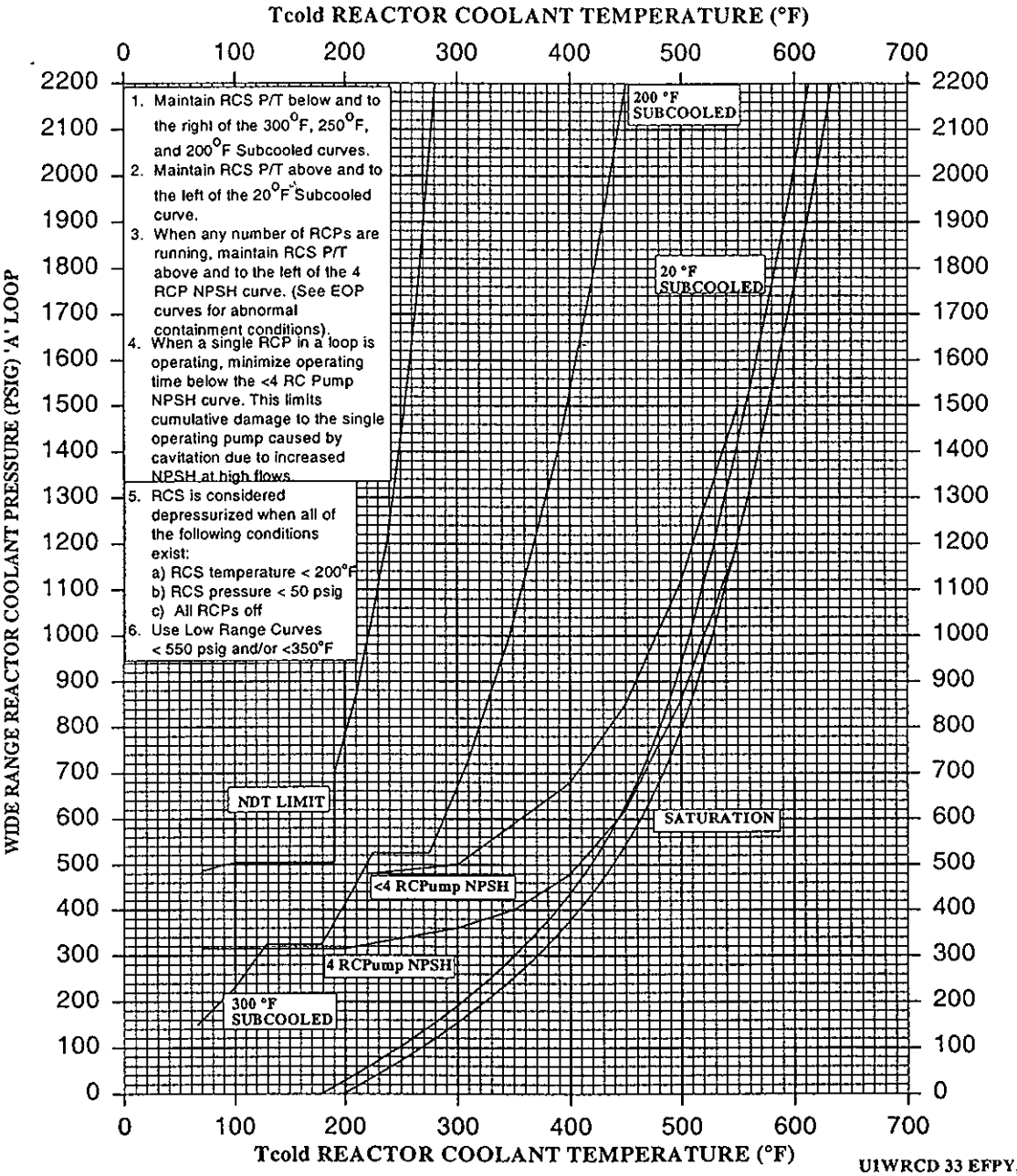
A. Incorrect. Although the PORV is operable, admin controls require pressurizer level <220" *unless an LTOP operator is established.*
B. Incorrect. Since the unit is in NO Tech Spec conditions, an LTOP operator is not already established.
C. Correct. An LTOP operator is allowed to replace any of the admin controls in Train 2 of LTOP (see TS 3.4.12 bases).
D. Incorrect See above.
Added SEE ATTACHMENT
Modified distractors and stem to improve plausibility

Tier:	1	Group:	1
Keyword:	TECH SPEC	Cog level:	C/A 2.9/4.0
Source:	M	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

SRO
000027 GEN 2.1.12

NOTE: If changes are required to curves in this enclosure, the OAC curves must be updated at the same time or the OAC curves must be considered not valid. {1}

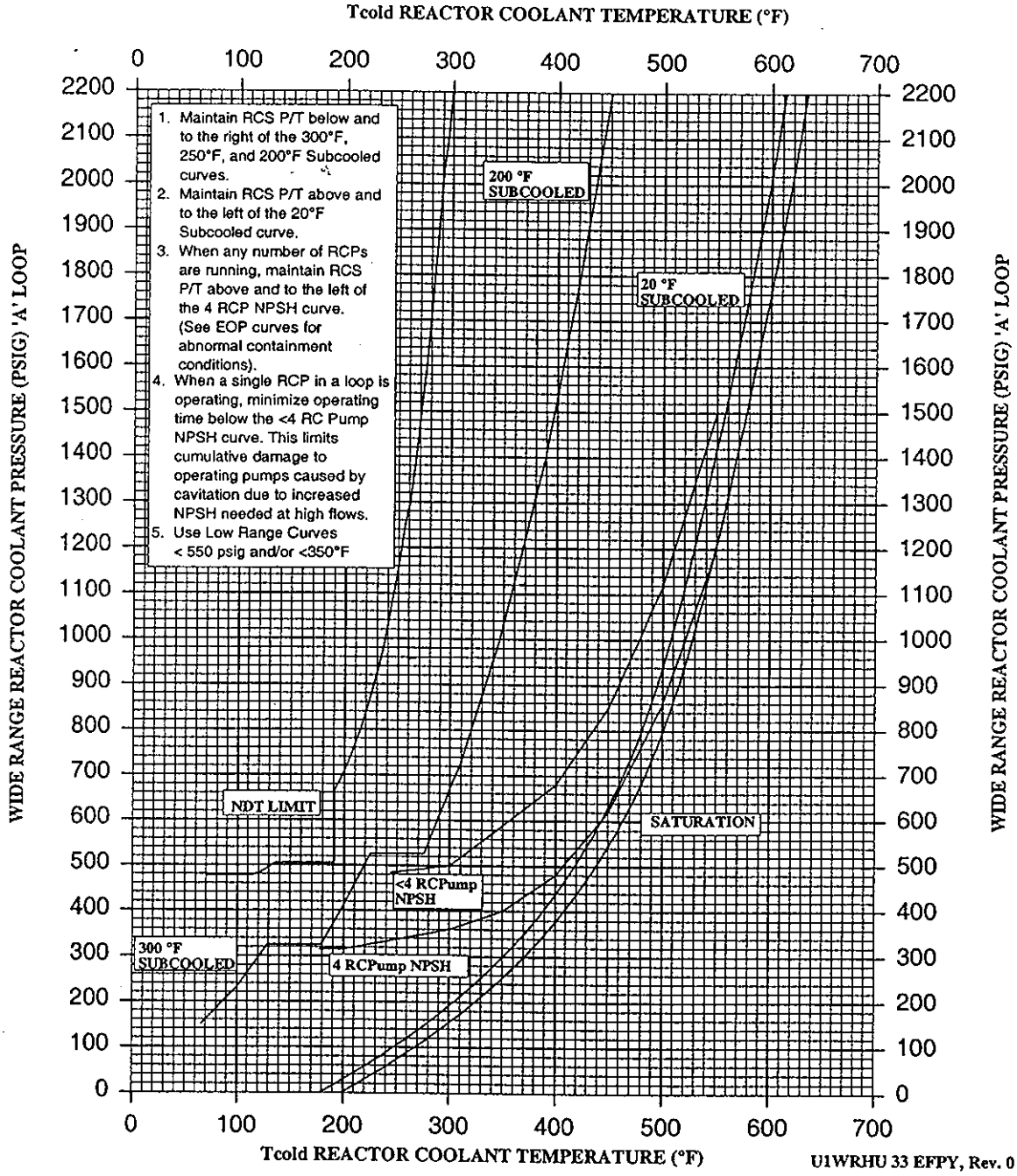
Unit 1 Wide Range Cooldown Curve



U1WRCD 33 EFPY, Rev. 0

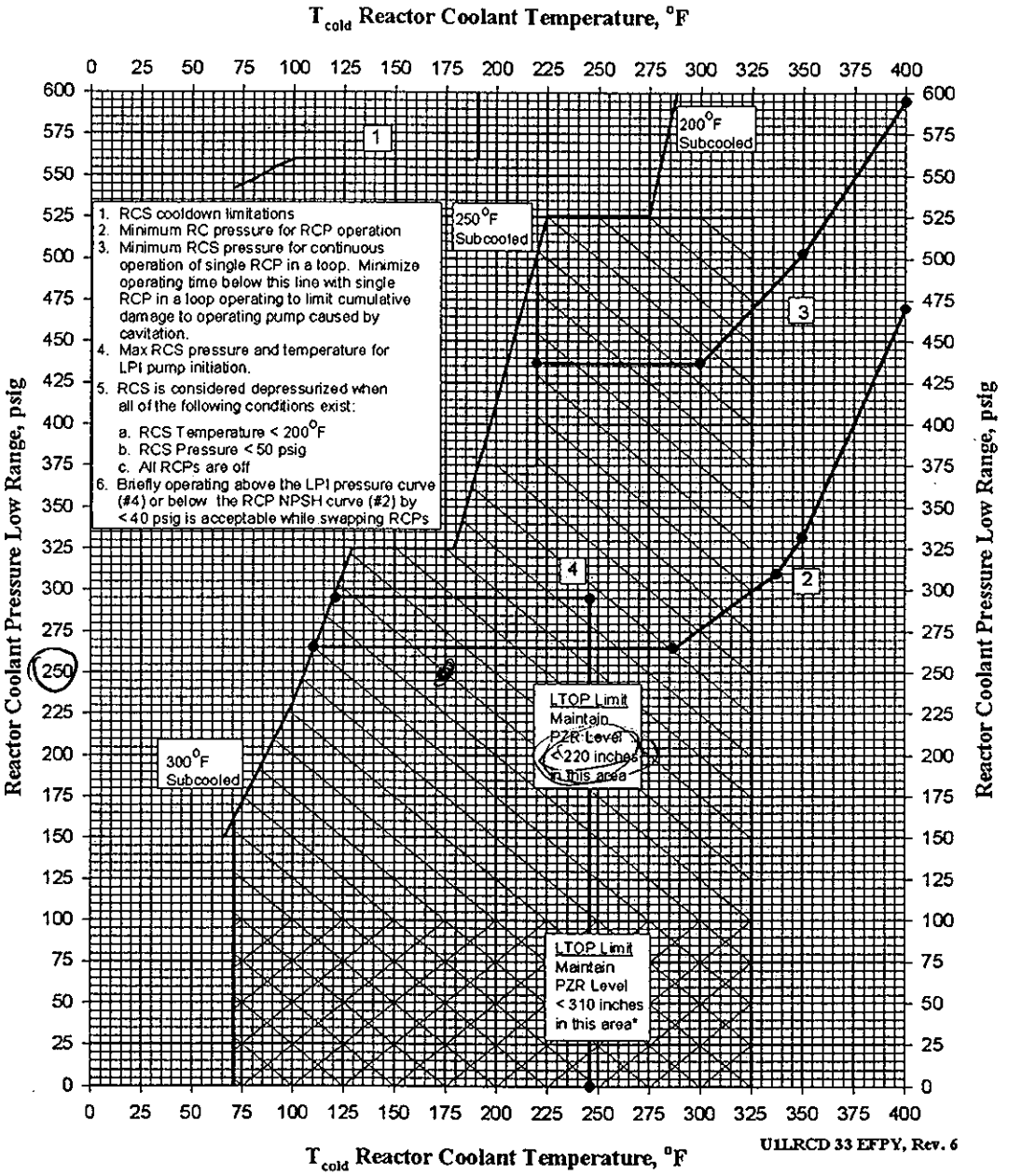
RCS TEMPERATURE	MAX COOLDOWN RATE
T > 280°F	≤ 45°F in any 1/2 hour period
150°F < T ≤ 280°F	≤ 20°F in any 1/2 hour period
T ≤ 150°F	≤ 9°F in any 1 hour period
RCS depressurized	≤ 45°F in any 1 hour period

Unit 1 Wide Range Heatup Curve



RCS TEMPERATURE	MAX HEATUP RATE
T≤280°F	≤ 45°F in any 1 hour period
T>280°F	≤ 90°F in any 1 hour period

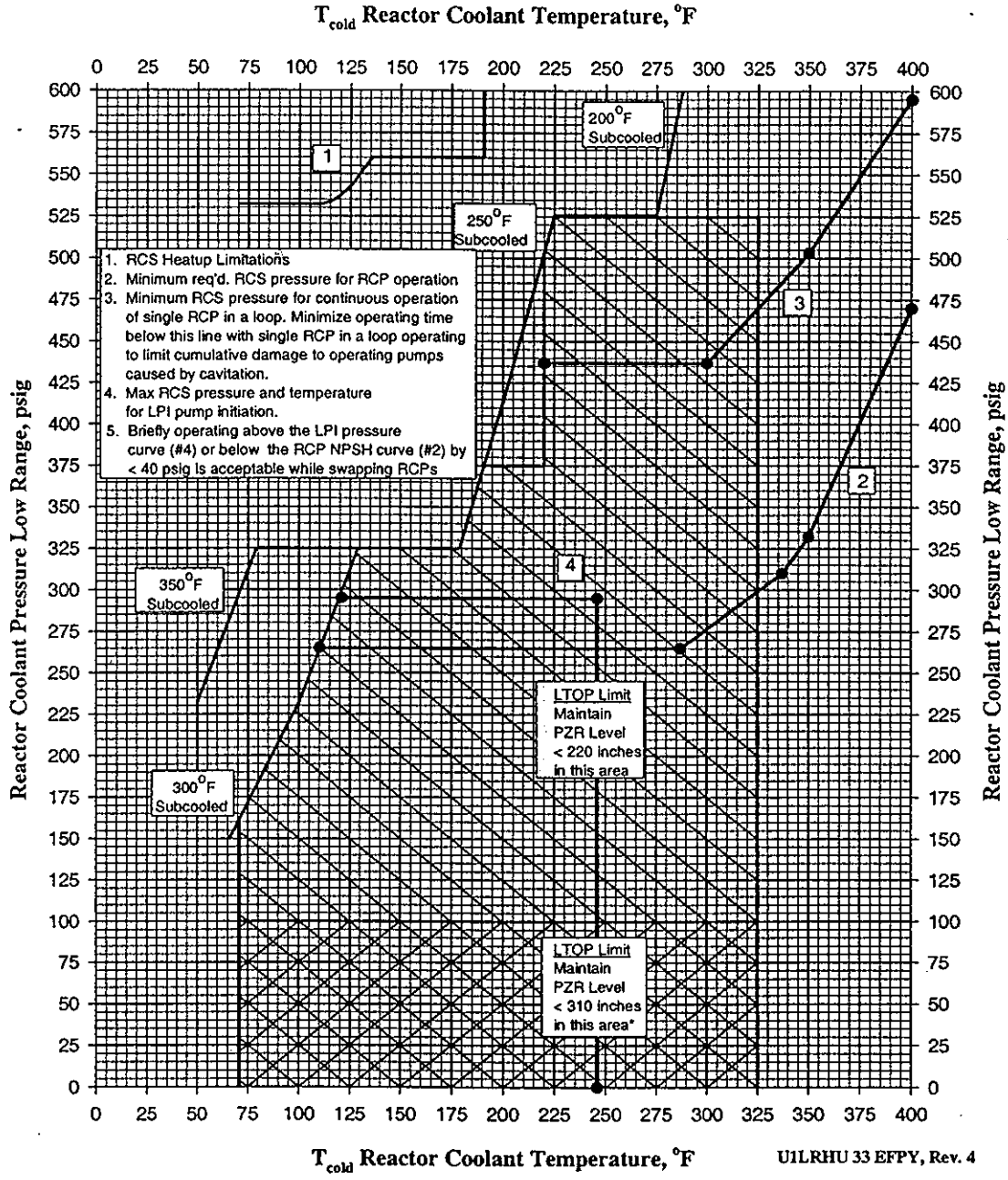
Unit 1 Low Range Cooldown Curve



* PZR level restricted to ≤ 380 inches when RCS temperature is ≤ 160°F, and NO HPIPs operating.

RCS TEMPERATURE	MAX COOLDOWN RATE
T > 280°F	≤ 45°F in any 1/2 hour period
150°F < T ≤ 280°F	≤ 20°F in any 1/2 hour period
T ≤ 150°F	≤ 9°F in any 1 hour period
RCS depressurized (note 5)	≤ 45°F in any 1 hour period

Unit 1 Low Range Heatup Curve

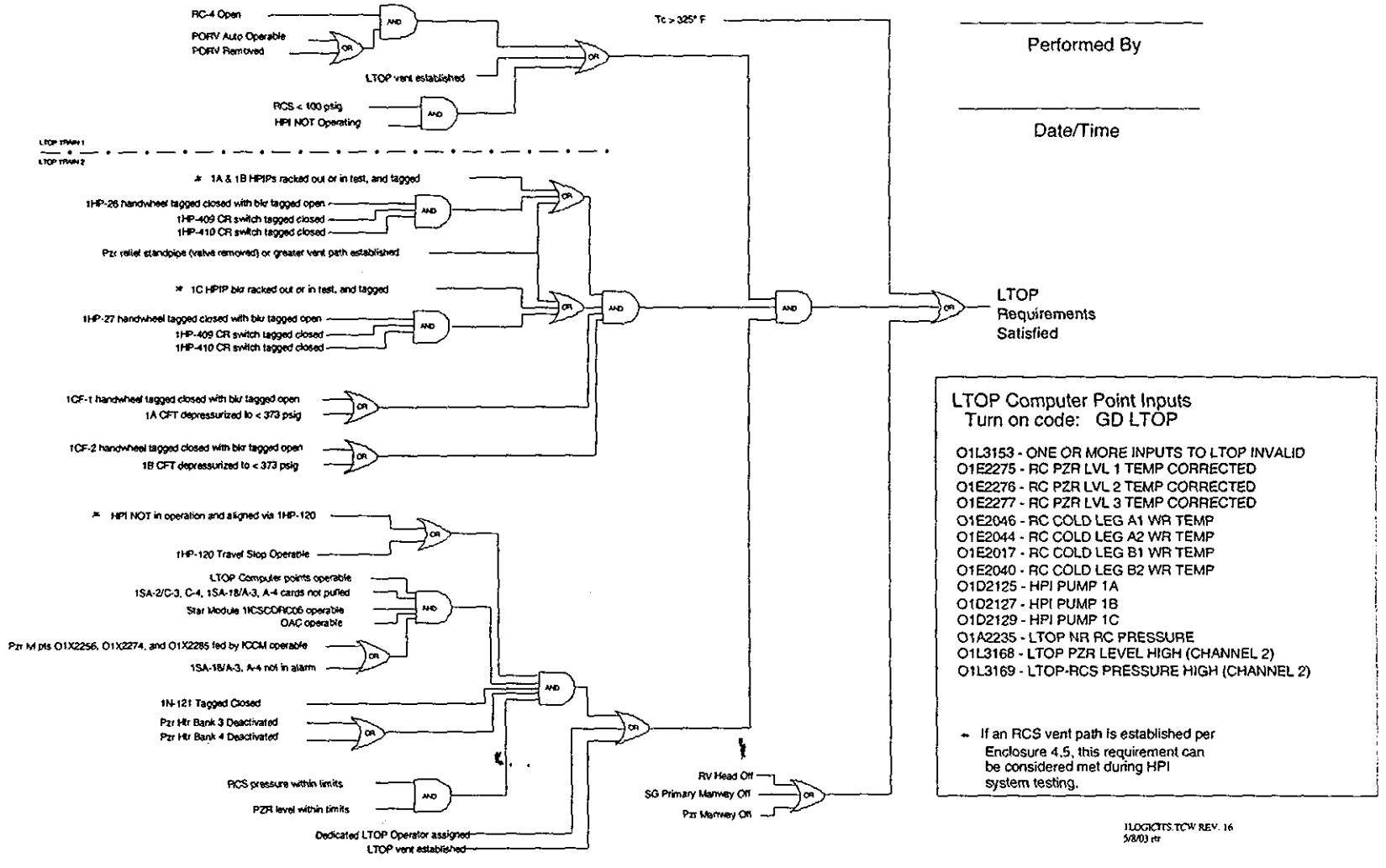


* PZR level restricted to ≤ 380 inches when RCS temperature is ≤ 160°F and NO HPIPs operating.

RCS TEMPERATURE	MAX HEATUP RATE
T ≤ 280°F	≤ 45°F in any 1 hour period
T > 280°F	≤ 90°F in any 1 hour period

Enclosure 4.13

LTOP Requirements Logic Diagram



Performed By

Date/Time

LTOP Computer Point Inputs
Turn on code: GD LTOP

O1L3153 - ONE OR MORE INPUTS TO LTOP INVALID
O1E2275 - RC PZR LVL 1 TEMP CORRECTED
O1E2276 - RC PZR LVL 2 TEMP CORRECTED
O1E2277 - RC PZR LVL 3 TEMP CORRECTED
O1E2046 - RC COLD LEG A1 WR TEMP
O1E2044 - RC COLD LEG A2 WR TEMP
O1E2017 - RC COLD LEG B1 WR TEMP
O1E2040 - RC COLD LEG B2 WR TEMP
O1D2125 - HPI PUMP 1A
O1D2127 - HPI PUMP 1B
O1D2129 - HPI PUMP 1C
O1A2235 - LTOP NR RC PRESSURE
O1L3168 - LTOP PZR LEVEL HIGH (CHANNEL 2)
O1L3169 - LTOP-RCS PRESSURE HIGH (CHANNEL 2)

* If an RCS vent path is established per Enclosure 4.5, this requirement can be considered met during HPI system testing.

1LOGICTTS.TCW REV. 16
5/8/03 rtr

11. 000027AK1.01 001

Which one of the following is correct, following a failure of the Channel "A" Pressurizer Temperature RTD to a minimum value?

PZR Level #1 indication will _____, PZR Saturation Pressure indication will _____.

A. increase / increase

B. decrease / decrease

C. increase / decrease

D. decrease / increase

Answer 409
B
A. Incorrect, failed RTD provides 0 output => low temperature indication. Loss of temp compensation will decrease indicated level. Indicated temp decreases to the saturation program and this will decrease the saturated pressure for
that temperature.
B. Correct, The RTD fails LOW; decreasing both operator indications.
C. Incorrect, same as A for PZR level
D. Incorrect ,same as A for Sat temperature

Added "indication" to stem. Suggest cog level is C/A.

Validation comment:
Added "indication" to PZR Saturation Pressure.

Tier:	1	Group:	1
Keyword:	PRESSURIZER	Cog level:	C/A 3.1/3.4
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

12. 000028AA2.01 001

The reactor is operating normally at 100% power with Pressurizer Level Instrument #1 selected for control with SASS in auto.

Which one of the following describes the resulting plant conditions when a "Data Link Failure" is indicated on ICCM Train "A" due to an internal power failure?

A. PZR level goes to zero, HP-120 fully opens, and PZR level High/Low statalarms actuate.

B. PZR level goes full scale, HP-120 fully closes, and PZR level High/Low statalarms are inoperable.

C. SASS selects the alternate PZR level signal, HP-120 throttles as demanded by the good level signal, and PZR level High/Low statalarms are inoperable.

D. SASS selects the alternate PZR level signal, HP-120 throttles as demanded by the good level signal, and PZR level High/Low statalarms are operable.

OP-OC-PNS-PZR

Added "with SASS in auto" and "due to an internal power failure" to stem to clarify question and to ensure "D" is the only correct answer.

Tier:	1	Group:	2
Keyword:	PZR	Cog level:	C/A 3.4/3.6
Source:	M	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

13. 000028AK2.02 001

Plant conditions on Unit 2 are as follows:

- Reactor trip from 100% power.
- Loss of pressurizer level control has occurred.
- Pressurizer level is 398 inches slowly increasing on all indicators.
- RCS pressure is slowly increasing.

Which one of the following describes the response of RCS pressure and the reason for this response when PZR level increases to indicate full scale?

RCS pressure:

A. continues to slowly increase because the PZR level instrument reference leg does NOT tap off the true top of the PZR

B. continues to slowly increase because the PZR level instrument variable leg does NOT tap off the true bottom of the PZR

C. rapidly increases because the PZR level instrument reference leg taps off the true top of the PZR

D. rapidly increases because the PZR level instrument variable leg taps off the true bottom of the PZR

Oconee Lesson Plan OP-OC-PNS-PZR

Added "slowly increasing" to stem and "A" and "B" choices. Pressure would slowly increase if PZR level is increasing. Changed to KA 000028AK2.02

Tier:	1	Group:	2
Keyword:	PZR	Cog level:	C/A 2.6/2.7
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

14. 000029EA2.09 001

Unit 2 plant conditions:

- Unit tripped due to Main Turbine trip.
- CRD breakers opened
- Two control rods stuck at 15% withdrawn.
- Reactor power = 7% and stable by Wide Range indication
- EOP section UNPP was entered by the operating crew.

Which ONE of the following is the correct course of action?

