Enclosure 1

Written Examination Performance Analysis with Recommended Substantive Changes

Examination Performance Analysis

Question 11

008G2.4.24 035

Plant conditions are as follows:

- The Unit is at 90% power.
- All systems are in their normal at-power alignments.
- CCP 1A-A is running and CCP 1B-B is in stop with the control switch in A-Auto.
- A large unisolable leak occurred on the CCS supply header to Spent Fuel Pit Cooling System Heat Exchanger "A."

Which one of the following correctly describes the status of the Centrifugal Charging Pumps after the crew completes the applicable actions of AOI-15, Loss of Component Cooling Water (CCS), up to the point of initiating repairs?

A. CCP 1A-A is running, with CCS aligned. CCP 1B-B is not running, with CCS aligned.

B. CCP 1B-B is running, with CCS aligned. CCP 1A-A is not running, with CCS aligned.

C. CCP 1B-B is running, with CCS aligned. CCP 1A-A is not running, with ERCW aligned.

D. CCP 1B-B is running, with ERCW aligned. CCP 1A-A is not running, with ERCW aligned.

Answer: C

Comments and Recommendations

Accept both "A" and "C" as correct answers

The status and alignment of the CCPs is dependent on the flow path through the procedure (AOI-15, Loss of Component Cooling Water). Specifically Step 6 in Section 3.2

While formulating an answer to this question, the test taker has to determine from the question whether the loss of level is imminent. The question only states that the leak is large without quantifying the size of the leak (i.e. is CCS surge tank level dropping with makeup established or is level able to be maintained above a minimum value.) The test taker must make an assumption regarding the imminent loss question without the information being given to direct his decision. If the level loss is determined to be imminent, then the Choice "C" is the correct answer. If the level loss is not determined to be imminent, then the steps to Start

B CCP and Align ERCW to A CCP will not be performed leaving A CCP running and CCS align to the B CCP. This is the condition stated in Choice "A" making it also, a correct answer.

Both of these possible flow paths are identified on the attached copy of AOI-15.

Upon entering the instruction Section 3.2 from the Diagnostics, the "Green Line" can be followed to the key decision point at step 6. At Step 6 the "Red Line" can be followed if the determination is that the loss of level is not imminent and the "Blue Line" can be followed if the loss of level is determined to be imminent.

It can be seen that via the "Red Line" path that the answer would be Choice A and via the "Blue Line" path the answer would be Choice C.

Reference

AOI-15, Loss of Component Cooling Water

3.0 OPERATOR ACTIONS

3.1 Diagnostics

NOTE: The loss of CCS heat sink (e.g. loss of ERCW to CCS heat exchanger) should be evaluated as a loss of CCS flow (Subsection 3.2) with equipment and CCS temperatures monitored closely.

Operator should determine that a leak in CCS is occurring due noticeable decrease in flow or surge tank level and go to this procedure section.

IF	GO TO
Loss of CCS Flow, OR Surge tank level less than 60% or dropping uncontrolled.	Subsection 3.2
Surge tank level greater than 72% or rising uncontrolled OR CCS Rad Monitor alarm.	Subsection 3.3
Loss of CCS due to loss of AC power train.	AOI-35

3.2 Loss of CCS Flow/Outleakage

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. **CHECK** CCS pumps status:	
a. **CHECK** any CCS pump TRIPPED or running pump NOT pumping forward: • ERCW/CCS Motor tripout alarm, • Low header pressure (train A or B), • Multiple low flow alarms.	a. ** **GO TO** Caution prior to Step 2.
b. **CHECK** at least one U-1 Train A header supply pump RUNNING AND pumping forward: • 1A-A • 1B-B	b. **START** available U-1 Train A CCS Pump.
c. **CHECK** any Train B header supply pump RUNNING AND pumping forward: • C-S • 2B-B	c. **START** available Train B CCS pump, OR **REFER** to SOI-70.01 to align CCS pump 1B to Train B header as necessary.
d. **PLACE** any non-operable or tripped CCS pump in STOP/PULL-TO-LOCK.	
e. **CHECK** TWO U-1Train A header supply pumps RUNNING: • 1A-A • 1B-B	e. **ENSURE** at least one of the following CLOSED to avoid excessive flow: • RHR htx A, 1-FCV-70-156, OR • SFP htx A, 0-FCV-70-197.