A. Ensure 2HP-5, Letdown Isolation is closed and manually drive the stuck control rods to their In-limit.

B. Ensure 2RC-4, Pressurizer Relief Block is closed and manually drive the stuck control rods to their In-limit.

C. Borate the RCS by aligning the BWST to the HPI suction.

D. Borate the RCS by aligning "A" Bleed to the LDST.

EAP-UNPP

C

A) Incorrect- If any wide range NI is indicating > 1% full power this step is bypassed by the RNO.
B) Incorrect- The CRD breakers are open and the stuck rods cannot be driven with the trip breakers open.
C) Correct- The initial action of Rule 1 is to manually drive rods if any Power Range NI indicates = 5%. The rods cannot be manually driven however there is no RNO for this action. The next step of Rule 1 has the operator open HP-24/25 to add negative reactivity from the BWST.
D) Incorrect- FDW will be automatically controlled at Low Level Limits

EOP no longer has a limit on SG level during UNPP. Modified bank question 199.

Tier:	1	Group:	1
Keyword:	ATWS	Cog level:	C/A 4.4/4.5
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

15. 000029EK3.12 001

Which one of the following is the reason that UNPP, Unanticipated Nuclear Power Production, tab of the EOP directs operators to trip the main turbine if it has not already tripped?

To:

A. prevent the chance of an overcooling event adding additional reactivity to the core.

B. allow heatup of the RCS enabling moderator temperature and doppler coefficients to reduce reactor power.

C. prevent motorizing the main generator.

D. prevent the loss of pressurizer level due to AMSAC activation.

OP-OC-EAP-E26

Editorial changes to match current EOP designations.

Tier:	1	Group:	1
Keyword:	ATWS	Cog level:	M 4.4/4.8
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

16. 000036AA2.02 001

Plant conditions:

- Unit 3 in MODE 6
- Defueling has not begun
- Unit 3 SFP temperature = 136° F
- A loss of RCW has occurred

Which ONE of the following is the estimated time (hours) to boil in Unit 3 SFP?

SEE ATTACHMENT

A. 7

B. 23

C. 108

D. 112

C

REFERENCE AP/3/A/1700/035, Enclosure 5.4

A INCORRECT - Used Core offload curve - NOT offloaded per info provided.

B INCORRECT - Used BOC curve - 1/3 core has NOT been added to SFP per info provided.

C CORRECT - Use EOC curve.

D INCORRECT - Incorrect used incorrect axis and EOC curve.

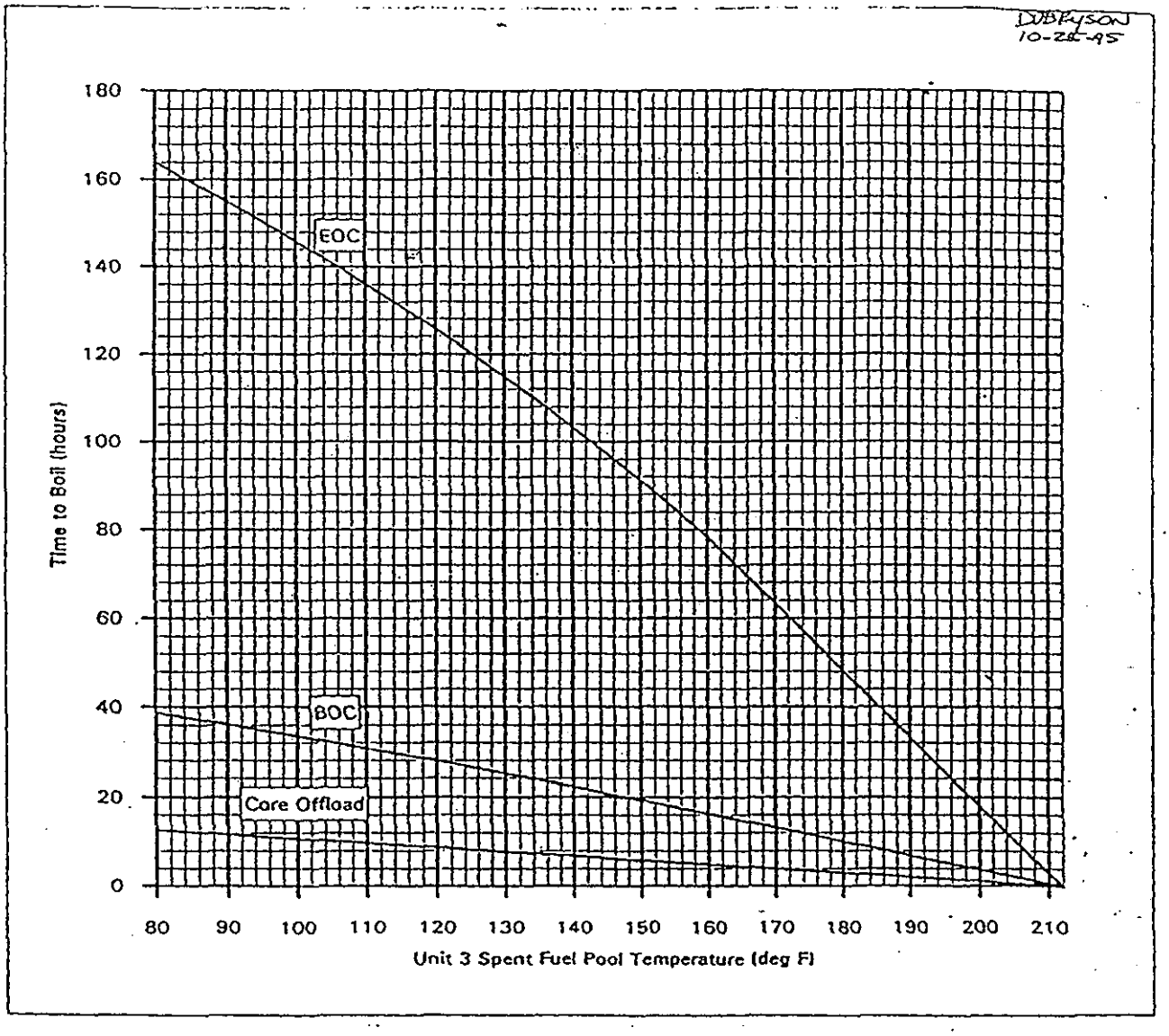
ONS no longer has Intermediate Range detectors. KA no longer applicable to ONS. Suggest new KA 000036AA2.02. Replaced with new question.

Tier:	1	Group:	2
Keyword:	FUEL HANDLING	Cog level:	M 3.1/3.4
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

000036 AA 2.02

Enclosure 5.4

Unit 3 SFP Time to Boil
After Loss of SFP Cooling



NOTE: Graph assumes SFP level at -2.0' when SF Cooling is lost and SSF is required.

Curve	Condition
Core Offload	One unit complete core offloaded to SFP
BOC	After core loading (≈ 1/3 core added to SFP inventory) and between refuelings
EOC	After one unit has shutdown for refueling, but prior to core offload

17. 000038EA1.19 001
The following plant conditions exist:

- A tube rupture is in progress in OTSG "A".
- RCS pressure is 1700 psig.
- RCS temperature is 540 degrees F.
- 1A Main FDW pump operating
- OTSG "A" operating range level is 89% (~280 inches XSUR).
- The operator is steaming OTSG "A" and OTSG "B".
- All RCPs are tripped.

Which one of the following is the reason for increasing the steaming rate for OTSG "A"?

A. To prevent a trip of the MFDW pumps.

B. To maintain a 100 degrees F. per hour RCS cooldown rate with BOTH OTSGs.

C. To prevent OTSG "A" from filling and lifting a MSRV.

D. To maintain Tube-to-Shell delta T within 50 degrees F.

OP-OC-EAP-E24, EP/1/A/1800/01
No utility comments.

Validation comment:
Added "1A Main FDW pump operating" to stem to clarify plant status.

Tier:	1	Group:	1
Keyword:	SGTR	Cog level:	C/A 3.4/3.4
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

18. 000040AA2.1 001
The following plant conditions exist:

- Unit 1 reactor has tripped.
- Core subcooling margin = 10 degrees F.
- "A" OTSG pressure is 800 psig and decreasing.
- "B" OTSG pressure is 1010 and stable.
- RCS Tc is 535 degrees F and decreasing.
- RCS pressure is decreasing.
- Pressurizer level = 0 inches.

Which one of the following procedures should be used to mitigate these abnormal RCS indications?

A. Steam Generator Tube Rupture.

B. Loss of Subcooling Margin

C. Loss of Heat Transfer

D. Excessive Heat Transfer

Oconee Procedure Index

(o Core subcooling margin indicates ZERO (0) degrees F.). This bullet implies that the instrument is failed based on other indications.

Removed refer to attachment. Attachment not required. Removed tab letter designations from distractors, not used at ONS. Changed "B" to "Loss of Subcooling Margin" to reflect ONS EOP tab.

Tier:	1	Group:	1
Keyword:	EXCESSIVE HEAT TRANS	Cog level:	C/A 3.1/4.2
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

19. 000051AA2.02 001
Unit 1 conditions:

INITIAL CONDITIONS:

- Reactor power = 20%
- Unit startup in progress
- All RCPs operating

CURRENT CONDITIONS:

- Reactor tripped
- Reactor power = 1% and decreasing
- RCS pressure = 1850 psig and decreasing
- Condenser vacuum = 19 inches and decreasing
- 1A2 RCP tripped

Which one of the following is the cause of the reactor trip?

A. Low RCS pressure.

B. Power to flow imbalance.

C. Main turbine anticipatory trip.

D. Loss of feedwater anticipatory trip.

Answer 423
D
A. Incorrect - RCS pressure > 1810 psig.
B. Incorrect - Rx power < min. flux/flow/imb trip setpoint.
C. Incorrect - Rx power < 27.75% and decreasing, turb. anticipatory trip bypassed.
D. Correct - Operating MFDWP tripped on low vacuum.

No utility comments.

Tier:	1	Group:	2
Keyword:	COND VACUUM	Cog level:	C/A 3.9/4.1
Source:	B	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

20. 000054AK3.03 001
Unit 2 plant conditions:

- A transient has occured which requires the use of EFDW
- 2FDW-315 fails to respond from the control room
- 2FDW-315 indicates approximately 70% open locally
- 2FDW-315 valve disk is free to move

Which one of the following decsribes the local control of the EFDW flow control valve using the manual handwheel?

The handwheel can be used to...

A. fully open or throttle open the valve.

B. fully close or throttle closed the valve.

C. open, close, or throttle the valve upon a loss of the remote control positioning signal.

D. lock the valve in its fully open or fully closed position, if instrument air is availble to stroke the valve.

B

A. Incorrect, handwheel cannot be used to open the valve. Question stem implies valve is failed partially closed/open.
B. Correct,
C. Incorrect, handwheel cannot be used to open the valve.
D. Incorrect, handwheel cannot open the valve.
Replaced question because EFDW valve controllers have been replaced and no longer operate as the question assumes. NO longer an AP/19, information moved to EOP. Bank CF025004

Tier:	1	Group:	1
Keyword:	FEEDWATER	Cog level:	M 3.8/4.1
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

21. 000055EA2.01 001
Unit 1 plant conditions:

- Blackout tab of EOP has been in progress for 28 minutes
- Diesel Air Compressor cannot be started

Which one of the following is correct?

A. 1HP-31 (RCP Seal Flow Control) will fail open.

B. 1HP-31 (RCP Seal Flow Control) will fail closed.

C. 1FDW-315/316 (1A/1B EFDW Control Valve) will fail open.

D. 1FDW-315/316 (1A/1B EFDW Control Valve) will fail closed.

A

A. Correct, 1HP-31 (RCP Seal Flow Control) will fail open on a loss of IA.
B. Inocrrect, 1HP-31 (RCP Seal Flow Control) will fail open on a loss of IA.
C. Incorrect, 1FDW-315/316 (1A/1B EFDW Control Valve) would fail open on loss of IA except they have a nitrogen backup supply.
D. Incorrect, FDW-315/316 (1A/1B EFDW Control Valve) would fail open on loss of IA except they have a nitrogen backup supply.

Question does not meet the KA. Question deals with cycling TBVs due to emergency CCW flow during a blackout. The KA specifies valve position during a loss of IA as a result of a blackout. Conditions stated in question are no longer addressed in current procedure. Replaced with a new question that matches KA.

Tier:	1	Group:	1
Keyword:	BLACKOUT	Cog level:	C/A 3.4/3.7
Source:	N	Exam:	OC03301
Test:	S	Author/Reviewer:	GCW

22. 000056AA2.47 001

Unit 1 plant conditions:

- A LOCA has decreased RCS pressure to 1500 psig
- A loss of power has caused both Keowee Units to emergency start and MFBs have been re-energized through CT-4.

Which one of the following sets of actions is required to reset the load shed signals?

The operator must:

A. reset "ES Channels 1 & 2" and secure both Keowee Units.

B. energize the startup source and push the load shed reset pushbuttons.

C. depress "Manual" on the Load Shed ES modules and simultaneously depress the reset push buttons for the MFB monitor panels load shed circuit.

D. restore an offsite power source to the 230 KV "Yellow Bus" and reset both the Keowee Emergency Start signals in Unit 1 and 2 control room.

bank 327

A. Incorrect, securing Keowee units not required
B. Incorrect, no loadshed reset buttons. There are Keowee reset buttons
C. Correct, depress "Manual" on the Load Shed ES modules and simultaneously depress reset push buttons for MFB monitor panels load shed circuit.
D. Incorrect, will not reset loadshed

ONS has hydro electric versus EDGs. Therefore, CE determined this KA acceptable because ONS load sheds up front vs sequencing loads. Intent of KA met.

Tier:	1	Group:	1
Keyword:	LOSP	Cog level:	M 3.8/3.9
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

23. 000057 GEN 2.1.8 001

Vital inverter 3DIA tripped. The repairs are complete and it is ready to be returned to service. Currently, regulated AC power from Panelboard 3KRA is supplying the load.

- DC power to the inverter has been isolated.
- You have been instructed to restart the Vital Bus Inverters.
- You have just directed the closure of breaker #33 on the 3DIA DC Panelboard.
- The operator pressed the PRECHARGE SWITCH pushbutton.
- The PRECHARGE Light illuminates.

Which one of the following actions should be directed next?

SEE ATTACHMENT

Close the:

A. AC INPUT circuit breaker and verify that the input filter capacitors discharge.

B. DC INPUT circuit breaker and verify that the input filter capacitors discharge.

C. AC INPUT circuit breaker and verify that the INVERTER OUTPUT volt meter increases to 120 Volts.

D. DC INPUT circuit breaker and verify that the INVERTER OUTPUT volt meter increases to 120 Volts.

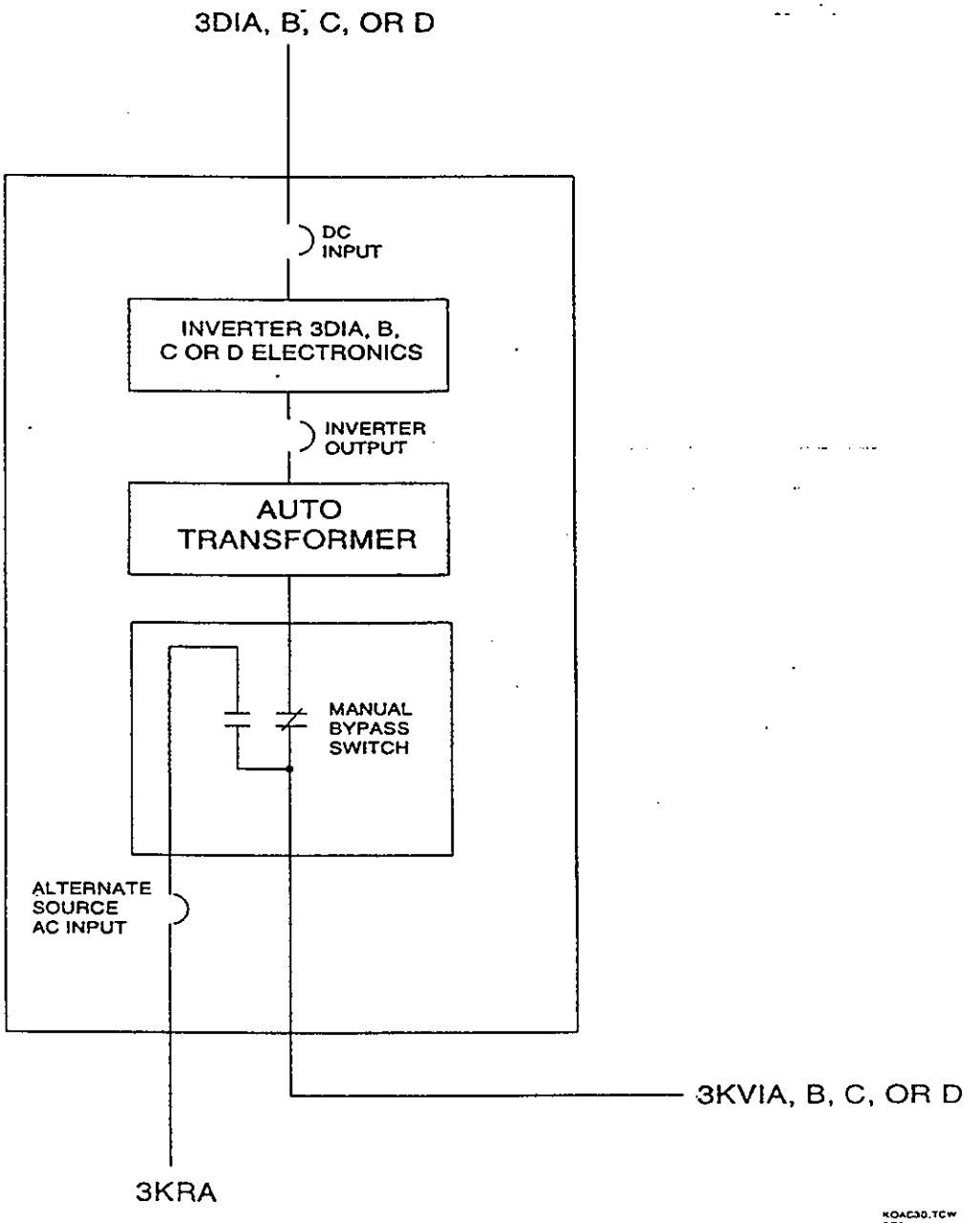
op/3/a/1107/004

2.2 Press the PRECHARGE SWITCH pushbutton until the PRECHARGE Light comes on.
2.3 Close the DC INPUT circuit breaker and verify INVERTER OUTPUT volt meter increases to 120 Volts.
2.4 Close the INVERTER OUTPUT circuit breaker.
2.5 Verify the IN SYNC light is on.
2.6 Position the MANUAL BYPASS SWITCH to the "NORMAL SOURCE" position.
2.7 Verify the following indications:
· INVERTER OUTPUT volt meter » 120 Volts.
· Inverter Output frequency meter » 60 Hz.
· INVERTER OUTPUT amp meter increases and stabilizes to match SYSTEM OUTPUT amp meter.

Remove "RPS Channel testing is also due during your shift" from stem. Has no bearing on question. Attach reference OP/3/A/1107/004, Encl. 4.15 (System Drawing)

Tier:	1	Group:	1
Keyword:	INSTRUMENT	Cog level:	C/A 3.7/4.4
Source:	N	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

SRO
000057GEN 2.1.8



24. 000057AA106 001

Which one of the following will occur upon a loss of KI (ICS AUTO) power from 100% with the ICS in the integrated mode?

A. Turbine Bypass Valves (TBVs) FAIL closed

B. FWPTs trip from High SG Level circuit.

C. All Dixsons Fail with no indication.

D. All Bailey stations transfer to HAND.

D

A. Incorrect, TBVs do not fail closed on loss KI.
B. Incorrect, FDWPTs do not trip on loss of KI. They will trip on loss of KI and KU.
C. Incorrect, Dixsons will auto swap to backup source and be available.
D. Correct, All Bailey stations transfer to HAND on loss of KI.

ICS has been upgraded and loss of KI no longer requires use of Aux Shutdown Panel. Replaced with bank question STG636.

Tier:	1	Group:	1
Keyword:	LOSS OF AC POWER	Cog level:	M 3.5/3.5
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

25. 000058AA2.03 001
Plant conditions:

- 1015 on 04/30/01 the "125 VDC Ground Trouble" stat alarm was received.
- 1215 on 04/30/01 bus to ground voltage measurements were taken.
- 1415 on 04/30/01 The Units' DC systems were separated using OP/0/A/1107/08, Isolation of DC Systems Between Units after gaining OSM concurrence.
- 1730 on 04/30/01 the ground has been determined to exist on Unit 2
- Ground magnitude = 2.8V (~525 Ohms).

Which one of the following is correct?

SEE ATTACHMENT

A. The ground detector is inoperable on Unit 1, 2, & 3.

B. Both Unit 2 and Unit 3 DC systems are functional, but not operable.

C. Unit 2 is required to initiate efforts to locate the ground by 1015 on 05/02/01.

D. Unit 3 is required to measure ground and bus voltage by 0215 on 05/01/01.

A. Incorrect- The ground detector is operable on unit 1. Buses to ground voltages were taken prior to the separation of the buses. A ground locating effort located the ground on Unit 2 so the ground detector is operable because a hard ground existed.
B. Incorrect- the TS definition of functional does not apply in this case.
C. Correct- With the magnitude of the ground at 2.8 volts, condition D requires that efforts to locate the ground be initiated 48 hours from the receipt of the continuous ground alarm.
D.
Incorrect. Unit 3 is required to measure ground and bus voltage by 0300 on 05/01/01. This is the 12 hours allowed by condition B with the continuous ground alarm present.
Added ATTACHMENT SLC 16.8.5 (125v DC Vital I&C System Ground Locating Policy).
CE determined KA acceptable because system is degraded due to ground.

Tier:	1	Group:	1
Keyword:	DC POWER	Cog level:	C/A 3.5/3.9
Source:	M	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

SRO
0000588AA2.03

16.8 ELECTRIC POWER SYSTEM

16.8.5 125 Vdc Vital I&C System Ground Locating Policy

COMMITMENT Grounds on the 125 Vdc Vital Instrumentation and Control System will be pursued in accordance with this ground locating policy.

APPLICABILITY: At all times

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. A continuous ground alarm is received.	A.1 Determine the ground magnitude with buses separated. OR A.2.1 OSM shall determine extenuating circumstances exist which prohibit separating buses and document in the Unit log. AND A.2.2 Determine the ground magnitude with buses separated.	8 hours 8 hours 8 hours after buses are separated
B. One or more continuous ground alarms are present. OR One ground alarm is inoperable.	B.1 Measure ground voltage.	----------NOTE---------- A 50% interval extension applies to the Completion Times. ---------- Once within 12 hours AND 12 hours thereafter

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Ground resistance < 2.8V to ground (≤ 500 Ohms).	C.1 Initiate efforts to locate the ground. AND	24 hours from receipt of continuous ground alarm
	C.2 Perform engineering evaluation of safety system vulnerability to the ground using the available data. AND	7 days from receipt of continuous ground alarm
	C.3 Request Plant Operations Review Committee (PORC) approval of the evaluation.	7 days from receipt of continuous ground alarm
D. Ground resistance ≥ 2.8V and < 6V (> 500 Ohms and ≤ 2,000 Ohms).	D.1 Initiate efforts to locate the ground. AND	48 hours from receipt of continuous ground alarm
	D.2 If ground is not located, perform engineering evaluation of safety system vulnerability to the ground using the available data. AND	14 days from receipt of continuous ground alarm
	D.3 Request PORC approval of the evaluation.	14 days from receipt of continuous ground alarm

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Ground resistance ≥ 6V and ≤ 18V (> 2,000 Ohms and ≤ 10,000 Ohms).	E.1 Initiate efforts to locate the ground. AND	128 hours from receipt of continuous ground alarm
	E.2 If ground is not located, perform engineering evaluation of safety system vulnerability to the ground using the available data. AND	728 hours from receipt of continuous ground alarm
	E.3 Request PORC approval of the evaluation.	728 hours from receipt of continuous ground alarm

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 16.8.5.1 NA	NA

BASES

BACKGROUND

The DC ground locating process was identified as a weakness in NRC Inspection Report 50-269,270,287/93-26. During December 1993, a pressure switch failed which resulted in a ground on the DC system and the inoperability of the 2A Motor Driven Emergency Feedwater Pump. This inoperability exceeded the allowed outage time in the CTS and resulted in NRC Violation 50-270/94-08-02. The response to this violation indicated that guidelines would be developed for locating a DC ground, evaluating the significance of the ground, and removing the ground. The guidelines have been developed and are contained in this SLC.

The primary concern with grounds is that the interaction of two or more grounds may cause the malfunction of equipment. The actions contained in this SLC are based on the recognition that lower resistance grounds have a greater probability to induce equipment malfunctions. In addition, the risk of ground-induced malfunctions is decreased as the ground resistance increases. This decrease in risk is associated with the lower probability of affecting individual relays and the reduced number of relays which are vulnerable.

The ground detection system is considered to be OPERABLE for all three Units if the buses are not separated and a single ground detector is OPERABLE for the bus (e.g., one detector for the 1DCA bus or one detector for the 1DCB bus).

APPLICABILITY

At all times, DC grounds on the 125Vdc Vital Instrumentation and Control System will be located in accordance with this ground locating policy.

ACTIONS

A.1, A.2.1, A.2.2

When a continuous valid ground alarm is received, the ground magnitude must be determined with the buses separated. Separation of the buses at the isolating transfer diodes is required to eliminate interactions between the buses, to determine which bus the ground is located on and to determine the magnitude of the ground. Prior to separating the buses, bus to ground voltage measurements are taken in order to determine if a hard ground exists or if the problem exists within the detector circuitry. Eight hours to separate the buses and determine the ground magnitude is acceptable based on engineering judgement considering the low likelihood of multiple grounds causing inoperability of required equipment or instrumentation.

Separation of the buses may not be desirable due to extenuating circumstances as determined by the Operations Shift Manager. In this event, the circumstances shall be documented in the Unit log within 8 hours of the continuous ground alarm. When the buses are separated, an additional 8 hours is permitted to determine the ground magnitude.

B.1

Whenever continuous valid ground alarms are present or a ground alarm is inoperable, ground voltage measurements will be made every 12 hours. Any changes in the positive-to-ground or negative-to-ground voltages will be evaluated to ensure that there is no additional system degradation.

C.1

If the ground magnitude is determined to be $\leq$ 500 Ohms, then locating efforts will begin within 24 hours from receipt of the ground alarm. If determination of ground magnitude is delayed due to extenuating circumstances as described above, ground locating efforts will begin within 16 hours after the 8 hour period for determination of the ground magnitude. The ground will be located within 7 days after the receipt of a continuous ground alarm, or an evaluation of the

located within 7 days after the receipt of a continuous ground alarm, or an evaluation of the safety system vulnerability using the available ground data will be performed. This 7 day action statement is based on 24 hours to initiate the locating efforts and 6 days to locate the ground or perform an evaluation. The Plant Operations Review Committee (PORC) will be contacted to approve the evaluation.

D.1

If the ground magnitude is determined to be > 500 Ohms and ≤ 2,000 Ohms, then fewer relays are vulnerable. Locating efforts will begin within 40 hours. This is based on a total time period of 48 hours from receipt of the ground alarm until locating efforts begin (40 hours plus the initial 8 hours). If determination of ground magnitude is delayed due to extenuating circumstances as described above, ground locating efforts will begin within 40 hours after the 8 hour period for determination of the ground magnitude. The ground will be located within 14 days after the buses are separated, or an evaluation of the safety system vulnerability using the available ground data will be performed. This 14 day action statement is based on 48 hours to initiate the locating efforts and 12 days to locate the ground or perform an evaluation. The PORC will be contacted to approve the evaluation.

E.1

If the ground magnitude is determined to be > 2,000 Ohms and ≤ 10,000 Ohms, then locating efforts will begin within 128 hours. If determination of ground magnitude is delayed due to extenuating circumstances as described above, ground locating efforts will begin within 5 days after the 8 hour period for determination of the ground magnitude. The ground will be located within 728 hours after receipt of a continuous ground alarm, or an evaluation of the safety system vulnerability using the available ground data will be performed. This 728 hour action statement is based on 5 days and 8 hours to initiate the locating efforts and 25 days to locate the ground or perform an evaluation. The PORC will be contacted to approve the evaluation.

REFERENCES:

1. LER 270/94-01 dated March 10, 1994, "Technical Specification Limit Exceeded Due to Equipment Failure."
2. NRC Inspection Report 50-269,270,287/93-26.
3. NRC Inspection Report 50-269,270,287/94-08.
4. 5/11/94 letter from J. W. Hampton to NRC Document Control Desk, "Reply to Notice of Violation."
5. 6/23/94 letter from J. W. Hampton to NRC Document Control Desk, "Reply to Notice of Violation."
6. 2/9/95 memo from L. S. Underwood to C. A. Little, "DC Ground Locating Policy."

26. 000059AK3.01 001

Both a GWR and an LWR are in progress. IRIA-35 (LPSW DISCH) has just alarmed.

Which one of the following are your ***required*** actions?

A. Terminate both the GWR and LWR.

B. Terminate the GWR only.

C. Terminate the LWR only.

D. Continue both releases until a confirmatory sample indicates the alarm is valid.

Per AP/1/A/1700/018 Section 4C
Added (LPSW DISCH) to stem.

Tier:	1	Group:	2
Keyword:	RAD RELEASE	Cog level:	M 2.7/2.8
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

27. 000061K1.01 001

Which one of the following Radiation Monitors is potentially unreliable under accident conditions?

A. RIA- 4, Reactor Building Hatch Area Radiation Monitor.

B. RIA-56, High Range Stack Radiation Monitor.

C. RIA-57, High Range Containment Radiation Monitor.

D. RIA-58, High Range Containment Radiation Monitor.

bank 2003 question 791

A. Correct - RIA-4 is not totally EQ.
B, C, D. Incorrect - RIAs are used during accident conditions

No utility comments.

Tier:	1	Group:	2
Keyword:	ARM	Cog level:	M 2.5/2.9
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

28. 000062AA1.07 001

Unit 3 plant conditions:

- MODE 5
- 3A LPSW is tagged out for bearing replacement
- 3B LPSW pump has just tripped

Which ONE of the following is correct?

Cross connect:

A. Unit 3 LPSW system with HPSW system and reduce LPSW loads.

B. Unit 3 LPSW system with HPSW system and maintain EWST level >90,000 gallons.

C. Units 1&2 LPSW system with Unit 3 and start an additional Unit 1&2 LPSW Pump.

D. Units 1&2 LPSW system with Unit 3 and maintain the current LPSW Pump combination.

C

A. Incorrect- HPSW is not used to backup LPSW (procedurally)
B. Incorrect - Cross connecting LPSW alone is not a correct action
C. Correct - Cross connecting LPSW and starting an additional U1&2 LPSW Pump is the correct mitigation action
D. Incorrect - HPSW is not used to backup LPSW (procedurally)

Operability determinations are performed by SROs. Replaced modified bank question 605 that meets KA.

Tier:	1	Group:	1
Keyword:	SERVICE WATER	Cog level:	C/A 2.9/3.0
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

29. 000067 GEN 2.4.27 001

A fire near the control room door has rendered the control room unsafe requiring activation of the SSF. The decision has been made to enter AP/1/A/1700/08, Loss of Control Room.

Which one of the following actions are taken before transitioning out of AP/1/A/1700/08?

A. Dispatch an operator to locally close 1-FDW-315.

B. Dispatch an operator to locally open 1-HP-24.

C. Verify **both** Keowee Units emergency started.

D. Verify at least one Keowee Unit emergency started.

AP/1/A/1700/008

A. Correct

B. & C . Actions taken only if the control room is abandoned for reasons other than fire.

D. This is not an action taken in AP/1/A/1700/008

Added "requiring activation of the SSF" to stem to ensure proper path in the AP.

Tier:	1	Group:	2
Keyword:	FIRE	Cog level:	M 3.0/3.5
Source:	N	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

30. 000067AK3.04 001
The following conditions exist:

- A fire occurred that destroyed equipment, normal power supplies, controls, and cabling.
- Pumps required for plant shutdown cannot be operated from their normal power supply.

Which one of the following is correct?

I&E will align power to required Appendix R pumps from:

A. CT-5 through the Appendix R Switchgear.

B. CT-5 through motor starters on the back of the Appendix R Portable Valve Control Panel.

C. CT-4 through the Appendix R Switchgear.

D. CT-4 through motor starters on the back of the Appendix R Portable Valve Control Panel.

Bank 238

A Incorrect. Power to Appendix R Pumps and controls is supplied via CT-4 (Keowee underground feeder) through the Appendix R Switchgear.

B Incorrect. Power to Appendix R Pumps and controls is supplied via CT-4 (Keowee underground feeder) through the Appendix R Switchgear.

C Correct. Power to Appendix R Pumps and controls is supplied via CT-4 (Keowee underground feeder) through the Appendix R Switchgear.

D Incorrect. Power to Appendix R Pumps and controls is supplied via CT-4 (Keowee underground feeder) through the Appendix R Switchgear. Power is not through motor starters on the back of the Appendix R Portable Valve Control Panel.

No utility comments.

Tier:	1	Group:	2
Keyword:	PLANT FIRE	Cog level:	M 3.3/4.1
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

31. 00009EA2.39 001
The following plant conditions exist:

- SBLOCA in progress
- TA and TB Switchgear locked out
- Boiler Condenser heat transfer is occurring

Which one of the following describes the method of post cooldown long term decay heat removal provided by the EOP?

A. Initiate Natural Circulation Cooldown and ensure one LPI train in High Pressure Mode and one LPI train in ECCS alignment with suction from the RBES.

B. Initiate Natural Circulation Cooldown and ensure one LPI train in series Mode and one LPI train in ECCS alignment with suction from the RBES.

C. Start one RCP and ensure one LPI train in High Pressure Mode and one LPI train in ECCS alignment with suction from the RBES.

D. Start one RCP and ensure one LPI train in series Mode and one LPI train in ECCS alignment with suction from the RBES.

Based on Bank Question 204
EAP130701

A. Correct. The LOCA Cooldown section of the EOP will align on LPI train in the High Pressure Mode while leaving the other in its ECCS alignment with suction on the RBES.

B. Incorrect. Series mode would require use of both LPI Coolers. One train remains aligned to the RBES to provide for replacement of water lost out of the break.

C. Actions are correct except an RCP is not used

D. Series mode would require use of both LPI Coolers. One train remains aligned to the RBES to provide for replacement of water lost out of the break. and an RCP is not used.

KA does not match. KA is for a LBLOCA. At ONS we have Boiler Condenser cooling instead of Reflux Boiling. 200 gpm leak will not saturate the plant. Added SBLOCA to stem. TA and TB Switchgear locked out added to stem to eliminate cue in stem that made "C" and "D" not plausible. Changed to SRO only. Changed to KA 00009EA2.39.

Tier:	1	Group:	1
Keyword:	NATURAL CIRC	Cog level:	C/A 4.3/4.7
Source:	N	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

32. 001A2.13 001
Unit 1 plant conditions:

- Reactor power = 100%
- RCS Pressure = 2476 psig
- CRD breakers did not open
- AMSAC/DSS Ch 1 AND Ch 2 enabled
- AMSAC/DSS Channel 1 "Halt" light is lit

Which one of the following is correct?

A. Control rod groups 1-4, 5, 6, 7 will insert into the core.

B. Control rod groups 5, 6, 7 ONLY will insert into the core.

C. Control rod groups1-4 ONLY will insert into the core.

D. No control rods will insert into the core.

D

A. Incorrect, this would be true if the CRD breakers opened.
B. Incorrect, AMSAC/DSS Channel 1 "Halt" light is lit will prevent AMSAC/DSS actuation and no rods will be inserted into the core. This would be correct if the halt light was not lit.
C. Incorrect, this would be true if the CRD breakers opened. AMSAC/DSS does not trip in groups 1-4.
D. Correct, AMSAC/DSS Channel 1 "Halt" light is lit will prevent AMSAC/DSS actuation and no rods will be inserted into the core.

Two correct answers ("B" and "D"). Replaced with new question.

Tier:	2	Group:	2
Keyword:	CRD	Cog level:	C/A 4.4/4.6
Source:	N	Exam:	OC03301
Test:	S	Author/Reviewer:	GCW

33. 003 K5.04 001

Unit 2 is implementing OP/2/A/1102/10 (Controlling Procedure for Unit Shutdown). During 2/0 RCP operation, an RCP is stopped and then later restarted. Which one of the following is the reason for this action?

A. To allow a more rapid cooldown to place DHR in service sooner.

B. To allow an electrical train to be taken out of service.

C. To minimize the possibility of inadvertent power increases.

D. To allow the DHR trains to be cross connected.

PIP 0-2-1374

Added procedure title. Changed "returned to service" to "restarted" to clarify stem. Changed RHR to DHR. Made Units designations match in stem.

Tier:	2	Group:	1
Keyword:	RCP	Cog level:	M 3.1/3.5
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

34. 003A3.02 001

Unit 1 plant conditions:

TIME: 1720

- Reactor manually tripped per AP/02, Excessive RCS Leakage
- RCP Amps: 1A1 = 430
  1A2 = 425
  1B1 = 410
  1B2 = 425

TIME: 1721

- Core SCM = 0°F

TIME: 1725

- Reactor Power = 0%
- Core SCM = 0°F
- RCP Amps: 1A1 = 250
  1A2 = 375
  1B1 = 190
  1B2 = 325

Which ONE of the following is correct?

A. Leave all RCPs running.

B. Trip all RCPs immediately.

C. Reduce the number of running RCPs to one RCP/loop operation.

D. Secure all RCPs with the exception of the associated spray pump.

Bank 162

A

A. Correct: RCPs should be left running due to amps not normal.
B. Incorrect: Per Rule 2 - trip all RCPs if reactor power Is < 1% and amps are normal and stable. Amps are not normal
C. Incorrect: Do not trip any RCPs. No guidance on securing selected RCPs
D. Incorrect: Do not trip any RCPs. no guidance on securing selected RCPs

Instrumentation mentioned in question is not monitored by the operator. Replaced with bank 162.

Tier:	2	Group:	I
Keyword:	RCP MOTOR	Cog level:	C/A 2.6/2.5
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

35. 004 GEN 2.4.11 001

You are the Senior Reactor Operator on Unit 1.

Plant conditions:

- SSF activation is required
- You have dispatched an RO, in accordance with AP/25 (SSF EOP), to the SSF to start the D/G and supply Unit 1 RCP seal flow with the RCMU pump.
- The Reactor Coolant Makeup (RCMU) pump OVERRIDE switch has been positioned to OVERRIDE.
- The RCMU pump Suction valve (SF-82) fails closed.

Which one of the following describes the RCMU pump response to an attempted start?

The RCMU Pump:

A. will start and continue to run.

B. will start but will trip on lube oil pressure.

C. will start but will trip on low discharge flowrate.

D. interlock will prevent the pump from starting.

NEED PROCEDURE NUMBER FROM FACILITY

A. Correct The RCMU Pump will start regardless of Suction Valve position.
B. Incorrect. The Low Lube Oil Press trip is bypassed when Override is used.
C. Incorrect. The Low Discharge Flowrate trip is bypassed when Override is used.
D. Incorrect. The RCMU Pump will start regardless of Suction Valve position.

(Ref: NRC #081). The only interlock associated with the Override Switch is HP-398

Reworded stem to improve readability. Added procedure number and title.

Tier:	2	Group:	1
Keyword:	MAKEUP	Cog level:	C/A 2.5/4.0
Source:	M	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

36. 004K2.02 001

Unit 1 plant conditions:

- Unit startup in progress
- Reactor power = 40%

Which one of the following is correct?

1A HPI pump will receive power from:

A. Main Transformer (1T) via switchgear 1TC

B. Startup Transformer (CT-1) via switchgear 1TC

C. Main Transformer (1T) via switchgear 1TD

D. Startup Transformer (CT-1) via switchgear 1TD

A

A. Correct, 1A HPI pump is powered from 1TC and at 40% power unit auxiliaries will be lined up to the Main Transformer (1T).
B. Incorrect, 1A HPI pump is powered from 1TC and at 40% power unit auxiliaries will be lined up to the Main Transformer (1T).
C. Incorrect, 1A HPI pump is powered from 1TC and at 40% power unit auxiliaries will be lined up to the Main Transformer (1T).
D. Incorrect, 1A HPI pump is powered from 1TC and at 40% power unit auxiliaries will be lined up to the Main Transformer (1T).

The question concerned how aux power was supplied to the Keowee units. The KA concerned the power supply to the RCS Makeup pumps. Wrote a new question that matched the KA.

Tier:	2	Group:	1
Keyword:	MUP	Cog level:	M 2.9/3.1
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

37. 005K3.07 001

The following conditions exist on Unit 3:

- The Reactor Vessel Head is removed.
- The Fuel Transfer Canal is flooded.

There is a thunderstorm in the area when you receive the following alarms:

- "LP DECAY HEAT LOOP A FLOW LOW" statalarm (1SA-03/A-8)
- "LP DECAY HEAT LOOP B FLOW LOW" statalarm (1SA-03/A-9)
- "LP INJECTION PUMP A DIFF PRESS LOW" statalarm (1SA-01/C-12)
- "LP INJECTION PUMP B DIFF PRESS LOW" statalarm (1SA-01/D-12)
- "LP INJECTION PUMP C DIFF PRESS LOW" statalarm (1SA-01/E-12)
- "LPSW HEADER A/B PRESS LOW" statalarm (1SA-09/A-9)
- "LPI COOLER 1A LPSW FLOW" LO alarm (O1A2124)
- "LPI COOLER 1B LPSW FLOW" LO alarm (O1A2125).

Which one of the following describes what has happened?

A. Only one LPI pump has tripped.

B. All LPI Pumps have tripped only.

C. All LPSW pumps have tripped only.

D. There are no LPI or LPSW pumps currently running.

solution: C both an LPI and LPSW pump have tripped

1. Purpose
This case provides the necessary actions to mitigate a loss of decay heat removal with the Reactor Vessel Head removed and the Fuel Transfer Canal (FTC) flooded. This case also provides actions to take in the event of loss of water level in the FTC.

2. Symptoms
2.1 LPI pump(s) tripped:

- "LP DECAY HEAT LOOP A FLOW LOW" statalarm (1SA-03/A-8)
- "LP DECAY HEAT LOOP B FLOW LOW" statalarm (1SA-03/A-9)
- "LP INJECTION PUMP A DIFF PRESS LOW" statalarm (1SA-01/C-12)
- "LP INJECTION PUMP B DIFF PRESS LOW" statalarm (1SA-01/D-12)
- "LP INJECTION PUMP C DIFF PRESS LOW" statalarm (1SA-01/E-12)
- "LPI HDR 1A INJECTION FLOW" LO alarm (O1A1310)
- "LPI HDR 1B INJECTION FLOW" LO alarm (O1A1311).

2.2 Loss of LPSW flow to cooler(s):
- "LPSW HEADER A/B PRESS LOW" statalarm (1SA-09/A-9)
- "LPI COOLER 1A LPSW FLOW" LO alarm (O1A2124)
- "LPI COOLER 1B LPSW FLOW" LO alarm (O1A2125).

2.3 LPI temperature increasing:
- "LP INJECTION PUMP SUCTION TEMP HIGH HEADER ÆAÆ" statalarm (1SA-03/B-8)
- "LP INJECTION PUMP SUCTION TEMP HIGH HEADER ÆBÆ" statalarm (1SA-03/B-9)
- "LP DECAY HEAT EXCH TEMP HIGH" statalarm (1SA-03/E-9)
- "LPI COLD SHUTDOWN TEMP HIGH" statalarm (1SA-05/E-10)
- "LPI DHR / RBES A SUCTION HDR TEMP" HI alarm (O1A1322)
- "LPI RBES B SUCTION HDR TEMP" HI alarm (O1A1323).

2.4 Loss of RCS/FTC inventory:
- "RB REACTOR BLDG. NORM SUMP LEVEL HIGH/LOW" statalarm (1SA-09/A-6)
- "SF SFP LEVEL HIGH/LOW" statalarm (1SA-09/A-5)
- "SF POOL LEVEL" LO alarm (O1D1064)
- Decreasing level in the Spent Fuel Pool
- Decreasing Level in the Fuel Transfer Canal
- Decreasing Level in the Pressurizer
- Increasing Level in RBNS
- Water spilling in the Auxiliary Building
- 1RIA-3 (Fuel Transfer Canal Wall) alarm
- 1RIA-6 (Spent Fuel Pool) alarm.

No utility comments.

Validation comment:
Removed the following bullets "LPI HDR 1A INJECTION FLOW" LO alarm (O1A1310) "LPI HDR 1B INJECTION FLOW" LO alarm (O1A1311) from stem. They will not alarm unless ES has actuated.

Tier:	2	Group:	1
Keyword:	DHR	Cog level:	C/A 3.2/3.6
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

38. 006 GEN 2.1.7 001
Unit 1 plant conditions:

- SB LOCA has occurred
- EOP Enclosure 5.12, ECCS Suction Swap to RBES is in progress
- 1LP-19 & 1LP-20 (1A &1B RX BLDG SUCTION) are OPEN
- 1LP-21 & 1LP-22 (1A & 1B LPI BWST SUCTION) are OPEN
- BWST level has STOPPED decreasing (stable) with continued HPI injection flow

Which one of the following is correct concerning the current BWST level trend?

A stable BWST level:

A. is not expected and LPI pump(s)must be secured to prevent overheating.

B. is not expected and LPI pump(s)must be secured to prevent hydrogen gas binding.

C. is expected and LPI pump(s) suction flow is currently from RBES only.

D. is expected and LPI pump(s) suction flow is still from the BWST but is below the flow instrument tap.

A. Incorrect: suction is from the RBES, LPI pump operation may continue.
B. Incorrect: 30 minutes is allowed while pumping against a shutoff head. This is not the case (LPI/HPI piggyback is aligned). Suction is the concern and RBES is providing suction at this time.
C. Correct: with both RBES and BWST suction valves open and BWST level not decreasing, then suction is from the RBES only. RB(P) could also be high causing flow to be from the RBES
D. Incorrect: With BWST level not decreasing ,this indicates no inventory being used from BWST.

Question 167 EAP062301 EAP062301

Reworded stem and answers to improve readability.

Tier:	2	Group:	1
Keyword:	ECCS	Cog level:	C/A 3.7/4.4
Source:	M	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

39. 006A4.05 001

You are performing EOP Enclosure 5.1. At step 13 you find that both BWST suction valves (1HP-24 and 1HP-25) are closed.

You then perform the following step:

IF both BWST suction valves (1HP-24 and 1HP-25) are closed,
THEN perform the following:

A. Ensure the following are open:
   - 1LP-6
   - 1LP-7
   - 1LP-9
   - 1LP-10
   - 1LP-15
   - 1LP-16

B. Start 1A or 1B LPI Pump.

C. Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (Unit 1 LPI Hatch area).

Which one of the following describes what these steps have accomplished?

A. Cross tied the HPI and LPI pump suction.

B. Cross tied the HPI and LPI pump discharge.

C. aligned HPI system discharge to the LPI pump suction.

D. aligned LPI system discharge to the HPI pump suction.

GO TO Step 13.
A. If RCS is saturated, Rule #2 will be performed as a higher priority. Rule #2 will perform the same actions as steps 10 through 13 below for HPI flow verification. Therefore the RNO skips HPI verification.
B. If RCS is subcooled, HPI verification will be performed here.
1.2 Ensure the following are open:
· 1HP-24
· 1HP-25
RNO:
(OBJ R10) IF both BWST suction valves
(1HP-24 and 1HP-25) are closed,
THEN perform the following:
A. Ensure the following are open:
· 1LP-6
· 1LP-7
· 1LP-9
· 1LP-10
· 1LP-15
· 1LP-16
B. Start 1A or 1B LPI Pump.
C. Dispatch an operator to open 1HP?363 (Letdown Line To LPI Pump Suction Block) (Unit 1 LPI Hatch area).
The steps above will align LPI system discharge to the HPI pump suction.
Suction can be supplied to the HPI Pumps through 1LP-15 and 1LP-16 after passing through the LPI Coolers. This flowpath would involve the LPI Pumps taking suction from the BWST..

No utility comments.

Tier:	2	Group:	1
Keyword:	ECCS	Cog level:	C/A 3.9/3.8
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

40. 007K1.03 001

The level of the Reactor Coolant Quench Tank is slowly rising. Which one of the following could have caused this to occur?

A. Core flood tank relief valves.

B. LPI suction relief valves.

C. Reactor high point vents.

D. RCP seal leakage.

A, b, and c not connected to quench tank

OP-OC-PNS-CPS

No utility comments.

Tier:	2	Group:	1
Keyword:	QUENCH TANK	Cog level:	M 3.0/3.2
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

41. 008A2.01 001

You are the OATC for unit 1. Unit 1 is at 73% power.

- CC flow is 500 gpm and decreasing.
- 1-HP-5 remains open.
- RCP seal return valves remain open.

Which one of the following are the correct action(s) to respond to this event?

Enter AP/1/A/1700/020 and:

A. Trip the reactor and stop the affected RCPs.

B. Trip the reactor and go to 2/0 RCP operation.

C. Reduce power to < 70% and stop all RCPs.

D. Start the standby CC pump.

AP/1/A/1700/020 pages 1 and 2

Corrected question by rewording stem, "C" and "D" choice. ONS does not have auto isolation of CC to individual RCPs. In "D" with CC-7/8 closed there would be no CC flow.

Tier:	2	Group:	1
Keyword:	CCS	Cog level:	C/A 3.3/3.6
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

42. 008A4.01 001

I&E is performing testing during a refueling outage. The I&E technician inadvertently presses the green "CC Interlock button" located in System Logic Cabinet No. 3 in the cable room.

Which one of the following is the consequence of pressing this button?

A. CC-7 and 8 will no longer close on actuation of ES Channels 5 and 6 respectively.

B. Letdown cooler CC inlet valve CC-1 (CC-2) may now be opened after the letdown cooler inlet valve HP-1 (HP-2) is opened.

C. A reactor coolant pump can now be started if CC flow is less than 575 GPM.

D. CRDs can now be energized without component cooling water.

1.1 (OBJ R15) Interlocks Associated With the CC System
A. If in AUTO, the standby CC Pump starts at 575 GPM flow.
B. If de-energized, the CRDs cannot be energized if CC flow is less than 138 GPM to the CRDs.
C. A reactor coolant pump cannot be started if CC flow is less than 575 GPM. Low CC flow will not affect a running RCP.
D. Letdown cooler CC inlet valve CC-1 (CC-2) must be open before letdown cooler inlet valve HP-1 (HP-2) will open.
E. CC-7 and 8 close on actuation of ES Channels 5 and 6 (respectively)
If CC-7 or CC-8 goes closed, the CC pumps will trip and automatically restart when CC-7 and CC-8 are reopened.

A. (OBJ R16) The component cooling system must be in operation for any of the following conditions:
1. Control rod drives energized. There is an interlock to prevent the CRDs from being energized without component cooling water, but will not de-energize the drive upon loss of cooling water.
· Prevents thermal damage to the CRD stators
Instructor note:
This interlock can be overridden by pressing green "CC Interlock button" located in System Logic Cabinet No. 3 in the cable room to allow I&E testing of CRDs during unit outage.