(step continued on next page)

3.2 Loss of CCS Flow/Outleakage (Continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	(continued from previous page)	
	f. **CHECK** flows returned to NORMAL.	f. ** **GO TO** Caution prior to Step 2.
	g. **CHECK** A and B side surge tank levels between 57% and 85%.	g. **IF** surge tank level less than 57%, **THEN** ** **GO TO** Caution prior to Step 2. **IF** surge tank level greater than 85%, **THEN** ** **GO TO** Section 3.3.
	h. ** **GO TO** Step 15.	
CAUTION	**A closed surge tank vent valve may cause a positive or negative tank pressure, giving an erroneous level indication.**	
2.	**CHECK** 1-FCV-70-66, U1 Surge Tank Vent, OPEN.	**OPEN** 1-FCV-70-66, U1 Surge Tank Vent.
3.	**IF** surge tank level less than 57%, **THEN** **ENSURE** 1-LCV-70-63, U1 Surge Tank Makeup LCV, OPEN (Refer to SOI-70.01 as required if makeup not available).	
4.	**MONITOR** A and B side surge tank levels greater than 10%.	**STOP** affected CCS pumps.

3.2 Loss of CCS Flow/Outleakage (Continued)

ACTION/EXPECTED RESPONSE **RESPONSE NOT OBTAINED**

5. **IF** RHR Shutdown Cooling is in service, **THEN**
** **GO TO** AOI-14, Loss Of RHR Shutdown Cooling.

Key decision point - decision is based upon surge tank level.

CAUTION **CCP may survive for only 10 to 12 minutes after loss of CCS to lube oil cooler.**

6. **MONITOR** U-1 CCS Train A level and if loss is imminent, **THEN** **PERFORM** the following:

If NO go to RNO

** **GO TO** Step 7.

If YES continue

a. **ENSURE** CCP 1B-B is RUNNING.

INITIATE alignment of ERCW to CCP 1A-A lube oil heat exchanger USING Attachment 1 (may use placard placed locally in CCP room 1A-A).

** **GO TO** Substep c.

b. **ENSURE** CCP 1A-A is STOPPED.

c. **ISOLATE** Letdown and Charging.

d. **STOP** and **LOCKOUT** the following pumps:

- TBBPs 1-A & 1-B,
- CCS pumps 1A-A & 1B-B,
- CS PUMP 1A-A,
- RHR PUMP 1A-A,
- SI Pump 1A-A,
- CCP 1A-A.

(step continued on next page)

3.2 Loss of CCS Flow/Outleakage (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6. (continued from previous page)

CAUTION RCPs can be operated for up to 10 minutes after loss of CCS flow.

e. **TRIP** Reactor.

f. **STOP** RCPs.

g. ** **GO TO** E-0, Reactor Trip or Safety Injection, WHILE continuing this instruction.

h. **INITIATE** alignment of ERCW to CCP 1A-A lube oil heat exchanger USING Attachment 1 (may use placard placed locally in CCP room 1A-A).

CAUTION CCS should not be re-established to RCP seals on a total loss of cooling due to probable damage to the seals. ECA-0.0, Loss of Shutdown Power, has guidance to isolate RCP seals.

i. **IF** CCS train B is available AND CCP 1B-B is in service, **THEN** ** **GO TO** Substep k.

WHEN ERCW cooling is aligned to CCP 1A-A, **THEN EVALUATE** performing the following based on time thermal barrier and RCP seal injection flow lost:

a. **START** CCP 1A-A.

b. **STOP** CCP 1B-B.

(step continued on next page)

3.2 Loss of CCS Flow/Outleakage (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. (continued from previous page) j. **IF** thermal barrier flow lost and RCP seal injection flow not re-established, **THEN REFER TO** ECA-0.0, LOSS OF SHUTDOWN POWER, to isolate RCP seals. k. **IF** CCS Train A, Unit 1 & 2, is not available, **THEN ALIGN** CCS Train B to SFP Hx B USING Attachment 2.	
7. **MONITOR** U-1 CCS Train B level and if loss is imminent, **THEN STOP** and **LOCKOUT** the following Train B equipment: • CCS PUMPS C-S & 2B-B, • CS PUMP 1B-B, • RHR PUMP 1B-B, • SI PUMP 1B-B, • CCP 1B-B.	From Step 6 RNO with no change to CCS alignment or CCPs

3.2 Loss of CCS Flow/Outleakage (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. **CHECK** all RCP upper and lower oil cooler flows NORMAL: • Upper Cooler flow: 150-220 gpm • Lower Cooler flow: 5-10 gpm	**IF** oil cooler flow abnormally high or low indicating possible line break, **THEN**: a. **CLOSE** RCP oil cooler isol valves: • 1-FCV-70-100 or 1-FCV-70-140, RCP Oil Clrs Sup CIV. • 1-FCV-70-89 or 1-FCV-70-92, RCP Oil Clrs Ret CIV.
CAUTION RCPs can be operated for up to 10 minutes after loss of CCS flow.	
	b. **TRIP** Reactor. c. **STOP** RCPs. d. ** **GO TO** E-0, Reactor Trip or Safety Injection.