No utility comments.

Tier:	2	Group:	1
Keyword:	CCW	Cog level:	C/A 3.3/3.1
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

43. 008K3.02 001

Unit 3 is operating at 100% rated power when the Component Cooling Water Containment Return valve (CC-8) fails closed.

Which one of the following is the correct IMMEDIATE operator action and WHEN the operator should perform the action?

A. Trip the reactor when the pressurizer low level alarm is received.

B. Trip individual RCPs when motor stator temperature exceeds 185 deg F.

C. Trip the reactor when two CRD stator temperatures exceed 180 deg F.

D. Trip the individual RCPs when their respective thermal barrier temperature exceeds 225 deg F.

Original KA not applicable. Changed to KA 008K3.02.

Tier:	2	Group:	1
Keyword:	CCS	Cog level:	M 2.9/3.1
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

44. 010K2.01 001

Which one of the following describes how the pressurizer heaters (excluding those powered from the SSF) for each unit are normally supplied?

They are supplied from:

A. safety related motor control centers. The pressurizer heaters are divided among three 4160 volt ES buses.

B. non-safety related motor control centers. The pressurizer heaters are divided among two 4160 volt ES buses such that the loss of one entire 4160 volt bus will not result in a loss of function.

C. non-safety related motor control centers. The pressurizer heaters are divided among three 4160 volt ES buses.

D. Safety related motor control centers. The pressurizer heaters are divided among two 4160 volt ES buses such that the loss of one entire 4160 volt bus will not result in a loss of function.

Solution - C

The pressurizer heaters for each unit are normally supplied from non-safety related motor control centers (MCCs) XH, XI, XJ, and XK. The pressurizer heaters are divided among the three 4160 volt ES buses such that the loss of one entire 4160 volt bus will not preclude the capability to supply sufficient pressurizer heaters to maintain natural circulation in MODE 3.
Added "will not result in a loss of function" to "B" and "D" to complete the sentence.

Validation comment:
Added "(excluding those powered from the SSF)" to stem because the SSF supplied heaters are powered from a safety related power source.

Tier:	2	Group:	1
Keyword:	PZR PRESSURE	Cog level:	M 3.0/3.4
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

45. 011K3.02 001

Which one of the following statements describes the plant response to a pressurizer level channel (controlling channel) failing LOW with SASS in manual? (ASSUME no operator action taken and the reactor is at 100% power).

HP-120:

A. OPENS, actual Pzr level increases and RCS pressure increases.

B. CLOSES, actual Pzr level decreases and RCS pressure decreases.

C. CLOSES, actual Pzr level decreases and pressurizer heaters turn off.

D. OPENS, actual Pzr level decreases and RCS pressure decreases.

OP-OC-PNS-PZR,

The status of SASS is required to answer this question. Added "with SASS in manual" to stem.

Tier:	2	Group:	2
Keyword:	PZR LEVEL	Cog level:	C/A 3.5/3.7
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

46. 012K5.01 001
Unit 1 plant conditions:

- Group 6/Rod 4 dropped into the core.
- An ICS runback was completed.
- Reactor power imbalance has become excessive.
- I&E has lowered the RPS setpoints for the Flux/Flow/Imbalance trip.

Which one of the following describes core limit(s) that will be protected by reducing the RPS setpoint?

A. Fuel Centerline Temperature only.

B. Fuel Centerline Temperature and DNBR.

C. Excessive core operating pressures and DNBR.

D. Excessive core operating temperatures and pressures.

Bank Question 427

A. Incorrect - Fuel Centerline temperature alone is not the only restrictive core operating limit
B. Correct - Fuel Centerline temperature and DNBR are concerns when the flux/flow/imbalance trip is reduced. And is the basis for the trip setpoint
C. Incorrect- pressure is not contained in the basis for the resetting of the trip setpoint.
D. Incorrect- the basis for the trip is temperature however it is fuel centerline temperature. Pressure is not part of the basis.

No utility comments.

Tier:	2	Group:	1
Keyword:	RPS	Cog level:	M 3.3/3.8
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

47. 012K6.04 001

Unit 1 is operating at 91% power when the OATC inadvertently places the "B" RPS Channel S/D Bypass Key switch to "Bypass"? Which one of the following will occur?

A. All RPS trips are bypassed on "B" RPS Channel.

B. All RPS trips are bypassed on ALL RPS Channels.

C. A high RCS pressure trip set point of 1720 psig is inserted and ALL RPS Channels will trip.

D. A high RCS pressure trip set point of 1720 psig is inserted and "B" RPS Channel will trip.

D

A. Incorrect, would be true for "manual bypass" key switch.
B. Incorrect, would be true for "manual bypass" key switch if all channels were placed in maual bypass.
C. Incorrect, will only trip affected channel.
D. Correct, a high RCS pressure trip set point of 1720 psig is inserted and "B" RPS Channel will trip.

In addition to bypassing the four trip parameters above, the "Bypass" position automatically inserts a high RCS pressure trip set point of 1720 psig, so that the plant cannot be operated normally with portions of the RPS in S/D Bypass.

a) Positioning S/D Bypass Key switch to "Bypass" bypasses the Low Pressure Trip, the variable low pressure trip, the flux/flow - imbalance trip, and the power/RCPs trip normally associated with the RPS.
b) In addition to bypassing the four trip parameters above, the "Bypass" position automatically inserts a high RCS pressure trip set point of £1720 psig, so that the plant cannot be operated normally with portions of the RPS in S/D Bypass.
1) While the normal high pressure trip of £2355 psig is not electrically bypassed it is basically nonfunctional because RPS will trip before the setpoint can be reached.
The setpoint of £1720 psig is selected for the new high pressure trip so that the plant must first be shutdown, using normal procedures, before S/D Bypass can be initiated; 1720 psig is below the normal low pressure trip of 1800 psig, so that the plant must first be maneuvered past the normal low pressure trip point before going to S/D bypass. 1710 psig is the actual setpoint used for conservatism.

Question assumes only one S/D Bypass Key Switch. Each RPS Channel (4) has a S/D Bypass Key Switch. Question reworded, modified stem and rewrote all distractors.

Tier:	2	Group:	1
Keyword:	RPS	Cog level:	C/A 3.3/3.6
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

48. 013A1.06 001

Unit 1 plant conditions:

- All SCMs = 0°F
- RCS Temperature = 456°F and stable
- BWST level = 11.5' and is slowly decreasing
- ES 1-8 actuated
- OTSG levels are being maintained at LOSCM Setpoint
- Turbine Bypass Valves are in AUTOMATIC

Which one of the following describes the current plant condition?

The OSTGs _____. The _____ is the water source to the RCS.

A. can not remove heat / BWST

B. can not remove heat / RBES

C. are removing heat / BWST

D. are removing heat / RBES

Solution : A. Based on Bank 2003 question 202

A) Correct . SGs can not be removing heat with the TBV's in auto, SG pressure would be greater than or equal to RCS pressure since TBV's are controlling at setpoint +125 and minimum setpoint is 600 psig. BWST suction swap to RBES is in progress, but RBES valves are not opened until 9' therefore even if LP-15 and 16 have been opened, suction source remains the BWST.

B) wrong water source

C. SGs can not be removing heat with the TBV's in auto,

D) SGs can not be removing heat with the TBV's in auto, wrong water source

No utility comments.

Tier:	2	Group:	1
Keyword:	BWST/ESFAS	Cog level:	C/A 3.6/3.9
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

49. 013K3.03 001
Unit 2 plant conditions:

A LOCA has occurred
RCS pressure = 85 psig
Reactor building pressure = 6 psig
RB spray has not actuated.

Which one of the following statements is correct and why?

A. No action should be taken, this is below the ES setpoint for RBS.

B. RBS should be actuated because this is below the actuation pressure assumed in the UFSAR.

C. RBS should be actuated because this is above the actuation pressure assumed in the UFSAR.

D. This is above the actuation pressure assumed in the UFSAR. Containment should be vented, then the RBS should be initiated.

The UFSAR assumes that RBS is actuated at 30 psig. The actual ES setpoint is 10 psig. The 20-psi difference between the safety analysis assumption and the plant setpoint is ample to account for instrument uncertainty.

The purpose of the Reactor Building Spray initiation is to protect the Reactor Building by removing heat from the RB via the LPI system decay heat coolers.
In addition, the RBS system can help provide protection while not actually removing heat from the RB.
The RBS system can be configured in many different ways while being used. The RBS can be aligned to spray cool water from the BWST into the RB atmosphere. As the spray condenses steam in the RB, the energy formerly in the steam is transferred to the liquid entering the RB sump. The water in the sump is not cooled until the LPI system is realigned to pass water through the LPI decay heat coolers. Current station procedures allow the water from the sump to be sprayed back into the RB without being cooled. As with the injection mode of operation, this mode will condense steam but will not remove heat from the RB. However, the condensation of steam by the spray will work to decrease the internal pressure of the RB by reducing the partial pressure of the steam. In this manner, the RB spray will help protect the RB integrity without actually providing RB cooling.

The UFSAR assumes that RBS is actuated at 30 psig. The actual ES setpoint is 10 psig. The 20-psi difference between the safety analysis assumption and the plant setpoint is ample to account for instrument uncertainty.

The UFSAR states that a 2.4-second ESFAS delay is assumed for Reactor Building Spray actuation.

T. S. basis for the 4 psi and 15 psi setpoints is to establish a setting which would be reached immediately in the event of a DBA, cover the entire spectrum of break sizes, and yet be far enough above normal operation pressures to prevent spurious initiation.

Reworded stem for clarification.

Tier:	2	Group:	1
Keyword:	ESF	Cog level:	C/A 4.3/4.7
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

50. 014A1.02 001

Which ONE of the following is correct?

The Sequence Monitoring logic utilizes rod position data from the control rod _____ system and the Diamond SEQUENCE INHIBIT lamp _____.

A. Relative Position / will be ON until all safety groups are withdrawn to the out limit.

B. Relative Position / must be OFF to commence withdrawing the safety rods.

C. Absolute Position / will be ON until all safety groups are withdrawn to the out limit.

D. Absolute Position / must be OFF to commence withdrawing the safety rods.

A

A. CORRECT, RPI inputs to Sequence Monitor
B. INCORRECT, Relative is correct / sequence inhibit will be ON until ALL safety rods are out.
C. INCORRECT, NOT Absolute / second section of answer is correct.
D. INCORRECT, NOT Absolute / sequence inhibit will be ON.

At ONS IA does not backup SA. Original KA is not applicable. Changed KA to 014A1.02. Replaced with bank question 367.

Tier:	2	Group:	2
Keyword:	RPI	Cog level:	C/A 3.2/3.6
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

51. *015 GEN 2.1.32 001*
Unit 2 plant conditions:

- Unit power escalation is in progress.
- Reactor power = 15% and is increasing.
- OP/1102/01, Controlling Procedure for Unit Startup is in progress.

Which one of the following describes the MAXIMUM NI calibration error allowed per Limits and Precautions of the controlling procedure?

NIs SHALL be maintained within the range of __% conservative to __% non-conservative.

A. 10, 4

B. 4, 10

C. 2, 2

D. 2, 1

Bank question 95 CP010302 (SRO ONLY)

A. Correct - L/P #17 describes MAX NI error during power maneuvering 10/4
B. Incorrect - correct numbers swapped
C. Incorrect - Steady state power operation limits
D. Incorrect - Steady state calibration limits

No utility comments.

Tier:	2	Group:	2
Keyword:	NI	Cog level:	M 3.4/3.8
Source:	M	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

52. 016A2.01 001
Unit 3 Conditions:

INITIAL CONDITIONS:

- Reactor power = 100%
- Pressurizer (PZR) Level Instrument 3 selected for control
- 3HP-120 (RC Volume Control) in AUTOMATIC
- SASS in MANUAL

CURRENT CONDITIONS:

- Pressurizer temperature "B" RTD fails LOW

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

A. PZR level 3 indicates lower, 3HP-120 fully opens and the operator should select PZR Level instrument 1 or 2.

B. PZR level 3 indicates higher, 3HP-120 closes and the operator should select PZR Level instrument 1 or 2.

C. PZR level indication swaps to Instrument 1, 3HP-120 controls level at setpoint and no operator actions are required.

D. PZR level indication swaps to Instrument 2, 3HP-120 controls level at setpoint and no operator actions are required.

A

A. Correct,"B" RTD failing low will cause PZR level 3 indication to be lower than actual. Since SASS is in manual it will not swap to channel 1. 3HP-120 will open. Per PT/600/01 the operator should select a good instrument.
B. Incorrect, "B" RTD failing low will cause PZR level 3 indication to be lower than actual.
C. Incorrect, would be correct if SASS in AUTO.
D. Incorrect, could be true in SASS in AUTO but it swaps to channel 1 instead of channel 2.
Question concerned SASS operation with a failure of Thot. SASS no longer swaps Thot. Thot is now median selected. Wrote new question on failure of PZR temperature and SASS.

Tier:	2	Group:	2
Keyword:	NNIS	Cog level:	C/A 3.0/3.1
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

53. 026 GEN 2.1.27 001
Which one of the following describes the purpose of the Reactor Building Spray System?

A. Removes sensible AND latent heat from the containment atmosphere, entrains fission product iodine and decreases radiation levels in containment.

B. Removes ONLY latent heat from the containment atmosphere, entrains fission product iodine, and decreases radiation levels in containment.

C. Removes sensible AND latent heat from the containment atmosphere and entrains fission product iodine.

D. Removes ONLY sensible heat from the containment atmosphere and entrains fission product iodine.

(decrease radiation levels in containment) is wrong. It may pull contaminants that give off radiation out of the atmosphere, but it redeposits it in the sump.

(Obj R1)Purposes of the Reactor Building Spray (RBS) System
The Reactor Bldg. Spray system has no function during normal plant operation.
When actuated by high Reactor Building (RB) pressure, the system provides two major functions:
Removes sensible and latent heat from the containment atmosphere.
Operation of the RBS System also serves to entrain fission product iodine (released into the RB during a LOCA) into the spray water, thereby reducing possible iodine leakage to the environment (to meet 10CFR100 criteria concerning offsite dose limits).

No utility comments.

Tier:	2	Group:	1
Keyword:	CCS	Cog level:	M 2.8/2.9
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

54. 026K3.01 001

Unit 2 is operating at 100 % power when an ES RB pressure analog channel fails upscale. An instrument technician is dispatched to investigate. The technician goes to the wrong cabinet and causes an additional ES RB pressure analog channel to fail upscale.

Assume no operator action, which one of the following will occur?

Both RBS pumps start and:

A. BS-1 remains closed and BS-2 opens.
LP-21 supplies RBS pumps from BWST, LP-22 remains closed.

B. BS-1 and BS-2 open.
LP-21 and LP-22 supply RBS pumps from BWST.

C. BS-1 opens and BS-2 remains closed.
LP-21 supplies RBS pumps from BWST, LP-22 remains closed.

D. BS-1 and BS-2 remain closed.
LP-21 and LP-22 do NOT supply RBS pumps from BWST.

(Obj R6) ES Mode (Channels 7 and 8)
Setpoint
The RBS System automatically actuates if two of the three ESG RB pressure analog channels reach 10 psig.
The TS required setpoint is < 15 psig RB pressure.
The following actions occur if the RBS System actuates:
Both RBS pumps start.
BS-1 and BS-2 open.
LP-21 and LP-22 supply RBS pumps from BWST.

No utility comments.

Tier:	2	Group:	1
Keyword:	CCS	Cog level:	C/A 3.9/4.1
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

55. 029K1.04 001

Following a LOCA, potential leakage past the purge system reactor building isolation valves is prevented from being released directly to the environment by which one of the following?

A. Inlet and outlet bleed lines open-ended into containment.

B. Outlet bleed lines open-ended into the Penetration Rooms and inlet bleed lines open ended into containment.

C. Inlet bleed lines open-ended into the Penetration Rooms and outlet bleed lines open ended into containment.

D. Inlet and outlet bleed lines open-ended into the Penetration Rooms.

Modified bank 2003 question 549
A, B, and C - new distractors
D) Correct- bleed lines are located between the outer most isolation valves on both the inlet and outlet purge duct work. These bleed lines vent any leakage from the RB through the purge isolation vales into the Penetration Rooms. The PRV system will then process the leakage and the leakage will not be released to the environment.

No utility comments.

Tier:	2	Group:	2
Keyword:	PURGE	Cog level:	M 3.0/3.1
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

56. 034 GEN 2.2.27 001

Plant conditions:

- Fuel reload in progress

Which ONE of the following is correct concerning the Refueling SRO Assistant per OMP 2-1 (Duties and Responsibilities of On-Shift Operations Personal)? (.25)

The Refueling SRO Assistant...

A. maintains the Refueling Log and may leave the Refueling Booth for short periods of time.

B. verifies reactivity changes are made with approved procedures and may leave the Refueling Booth for short periods of time.

C. maintains the Refueling Log and must remain in the Refueling Booth until relieved by another SRO Assistant.

D. verifies reactivity changes are made with approved procedures and must remain in the Refueling Booth until relieved by another SRO Assistant.

D

A. Incorrect, the Refueling and RB SRO maintains the Refueling Log.
B. Incorrect, first part is correct. Second part is incorrect.
C. Incorrect, the Refueling and RB SRO maintains the Refueling Log.
D. Correct, The Refueling SRO Assistant verifies reactivity changes are made with approved procedures and must remain in the Refueling Booth until relieved by another SRO Assistant.

RO duties during refueling no longer include activities in the RB or SFP. Therefore the KA was changed to 034GEN2.2.27. Replaced with modified bank question 359.

Tier:	2	Group:	2
Keyword:	FUEL HANDLING	Cog level:	M 2.6/3.5
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

57. 035A4.05 001

Which one of the following describes the **KEY** parameters monitored to prevent overcooling as the OTSGs fill to the OTSG natural circulation level setpoint with a subcooled RCS?

A. Pressurizer level and CETC temperatures.

B. Pressurizer pressure and hot leg temperatures.

C. OTSG levels and CETC temperatures.

D. OTSG pressures and cold leg temperatures.

Oconee: OP-OC-TA-AM1
Caps and bolded KEY. Added "with a subcooled RCS" to stem to clarify plant conditions.

Validation comment:
Added "to prevent overcooling" to stem to clarify question. This question is written based on an ONS plant event. This event concerned overcooling during a low decay heat natural circulation. During normal approach to natural circulation, "C" would be correct.

Tier:	2	Group:	2
Keyword:	SG SYSTEM	Cog level:	C/A 3.8/4.0
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

58. 039K1.02 001

Just inside the 5th floor of the turbine building, a 12" line on each main steam line taps off and runs back outside the turbine building. Which one of the following is the purpose of the valves on these lines?

These valves are designed to be used for a controlled plant cooldown in the event that the:

A. Atmospheric Dump Valves (ADVs) become inoperable. These valves are manually operated.

B. Turbine Bypass Valves (TBVs) become inoperable. These valves are manually operated.

C. Atmospheric Dump Valves (ADVs) become inoperable. These valves are two chain operated "drag" valves designed to allow maintenance on MS-153 & MS-155.

D. Turbine Bypass Valves (TBVs) become inoperable. These valves are two chain operated "drag" valves designed to allow maintenance on MS-153 & MS-155.

A. Atmospheric Dump Valves (ADVs) / Main Steam Vents

1. Just inside the 5th floor of the turb. bldg., a 12" line on each main steam line taps off and runs back outside the turb. bldg.

2. (OBJ R11) There are manually operated valves on these lines designed to be used for a controlled plant cooldown in the event that the Turbine Bypass Valves (TBVs) become inoperative.
a) ADVs are credited for reducing SG pressure and cooling the RCS when condenser vacuum is lost during SGTR and SBLOCA event analysis
3. Originally two manual gate isolation valves were installed on each atmospheric vent line (MS-153 & 154 "A" line and MS-155 & 156 on "B" line). Due to the difficulty in operating these valves (caused by the large DP), additional piping and valves were added on each unit.

A 1" bypass line now exists around MS-153 & MS-155. A 1" gate valve installed in each bypass line allows for reducing the DP across these 12" gate valves which allows for ease of operation.
Another line which bypasses MS-154 and MS-156 has a chain operated "drag" valve installed. These drag valves are much easier to operate and are suited better for throttling. Many turns of the handwheel are required for stroking these valves which will provide for a more controlled cooldown in the event they are needed.
No utility comments.

Changed the word "inoperative" to "inoperable" in the stem to match ONS terminology.

Tier:	2	Group:	1
Keyword:	ADV	Cog level:	M 3.3/3.3
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

59. 039K5.01 001

Which one of the following describe the system that Oconee uses to prevent water hammers from occurring in an "idle" steam line.

Many steam lines in the plant have steam traps that _____ side of the isolation valve.

A. automatically open on the downstream

B. automatically open on the upstream

C. are operated manually on the downstream

D. are operated manually on the upstream

A. *Steam Traps* (OBJ R14, 15)
1. An "idle" steam line (one in which there is no flow due to a closed isolation valve) tends to collect condensation in the line where the steam is bottled up.
2. All steam lines in the plant have small drain lines on the upstream side of the isolation valve in the line, to keep the condensation from building up.
3. These small drain lines automatically drain condensate to the condenser to prevent the steam line from filling with water and/or to prevent water hammers from occurring. This is accomplished by the use of a steam trap.
Thermostatic steam traps at Oconee are basically a valve with an expandable bellows acting as a valve disk.

Modified stem to improve readability.

Tier:	2	Group:	1
Keyword:	MAIN STEAM	Cog level:	M 2.9/3.1
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

60. 055A3.03 001

Valve 1V-196 (CSAE Exhaust to Stack Drain) must be locked closed at all times if activity above background exists on the OTSG secondary side.

Which one of the following is the reason for this action?

A. This prevents the release of radioactive liquid to the trench.

B. This prevents the CSAE relief valve from cycling.

C. This prevents the release of activity thru the vent stack.

D. This maintains high backpressure on CSAE.

A. (OBJ.R6)Valve (1)(2)(3) V-196 (CSAE Exhaust to Stack Drain) must be locked closed at all times if activity above background exists on the OTSG secondary side. (This prevents the release of radioactive liquid to the trench.)

In May of 1999, Unit 3 3C CSAE relief valve began lifting and closing several times. The steam supply was isolated hoping the relief valve would reseat. As a result, air entered through the relief valve and entered the condenser causing U3 to begin losing vacuum. Power was reduced per the AP to 73%, 3C CSAE was fully isolated and the Main Vacuum Pumps were placed in service

. Faulty Air Removal

a) High condensate temperature to the CSAE will cause a reduction in air ejector efficiency.

b) Low steam pressure or clogged steam strainers will reduce the velocity of steam and thus reduce the volume of air the CSAE will handle.

c) High backpressure on CSAE will affect air removal.

d)

Loss of loop seal would "short cycle" the air back into the system.

Reworded "C" to improve plausibility.

Tier:	2	Group:	2
Keyword:	CARS	Cog level:	M 2.5/2.7
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

61. 056A2.04 001
Unit 1 conditions:

INITIAL CONDITIONS:
- Unit startup in progress
- Reactor power = 30% and increasing
- "1A" Main Feedwater Pump operating
- "1C" and "1B" HWPs are operating
- "1A" HWP in AUTO
- "1C" CBP is operating
- "1A" CBP in AUTO

CURRENT CONDITIONS:
- "1C" CBP trips due to a breaker electrical fault

Which one of the following automatic actions has occurred?

The operator will refer to the Annunciator Response Procedure and verify that the:

A. reactor tripped on low MFDWP suction pressure.

B. operating MFDWP tripped on low MFDWP suction pressure after 30 seconds.

C. standby CBP auto started on low MFDWP suction pressure.

D. standby HWP auto started on low CBP suction pressure.

2003 bank question # 37

A. incorrect, there is not a reactor trip on low main feedwater pump suction pressure. It would take the loss of both main feedpumps to cause the trip.

B. incorrect, the standby booster pump will start at 360 psig on the feedwater pump suction pressure and the running feedwater pump should not trip. Does not trip until ≤ 235 psig on the feedwater pump suction.

C. correct, the standby condensate booster will start when feedwater pump suction pressure decreases to 360 psig.

D. incorrect, condensate booster suction pressure will not decrease because the Hotwell pump is still running.

No utility comments.

Tier:	2	Group:	1
Keyword:	CONDENSATE	Cog level:	C/A 2.6/2.8
Source:	M	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

62. 059A1.03 001
The Main FDW Block Valves are placed in OPEN when the Startup Control Valves reach 90%.

Which one of the following describes the basis for this step?

A. To prevent feedwater flow swings.

B. To prevent feedwater pump cavitation.

C. To allow complete closure of the minimum flow valves before reaching 100% power.

D. To bypass the Main FDW Block Valve auto open at a composite demand of 9.0%.

CF-FDWr11a

Automatic ICS demand signals to the Main and Startup Control Valves are developed from a common signal source called the Valve Composite Demand

1) Power increase: At a composite demand of 9.0% (equivalent to 90% open on the SU Control Valve), a bistable will automatically open the Main FDW Block Valve (if in AUTO).

1. Main Blocks (FDW-31 and FDW-40)
a) Motor operated from control room (UB1).
b) OPEN, AUTO, CLOSE.
c) ICS sends a signal to close the Main FDW Blocks on a Rx trip.
d) Automatic ICS demand signals to the Main and Startup Control Valves are developed from a common signal source called the Valve Composite Demand
1) Power increase: At a composite demand of 9.0% (equivalent to 90% open on the SU Control Valve), a bistable will automatically open the Main FDW Block Valve (if in AUTO).
2) Power decrease: At a composite demand of 5.0%, the Main FDW Block Valve will close (if in AUTO)
e) During some unit startups, when the Main Blocks were opened, leakage past the seat of the closed Main Control Valves would cause SG levels to increase. This would result in the SU Control Valves, which are controlling SG levels to start close and return SG levels to setpoint (25 inches SUR).
1) With the Main Blocks in AUTO, as the SU Control Valves reached 50%, the Main Blocks would close. After they closed, leakage past the seat of the Main Control Valves would stop, and SG levels would decrease, causing the SU Control Valves to re-open.
2) As the SU Control Valve reaches 90%, the Main Block would once again open, setting up a Feedwater cycle that could quickly become divergent. Once divergent cycle starts, a FDWP trip could occur due to Overspeed or High Discharge Pressure if not properly mitigated. This would lead to a Unit/Reactor Trip.