3.2 Loss of CCS Flow/Outleakage (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION **Seal injection water must be maintained to all RCPs following isolation of thermal barriers.**	
9. **CHECK** Thermal Barrier Hx flows NORMAL. • Thermal Barrier flow 40-50 gpm	**IF** flow abnormally high or low indicating possible line break, **THEN**: a. **ENSURE** Thermal Barrier Booster pumps STOPPED. b. **ENSURE** the following isol valves CLOSED: • 1-FCV-70-133 or 1-FCV-70-134, Thermal Barrier Supply CIV. • 1-FCV-70-87 or 1-FCV-70-90, Thermal Barrier Return CIV. c. **IF** RCP lower bearing temp rising uncontrolled (180 °F max), **THEN** **REFER TO** AOI-24, Reactor Coolant Pump Seal Abnormalities.

3.2 Loss of CCS Flow/Outleakage (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. **CHECK** 1A ESF Supply Header flow NORMAL, 1-FI-70-159A. • Normal ~100 gpm with RHR out of service.	**IF** flow abnormally high, **THEN**: a. **ENSURE** CCP 1-B in service, OR **PLACE** ERCW on CCP 1-A per Attachment 1. b. **STOP** and **LOCKOUT** the following pumps: • CS PUMP 1A-A, • RHR PUMP 1A-A, • SI Pump 1A-A, • CCP 1A-A. c. **CLOSE** bkr to 1-FCV-70-2 [Rx Mov Bd 1A2-A c/14A]. d. **CLOSE** 1-FCV-70-2, 1A ESF Equipment Supply Header. e. **CHECK** flood alarm panel [6.9kV SD Bd Rm A, el. 757]. f. **DISPATCH** operators to inspect 1A ESF Supply Header and components for leaks. g. **ISOLATE** leaks.

3.2 Loss of CCS Flow/Outleakage (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11. **CHECK** 1B ESF Supply Header flow NORMAL, 1-FI-70-165A. • Normal 5000-6000 gpm with RHR in service.	**IF** flow abnormally high, **THEN**: a. **ENSURE** CCP 1-A in service. b. **STOP** and **LOCKOUT** the following pumps: • CS PUMP 1B-B, • RHR PUMP 1B-B, • SI Pump 1B-B, • CCP 1B-B. c. **CLOSE** bkr to 1-FCV-70-3 [Rx Mov Bd 1B2-B c/14B]. d. **CLOSE** 1-FCV-70-3, 1B ESF Eq Sup Hdr. e. **DISPATCH** operators to inspect 1B ESF Sup Hdr and components for leaks. f. **ISOLATE** leaks.
12. **CHECK** SFP Hx A flow NORMAL, 0-FI-70-20. • Normal 2700-3500 gpm with SFP Hx A in service.	**IF** flow abnormally high, **THEN** **CLOSE** the following: • 0-FCV-70-197, SFP Hx A Supply. • 0-ISV-70-529A, SFPCS Hx A CCS isol [A7W/737]. AND • Refer to SOI-78.01 to place SFP Hx B in service.

3.2 Loss of CCS Flow/Outleakage (Continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13.	**CHECK** SFP Hx B flow NORMAL, 0-FI-70-6. • Normal top of scale with SFP Hx B in service (may require local observation to determine if leak exists).	**IF** flow abnormally high, **THEN** **CLOSE** the following: • 0-FCV-70-194, SFP Hx B Supply. • 0-ISV-70-529B, SFPCS Hx B CCS Isol [A6W/737]. AND • Refer to SOI-78.01 to place SFP Hx A in service.
14.	**IF** leak location can be isolated, **THEN** **RETURN** CCS surge tank to normal level (refer to SOI-70.01).	**IF** leak can NOT be isolated, **THEN** **CLOSE** 1-LCV-70-63, U1 Surge Tank Makeup LCV.
15.	**EVALUATE** affected equipment operation USING Appendix A.	
16.	**WHEN** CCS returned normal, **THEN** **CHECK** only one CCS pump per Train and one TBBP running.	**IF** 2 CCS pumps or 2 TBBPs running, **THEN** **STOP** second running pump and Return HS to A-P AUTO.
17.	**REFER TO** Tech Specs 3.7.7, Component Cooling Water System (CCS).	
18.	**INITIATE** repairs.	

3.2 Loss of CCS Flow/Outleakage (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
↓ ↓	
19. **WHEN** repairs are complete, **THEN**:	
a. ENSURE 1-HS-70-63A, U1 SURGE TANK MAKEUP LCV in P-AUTO	
b. ENSURE CCS, CVCS, CS pumps, RHR pumps & SI pumps are in normal alignment • REFER to SOI-70.01 Component Cooling Water (CCS) • REFER to SOI 62.01, CVCS-Charging and letdown • REFER to SOI 72.01, Containment Spray System • REFER to SOI 74.01, Residual Heat Removal System • REFER to SOI 63.01, Safety Injection System	
20. **RETURN TO** Instruction in effect.	

-END OF SUBSECTION -

Question 13

010G2.4.48 036

Plant conditions are as follows:

- Unit 1 was operating at 100% steady state power.
- The pressurizer pressure control system is operating normally.
- A Steam Generator PORV inadvertently opened while returning it to service.
- RCS pressure decreased to 2205 psig before operators were able to close the SG PORV.

If the only action operators take is to close the SG PORV, which one of the following correctly describes the response of the pressurizer pressure control system?

A. Pressurizer pressure will stabilize at 2235 psig.
Pressurizer spray valves will be open.

B. Pressurizer pressure will stabilize at 2235 psig.
Pressurizer spray valves will be closed.

C. Pressurizer pressure will stabilize at 2260 psig.
Pressurizer spray valves will be open.

D. Pressurizer pressure will stabilize at 2260 psig.
Pressurizer spray valves will be closed.

Answer: A

Comments and Recommendations

Accept both "A" and "B" as correct answers

The question, as written, tests the knowledge of the Backup heater Bank "C" being energized due to the stated pressure decrease and then remaining in service as the pressure rises. Depending upon the amount of leakage through the spray valves and settings of the pressurizer spray bypass valves, the position of the spray valves could be from some position open to fully closed.

By design the spray valves would be partially open to maintain pressure at the 2235 psig setpoint. This would result in the "A" choice being the correct answer as stated on the answer key.

The question was written to plant design; recent conditions on the unit result in a slightly different response. The flow through the pressurizer spray bypass valves combined with leakage through the spray valves is sufficient to offset the effects of the "C" bank heaters. With these conditions, the "D" bank variable heaters would be energizing to maintain pressure at setpoint and the pressurizer spray valves would be closed.

Bank "C" heaters on and the pressurizer spray valves indicating closed, with Bank "D" heaters modulating is a condition the trainees have observed during their time on shift. This results in the "B" choice also being a correct answer.