3) To prevent the Feedwater swing described above, the Main Block Valves were placed in OPEN when the Startup Control Valves reached 90%, and were left in OPEN until Feedwater demand was high enough to ensure that the SU Control Valves would not close. Current procedures require that the Main Blocks (and SU Blocks) be in AUTO prior to exceeding 700 psig MS pressure (to satisfy MSLB/AFIS circuit operability requirements).
Procedures do allow FDW-31 and 40 to be placed in OPEN if FDW control problems occur as a result of the valves opening in AUTO. The blocks will then be placed in AUTO when the Main Control Valve has reached 10% OPEN, since at that point, the SU Control Valve demand is at 100%, and is not likely to decrease until power level decreases for unit shutdown.
2) Power decrease: At a composite demand of 5.0%, the Main FDW Block Valve will close (if in AUTO)

d) Automatic ICS demand signals to the Main and Startup Control Valves are developed from a common signal source called the Valve Composite Demand
1) Power increase: At a composite demand of 9.0% (equivalent to 90% open on the SU Control Valve), a bistable will automatically open the Main FDW Block Valve (if in AUTO).
2) Power decrease: At a composite demand of 5.0%, the Main FDW Block Valve will close (if in AUTO)

No utility comments.

QUESTIONS REPORT
for Oconee 2003-301 fnl

Tier:	2	Group:	1
Keyword:	MFW	Cog level:	M 2.7/2.9
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

63. 061A3.01 001

Which one of the following conditions will initiate an automatic start of the MDEFDWPs if the control switch is in the AUTO 1 position?

A. BOTH channels of AMSAC actuate

B. BOTH "B" SG XSUR levels = 20" for 40 seconds

C. Hydraulic oil pressure = 0 psig on the operating MFDWP

D. Low MFDWP discharge pressure on the operating MFDWP

B

A. INCORRECT - AUTO 2 function
B. CORRECT - Dry-Out protection is signaled from the AUTO 1 position. BOTH XSUR level indications < 21" for > 30 seconds starts both MDEFWPs.
C. INCORRECT - AUTO 2 function, both Main FDW Pumps would not be operating at this temperature.
D. INCORRECT - AUTO 2 function, both Main FDW Pumps would not be operating at this temperature.

Question no longer correct due to plant mods. KA does not match. Replaced with bank question 43 to match KA. Requires memorization of procedure.

Tier:	2	Group:	1
Keyword:	AFW	Cog level:	C/A 4.2/4.2
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

64. 061K6.01 001
Unit 1 plant conditions:

- A and B SG pressure = 1000 psig
- TDEFWP is operating
- 1FDW-315 & 316 are full open
- "A" EFDW Header Flow = 802 gpm
- "B" EFDW Header Flow = 798 gpm
- "A" MDEFDWP Flow = 502 gpm
- "B" MDEFDWP Flow = 216 gpm

Which one of the following would cause these indications?

_____ MDEFDWP ARC (Automatic Recirculation Control) valve has failed _____.

A. "A" / OPEN

B. "B" / OPEN

C. "A" / CLOSED

D. "B" / CLOSED

B

A. Incorrect, "B" MDEFDWP flow is lower than "A" indicating the "B" ARC valve is failed open.
B. Correct, if the TDEFDWP is running, the operator would NOT see a flow mismatch on Total EFDW Flow indications but would see it on the MDEFDWP Discharge Flow gages. "B" MDEFDWP flow is lower than "A" indicating the "B" ARC valve is failed open.
C. Incorrect, if the discharge pressure is 1420 psig and flow is < 110 gpm the ARC valve is failed closed.
D. Incorrect, if the discharge pressure is 1420 psig and flow is < 110 gpm the ARC valve is failed closed.

EFW lesson plan

1. The MDEFDWPs have approximately 300 gpm (per pump) recirculation flow to the UST for pump and discharge piping protection. When a MDEFDWP is started, the ARC (Automatic Recirculation Control) valve automatically provides recirculation flow.
NOTE: An event has occurred at another plant concerning these same type ARC valves. The valves failed open due to internal valve failure. One of the problems that came from this failure was the operators were not able to determine from their flow indications that these valves had failed. Some examples of what the Oconee operator might see if these MDEFDWP recirculation valves failed open follows:
- The initial assumption is that the TDEFDWP is not running.
- If SG pressures were at about 1000 psig and the A MDEFDWP recirculation valve failed open, there would be a mismatch between the indicated flows to each SG. This indicated flow mismatch could be as much as 300 gpm if FDW-315 & 316 were full open. The operator would see the flow mismatch and depending on decay heat could see a lower SG level on the side with the failed valve. There would not be a pump runout concern unless SG pressures were 800 psig or less and FDW-315 & 316 were full open.
- If the TDEFDWP were running, the operator would NOT see a flow mismatch on Total EFDW Flow indications but would see it on the MDEFDWP Discharge Flow gages.

If the operator sees a flow mismatch or low SG level and the TDEFDWP is available, he should start the TDEFDWP. Starting the TDEFDWP will assure adequate flow to the SGs

AP change: To stop the MDEFDW Pumps if the discharge pressure is 1420 psig and flow is < 110 gpm.

Original question had FDW-315/316 failing open. Question explanation discussed ARC valve failure. No correct answer. Wrote new question to address ARC valve failure with a correct answer.

Tier:	2	Group:	1
Keyword:	EFW	Cog level:	C/A 2.5/2.8
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

65. 062A2.10 001

Upon a loss of 1KI (Auto) **AND** 1KU (Hand) power **ONLY**, which one of the following indicates where steam generator levels will be maintained ten (10) minutes after the loss of power?

A. 25 inches Startup Range

B. 30 inches Extended Startup Range

C. 50 percent Operating Range

D. 240 inches Extended Startup Range

B.

A. Incorrect: both MFDW pumps trip on high SG level contact de-energizing. Two sets fed by KI and KU power.
B. Correct: Both MFDW pumps trip due to de-energizing of the SG High level contacts which are powered from KI and KU. This results in EFW actuation and level being controlled at 30" XSUR with RCPs running.
C. Incorrect: RCPs remain running and MFDW pumps have tripped.
D. Incorrect: RCPs remain running. Would be correct if no RCPs.

Question setup not plausible. I&E working in an electrical cabinet would not affect the air supply to the MS gauge. Does not match KA. Replaced with bank *question 735 that matches KA.*

Tier:	2	Group:	1
Keyword:	AC ELECTRICAL	Cog level:	C/A 3.0/3.3
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

66. 062K4.02 001
Plant conditions are as follows on Unit 2:

- "2C" LPI pump operating in normal decay heat removal mode
- A Load Shed has occurred

Which one of the following descriptions is correct?

"2C" LPI pump:

A. must be manually tripped.

B. trips and cannot be restarted.

C. must be allowed to continue operating.

D. trips but can be manually started after a 5 second time delay.

D

A. Incorrect, will trip automatically.
B. Incorrect, can be manually started after a 5 second time delay.
C. Incorrect, pump will trip.
D. Correct, "2C" LPI pump will trip but can be manually started after a 5 second time delay.
Incorrect logic for "C" LPI pump start. No auto start on "C" LPI pump. Rewrote stem and distractors to make correct. Changed cog level to C/A.

Tier:	2	Group:	1
Keyword:	AC ELECTRICAL	Cog level:	C/A 3.3/3.4
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

67. 063A4.01 001

During alignment of the SSF DC electrical system, the operator is cautioned NOT to open the SSF inverter DC input breaker (CB-1) until the inverter is swapped to an AC-line.

Which one of the following is the expected adverse consequence if the operator fails to adhere to this precaution?

A. The KSF inverter power fuse may blow.

B. The SSF 600v load center XSF will de-energize.

C. Voltage spikes may damage loads on the bus.

D. Automatic transfer of SSF control power to ES valves will occur.

Bank 2003 Question 350
A. *Correct.*
B. Incorrect. The inverter supplies power to panelboard KSFC, not load center XSF.
C. Incorrect. Inverter fuses and rectifiers will limit voltage spike.
D. Incorrect. An automatic swap does not exist.

No utility comments.

Tier:	2	Group:	1
Keyword:	DC POWER	Cog level:	C/A 2.8/3.1
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

68. 063K2.01 001

A loss of DC power to the Turbine Driven Emergency Feedwater Pump (TDEFDWP) Auxiliary Oil pump has occurred.

Which one of the following describes the starting of the TDEFDWP if an AUTOMATIC initiation signal is received?

A. Automatically started because the steam supply valve, MS-93, will be opened when its pilot solenoid deenergizes.

B. Manually started by placing the Control Room control switch to RUN.

C. Manually started by verifing MS-93 open, and pulling up on the local hand starting lever.

D. Cannot be started since the low oil pressure start permissive for the turbine cannot be met.

Oconee Lesson Plan OP-OC-CF-EF

C

A. Incorrect, will not start because aux oil pump is required to open MS-95 (operating valve).
B. Incorrect, pump will not start from CR because aux oil pump is required to open MS-95 (operating valve).
C. Correct, *Manually started by verifing MS-93 open, and pulling up on the local hand starting* lever.
D. Incorrect, pump does not have a low oil pressure start permissive. Start is accomplished by oil pressure delivered to the operating valve (MS-95).

In stem loss of power was to aux oil pump not the TDEFDW Pump. Tripping throttle valve would stop all steam flow to turbine. No correct answer. Rewrote answer choices to ensure a correct choice. Added Aux oil pump to stem to clarify what lost power.

Tier:	2	Group:	1
Keyword:	LOSS OF DC POWER	Cog level:	C/A 2.9/3.1
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

69. 064K4.03 001
INITIAL CONDITIONS:

- The SSF has been manned for 6 hours due to a sustained Loss of HPI and CC.

CURRENT CONDITIONS:

- The SSF Diesel Generator speed = 970 RPM.

Which one of the following has failed on the Diesel Generator?

A. Startup Governor.

B. Hydraulic Amplifier.

C. Electric Governor.

D. Mechanical Governor.

Bank 2003 Question 148

A. Incorrect- the startup of the SSF Diesel is controlled by the Electric Governor. There is not a Startup Governor associated with the SSF Diesel.

B. Incorrect- this is a component controlled by the Electric governor to convert the magnetic speed signal to a useable signal by the hydraulic section of the electric governor system.

C. Correct- this is the component, which failed. The mechanical governor will take over speed control and maintain diesel speed between 950-980 RPM.

D. Incorrect- the mechanical governor is what is controlling the speed.

No utility comments.

Tier:	2	Group:	1
Keyword:	EDG	Cog level:	C/A 2.5/3.0
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

70. 071K4.01 001

Which one of the following is the reason that an interim building gas tank should **NOT** be used as the "in service" gas tank?

A. There is no way to recirc interim building gas tank contents.

B. There is no way to align the interim building gas tank to reduce the hydrogen concentration.

C. The only release path is direct to atmosphere.

D. The interim building gas tank initially requires about 20 psi Nitrogen pressure to have control of vent header pressure.

Solution - D

B. Tank Isolation
1. Tank should be isolated prior to high pressure alarm (70 psig).

2. Interim building gas tanks should not be used as the "in service" gas tank since it initially requires about 20 psi Nitrogen pressure to have control of vent header pressure.

3. Basic procedure:
a) Tank should be > 5 psig prior to placing in service, add Nitrogen if required to increase tank pressure.
b) Close "recirc" valve for isolated tank and open "recirc" valve for tank placed in service.
c) Close inlet valve for tank to be isolated and open inlet to tank to be placed in service.
d) Sample isolated tank for hydrogen.
e) After tank has been isolated for 6 hours, verify that isolated tank pressure is not decreasing and vent header is controlling normally.

4. Reducing Hydrogen in a GWD Tank
a) If hydrogen is > 3%, lower tank to 50 psig by transferring some for the gas to another tank.
b) Add 20 psig nitrogen to tank
c) Resample for hydrogen
d) Repeat until hydrogen < 3%

C. Transferring Gas Between Tanks
1. Normally done from in-service tank to another tank, this adds operational flexibility to determine which tank is used for in-service work and which tank(s) are used for isolation and decay.
2. Procedure:
a) Open inlet for tank receiving gas
b) Close inlet for tank transferring gas.
1) In-service tank pressure should begin decreasing and tank receiving gas should be increasing pressure as gas flows:
- From the in-service GWD Tank
- Through GWD-1
- To the vent header
- Is compressed by GWD compressor
- Discharges to tank being transferred to

c) When transfer is complete, open inlet for tank remaining in service and close inlet for tank to be isolated.
d) Sample isolated tank for hydrogen.
D. Sampling of waste gas decay tank
1. Sampling is done
a) 5 times weekly and after isolation for hydrogen
b) Prior to release for activity
2. Sample flowpath: (sample flows from tank, through sample apparatus, to the vent header)
E. (Obj R5) Cross-connecting the vent header
1. Isolation valves GWD-132 (Vent Header Tie Unit 1) and GWD-134 (Vent Header Tie Unit 3) are opened to make essentially one common vent header.
2. Either system (1&2's) or (3's) can be shutdown.
3. The other system can carry the load.
F. Gaseous Waste Releases
1. Should only be made when:
a) Additional tank space is needed.
b) Acceptable meteorological conditions exist as indicated on OAC.
1) Unfavorable conditions are:
(a) Positive delta temperature
(b) Very low wind speed
2) Sign Off step for Meteorological conditions are in the body of the procedure. Part of the process of deciding to submit a sample request for release should involve anticipating Meteorological conditions that will exist at time of desired release.

3) Atmospheric inversions
(a) The use of vertical temperature gradients is a practical and universally accepted method of determining atmospheric stability. An inversion is defined as: air at ground level colder than air aloft. Simply stated, unusually stable atmospheric conditions exist when an inversion exists, meaning that vertical air movement is stifled. Clear, calm nighttime conditions are usually very stable because the earth's surface cools rapidly, thus cooling the ground surface air. This is usually the time of day that an inversion will exist. The absence of winds prevents this cool air from "mixing" with the warmer air above. It is under these unfavorable, stable atmospheric conditions that the release of radioactive gases would not be desired.
2. We should hold tanks as long as possible to allow maximum radioactive decay (ALARA) and therefore release as little activity as practicable.
3. Prior to release, the operator submits a sample request and RP samples the tank to determine:
a) Types of activity
b) Quantities of each isotope present
4. RP also calculates and notes on sample request
a) Setpoints for RIA-37 & 38
b) Maximum allowable release flow rates
5. Procedure
· Steps described are a general description of actual procedure steps. Refer to procedure if more detail is desired.

Capped and bolded NOT in the stem. Added "initially" to "D".

QUESTIONS REPORT
for Oconee 2003-301 fnl

Tier:	2	Group:	2
Keyword:	WGDT	Cog level:	M 2.6/3.0
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

71. 075K1.01 001
Which one of the following is correct concerning the Siphon Seal Water supply?

"A" and "B" SSW Headers are normally in service with LPSW aligned to both headers and with HPSW:

A. throttled in the "A" header and in recirc in the "B" header.

B. throttled in the "A" Header and isolated in the "B" Header.

C. isolated in the "A" Header and throttled in the "B" Header.

D. throttled in both the "A" and "B" Headers.

Bank 2003 question 777
B
A Incorrect - HPSW is throttled in the "A" Header and isolated in the "B" Header.
B Correct
C Incorrect - HPSW is throttled in the "A" Header and isolated in the "B" Header.
D Incorrect - HPSW is throttled in the "A" Header are isolated in the "B" Header.

No utility comments.

Tier:	2	Group:	2
Keyword:	CWS/SWS	Cog level:	M 2.5/2.5
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

72. 076A2.01 001
Unit 1 plant conditons:

INITIAL CONDITIONS:

- LPSW system flow is degraded
- AP/024 (Loss of LPSW) in progress

CURRENT CONDITIONS:

- Evaluation of reducing LPSW loads in progress

Which one of the following is correct?

If LPSW flow is isolated to the _____, establishing backup cooling water flow would require _____ operator actions.

A. TDEFDWP Jacket Cooler / additional

B. HPI Pump Bearing Coolers / additional

C. Auxiliary Building Air handling Units / **NO** additional

D. Main Turbine Oil Tank / **NO** additional

A
A. Correct- 1LPSW-138 & 1HPSW-184 TDEFDWP COOLING BYPASS VALVE switch must be used to establish backup cooling water flow to the TDEFDWP.
B. Incorrect - establishing backup cooling water flow to HPI pumps is automatic.
C. Incorrect - Auxiliary Building Air handling Units have no backup cooling water available.
D. Incorrect - The Main Turbine Oil Tank has no backup cooling water available.

Not required for the operator to have this information memorized. This question would require 4 attachments. This information is in the OP L&P because of complexity of operability determination. If the OP is given it would be a direct lookup. Replaced with new question.

AP/024 (Loss of LPSW) is the procedure used to mitigate the consequences of this malfunction.

Tier:	2	Group:	1
Keyword:	SWS	Cog level:	C/A 3.5/3.7
Source:	N	Exam:	OC03301
Test:	S	Author/Reviewer:	GCW

73. 078K1.04 001
Plant conditions:

Maintenance has just been completed and the Instrument Air Compressors are aligned as follows for post maintenance testing:

- Primary IA compressor: Running
- Backup IA compressors "A" and "B" in Standby 1
- Backup IA compressor "C" in Standby 2
- Auxiliary IA compressor: Auto
- IA-2718 (Air Supply to Radwaste Facility) Open
- Radwaste Air pressure 78 psig (and stable)

CURRENT CONDITIONS:

- A large break has occurred affecting the Instrument Air (IA) System
- IA pressure has decreased to 88 psig

Which one of the following is the expected response of the IA system?

All Standby:

A. 2 IA compressor(s) start only.

B. 1 IA compressor(s) start only.

C. 1 AND 2 IA compressors start; Auxiliary IA Compressor starts.

D. 1 AND 2 IA compressors start; IA-2718 (Air Supply to Radwaste Facility) CLOSES.

Modified question 593. Different answer
C
A. INCORRECT - The 'B' B/U instrument air compressor in STBY #2 will not start until IA pressure reaches 90 psig, the stem identifies pressure at 91 psig.
B. INCORRECT - ONLY the 'A' and 'C' B/U IA compressors will start and they started at 93 psig.
C. Correct - Same as 'A' above for B/U instrument air compressors. The AIA compressors do not start until AIA receiver pressure reaches 88 psig. Changed stem to 88 psig-
D.
INCORRECT- See 'B' above, IA-2718 (Air Supply to Radwaste Facility) closes at IA pressure below 85 psig.
Changed cog level to C/A.

Tier:	2	Group:	1
Keyword:	IA	Cog level:	C/A 3.1/3.4
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

74. 078K3.02 001

A complete Loss of Instrument Air (IA and AIA) will result in which one of the following?

RCS Normal Makeup _____ and RCP seal injection _____.

A. is lost, increases.

B. increases, increases.

C. is lost, is lost.

D. increases, is lost.

OP-OC-SPS-SY-HPI,

Added (IA and AIA) to stem to clarify question.

Tier:	2	Group:	1
Keyword:	IA	Cog level:	M 3.1/3.4
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

75. 086 K4.03 001

For the Plant Fire Detection System, the specific detector which has caused a fire alarm can be determined by which one of the following?

A. An OAC display group.

B. A neon light on the detector.

C. An audible alarm from the detector.

D. An LED on the Fire Alarm Control panel.

B

A. Incorrect, OAC does not give detector information.
B. Correct, a neon light on the detector illuminates when a fire is dectected.
C. Incorrect, the detectors do not give local audible alarms.
D. Incorrect, an LED on the Fire Alarm Control panel will indicate the string in which the alarming dectector is located.

This question requires the recall of knowledge that is too specific for the closed reference test mode. Wrote new question.

Tier:	2	Group:	2
Keyword:	FIRE	Cog level:	M 3.1/3.7
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

76. BW/A01 AA1.2 001

Unit 1 is at 82 % power in power ascension. "1A1" RCP has just tripped.

Which one of the following describe the automatic responses?

A. Tave input to ICS from Loop "A" is selected and delta Tcold is near zero.

B. An ICS runback to 74% CTP at 25% per minute will occur and final FDW flow will be equivalent to 100% power in the "B" Loop.

C. An ICS runback to 74% CTP at 25% per minute occurs with the affected loop SG being on low level limits.

D. An initial 2:1 FDW ratio followed by a reactor trip due to RPS occurs followed by variable low pressure bistables tripping.

B

A. Incorrect: Loop "B" Tave will be selected
B. Correct: 74% is load limit. No RPS trip due to initial power level at 85%. Re-ratio will require ~5.5 mpph in "B" header which equals the 100% value for that header.
C. Incorrect: FDW flow in "A" header will be ~2.5 mpph...well above that for 25"SU level and LLL.
D. Incorrect: Ratio will be 1:2, RPS trip will not be generated.

Added delta to "A". Modified "C" to match "B".

Tier:	1	Group:	2
Keyword:	RUNBACK	Cog level:	M 3.2/3.5
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

77. BW/A04 AA2.2 001
Unit 3 plant conditions:

- A Reactor trip occurred.
- The OATC is performing IMAs and has depressed the TURBINE TRIP pushbutton.
- The Main Steam Stop Valve positions indicate "OPEN."
- The Generator Output breakers (PCB-58 & 59) indicate "CLOSED."

Which one of the following is the next IMA step required by the OATC?

A. Open BOTH generator output breakers.

B. Place the operating EHC pump to the OFF position.

C. Place the EHC pumps control switches to the PULL-TO-LOCK position.

D. Send an operator to PULL the local turbine trip lever at the front standard.

Answer 159
C
A. Incorrect - PCBs are not opened during the performance of IMAs.
B. Incorrect - This would only start the automatic pump and the MSSVs would remain open.
C. Correct - This action secures both EHC pumps and allows the MSSV to close
D. Incorrect - This would be a method to locally trip the turbine if C did not work but, is operator knowledge and not part of IMA's.

No utility comments.

Tier:	1	Group:	2
Keyword:	TURBINE TRIP	Cog level:	C/A 3.7/3.7
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

78. BW/A05 AK2.1 001

A thunderstorm was in the area, and there were instabilities in the grid. The OATC has been instructed to start the SSF Diesel Generator. The Diesel has been emergency started and the output breaker is OPEN.

The OATC has been instructed to parallel the diesel to Unit 2's MFB #2. Which one of the following describes the paralleling of the SSF Diesel Generator?

The DG should:

A. not be paralleled because it is in speed droop mode.

B. not be paralleled because it is in isochronous mode.

C. be paralleled because it is in speed droop mode.

D. be paralleled because it is in isochronous mode.

Oconee Lesson Plan OP-OC-EAP-SSF
SSF Diesel Generator will not tie to the grid but can tie to Unit 2's MFB #2. Added "Unit 2's MFB #2" to stem to match our nomenclature.

Validation comments:
Underlined "emergency" to emphasize start method.

Tier:	1	Group:	2
Keyword:	EDG	Cog level:	M 3.0/4.0
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

79. BW/E02EK2.2 001

A reactor trip has occured with the following parameters observed:

- "A" SG SU Level = 15" and decreasing
- "A" SG Startup Control valve = 100% demand
- "A" SG Startup FDW flow = "0" gpm
- "B" SG SU Level = 25" and stable
- "B" SG Startup Control valve =15% demand with green and red light
- RB pressure = 0.23 psig and steady

Which one of the following is the correct diagnosis of what is occurring?

A. The "A" SG is experiencing inadequate heat transfer due to insufficient level.

B. The "B" SG level is inaccurate due to degraded reactor building.

C. The "B" SG S/U FDW valve is not opening properly.

D. The "A" SG is indicating a SG tube leak.

Bank 184

A. Correct - B SG is performing as required (now an inadequate heat transfer)
B. Incorrect - RB pressure is < 3 psig so SG level is accurate
C. Incorrect - A SG CV operating properly as level is ablove LLL.
D. Incorrect - conditions indicate a no FDW

No utility comments.

Tier:	1	Group:	1
Keyword:	VITAL SYSTEM VERF	Cog level:	C/A 4.2/4.2
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

80. BW/E04EK2.2 001

Unit 3 has implemented the Loss of Heat Transfer tab due to a complete loss of feedwater.

The crew has just completed Steps 9 and 10 which opened the RCS High Point Vents.

RCS pressure will be governed by the RCS High Point Vents and which one of the following?

A. SG steaming rate and HPI pump discharge pressure ONLY.

B. HPI pump discharge pressure and the PORV relief flow capacity ONLY.

C. A combination of HPI pump discharge pressure, the PORV relief flow capacity and the decay heat level.

D. A combination of HPI pump discharge pressure, the SG steaming rate and the decay heat level.

Inadequate Heat transfer Lesson plan page 15

Steps 9 and 10 opens the RCS High Point Vents which will result in lower RCS pressure, which will allow greater injection flow and therefore better core cooling.
RCS pressure will be governed by a combination of HPI pump discharge pressure, the PORV relief flow capacity and the decay heat level.

RFA removed " which will result in lower RCS pressure, which will allow greater injection flow and therefore better core cooling" from the stem because it teaches.

Three correct answers. A, B, and C. Modified "A" and "B" to make incorrect.