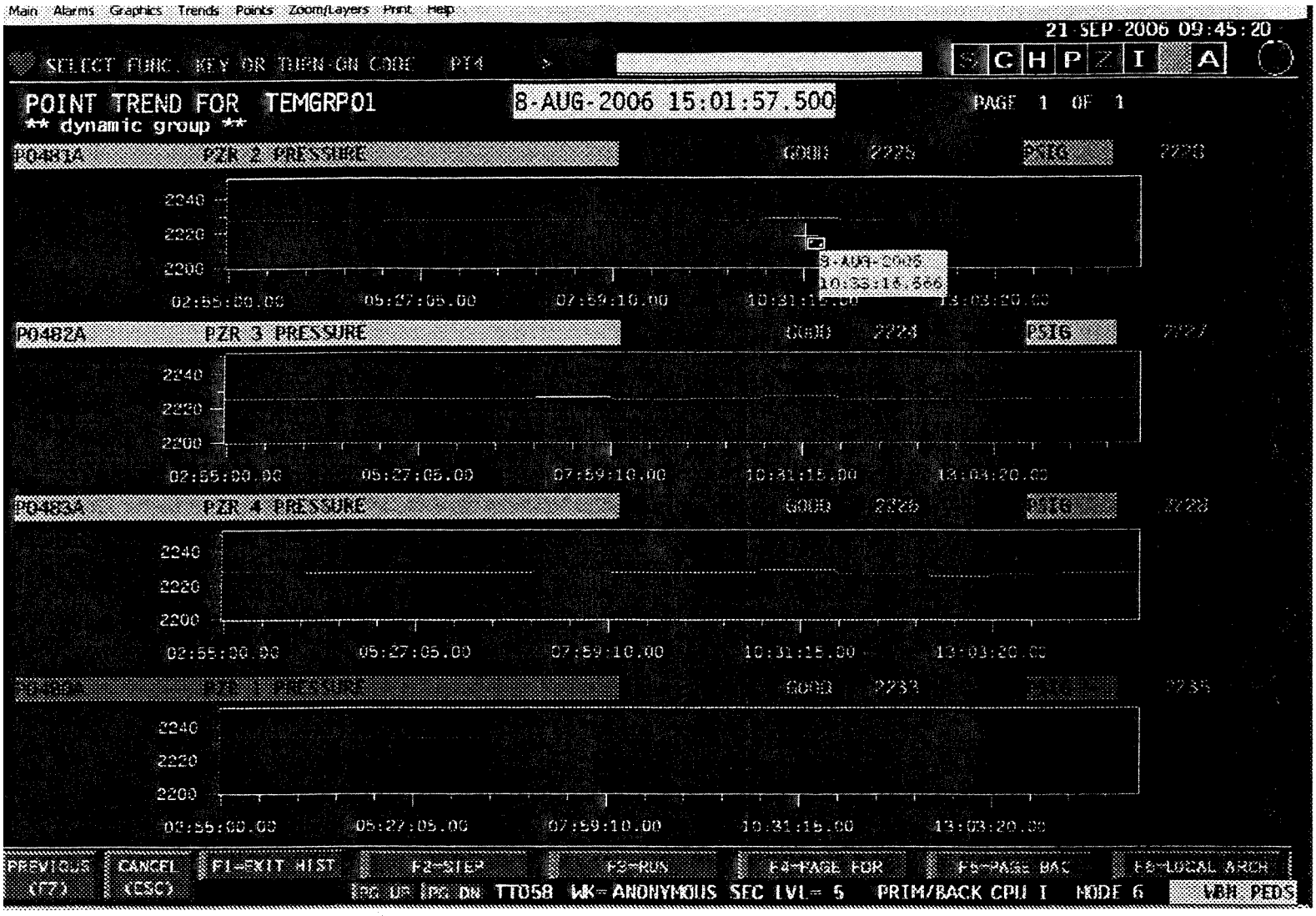
This condition had not been observed in previous fuel cycles. The pressurizer spray bypass valves are scheduled to be replaced in the current on-going refueling outage.

1021 Appendix E, Policies and Guidelines for Taking NRC examinations, states "... Finally answer all questions based on actual plant operation, procedures, and references. If you believe that the answer would be different based on simulator operation or training references, you should answer the question based on the actual plant

3 graphs are attached showing pressurizer pressure, pressurizer spray valve position, and pressurizer spray valve demand. This data is from August 8, 2006 while the unit was in service at 100% power. The C Bank pressurizer heater was energized during this time. As can be seen, the pressure was stable at 2235 psig and the pressurizer spray valves were not open and did not have a demand to open.