Tier:	1	Group:	1
Keyword:	INADEQUATE HEAT TRAN	Cog level:	C/A 4.2/4.2
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

81. BW/E04EK3.3 001

The "Loss of Heat Transfer" tab has been implemented when Unit 1 suffered a loss of Main and Emergency Feedwater.

FDW is not yet restored, but RCS conditions do not yet require HPI cooling.

Which one of the following describe the preferred configuration of the RCPs?

A. One RCP per loop

B. Any One RCP

C. 1A1 RCP and any other RCP

D. All RCPs running

THEN GO TO Step 4.
RNO:
1. (Obj. R2) Reduce operating RCPs to one pump/loop.

FDW is not yet restored, but RCS conditions do not yet require HPI cooling. Two RCPs are left running to reduce total heat input to the RCS. The preferred configuration is one RCP per loop so that forced flow exists in both SGs when feedwater is restored. Since it is not known in which SG(s) feedwater will be restored, or if it will be restored, one RCP should be left running in each loop if possible. The selection of RCPs to run should consider pressurizer spray flow capacity.

Further Explanation of C - while 1A1 RCP provides the best PZR spray, the preferred configuration is one pump per loop

No utility comments.

Tier:	1	Group:	1
Keyword:	HEAT TRANSFER	Cog level:	C/A 4.2/3.8
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

82. BW/E08 GEN 2.4.18 001
Unit plant conditions:

LOCA CD procedure in progress
EFDW being supplied from 2B MDEFDW pump
3FDW-316 (3B SG EFDW Control) has failed open
Enclosure 5.27 (Alternate Methods For Controlling EFDW Flow) has been initiated

Which one of the following will you acomplish using this procedure?

A. Stop 2B MDEFDW pump.

B. Swap the EFDWP supply from unit 2 to unit 1.

C. Regulate EFDWP flow with the unit 2 EFDW cross-connect valve.

D. Take manual control of 3FDW-316 (3B SG EFDW Control) controller.

EP/3/A/1/1800/001 Enclosure 5.27.
Answer incorrect. Modified stem and distractors to improve readability and make "A" correct. Added ONS specfic nomenclature.

Validation comments:
Added "controller" to "D" to clarify location of manual control.

Tier:	1	Group:	2
Keyword:	COOLDOWN	Cog level:	C/A 2.7/3.6
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

83. BW/E13 EA2.1 001
Unit 1 plant conditions:

- An MS Line Break has occurred
- Manual control of HPI is desired

Which one of the following is the minimum requirement to take manual control of HPI and throttle flows under the above plant conditions?

The BOP can take manual control of HPI:

A. if the severity of the transient will be increased based on their judgment.

B. if the safety system is not required to perform its intended safety function.

C. as directed by EOP tab SA (Subsequent Actions).

D. as directed by Rule 6 (HPI).

A) Incorrect- Non-procedural bypassing requires two licensed operators, one of which is an SRO.
B) Incorrect. Non-procedural bypassing requires two licensed operators, one of which is a SRO.
C) Incorrect- EOP Section 5.0 (Subsequent Actions) does not contain directions on taking manual control of ES components.
D)
Correct- procedural guidance is contained in Rule 6 for taking manual control of ES and throttling HPI.
No utility comments.

Validation comments:
Changed "C": to read "tab SA (Subsequent Actions)" to match current EOP nomenclature.
Added "(HPI)" to D. This is the Rule 6 title.

Tier:	1	Group:	2
Keyword:	EOP RULES	Cog level:	M 3.4/4.0
Source:	B	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

84. GEN 2.1.11 001

Unit 3 plant conditions:

- Unit startup in progress
- Reactor power = 7.5% increasing to 15%
- Engineering has determined that BOTH RBS Trains are inoperable

Which one of the following is correct?

Immediately:

A. enter LCO 3.0.3

B. decrease power to <5% and enter MODE 3

C. verify all three RBCU are operable and suspend power escalation.

D. ensure two Trains of RBC operable and return RBS to service within 7 days.

A

A. Correct - TS 3.6.5.H Required Action is to immediately enter TS 3.0.3 if operating in MODE 1 or 2 OR 3 or 4.
B. Incorrect - TS 3.6.5.H Condition is for MODE 1 or 2. Entering a non applicable MODE of operation (MODE 3) is not an option as directed by TS 3.6.5.H when any two train combinations are inoperable.
C. Incorrect -Never allows both trains OOS in modes 1 and 2.
D. Incorrect –7 days if only 1 RBS train is inoperable. Never allows both trains OOS in modes 1 and 2.

Original question did not meet KA GEN 2.1.11. Selected bank question to meet KA GEN 2.1.11.

Tier:	3	Group:	
Keyword:	TECH SPEC	Cog level:	M 3.0/3.8
Source:	B	Exam:	OC03301
Test:	S	Author/Reviewer:	GCW

85. GEN 2.1.14 001

You are the assigned Control Room SRO. You have just been notified that a draining evolution in the East Penetration Room has just been completed. Before the operator overseeing the drain down leaves the area, you inform him that OMP 1-2, requires additional notification(s) that the task is complete. Which one of the following do you instruct the operator to notify?

A. RP only.

B. Chemistry only.

C. Operations Shift Manager only.

D. RP, Chemistry and Operations Shift Manager.

Based on - ADM040306

A. Incorrect: OMP 1-2, 5.9.1 (I) required that chemistry and the assigned Control Room SRO be informed when the draining evolution is stopped or concluded and NOT RP.

B. Correct: OMP 1-2, 5.9.1(I) requires that chemistry and the assigned Control Room SRO be informed when the draining evolution is stopped or concluded.

C. OMP 1-2, 5.9.1 (I) required that chemistry and the assigned Control Room SRO be informed when the draining evolution is stopped or concluded and NOT the Operations Shift Manger.

D. Incorrect: OMP 1-2, 5.9.1 (I) required that chemistry and the assigned Control Room SRO be informed when the draining evolution is stopped or concluded

Added (s) to notification to indicate one or more notifications.

Validation comments:
In the stem changed "RO supervising" to read "operator overseeing" because ROs do not supervise.

Tier:	3	Group:	
Keyword:	ADMIN	Cog level:	M 2.5/3.3
Source:	M	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

86. GEN 2.1.27 001

Which one of the following describes the operation of the AMSAC (ATWS Mitigation Safety Actuation Circuit) and the DSS (Diverse Scram System) during an ATWS with a complete loss of Main Feedwater?

AMSAC:

A. trips the main turbine while DSS trips the regulating rods and starts the EFDWPs.

B. trips the regulating rods while DSS trips the main turbine and starts EFDWPs.

C. trips the main turbine and starts EFDWPs while DSS trips the regulating rods.

D. starts EFDWPs while DSS trips the regulating rods and trips the main turbine.

Oconee Lesson Plan OP-OC-CF-EF, Obj. R24

No utility comments.

Tier:	3	Group:	
Keyword:	SYSTEM PURPOSE	Cog level:	M 2.8/2.9
Source:	N	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

87. GEN 2.1.32 001

INITIAL CONDITIONS:

- TIME = 0900
- Reactor tripped on Loss of Main FDWPs
- EFDW system is operating

CURRENT CONDITIONS:

- TIME = 1000
- EFDW system is operating

Which one of the following describes the MAXIMUM UST temperature per OP/1/A/1102/01, Controlling Procedure for Unit Startup to ensure the EFDW system adequately removes core decay heat?

A. 85° F

B. 125° F

C. 145° F

D. 150° F

Bank 2003 question 94
A. Incorrect - This is the minimum temperature limit for feeding the SG's
B. Correct - OP/1/A/1102/01, Controlling Procedure for Unit Startup, Limit and Precautions states that UST temperature is limited to 125°F two hours following a reactor trip.
C. Incorrect - This is the limit for power operations up to 30% power and for shutdown conditions.
D.
Incorrect - This is the EFDW system piping design temperature.

No utility comments.

Tier:	3	Group:	
Keyword:	LIMITS & PRECAUTIONS	Cog level:	C/A 3.4/3.8
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

88. GEN 2.1.6 001

Which one of the following is the Control Room SRO authorized to do without being relieved?

A. Provide relief for the Control Room operators.

B. Prepare Removal and Restorations (R&Rs).

C. Designate another SRO as reader of the EOP.

D. Prepare procedure changes.

BANK 1994/03/07
REFERENCE
OMP 2-1 Rev 10/15/93, Encl. 4.5
EAP-E11, Obj. R7

No utility comments.

Tier:	3	Group:	
Keyword:	ADMIN	Cog level:	M 2.1/4.3
Source:	B	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

89. GEN 2.2.12 001

An NEO performing surveillances on the ESV/SSW systems observes the following indications:

- Both SSW Headers in service
- "A" SSW Hdr gpm = 85
- "B" SSW Hdr gpm = 65
- "A" SSW Hdr Strainer ΔP = 10.5
- "B" SSW Hdr Strainer ΔP = 5.5

Which ONE of the following is the correct action in response to these indications?

Assume normal ESV/SSW system operation and valve alignment

SEE ATTACHMENT

A. Declare the "A" SSW Header inoperable.

B. Swap and clean the "A" and "B" SSW Header Strainers.

C. Declare both SSW Headers and both associated ECCW Siphon Hdrs inoperable.

D. Increase the "B" SSW Hdr flow rate and reduce the "A" SSW Hdr flow rate until strainer P is within operability limit.

Question 778 STG220301
Reference: OP/O/A/1104/052
A. Correct. With both SSW Headers in service, L&P 2.6.2 states that if strainer dp of 10 psid is received, then declare the SSW Hdr inoperable. The curve is used when only one SSW Hdr is in service.
B. Incorrect The "A" SSW Hdr should be declared inoperable due to the strainer dp. The "B" SSW Hdr strainer is not rquired to be cleaned until 6 psid and the operability limit is 10 psid.
C.Incorrect, The "A" SSW Hdr is ioperable only based on L&P 2.6.2
D. Incorrect, The operability limit of 10 psid has been exceeded in only the "A" Hdr.

No utility comments.

Tier:	3	Group:	
Keyword:	SURVEILLANCE	Cog level:	C/A 3.0/3.4
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

GEN 2.2.12

SSW System

1. Purpose

Describe the proper procedure for operation of the Siphon Seal Water (SSW) System.

2. Limits and Precautions

2.1 One SSW header is required to be operable for ESV to meet TS 3.7.8 (ECCW) requirements. For the required SSW header to be operable, the required LPSW pumps to that header must be operable (Ref SLC 16.9.12), AND LPSW Pump Auto Start on the Unit supplying the operating SSW header must be operable (Ref TS 3.3.28).

2.2 Normal SSW lineup should be as follows:

- A SSW Header in service with LPSW (SSW-1) valved in; HPSW-901 throttled to maintain balanced flow between A and B SSW Headers to within 20 gpm.. {1}
- B SSW Header in service with LPSW (SSW-2) valved in, HPSW-900 closed.
- A and B SSW Headers supplying all CCW and ESV pumps.
- Maintain > 50 gpm in a single SSW Header, to allow surveillance of SSW strainer ΔP. {1}

2.3 Entry into SLC 16.9.12 is NOT required IF SSW header flow < 50 gpm due to changes in SSW header flow caused by starting/stopping ESV pumps, large changes in HPSW pressure, etc Enclosure "Balancing Flow Between SSW Headers" can be performed as needed.

2.4 Portions of the SSW system specific to the CCW pumps may be removed from service without affecting SSW header operability.

2.5 Status of SSW Header lineup should be documented either in the Unit Log or Turnover Sheets.

2.6 SSW Strainer ΔP information:

2.6.1 OAC Points associated with SSW strainer ΔP:

- O1E2746D2, O2E2746, O3E2746D2"ESV Bldg SSW B Header Strainer Differential Pressure" (Units 1, 2, and 3 respectively)
- O1E2747D2, O2E2747, O3E2747D2"ESV Bldg SSW A Header Strainer Differential Pressure" (Units 1, 2, and 3 respectively)
- OAC alarm setpoints:

  HI alarm: 6 psid

  HI-HI alarm: 10 psid

- SSW strainer ΔP indication is data-linked to Units 1 and 3 via Unit 2 OAC. **IF** Unit 2 OAC is OOS, all data points are lost and only local readings will be available.

2.6.2 When in two SSW Header operation, the curve in Enclosure "SSW Strainer ΔP for SSW header Flow Rates" does **NOT** apply to either header.

- **IF** SSW Strainer 6 psid HI alarm is received, swap and clean associated SSW Strainer per Enclosure "Swapping SSW Strainers".
- **IF** SSW Strainer 10 psid HIHI alarm is received, declare associated SSW Header out of service per SLC 16.9.12. Swap and clean associated SSW Strainer immediately per Enclosure "Swapping SSW Strainers".

2.6.3 Prior to changing from two SSW Headers to one SSW Header operation, verify both headers SSW Strainer ΔP within Enclosure "SSW Strainer ΔP for SSW Header Flow Rates" limits. Swap and clean any SSW strainer above limit per Enclosure Swapping SSW Strainers".

2.6.4 When in single SSW Header operation:

- Monitor SSW Header flow and Strainer ΔP limits using Enclosure "SSW Strainer ΔP for SSW header Flow Rates". Curve only applies when one SSW Header is in service.
- **IF** "Allowed ΔP" curve is exceeded, swap and clean associated SSW Strainer.
- **IF** "Operability Limit ΔP" curve is exceeded, declare associated SSW Header out of service per SLC 16.9.12. Swap and clean associated SSW Strainer immediately per Enclosure "Swapping SSW Strainers".

2.7 ESV Pump minimum SSW seal flow is 1.5 gpm. With instrument uncertainty of 0.8 gpm, the minimum indicated flow is 2.3 gpm. **IF** less, damage to ESV Pump shaft seals could occur within 2 to 3 minutes. ESV Pump flow may be expected to increase as SSW flow to CCW pumps is decreased. Normal flow is 7.0 to 10.0 gpm, and will vary with SSW system pressure. **IF** flow ≤ 6.5 gpm Systems Engineering should be contacted to perform an evaluation. Flow >10 gpm does **NOT** make the pump inoperable.

2.8 CCW Pump seal **AND** motor cooler flow:

- Normal Range: 3 - 5 gpm.
- OAC Alarm setpoints:

  Low 3.0 gpm

  Low Low 2.0 gpm.
- CCW Pump operation with < 2 gpm seal flow may result in increased bearing wear rates.
- CCW Pump operation with between 2 to 3 gpm seal flow should be evaluated by Systems Engineering.
- CCW Pump should be stopped if seal flow < 2 gpm.
- Loss of seal flow to an operating CCW pump may cause bearing failure within several seconds.
- When both supplies of HPSW are isolated from the SSW system, expect SSW flow to CCW Pumps to decrease.

2.9 Damage to running ESV Pump seals can occur in 2 - 3 minutes following a loss of SSW flow.

2.10 **IF** any accident (ES, LOOP, etc) occurs on any unit, flush of SSW Hdr should be terminated.

Reference Use

1. Initial Conditions

_____ 1.1 SSW System is in service.

☐ "Normal" alignment: A **AND** B SSW headers in service.

☐ A SSW Header in service, B SSW Header **NOT** in service.

☐ B SSW Header in service, A SSW Header **NOT** in service.

_____ 1.2 Review Limits and Precautions 2.6.

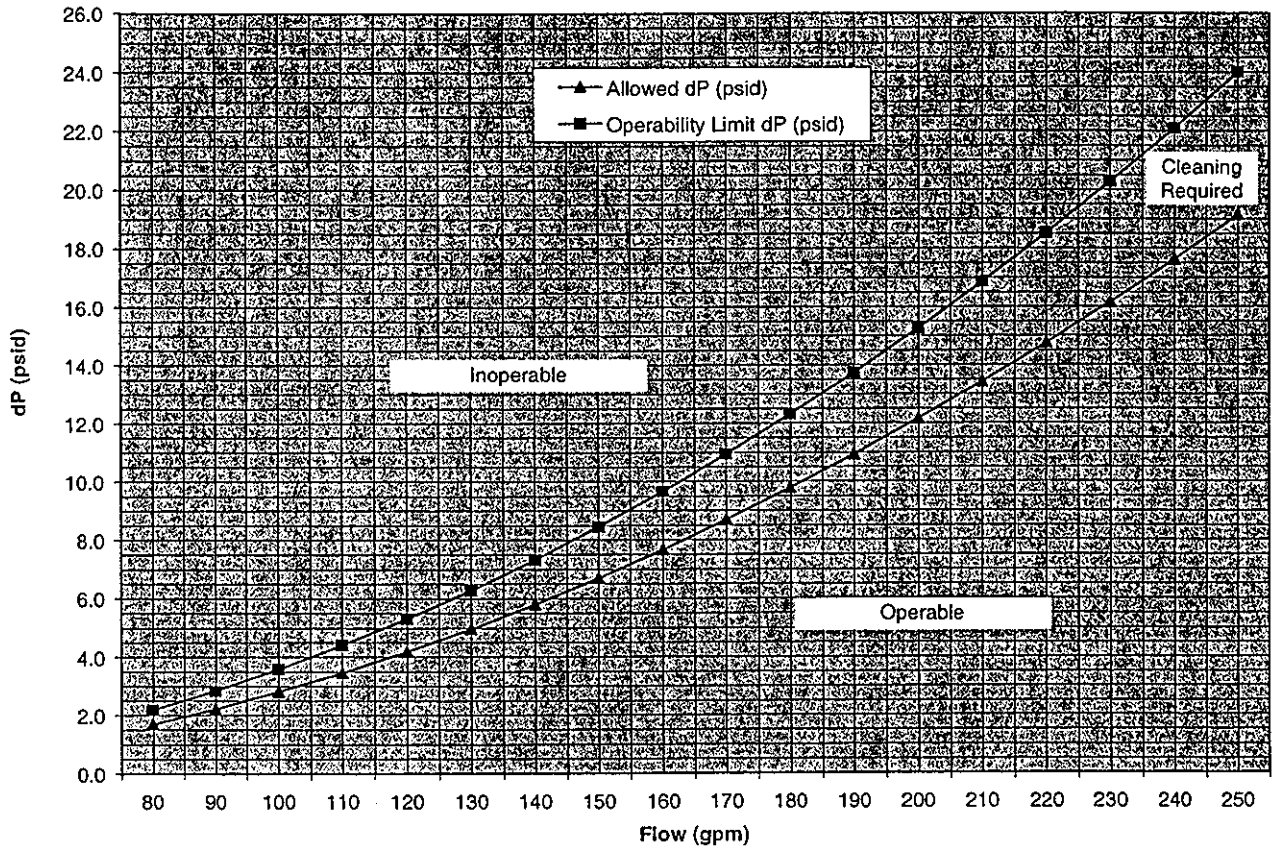
2. Procedure

2.1 Utilize graph in step 2.3 to determine allowable A or B SSW Strainer ΔP based on flow in the respective SSW Header.

2.2 A SSW Header Flow: _____ gpm, OSSWPG0903 (TB1-J29, N)

B SSW Header Flow: _____ gpm, OSSWPG0902 (TB1-K48, S).

2.3 ΔP vs. Flow graph:



SSW Strainer ΔP Cleaning and Operability Limits

90. GEN 2.2.17 001

Mechanical maintenance is planning to work on the HPI system. The engineering evaluation determines that during maintenance the system will be FUNCTIONAL.

Which one of the following describes if you should allow the maintenance to take place with the unit at 100% power?

The work can:

A. occur because the HPI system can perform its intended service; however, applicable TS requirements or licensing/design basis assumptions may NOT be maintained.

B. NOT occur because the HPI system cannot perform its specified function even with all applicable TS or SLC requirements satisfied.

C. NOT occur because the A Module of ORAM-SENTINEL has assigned a color of WHITE to the HPI system.

D. occur because the A Module of ORAM-SENTINEL has assigned a color of GREEN to the HPI system.

A correct
B. Definition of Operable
C and D. PRA information related to risk, not system operability of function

Reference

ADMMRr03

ENABLING OBJECTIVES:1.
Define and relate the following terms and their application to the assessment of equipment removed from service. (R2)

a. Functional
b. Maintenance
c. Operable
d. Probability Risk Assessment (PRA)
e. Risk
f. Risk Significant System (RSS)

The following are some of the definitions adopted by the industry and Duke Power Company for consistent interpretation of the Maintenance Rule. These definitions are from the regulation 10CFR50.65, NUMARC 93-01, or were specifically developed for Duke Power.

Removed "You are the Plant Supervisor." from stem not required to answer the question. Reworded stem to improve readability.

QUESTIONS REPORT
for Oconee 2003-301 fnl

Tier:	3	Group:	
Keyword:	DEFINITIONS	Cog level:	M 2.3/3.5
Source:	N	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

91. GEN 2.2.2 001

Which one of the following determines when the FDW Calibrating Integral will be controlled by turbine header pressure error at 100% power?

A. The bypass valves controls are in manual.

B. The diamond control is in manual.

C. The SG/RX control is in manual.

D. Turbine Master is in hand while all other stations are in auto.

REFERENCE
LP Vol. II, ICS, OP-OC-STG-ICS p.59

Changed stem to "FDW Calibrating Integral" due to new ICS. Changed "Bailey" to "Master" in "D" to match current plant designations.

Tier:	3	Group:	
Keyword:	CONTROLS	Cog level:	M 4.0/3.5
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

92. GEN 2.3.2 001

A point radiation source in the auxiliary building reads 500 mRem/hr at a distance of two feet. Two options exist to complete a mandatory assignment near this point source.

OPTION 1. Operator X can perform the task in 30 minutes while working at a distance of FOUR (4) feet from the point source.

OPTION 2. Operators X and Y, using an extension tool, can perform the task in 75 minutes at a distance of EIGHT (8) feet from the point source.

Operator X has a quarterly dose of 902 mRem
Operator Y has a quarterly dose of 1115 mRem

Which one of the following choices is the preferred option, if any, to complete the assignment in accordance with ALARA? (Assume no dose extensions have been authorized)

SEE ATTACHMENT

A. Option 1

B. Option 2

C. Option 1 and 2 are equally acceptable.

D. Neither Option 1 nor 2 can be used.

Solution - A - Option 1 62.5 mRem

REFERENCE
Oconee: ALARA Manual, General Employee Training Handbook
194001K104 (3.3/3.5)

Modified - Original Question:

*QNUM 29735
*HNUM 30083 (Do NOT change If < 9,000,000)
*ANUM 29745
*QCHANGED FALSE
*ACHANGED FALSE
*QDATE 1991/07/24
*FAC 269 Oconee 1, 2 & 3
*RTYP PWR-B&W177
*EXLEVEL R
*EXMNR
*QVAL
*SEC
*SUBSORT
*KA 194001K104
*QUESTION
A point radiation source in the auxiliary building reads 500 mRem/hr at a distance of TWO (2) feet. TWO (2) options exist to

complete a mandatory assignment near this point source.

OPTION 1. Operator X can perform the task in 30 minutes while working at a distance of FOUR (4) feet from the point source.

OPTION 2. Operators X and Y, using an extension tool, can perform the task in 75 minutes at a distance of EIGHT (8) feet from the point source.

WHICH ONE (1) of the following choices is the preferred option, with correct rationale, to complete the assignment, in accordance with ALARA?

a. Option 1, as X's exposure is 62.5 mRem.

b. Option 1, as X's exposure is 125 mRem.

c. Option 2, as the exposure per person is 39 mRem.

d. Option 2, as the exposure per person is 156 mRem.

*ANSWER
a. [+1.0]
*REFERENCE
Oconee: ALARA Manual, General Employee Training Handbook
194001K104 (3.3/3.5)

Added "SEE ATTACHMENT" Alara Manual Appendix "C" Section 4.4 (General Dose Reduction Methods)

Possible modify to include plan view instead of point source calculation. Operators do not perform point source calculations.

Tier:	3	Group:	
Keyword:	ALARA	Cog level:	C/A 2.5/2.9
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

4.4 General Dose Reduction Methods

4.4.1 Principles of Dose Reduction

There are four basic principles that can reduce the radiation exposure of plant workers. These principles are as follows:

TIME	Keep the time of exposure to the source to a minimum.
DISTANCE	Maximize the distance between the source and personnel.
SHIELDING	Add a shielding material between the source and personnel.
SOURCE CONTROL	Control the source by proper chemistry control, flushing the piping or decontaminating the surfaces as appropriate.

4.4.2 Dose Reduction By Time

The first of these principles is self explanatory. Exposure is a direct function of the time exposed. Reduce the time, and the exposure is reduced proportionally. A continuing effort should be made to search for additional means of time reduction. By far, the greatest means of time reduction will be as a result of increasing worker productivity.

Increasing productivity may be accomplished through the use of special tooling, quality work procedures, mockup training, etc. Training is an effective tool for increasing worker efficiency.

Reducing the need for entry into radiaiton areas by the use of highly reliable components and/or remotely operated components should be considered in design. Further discussion of time saving methods are discussed in Section 5.0.

4.4.3 Dose Reduction by Distance

The second principle (distance) is not as clear, until we understand the nature of the source geometry. In very general terms, there are three types of sources usually encountered in the plant, namely point sources, line sources, and plane sources. Each of these will be explained mathematically in the following paragraphs:

4.4.3.1 Inverse Square Law for a Point Source

Parameters:

R_1 = Dose Rate at Point D_1 (mR/hr)

R_2 = Dose Rate at Point D_2 (mR/hr)

D_1 = Distance From Source to Point D_1

D_2 = Distance From Source to Point D_2

Assumptions:-no absorbing material.

Formula: $R_1(D_1)^2 = R_2(D_2)^2$

Explanation:

Point sources are sources whose dimensions are very small (a few inches) when compared with the distances from the source (several feet).

The dose rate falls off inversely with the square of the distance from the source. Thus, moving to a point twice as far from the sources cuts the dose rate by a factor of four.