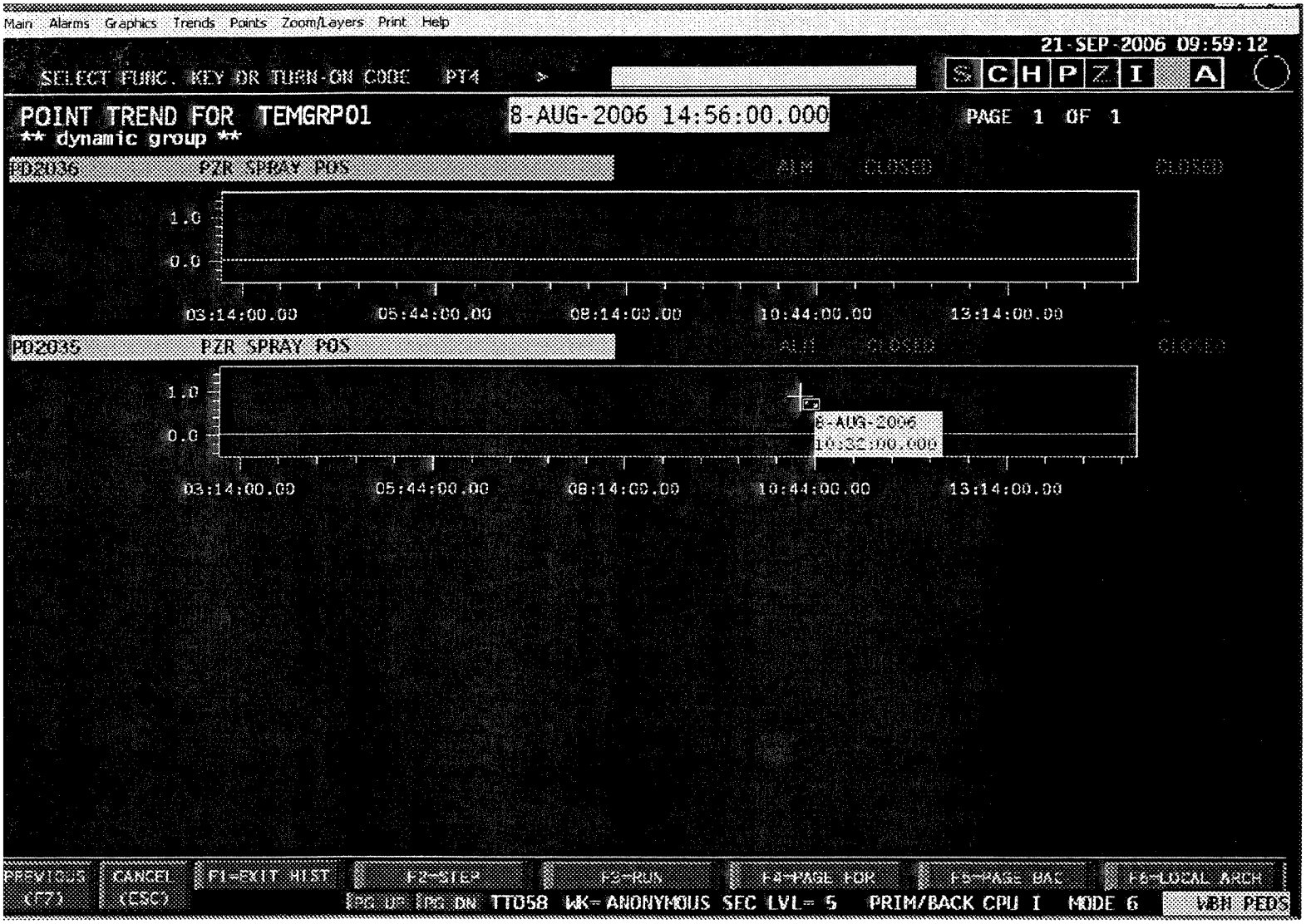
Reference

Plant Data



PZR PRESSURE

AUG 8, 2006



PZR SPRAY VALVE POSITION

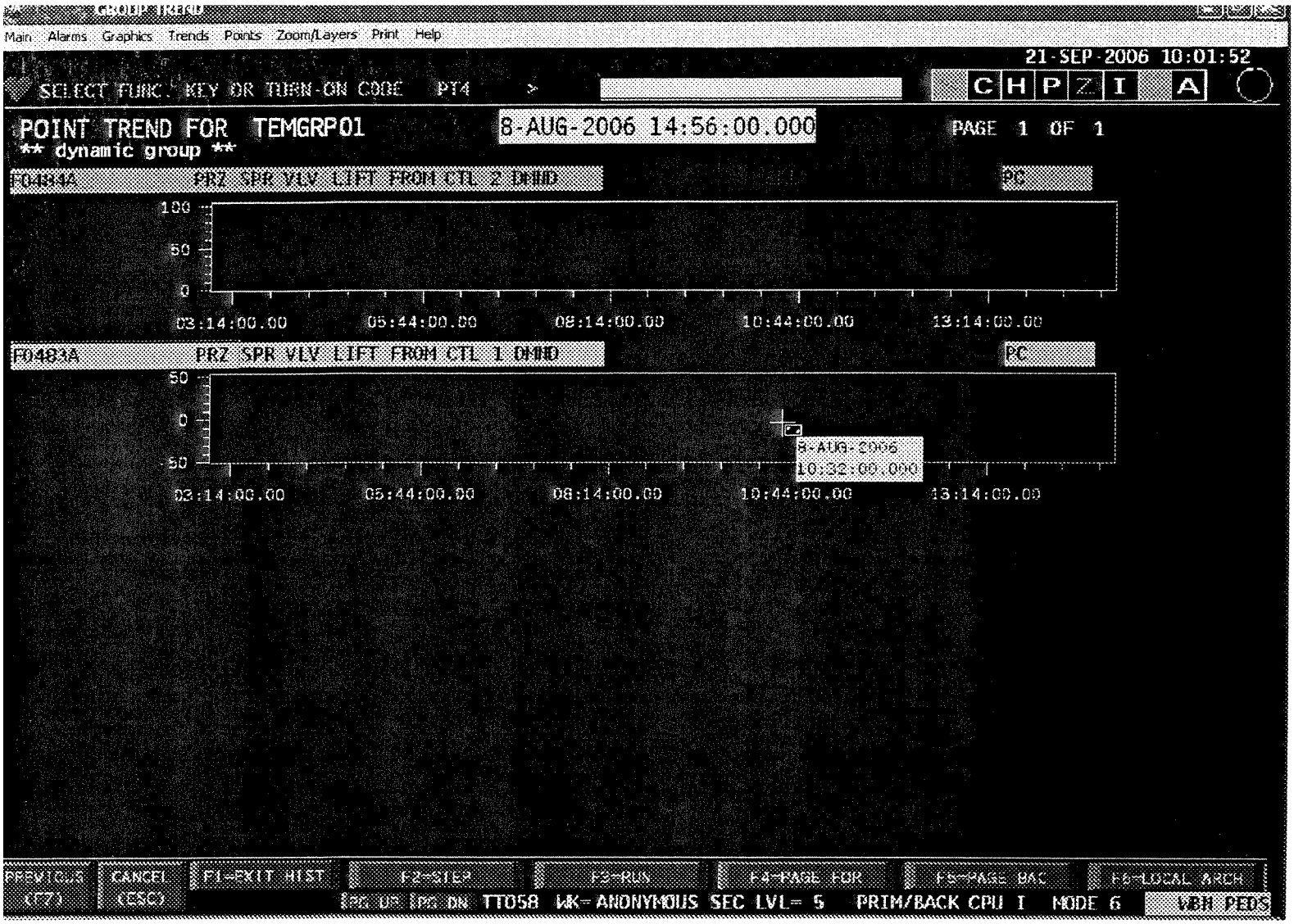
AUG 8, 2006

PD2035 (LOWER) 1-PCV-068-340B

PD2036 (UPPER) 1-PCV-068-340D

Ø IS CLOSED

1 IS OPEN



SPRAY VALVE DEMAND (0 TO 100%)

AUG 8, 2006

F0483A (LOWER) 1-PIC-68-340B DEMAND

F0484A (UPPER) 1-PIC-68-340D DEMAND

0% IS CLOSED

100% IS FULL OPEN

Question 19

022AA1.03 005

At 10:00, plant conditions were as follows:

- 100% steady state power
- All RCP paramaters were normal
- Normal charging and letdown were in service per SOI-62.01, CVCS - Charging and Letdown
- Letdown flow: 75 gpm
- Total Charging flow: 100 gpm
- Seal Injection Flow: 10 gpm per RCP
- Assume seal return flow is 3 gpm per RCP

At 12:00, plant conditions were as follows:

- 100% steady state power
- All RCP parameters were normal
- Normal charging and letdown were isolated per SOI-62.01, CVCS - Charging and Letdown
- Excess letdown was in service per SOI-62.01, CVCS - Charging and Letdown
- Excess Letdown flow: At design flow rate
- Seal Injection Flow: 10 gpm per RCP
- Assume seal return flow is 3 gpm per RCP

Which one of the following correctly describes the trend in pressurizer level at 10:00 and 12:00?

Pressurizer level at 10:00 was _____ and pressurizer level at 12:00 was _____.

A. Increasing Increasing

B. Increasing Decreasing

C. Decreasing Increasing

D. Decreasing Decreasing

Answer: A

Comments and Recommendations

Date _____ INITIALS

8.3 Establishing Excess Letdown

CAUTIONS

1) **RCP Seal leakoff flow must be within limits specified in Appendix B of SOI-68.02, according to the #1 seal differential pressure. As excess letdown is placed in service, the #1 seal leakoff flow could potentially fall below the limit.**
2) **With normal Letdown isolated, C_B may only be raised small amounts, to avoid excessive letdown to the RCDT.**

NOTES

1) RADCON Shift Supervisor should be notified of intent to place Excess Letdown in service.
2) Charging and RCP seal flow must be manually controlled.