4.4.3.2 Inverse Law for a Line Source

Parameters:

R_1 = Dose Rate at Point D_1 (mR/hr)

R_2 = Dose Rate at Point D_2 (mR/hr)

D_1 = Distance From Source to Point D_1

D_2 = Distance From Source to Point D_2

Assumptions:-no absorbing material.

-Distances less than half a length of the line source.

Formula: $R_1D_1 = R_2D_2$

Explanation:

A line source is a thin, long source such as a pipe filled with radioactive material. The dimensions of the pipe should be small (inches) when compared to the distance from the pipe (several feet). The dose rate falls off inversely with the distance from the source. Thus, moving to a point twice as far from the source cuts the dose rate to one half.

For a pipe of finite length, the dose rate would fall off more rapidly than the above dictates. In fact, when the distance from the pipe becomes several times the length of the pipe, the dose rate fall off would more closely follow that of a point source.

4.4.3.3 Law for Finite Plane Source

Parameters:

H = Height of source rectangle

W = Width of source rectangle

S_R = Effective radius of the source

D = Distance from the source

Assumptions: - Finite plane source.

- No absorbing material.

The plane source roughly simulates a circle. For example, an object which appears to be square or rectangular in shape would fall into this category. Mathematically it would be: 2/3 W < H < 3/2 W.

Formulas: $S_R = ((H \times W)/\Pi)^{1/2}$ (effective source radius)

Dose rate calculations change, depending on the distance from the source. The calculation is broken down into three sections, as follows

1. D = 0.0 to 0.1 S_R:

   Dose = Contact Dose Rate

2. D = 0.1 S_R to 1.0 S_R:

Use Inverse Law for Line Source

3. D = 1.0 S_R and beyond:

   Use Inverse Square Law for a Point Source.

4.4.4 Dose Reduction By Shielding

The third dose reduction principle (shielding) is the introduction of an absorbing material (shield between the source) and the dose point. Whether the shield is placed close to the source or close to the dose point is immaterial with regard to shielding effectiveness. However, if the source is small with respect to the dose point (or person), it makes economic sense to place the shield close to the source, since the width and height of the shield need only be slightly larger than the dimensions of the source. Conversely, if the source is large (for example, a large tank full of radioactive water) it might be more economical to place the shield closer to the dose point to shield the person. This way, the shield needs to be only slightly larger than the person rather than the size of the tank.

Of the four types of radiation that exist in a nuclear power plant (alpha, beta, neutron and gamma), only gamma radiation will be considered in the shielding calculations described below.

Most gamma ray sources in a power plant (except for the nitrogen-16 found in the primary coolant systems during operation) have an average gamma ray energy of about 1 MeV. To calculate the necessary shield thickness, the radiation dose rate on the source side of the shield must be known as well as the dose rate desired on the outside of the shield. The thickness can be calculated by adding tenth value thicknesses and half value thicknesses obtained from the table in Section 4.4.5 of this manual as appropriate. For thick shields, it is a good idea to add about 10% to the thickness to account for buildup. Buildup is the radiation that is scattered by the shielding, but still reaches the receptor. Also, lead wool blankets have only about 30%-40% of the density of solid lead, so the calculated shield thickness needs to be tripled for lead wool blankets or the equivalent solid lead thickness specified for the blankets must be used. Definitions:

A. Tenth value thickness - That amount of material (thickness) that will reduce the dose rate to one-tenth (10%) of the original unshielded value.

B. Half value thickness - That amount of material (thickness) that will reduce the dose rate to one-half (50%) of the original unshielded value.

4.4.5 Shielding Material

Shielding Material For 1 MeV Gamma Rays	Tenth Value Thickness (in.)	Half Value Thickness (in.)
Lead	1.50	0.5
Iron	3.33	1.5
Concrete	11.5	5.5
Water	25.0	12.0

NOTE 1: The half value thickness is approximately one third of the tenth value thickness.

NOTE 2: Two (2) Standard lead wool blankets, stacked, will provide one half value thickness.

Example:

To reduce 400 R/hr to 2.5 mr/hr., calculate thickness of the lead shield required. Solution: Add up tenth and half value layers as follows:

mr/hr	thickness (in.)
400,000	1.50
40,000	1.50
4,000	1.50
400	1.50
40	1.50
4	1.50
2	0.50 (0.002 R/hr < 2.5 mR/hr.)
	8.00 inches of lead

Adding 10% for buildup = 0.8 inches or a total of 8.8 inches.

Another method, which can be useful in approximating shielding thickness is the shielding equation:

$I = (I_0)*10^{(-X/X1/10)}$

Where: I = Final radiation level after shielding installation.
I_0 = Initial radiation level prior to shielding installation.
X = Thickness of shielding utilized (inches or cm).
$X_{1/10}$ = Tenth value thickness of the material used.

4.5 Dose Reduction By source Control

93. GEN 2.3.3 001

Which one of the following describes the most favorable meteorological conditions for making a Gaseous Waste Release?

_____ wind speed with air at ground level _____ than air aloft.

A. LOW / COLDER

B. LOW / WARMER

C. HIGH / COLDER

D. HIGH / WARMER

REFERENCE
OP-OC-WE-GWD, Revision 05, page 22
(2.5/2.8) #49

No utility comments.

Tier:	3	Group:	
Keyword:	RAD RELEASE	Cog level:	C/A 1.8/2.9
Source:	B	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

94. GEN 2.4.12 001
Unit 1 plant conditions:

- A Reactor trip occurred on low RCS pressure
- RCS pressure = 1200 psig
- RB pressure = 2.0 psig
- The BOP is performing Rule #2, Loss of SCM

Which one of the following statements is correct concerning this condition?

A. ES will NOT actuate if power is lost to two out of three ES analog channels.

B. Channels 1-6 RZ module Blue and White lights should be "ON" and verified "ON" by the operator performing Enclosure 5.1, ES Actuation.

C. Enclosure 5.1, ES Actuation, shall be performed by the BOP after Rule #2 is completed, while the OATC performs EOP LOSCM tab actions.

D. Enclosure 5.1, ES Actuation, shall be performed by the OATC after IMAs are verified, symptoms check is completed, and while the BOP performs Rule #2.

A. Incorrect - analogs will trip on a loss of power.
B. Incorrect - at this time only ES 1 and 2 have or should have actuated.
C. Incorrect - encl. 5.1 should be performed as soon as possible. It has higher priority than LOSCM tab actions and should be performed as soon as an operator is available.
D.
Correct: BOP performs Rule #2. When IMAs and symptom check completed by the OATC, a Parallel Action of LOSCM is to perform Encl. 5.1. OATC will have to perform this with the BOP running rule #2.
No utility comments.

Tier:	3	Group:	
Keyword:	ADMIN	Cog level:	M 3.4/3.9
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

95. GEN 2.4.23 001

Which one of the following represents the correct order of priority (from highest to lowest priority) for the following critical safety functions?

A. Inadequate Core Cooling, Subcriticality, RCS Integrity, Heat Sink.

B. Inadequate Core Cooling, Subcriticality, Heat Sink, RCS Integrity.

C. Subcriticality, Inadequate Core Cooling, RCS Integrity, Heat Sink.

D. Subcriticality, Inadequate Core Cooling, Heat Sink, RCS Integrity.

GEN 2.4.23

*REFERENCE
LP Vol V., SPDS, OP-OC-SPS-IC-SPDS, p.9,LPRO/LPSO 2a

No utility comments.

Tier:	3	Group:	
Keyword:	CRITICAL SAFETY	Cog level:	M 2.8/3.8
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

96. GEN 2.4.25 001
Which one of the following areas does the HPSW system provided sprinkler fire protection for?

A. Reactor Building.

B. 230 KV switchyard.

C. Keowee Hydro Units.

D. CCW Intake Structure.

Question 587 SSS030301 SSS030301

Which one of the following areas is provided sprinkler fire protection via the HPSW system?

Answer 587
B
A. Incorrect. supplied from LPSW
B. Correct. supplied from Yard header (Major Fire Loop load).
C. Incorrect. has own water supply system
D. Incorrect. no sprinkler system supplied for intake structure

Cog level change to memory.

Tier:	3	Group:	
Keyword:	FIRE	Cog level:	M 2.9/3.4
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

97. GEN 2.4.3 001
Plant conditions:

The Gaseous Post Accident Sample Panel is in operation
ES Channel 1 and 2 have actuated

Which one of the following, lists the required immediate actions?

A. MANUALLY close the reactor building isolation valves for the Hydrogen Analyzer system, then return the Gaseous Post Accident Sample Panel to service.

B. Verify the Gaseous Post Accident Sample Panel remains in service, then verify the reactor building Hydrogen Analyzer system isolation valves AUTOMATICALLY open.

C. MANUALLY close the reactor building isolation valves for the Gaseous Post Accident Sample Panel, then place the reactor building Hydrogen Analyzer system in service.

D. Verify the reactor building isolation valves for the Gaseous Post Accident Sample Panel AUTOMATICALLY close, then place the reactor building Hydrogen Analyzer system in service.

Original Question - Question 562 PNS582 PNS582 SRO ONLY (Modified to be RO)

The *Limits and Precautions* of OP/1,2,3/A/1102/22, *Reactor Building Hydrogen Analyzer* system, directs immediate operator actions if the Gaseous Post Accident Sample Panel is in operation when an ES actuation occurs.

Which ONE of the following lists the required immediate actions? (.25)

A) MANUALLY close the reactor building isolation valves for the Hydrogen Analyzer system, then return the Gaseous Post Accident Sample Panel to service.

B) Verify the Gaseous Post Accident Sample Panel remains in service, then verify the reactor building Hydrogen Analyzer system isolation valves AUTOMATICALLY open.

C) MANUALLY close the reactor building isolation valves for the Gaseous Post Accident Sample Panel, then place the reactor building Hydrogen Analyzer system in service.

D) Verify the reactor building isolation valves for the Gaseous Post Accident Sample Panel AUTOMATICALLY close, then place the reactor building Hydrogen Analyzer system in service.

Answer 562
C

Redesigned the stem to improve readability. Added "ES" to the stem. Added "and 2 *have actuated" to stem to make "C" correct and "D" plausible.*

Tier:	3	Group:	
Keyword:	POST ACCIDENT INS	Cog level:	M 3.5/3.8
Source:	M	Exam:	OC03301
Test:	R	Author/Reviewer:	LSM/RFA

98. GEN 2.4.41 002

Unit 2 sequence of events:

Time=1200

- Unit 2 is shutting down with a 30 gpm tube leak in the 2B SG
- An Unusual Event (NOUE) has been declared

Time=1230

- While taking the Turbine Generator off-line a Turbine Trip occurs.

Time=1255

- One Main Steam Relief valve on the 2B SG will NOT reseat

Time=1300

- 2B SG has been isolated
- The blowing Main Steam Relief valve on 2B SG Main Steam Relief did NOT reseat when the SG was isolated

PRESENT TIME=1305

Assume NO additional failures occur and that "Emergency Coordinator Judgment/EOF Director Judgment" is NOT used as reason for the classification.

SEE ATTACHMENT

Which one of the following correctly classifies the event

A. Remain as an NOUE

B. Upgrade to an Alert

C. Upgrade to a Site Area Emergency

D. Upgrade to a General Emergency

Answer 223

REFERENCE ATTACHMENT REQUIRED

A. Correct: Enclosure 4.1 Fission Barrier Matrix Containment Barriers gives 3 points. No point earned from the other two barriers.

B. Incorrect: Enclosure 4.1 Fission Barrier Matrix Containment Barriers gives 3 points. No point earned from the other two barriers. No EAL above a NOUE have been met.

C. Incorrect: Enclosure 4.1 Fission Barrier Matrix Containment Barriers gives 3 points. No point earned from the other two barriers. No EAL above a NOUE have been met.

D.
Incorrect: Enclosure 4.1 Fission Barrier Matrix Containment Barriers gives 3 points. No point earned from the other two barriers. No EAL above a NOUE have been met.

Added "SEE ATTACHMENT" to stem.

Tier:	3	Group:	
Keyword:	ADMIN	Cog level:	C/A 2.3/4.1
Source:	B	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA

INFORMATION ONLY

SPO GEN 2.4.41

NSD 703 Rev 4

Duke Power Company (1) ID No. RP/O/B/1000/001

PROCEDURE PROCESS RECORD Revision No. 013

PREPARATION

(2) Station OCONEE NUCLEAR STATION

(3) Procedure Title Emergency Classification

(4) Prepared By Mike Thorne (Signature) M R Thorne Date 01/27/03

(5) Requires NSD 228 Applicability Determination?

- ☒ Yes (New procedure or revision with major changes)
- ☐ No (Revision with minor changes)
- ☐ No (To incorporate previously approved changes)

(6) Reviewed By Ray Waterman (QR) Date 1/22/03

Cross-Disciplinary Review By _____ (QR) NA RBW Date 1/27/03

Reactivity Mgmt Review By _____ (QR) NA RBW Date 1/27/03

Mgmt Involvement Review By _____ (Ops Supt) NA RBW Date 1/27/03

(7) Additional Reviews

Reviewed By _____ Date _____

Reviewed By _____ Date _____

(8) Temporary Approval *(if necessary)*

By _____ (OSM/QR) Date _____

By _____ (QR) Date _____

(9) Approved By Rodney Brown Date 02/11/03

PERFORMANCE *(Compare with control copy every 14 calendar days while work is being performed.)*

(10) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(11) Date(s) Performed _____

Work Order Number (WO#) _____

COMPLETION

(12) Procedure Completion Verification:

☐ Unit 0 ☐ Unit 1 ☐ Unit 2 ☐ Unit 3 Procedure performed on what unit?

- ☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- ☐ Yes ☐ NA Required enclosures attached?
- ☐ Yes ☐ NA Data sheets attached, completed, dated, and signed?
- ☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?
- ☐ Yes ☐ NA Procedure requirements met?

Verified By _____ Date _____

Procedure Completion Approved _____ Date _____

Remarks *(Attach additional pages)*

Duke Power Company Oconee Nuclear Site **Emergency Classification** **Reference Use**	Procedure No. RP/0/B/1000/001 Revision No. 013 Electronic Reference No. OX002WOS

Emergency Classification

NOTE: This procedure is an implementing procedure to the Oconee Nuclear Site Emergency plan and must be forwarded to Emergency Planning within seven (7) working days of approval.

1. Symptoms

1.1 This procedure describes the immediate actions to be taken to recognize and classify an emergency condition.

1.2 This procedure identifies the four emergency classifications and their corresponding Emergency Action Levels (EALs).

1.3 This procedure provides reporting requirements for non-emergency abnormal events.

1.4 The following guidance is to be used by the Emergency Coordinator/EOF Director in assessing emergency conditions:

1.4.1 The Emergency Coordinator/EOF Director shall review all applicable initiating events to ensure proper classification.

1.4.2 The BASIS Document (Volume A, Section D of the Emergency Plan) is available for review if any questions arise over proper classification.

1.4.3 IF An event occurs on more than one unit concurrently,

THEN The event with the higher classification will be classified on the Emergency Notification Form.

A. Information relating to the problem(s) on the other unit(s) will be captured on the Emergency Notification Form as shown in RP/0/B/1000/015A, (Offsite Communications From The Control Room), RP/0/B/1000/015B, (Offsite Communications From The Technical Support Center) or RP/0/B/1000/015C, (Offsite Communications From The Emergency Operations Facility).

1.4.4 IF An event occurs,

AND A lower or higher plant operating mode is reached before the Classification can be made,

THEN The classification shall be based on the mode that existed at the time the event occurred.

1.4.5 The Fission Product Barrier Matrix is applicable only to those events that occur at Hot Shutdown or higher.

A. An event that is recognized at Cold Shutdown or lower shall not be classified using the Fission Product Barrier Matrix.

1. Reference should be made to the additional enclosures that provide Emergency Action Levels for specific events (e.g., Severe Weather, *Fire*, Security).

1.5 IF A transient event should occur,

THEN Review the following guidance:

1.5.1 IF An Emergency Action Level (EAL) identifies a specific duration

AND The Emergency Coordinator/EOF Director assessment concludes that the specified duration is exceeded or will be exceeded, (i.e.; condition cannot be reasonably corrected before the duration elapses),

THEN Classify the event.

1.5.2 IF A plant condition exceeding EAL criteria is corrected before the specified duration time is exceeded,

THEN The event is NOT classified by that EAL.

A. Review lower severity EALs for possible applicability in these cases.

NOTE:	Reporting under 10CFR50.72 may be required for the following step. Such a condition could occur, for example, if a follow up evaluation of an abnormal condition uncovers evidence that the condition was more severe than earlier believed.

1.5.3 IF A plant condition exceeding EAL criteria is not recognized at the time of occurrence, but is identified well after the condition has occurred (e.g.; as a result of routine log or record review)

AND The condition no longer exists,

THEN An emergency shall NOT be declared.

1.5.4 IF An emergency classification was warranted, but the plant condition has been corrected prior to declaration and notification,

THEN The Emergency Coordinator must consider the potential that the initiating condition (e.g.; Failure of Reactor Protection System) may have caused plant damage that warrants augmenting the on shift personnel through activation of the Emergency Response Organization.

A. IF An ***Unusual Event*** condition exists,

THEN Make the classification as required.

1. The event may be terminated in the same notification or as a separate termination notification.

B. IF An ***Alert***, ***Site Area Emergency***, or ***General Emergency*** condition exists,

THEN Make the classification as required,

AND Activate the Emergency Response Organization.

1.6 Emergency conditions shall be classified as soon as the Emergency Coordinator/EOF Director assessment determines that the Emergency Action Levels for the Initiating Condition have been exceeded.

2. Immediate Actions

2.1 Determine the operating mode that existed at the time the event occurred prior to any protection system or operator action initiated in response to the event.

2.2 IF The unit is at Hot Shutdown or higher

AND The condition/event affects fission product barriers,

THEN GO TO Enclosure 4.1, (Fission Product Barrier Matrix).

2.2.1 Review the criteria listed in Enclosure 4.1, (Fission Product Barrier Matrix) and make the determination if the event should be classified.

2.3 Review the listing of enclosures to determine if the event is applicable to one of the categories shown.

2.3.1 IF One or more categories are applicable to the event,

2.3.2 THEN Refer to the associated enclosures.

2.3.3 Review the EALs and determine if the event should be classified.

A. IF An EAL is applicable to the event,

THEN Classify the event as required.

2.4 IF The condition requires an emergency classification,

THEN GO TO RP/0/B/1000/002, (Control Room Emergency Coordinator Procedure) Subsequent Actions.

2.5 Continue to review the emergency conditions to assure the current classification continues to be applicable.

3. Enclosures

DETERMINE THE APPROPRIATE CLASSIFICATION USING THE TABLE BELOW: CIRCLE EALS CHOSEN. ADD POINTS TO CLASSIFY. (SEE NOTE BELOW)

RCS BARRIERS (BD 5-7)		FUEL CLAD BARRIERS (BD 8-9)		CONTAINMENT BARRIERS (BD 10-12)	
Potential Loss (4 Points)	**Loss (5 Points)**	**Potential Loss (4 Points)**	**Loss (5 Points)**	**Potential Loss (1 Point)**	**Loss (3 Points)**
RCS Leakrate > Makeup capacity of one HPI pump in normal makeup mode (approx. 160 gpm) with Letdown isolated.	RCS Leak rate > available makeup capacity as indicated by a loss of subcooling	Average of the 5 highest CETC ≥ 700° F	Average of the 5 highest CETC ≥ 1200° F	CETC ≥ 1200° F ≥ 15 minutes <u>OR</u> CETC ≥ 700° F ≥ 15 minutes with a *valid* RVLS reading 0"	Rapid unexplained containment pressure decrease after increase <u>OR</u> containment pressure or sump level not consistent with LOCA
SGTR > Makeup capacity of one HPI pump in normal makeup mode (approx. 160 gpm) with Letdown isolated.		*Valid* RVLS reading of 0" NOTE: RVLS is <u>NOT</u> valid if one or more RCPs are running <u>OR</u> if LPI pump(s) are running.	Coolant activity ≥ 300 µCi/ml DEI	RB pressure ≥ 59 psig <u>OR</u> RB pressure ≥ 10 psig and no RBCU or RBS	Failure of secondary side of SG results in a direct opening to the environment with P/S leakage ≥ 10 gpm in the same SG
Entry into the PTS (Pressurized Thermal Shock) Operation NOTE: PTS is entered under either of the following: • A cooldown below 400°F @ > 100°F/hr. has occurred. • HPI has operated in the injection mode while NO RCPs were operating.	1RIA 57/58 reading ≥ 1.0 R/hr 2 RIA 57 reading ≥ 1.6 R/hr 2 RIA 58 reading ≥ 1.0 R/hr 3RIA 57/58 reading ≥ 1.0 R/hr		<u>Hours Since SD</u> <u>RIA57/58 R/hr</u> 0 - < 0.5 ≥ 300/150 0.5 - < 2.0 ≥ 80/40 2.0 - 8.0 ≥ 32/16	<u>Hours Since SD</u> <u>RIA57/58 - R/hr</u> 0 - < 0.5 ≥ 1800/860 0.5 - < 2.0 ≥ 400/195 2.0 - 8.0 ≥ 280/130	Failure of secondary side of SG results in a direct opening to the environment with P/S leakage ≥ 10 gpm in the other SG <u>AND</u> Feeding SG with secondary side failure from the affected unit
HPI Forced Cooling	RCS pressure spike ≥ 2750 psig			Hydrogen concentration ≥ 9%	Containment isolation is incomplete and a release path to the environment exists
Emergency Coordinator/EOF Director judgment	Emergency Coordinator/EOF Director judgment	Emergency Coordinator/EOF Director judgment	Emergency Coordinator/EOF Director judgment	Emergency Coordinator/EOF Director judgment	Emergency Coordinator/EOF Director judgment

UNUSUAL EVENT (1-3 Total Points)	ALERT (4-6 Total Points)	SITE AREA EMERGENCY (7-10 Total Points)	GENERAL EMERGENCY (11-13 Total Points)
<u>OPERATING MODE:</u> 1, 2, 3, 4 ♦ Any potential loss of Containment ♦ Any loss of containment	<u>OPERATING MODE:</u> 1, 2, 3, 4 ♦ Any potential loss or loss of the Fuel Clad ♦ Any potential loss or loss of the RCS	<u>OPERATING MODE:</u> 1, 2, 3, 4 ♦ Loss of any two barriers ♦ Loss of one barrier and potential loss of either RCS or Fuel Clad Barriers ♦ Potential loss of both the RCS and Fuel Clad Barriers	<u>OPERATING MODE:</u> 1, 2, 3, 4 ♦ Loss of any two barriers and potential loss of the third barrier ♦ Loss of all three barriers
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1,2,3,4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1,2,3,4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY .NOTIFY 1,2,3,4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1,2,3,4

NOTE: An event with multiple events could occur which would result in the conclusion that exceeding the loss or potential loss threshold is <u>IMMINENT</u> (i.e., within 1-3 hours). In this IMMINENT LOSS situation, use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
1. *RCS LEAKAGE* (BD 14) OPERATING MODE: 1, 2, 3, 4 A. Unidentified leakage ≥ 10 gpm B. Pressure boundary leakage ≥ 10 gpm C. Identified leakage ≥ 25 gpm 1. *UNPLANNED* LOSS OF MOST OR ALL SAFETY SYSTEM ANNUNCIATION/ INDICATION IN CONTROL ROOM FOR > 15 MINUTES (BD 15) OPERATING MODE: 1, 2, 3, 4 A.1 *Unplanned* loss of > 50% of the following annunciators on one unit for > 15 minutes: Units 1 & 3 1 SA1-9, 14-16, and 18 3 SA1-9, 14-16, and 18 Unit 2 2 SA1-9, 14-16 AND A.2 Loss of annunciators or indicators requires additional personnel (beyond normal shift complement) to safely operate the unit 3. INABILITY TO REACH REQUIRED SHUTDOWN WITHIN LIMITS (BD 16) OPERATING MODE: 1, 2, 3, 4 A. Required operating mode not reached within TS LCO action statement time (CONTINUED)	1. *UNPLANNED* LOSS OF MOST OR ALL SAFETY SYSTEM ANNUNCIATION/ INDICATION IN CONTROL ROOM (BD 19) OPERATING MODE: 1, 2, 3, 4 A.1 *Unplanned* loss of > 50% of the following annunciators on one unit for > 15 minutes: Units 1 & 3 1 SA1-9, 14-16, and 18 3 SA1-9, 14-16, and 18 Unit 2 2 SA1-9, 14-16 AND A.2 Loss of annunciators /indicators requires additional personnel (beyond normal shift complement) to safely operate the unit AND A.3 *Significant plant transient in progress* OR A.4 Loss of the OAC and ALL PAM indications (END)	1. INABILITY TO MONITOR A SIGNIFICANT TRANSIENT IN PROGRESS (BD 21) OPERATING MODE: 1, 2, 3, 4 A.1 *Unplanned* loss of > 50% of the following annunciators on one unit for > 15 minutes: Units 1 & 3 1 SA1-9, 14-16, and 18 3 SA1-9, 14-16, and 18 Unit 2 2 SA1-9, 14-16 AND A.2 A *significant transient* is in progress AND A.3 Loss of the OAC and ALL PAM indications AND A.4 *Inability to directly monitor* any one of the following functions: 1. Subcriticality 2. Core Cooling 3. Heat Sink 4. RCS Integrity 5. Containment Integrity 6. RCS Inventory (END)	
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
4. *UNPLANNED* LOSS OF ALL ONSITE OR OFFSITE COMMUNICATIONS (BD 17) ========== OPERATING MODE: All A. Loss of all onsite communications capability (ROLM system, PA system, Pager system, Onsite Radio system) affecting ability to perform Routine operations B. Loss of all onsite communications capability (Selective Signaling, NRC ETS lines, Offsite Radio System, AT&T line) affecting ability to communicate with offsite authorities. 5. FUEL CLAD DEGRADATION (BD 18) ========== OPERATING MODE: All: A. DEI - >5µCi/ml (END)			
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1,2,3,4			

Abnormal Rad Level. diological Effluent

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
1 ANY *UNPLANNED* RELEASE OF GASEOUS OR LIQUID RADIOACTIVITY TO THE ENVIRONMENT THAT EXCEEDS TWO TIMES THE SLC LIMITS FOR 60 MINUTES OR LONGER (BD 23) OPERATING MODE: All A. *Valid* indication on radiation monitor RIA 33 of ≥ 4.06E+06 cpm for > 60 minutes (See Note 1) B. *Valid* indication on radiation monitor RIA 45 of ≥ 9.35E+05 cpm for > 60 minutes (See Note 1) C. Liquid effluent being released exceeds two times SLC 16.11.1 for > 60 minutes as determined by Chemistry Procedure D. Gaseous effluent being released exceeds two times SLC 16.11.2 for > 60 minutes as determined by RP Procedure NOTE 1: If monitor reading is sustained for the time period indicated in the EAL AND the required assessments (procedure calculations) cannot be completed within this period, declaration must be made on the *valid* Radiation Monitor reading. (CONTINUED)	1. ANY *UNPLANNED* RELEASE OF GASEOUS OR LIQUID RADIOACTIVITY TO THE ENVIRONMENT THAT EXCEEDS 200 TIMES RADIOLOGICAL TECHNICAL SPECIFICATIONS FOR 15 MINUTES OR LONGER (BD 28) OPERATING MODE: All A. *Valid* indication on RIA 46 of ≥ 2.09E+04 cpm for >15 minutes (See Note 1) B.1 RIA 33 HIGH Alarm AND B.2 Liquid effluent being released exceeds 200 times the level of SLC 16.11.1 for > 15 minutes as determined by Chemistry Procedure C. Gaseous effluent being released exceeds 200 times the level of SLC 16.11.2 for >15 minutes as determined by RP Procedure 2. RELEASE OF RADIOACTIVE MATERIAL OR INCREASES IN RADIATION LEVELS THAT IMPEDES OPERATION OF SYSTEMS REQUIRED TO MAINTAIN SAFE OPERATION OR TO ESTABLISH OR MAINTAIN COLD SHUTDOWN (BD 30) OPERATING MODE: All A. *Valid* radiation reading ≥ 15 mRad/hr in CR, CAS, or, Radwaste CR B. *Unplanned*/unexpected *valid* area monitor readings exceed limits stated in Enclosure 4.9 (CONTINUED)	1. BOUNDARY DOSE RESULTING FROM ACTUAL/IMMINENT RELEASE OF GASEOUS ACTIVITY (BD 32) OPERATING MODE: All A. *Valid* reading on RIA 46 of ≥ 2.09E+05 cpm for >15 minutes (See Note 2) B. *Valid* reading on RIA 57 or 58 as shown on Enclosure 4.8 (See Note 2) C. Dose calculations result in a dose projection at the *site boundary* of: ≥ 100 mRem TEDE or 500 mRem CDE adult thyroid D. Field survey results indicate *site boundary* dose rates exceeding ≥100 mRad/hr expected to continue for more than one hour OR D.1 Analyses of field survey samples indicate adult thyroid dose commitment of ≥ 500 mRem CDE (3.84 E^{-7} µCi/ml) for one hour of inhalation NOTE 2: If actual Dose Assessment cannot be completed within 15 minutes, then the *valid* radiation monitor reading should be used for emergency classification. (CONTINUED)	1. BOUNDARY DOSE RESULTING FROM ACTUAL/ IMMINENT RELEASE OF GASEOUS ACTIVITY (BD 36) OPERATING MODE: All A. *Valid reading on RIA 46 of* ≥ 2.09E+06 cpm for ≥15 minutes (See Note 3) B. *Valid* reading on RIA 57 or 58 as shown on Enclosure 4.8 (See Note 3) C. Dose calculations result in a dose projection at the *site boundary* of: C.1 ≥ 1000 mRem TEDE OR C.2 ≥ 5000 mRem CDE adult thyroid D. Field survey results indicate *site boundary* dose rates exceeding ≥1000 mRad/hr expected to continue for more than one hour OR D.1 Analyses of field survey samples indicate adult thyroid dose commitment of ≥ 5000 mRem CDE for *one hour of inhalation* NOTE 3: If actual Dose Assessment cannot be completed within 15 minutes, then the *valid* radiation monitor reading should be used for emergency classification. (END)
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

Assumptions used for calculation of vent monitors RIA 45 & 46:

1. Average annual meteorology (1.672 E-6 sec/m^3), semi-elevated
2. Vent flow rate 65,000 cfm (average daily flow rate)
3. No credit is taken for vent filtration
4. One hour release duration for *Unusual Event*, 15 minute duration for *Alert*, *Site Area Emergency*, *General Emergency*
5. *General Emergency* PAGs are 1 rem TEDE and 5 rem CDE; *Site Area Emergency* determination is based on 10% of the *General Emergency* PAGs
6. Calculations for monitor readings are based on whole body dose
7. Standard ODCM guidance together with NUMARC guidance indicates that effluent releases are based on Technical Specification releases

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
2 UNEXPECTED INCREASE IN PLANT RADIATION OR AIRBORNE CONCENTRATION (BD 25) OPERATING MODE: All A. LT 5 reading 14" and decreasing with makeup not keeping up with leakage WITH fuel in the core B. *Uncontrolled* water level decrease in the SFP and fuel transfer canal with all irradiated fuel assemblies remaining covered by water C. 1 R/hr radiation reading at one foot away from a damaged storage cask located at the ISFSI D. *Valid* area monitor readings exceeds limits stated in Enclosure 4.9. (END)	2. MAJOR DAMAGE TO IRRADIATED FUEL OR LOSS OF WATER LEVEL THAT HAS OR WILL RESULT IN THE UNCOVERING OF IRRADIATED FUEL OUTSIDE THE REACTOR VESSEL (BD 31) OPERATING MODE: All A. *Valid* RIA 3, 6, 41, OR 49 HIGH Alarm B. HIGH Alarm for portable area monitors on the main bridge or SFP bridge C Report of visual observation of irradiated fuel uncovered D. Operators determine water level drop in either the SFP or fuel transfer canal will exceed makeup capacity such that irradiated fuel will be uncovered (END)	2. LOSS OF WATER LEVEL IN THE REACTOR VESSEL THAT HAS OR WILL UNCOVER FUEL IN THE REACTOR VESSEL (BD 35) OPERATING MODE: 5, 6 A.1 Failure of heat sink causes loss of Cold Shutdown condition AND A.2 LT 5 indicates 0 inches after initiation of RCS makeup B.1 Failure of heat sink causes loss of Cold Shutdown condition AND B.2 Either train ultrasonic level indication less than 0 inches and decreasing after initiation of RCS makeup NOTE: This Initiating Condition is also located in Enclosure 4.4., (Loss of Shutdown Functions). High radiation levels will also be seen with this condition. (END)	
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
	1. FAILURE OF RPS TO COMPLETE OR INITIATE A Rx SCRAM (BD 39) OPERATING MODE 1, 2, 3 A.1 *Valid* reactor trip signal received or required WITHOUT automatic scram AND A.1.1 DSS has inserted Control Rod Groups 5, 6, 7 OR A.1.2 Manual trip from the Control Room is successful and reactor power is less than 5% and decreasing **2. INABILITY TO MAINTAIN PLANT IN COLD SHUTDOWN (BD 41)** OPERATING MODE: 5, 6 A.1 Loss of LPI and/or LPSW AND A.2 Inability to maintain RCS temperature below 200° F as indicated by either of the following: A.2.1 RCS temperature at the LPI Pump Suction OR A.2.2 Average of the 5 highest CETCs as indicated by ICCM display OR A.2.3 Visual observation (END)	**1. FAILURE OF RPS TO COMPLETE OR INITIATE A Rx SCRAM (BD 42)** OPERATING MODE: 1, 2 A.1 *Valid* reactor trip signal received or required WITHOUT automatic scram AND A.2 DSS has NOT inserted Control Rod Groups 5, 6, 7 AND A.3 Manual trip from the Control Room was NOT successful in reducing reactor power to less than 5% and decreasing **2. COMPLETE LOSS OF FUNCTION NEEDED TO ACHIEVE OR MAINTAIN HOT SHUTDOWN (BD 43)** OPERATING MODE: 1, 2, 3, 4 A. Average of the 5 highest CETCs ≥1200° F shown on ICCM B. Unable to maintain reactor subcritical C. SSF feeding SG per EOP (CONTINUED)	**1. FAILURE OF RPS TO COMPLETE AUTOMATIC SCRAM AND MANUAL SCRAM NOT SUCCESSFUL WITH INDICATION OF CORE DAMAGE (BD 45)** OPERATING MODE: 1, 2 A.1 *Valid* Rx trip signal received or required WITHOUT automatic scram AND A.2 Manual trip from the Control Room was NOT successful in reducing reactor power to < 5% and decreasing AND A.3 Average of the 5 highest CETCs ≥1200° F on ICCM (END)
	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
		3. LOSS OF WATER LEVEL IN THE REACTOR VESSEL THAT HAS OR WILL UNCOVER FUEL IN THE REACTOR VESSEL (BD 44) OPERATING MODE: 5, 6 A.1 Failure of heat sink causes loss of Cold Shutdown conditions AND A.2 LT-5 indicates 0 inches after initiation of RCS Makeup B.1 Failure of heat sink causes loss of Cold Shutdown conditions AND B.2 Either train ultrasonic level indication less than 0 inches and decreasing after initiation of RCS makeup (END)	
		INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
1. LOSS OF ALL OFFSITE POWER TO ESSENTIAL BUSSES FOR GREATER THAN 15 MINUTES (BD 47) OPERATING MODE: All A.1 Loss of all offsite AC power to both the Red and Yellow Busses for > 15 minutes AND A.2 Unit auxiliaries are being supplied from Keowee or CT5 2. *UNPLANNED* LOSS OF REQUIRED DC POWER FOR GREATER THAN 15 MINUTES (BD 48) OPERATING MODE: 5, 6 A.1 *Unplanned* loss of vital DC power to required DC busses as indicated by bus voltage less than 110 VDC AND A.2 Failure to restore power to at least one required DC bus within 15 minutes from the time of loss (END)	1. LOSS OF ALL OFFSITE AC POWER AND LOSS OF ALL ONSITE AC POWER TO ESSENTIAL BUSSES (BD 49) OPERATING MODE: 5, 6 Defueled A.1 MFB 1 and 2 de-energized AND A.2 Failure to restore power to at least one MFB within 15 minutes from the time of loss of both offsite and onsite AC power 2. AC POWER CAPABILITY TO ESSENTIAL BUSSES REDUCED TO A SINGLE SOURCE FOR GREATER THAN 15 MINUTES (BD 50) OPERATING MODE: 1, 2, 3, 4 A. AC power capability has been degraded to a single power source for > 15 minutes due to the loss of all but one of: Unit Normal Transformer Unit SU Transformer Another Unit SU Transformer CT4 CT5 (END)	1. LOSS OF ALL OFFSITE AC POWER AND LOSS OF ALL ONSITE AC POWER TO ESSENTIAL BUSSES (BD 51) OPERATING MODE: 1, 2, 3, 4 A.1 MFB 1 and 2 de-energized AND A.2 Failure to restore power to at least one MFB within 15 minutes from the time of loss of both offsite and onsite AC power 2. LOSS OF ALL VITAL DC POWER (BD 52) OPERATING MODE: 1, 2, 3, 4 A.1 *Unplanned* loss of *vital* DC power to required DC busses as indicated by bus voltage less than 110 VDC AND A.2 Failure to restore power to at least one required DC bus within 15 minutes from the time of loss (END)	1. PROLONGED LOSS OF ALL OFFSITE POWER AND ONSITE AC POWER (BD 54) OPERATING MODE: 1, 2, 3, 4 A.1 MFB 1 and 2 de-energized AND A.2 SSF fails to maintain Hot Shutdown AND A.3 At least one of the following conditions exist: A.3.1 Restoration of power to at least one MFB within 4 hours is NOT likely OR A.3.2 Indications of continuing degradation of core cooling based on Fission Product Barrier monitoring (END)
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
1. *FIRES/EXPLOSIONS* WITHIN THE PLANT (BD 57) OPERATING MODE: All NOTE: Within the plant means Turbine Building, Auxiliary Building, Reactor Building, Keowee Hydro. A. Fire within the plant not extinguished within 15 minutes of Control Room notification or verification of a Control Room alarm B. Unanticipated *explosion* within the plant resulting in *visible damage* to permanent structures/equipment 2. CONFIRMED SECURITY THREAT INDICATES POTENTIAL DEGRADATION IN THE LEVEL OF SAFETY OF PLANT (BD 58) OPERATING MODE: All NOTE: RP/0/B/1000/007, (Security Event), shall be used in conjunction with all security related emergency classifications. A. Discovery of *bomb* within plant *protected area* and outside security vital areas B. *Hostage/Extortion* situation C. *Violent* civil disturbance within the owner controlled area D. *Credible* Security threat to the site (END)	1. *FIRE/EXPLOSION* AFFECTING OPERABILITY OF PLANT SAFETY SYSTEMS REQUIRED TO ESTABLISH/MAINTAIN SAFE SHUTDOWN (BD 59) OPERATING MODE: All NOTE: Only one train of a system needs to be affected or damaged in order to satisfy this condition. A.1 *Fire/explosions* AND A.1.1 Affected safety-related system parameter indications show degraded performance OR A.1.2 Plant personnel report *visible damage* to permanent structures or equipment required for safe shutdown 2 SECURITY EVENT IN A PLANT PROTECTED AREA (BD 60) OPERATING MODE: All NOTE: RP/0/B/1000/007, (Security Event), shall be used in conjunction with all security related emergency classifications. A. *Intrusion* into plant *protected area* by a hostile force B. *Bomb* discovered in an area containing safety related equipment (END)	1. SECURITY EVENT IN A PLANT VITAL AREA (BD 61) OPERATING MODE: All NOTE: RP/0/B/1000/007, (Security Event), shall be used in conjunction with all security related emergency classifications A. *Intrusion* into any of the following plant areas by a hostile force: Reactor Building Auxiliary Building Keowee Hydro B. *Bomb* detonated in any of the following areas: • Keowee Hydro • Keowee Dam • ISFSI • Reactor Building • Auxiliary Building • SSF (END)	1. SECURITY EVENT RESULTING IN LOSS OF ABILITY TO REACH AND MAINTAIN COLD SHUTDOWN (BD 62) OPERATING MODE: All NOTE: RP/0/B/1000/007, (Security Event), shall be used in conjunction with all security related emergency classifications A. Loss of physical control of the control room due to security event B. Loss of physical control of the Aux Shutdown panel and the SSF due to a Security Event (END)
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY. NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

Natural Disasters, Hazards and Other Conditions Affecting Plant Safety

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
1. NATURAL AND DESTRUCTIVE PHENOMENA AFFECTING THE *PROTECTED AREA* (BD 64) OPERATING MODE: All A. Tremor felt and *valid* alarm on the strong motion accelerograph B Tornado striking within *Protected Area* Boundary C. Vehicle crash into plant structures/systems within the *Protected Area* Boundary D. Turbine failure resulting in casing penetration or damage to turbine or generator seals (CONTINUED)	1. NATURAL AND DESTRUCTIVE PHENOMENA AFFECTING THE PLANT *VITAL* AREA (BD 69) OPERATING MODE: All A. Tremor felt and seismic trigger actuates (0.05g) B.1 Tornado, high winds, missiles resulting from turbine failure, vehicle crashes, or other catastrophic event AND NOTE: Only one train of a safety-related system needs to be affected or damaged in order to satisfy these conditions. B.1.1 *Visible damage* to permanent structures or equipment required for safe shutdown of the unit OR B.1.2 *Affected safety system parameter* indications show degraded performance 2. RELEASE OF TOXIC/FLAMMABLE GASES JEOPARDIZING SYSTEMS REQUIRED TO MAINTAIN SAFE OPERATION OR ESTABLISH *MAINTAIN COLD SHUTDOWN* (BD 71) OPERATING MODE: All A. Report/detection of *toxic gases* in concentrations that will be life-threatening to plant personnel B. Report/detection of flammable gases in concentrations that will affect the safe operation of the plant: • Reactor Building • Auxiliary Building • Turbine Building • Control Room (CONTINUED)	1. CONTROL ROOM EVACUATION AND PLANT CONTROL CANNOT BE ESTABLISHED (BD 75) OPERATING MODE: All A.1 *Control Room evacuation has been initiated* AND A.2 Control of the plant cannot be established from the Aux Shutdown Panel or the SSF within 15 minutes 2. *KEOWEE HYDRO DAM FAILURE* (BD 76) OPERATING MODE: All A. Imminent/actual dam failure includes any of the following: • Keowee Hydro Dam • Little River Dam • Dikes A, B, C, or D • Intake Canal Dike 3. OTHER CONDITIONS WARRANT DECLARATION OF *SITE AREA EMERGENCY* (BD 77) OPERATING MODE: All A. Emergency Coordinator/EOF Director judgment (END)	1. OTHER CONDITIONS WARRANT DECLARATION OF GENERAL EMERGENCY (BD 78) OPERATING MODE: All A.1 Emergency Coordinator/EOF Director judgment indicates: A.1.1 Actual/imminent substantial core degradation with potential for loss of containment OR A.1.2 Potential for *uncontrolled* radionuclide releases that would result in a dose projection at the site boundary greater than 1000 mRem TEDE or 5000 mRem CDE Adult Thyroid (END)
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
2. NATURAL AND DESTRUCTIVE PHENOMENA AFFECTING KEOWEE HYDRO (BD 66) OPERATING MODE: All A. Reservoir elevation ≥ 807 feet with all spillway gates open and the lake elevation continues to rise B. Seepage readings increase or decrease greatly or seepage water is carrying a significant amount of soil particles C New area of seepage or wetness, with large amounts of seepage water observed on dam, dam toe, or the abutments D. Slide or other movement of the dam or abutments which could develop into a failure E. Developing failure involving the powerhouse or appurtenant structures and the operator believes the safety of the structure is questionable 3. RELEASE OF TOXIC OR FLAMMABLE GASES DEEMED DETRIMENTAL TO SAFE OPERATION OF THE PLANT (BD 67) OPERATING MODE: All A. Report/detection of toxic or flammable gases that could enter within the site area boundary in amounts that can affect normal operation of the plant B. Report by local, county, state officials for potential evacuation of site personnel based on offsite event (CONTINUED)	3. TURBINE BUILDING FLOOD (BD 72) OPERATING MODE: All A. Turbine Building flood requiring use of AP/1,2,3/A/1700/10, (Turbine Building Flood) 4. CONTROL ROOM EVACUATION HAS BEEN INITIATED (BD 73) OPERATING MODE: All A.1 Evacuation of Control Room AND ONE OF THE FOLLOWING: AND A.1.1 Plant control IS established from the Aux shutdown Panel or the SSF OR A.1.2 Plant control IS BEING established from the Aux Shutdown Panel or SSF 5. OTHER CONDITIONS WARRANT CLASSIFICATION OF AN *ALERT* (BD 74) OPERATING MODE: All A.1 Emergency Coordinator judgment indicates that: A.1.1 Plant safety may be degraded AND A.1.2 Increased monitoring of plant functions is warranted (END)		
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4	INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4

UNUSUAL EVENT	ALERT	SITE AREA EMERGENCY	GENERAL EMERGENCY
4 OTHER CONDITIONS EXIST WHICH WARRANT DECLARATION OF AN *UNUSUAL EVENT* (BD 68) OPERATING MODE: All A. Emergency Coordinator determines potential degradation of level of safety has occurred (END)			
INITIAL NOTIFICATION REQUIREMENTS: SEE EMERGENCY TELEPHONE DIRECTORY NOTIFY 1, 2, 3, 4			

Radiation Monitor Readings for Emergency Classification

NOTE: IF Actual Dose Assessment **cannot be** completed within 15 minutes.
THEN The *valid* monitor reading should be used for Emergency Classification.

All RIA values are considered GREATER THAN or EQUAL TO

HOURS SINCE REACTOR TRIPPED	RIA 57 R/hr		RIA 58 R/hr*	
	Site Area Emergency	General Emergency	Site Area Emergency	General Emergency
0.0 - < 0.5	5.9E+003	5.9E+004	2.6E+003	2.6E+004
0.5 - < 1.0	2.6E+003	2.6E+004	1.1E+003	1.1E+004
1.0 - < 1.5	1.9E+003	1.9E+004	8.6E+002	8.6E+003
1.5 - < 2.0	1.9E+003	1.9E+004	8.5E+002	8.5E+003
2.0 - < 2.5	1.4E+003	1.4E+004	6.3E+002	6.3E+003
2.5 - < 3.0	1.2E+003	1.2E+004	5.7E+002	5.7E+003
3.0 - < 3.5	1.1E+003	1.1E+004	5.2E+002	5.2E+003
3.5 - < 4.0	1.0E+003	1.0E+004	4.8E+002	4.8E+003
4.0 - < 8.0	1.0E+003	1.0E+004	4.4E+002	4.4E+003

*** RIA 58 is partially shielded**

Assumptions used for calculation of high range in-containment monitors RIA 57 and 58:

1. Average annual meteorology (7.308 E^{-6} sec/m^3)
2. Design basis leakage (5.6 E^6 ml/hr)
3. One hour release duration
4. *General Emergency* PAGs are 1 rem TEDE and 5 rem CDE; *Site Area Emergency* determination is based on 10% of the *General Emergency* PAGs
5. Calculations for monitor readings are based on CDE because thyroid dose is limiting
6. No credit is taken for filtration
7. LOCA conditions are limiting and provide the more conservative reading

NOTE: This Initiating Condition is not intended to apply to anticipated temporary increases due to planned events (e.g.; incore detector movement, radwaste container movement, depleted resin transfers, etc.).

MONITOR NUMBER	UNITS 1, 2, 3	
	UNUSUAL EVENT 1000x NORMAL LEVELS mRAD/HR	*ALERT* mRAD/HR
RIA 7, Hot Machine Shop Elevation 796	150	≥ 5000
RIA 8, Hot Chemistry Lab Elevation 796	4200	≥ 5000
RIA 10, Primary Sample Hood Elevation 796	830	≥ 5000
RIA 11, Change Room Elevation 796	210	≥ 5000
RIA 12, Chem Mix Tank Elevation 783	800	≥ 5000
RIA 13, Waste Disposal Sink Elevation 771	650	≥ 5000
RIA 15, HPI Room Elevation 758	NOTE*	≥ 5000

NOTE: RIA 15 normal readings are approximately 9 mRad/hr on a daily basis. Applying 1000x normal readings would put this monitor greater than 5000 mRad/hr just for an *Unusual Event*. For this reason, an *Unusual Event* will NOT be declared for a reading less than 5000 mRad/hr.

99. GEN 2.4.6 001

Unit 1 plant conditions:

- LOCA in progress
- Core SCM indicates negative 25°F
- "Fully depressurizing both SGs" is in progress

Which ONE of the following describes the purpose for depressurizing the SGs?

To ensure the SGs:

A. remain intact.

B. do not act as a heat source.

C. tube-to-shell ΔT limits are not exceeded.

D. are getting the maximum amount of EFDW flow available.

B

A. Incorrect- the purpose of the depressurization is to ensure that the SGs act as a heat sink and not as a heat source.
B. Correct- the depressurization will cause the SGs to become a heat sink and not be a heat source. This will allow heat removal from the primary.
C. Incorrect. Not concerned about tube-to-shell delta T at this time.
D. Incorrect. EFDW pumps can supply adequate flow at normal SG pressures.

The question requires the recall of knowledge that is to specfic for the closed reference test mode. Replaced with bank question 190.

Tier:	3	Group:	
Keyword:	EOP	Cog level:	C/A 3.1/4.0
Source:	B	Exam:	OC03301
Test:	R	Author/Reviewer:	GCW

100. GEN 2.4.7 001

Unit 2 plant conditions:

INITIAL CONDITIONS:

- 2A1 RCP secured

CURRENT CONDITIONS:

- AP/29 in progress
- Reactor power = 43% decreasing
- BOP is swapping Auxiliaries:
  - When attempting to close 2TA SU 6.9 FDR, 2TA switchgear lockout occurs

Which ONE of the following describes your actions as the Procedure Director?

A. GO TO the EOP and stop AP/29 directions.

B. Refer to the EOP and continue with AP/29 in parallel.

C. Suspend AP/29 directions until 2TA switchgear can be returned to service.

D. Continue AP/29 until the GO TO OP/1102/10, Controlling Procedure for Unit Shutdown is reached.

Bank 250
A

A. Correct - When 2TA swgr lockout occurs the reactor will trip on flux/flow (loss of 2 RCPs) this meet entry conditions to the EOP. AP/29 should be stopped as the first note say AP/29 should not be used when EOP entry conditions exist. This note is conflicting later in AP/29 when tripping the reactor per AP/29 then the EOP is not entered.
B. Incorrect - AP/29 is stopped when EOP entry conditions are met.
C. Incorrect - EOP entry condition - reactor trip - have been met.
D. Incorrect - EOP entry conditions have been met

Added "RCP" to stem. Should be SRO question because it is asking for actions of the procedure director who is an SRO. Cog level should be C/A.

Tier:	3	Group:	
Keyword:	ADMIN	Cog level:	C/A 3.1/3.8
Source:	B	Exam:	OC03301
Test:	S	Author/Reviewer:	LSM/RFA