[1] **OPEN** Excess LDHX CCS valves:

NOMENCLATURE	LOCATION	POSITION	UNID	PERF INITIAL
EXC LTDN HX SUP CIV-ØA	0-M-27B	OPEN	1-HS-70-143A	
EXC LTDN HX OUT CIV-ØA	0-M-27B	OPEN	1-HS-70-85A	

[2] **CHECK** 1-HS-62-59A, CVCS EXCESS LETDOWN **DIVERT** FLOW CNTL, aligned to one of the following (**N/A** choice **NOT** aligned):

[2.1] NORM _____

[2.2] DIV _____

Date _____ INITIALS

8.3 Establishing Excess Letdown (continued)

NOTE

As VCT level rises, 1-LCV-62-118, LETDOWN DIVERT TO HUT, Auto Diverts to HUT.

[3] **PERFORM** the following:

NOMENCLATURE	LOCATION	POSITION	UNID	PERF INITIAL
EXCESS LTDN ISOL	1-M-5	OPEN	1-HS-62-54A	
EXCESS LETDOWN ISOLATION	1-M-5	OPEN	1-HS-62-55A	

CAUTION

Excess letdown design flow is 20 gpm. Preop W-2.1 determined that 1-FCV-62-56, CVCS EXCESS LETDOWN FLOW CONTROL, can pass up to 50 gpm (depending on RCS pressure and 1-HIC-62-56A output), which could cause higher than designed excess letdown and CCS temperature.

NOTE

If excess letdown is being placed in service in preparation for 1-TRI-62-901, flow may be maintained at a small value to allow piping and the heat exchanger to remain at an elevated temperature and pressure.

[4] **SLOWLY OPEN** 1-HIC-62-56A, EXCESS LTDN FLOW CONTROL, to maintain Excess LD Hx Outlet temperature below 206°F and Excess LD Hx CCS Outlet temperature below 135°F. _____

Question 21

022K3.01 040

Which one of the following describes the effect of a rapid increase in Containment Lower Compartment air temperature from 102°F to 125°F over a 10 minute period?

A. Damage to the Control Rod Drive Mechanisms.

B. Damage to Neutron Detectors and/or associated cables.

C. Reduction in Pzr PORV lift setpoint.

D. Affects Pzr Safety Valve leakage.

Answer: D

Comments and Recommendations

Delete the question from the test due to technical inaccuracy.

None of the answers are correct.

The question asks for the effect of a rapid increase in Containment Lower Compartment air temperature. Precaution D in SOI-30.03 addresses the changes in pressurizer enclosure temperature. Changes in temperature in lower containment can occur without seeing the same effect in the pressurizer enclosure temperature. Changes in the pressurizer enclosure temperature can occur due to changes in air flow without changing lower containment temperature. See precaution H in the attached SOI- 30.03

SOI-30.3, Precaution and Limitation D reads "Pzr Enclosure temperature must be monitored before and after starting or stopping Lower CNTMT Coolers. Rapid heat up rates effect Pzr Safety Valve leakage. The US should be notified of any drastic change in Pzr Enclosure temperature."

The question should have read *"Which one of the following describes the effect of a rapid increase in Pressurizer Enclosure air temperature from 102°F to 125°F over a 10 minute period?"* to get the desired answer.

Additionally, 2 charts are included showing the pressurizer enclosure wall temperature and containment temperature at the reactor shield wall. These charts are from August 23, 2006 while the unit was at 100% power. It should be noted that there is approximately 16°F difference between the 2 temperatures.

Reference

SOI-30.03, Containment HVAC and Pressure Control

3.0 PRECAUTIONS AND LIMITATIONS

A. Cooler air inlets should be checked to be free of debris before they are started.

B. When only 2 Lower CNTMT Coolers are in service, it is preferable to have one fan running in the North Fan Rm (Fan 1B-B or 1C-A), and one fan running in the South Fan Rm (Fan 1A-A or 1D-B).

C. Lower CNTMT Coolers, CRDM Coolers, and RCP Motor Coolers are supplied by the same ERCW header.

D. Pzr Enclosure temperature must be monitored before and after starting or stopping Lower CNTMT Coolers. Rapid heat up rates effect Pzr Safety Valve leakage. The US should be notified of any drastic change in Pzr Enclosure temperature.

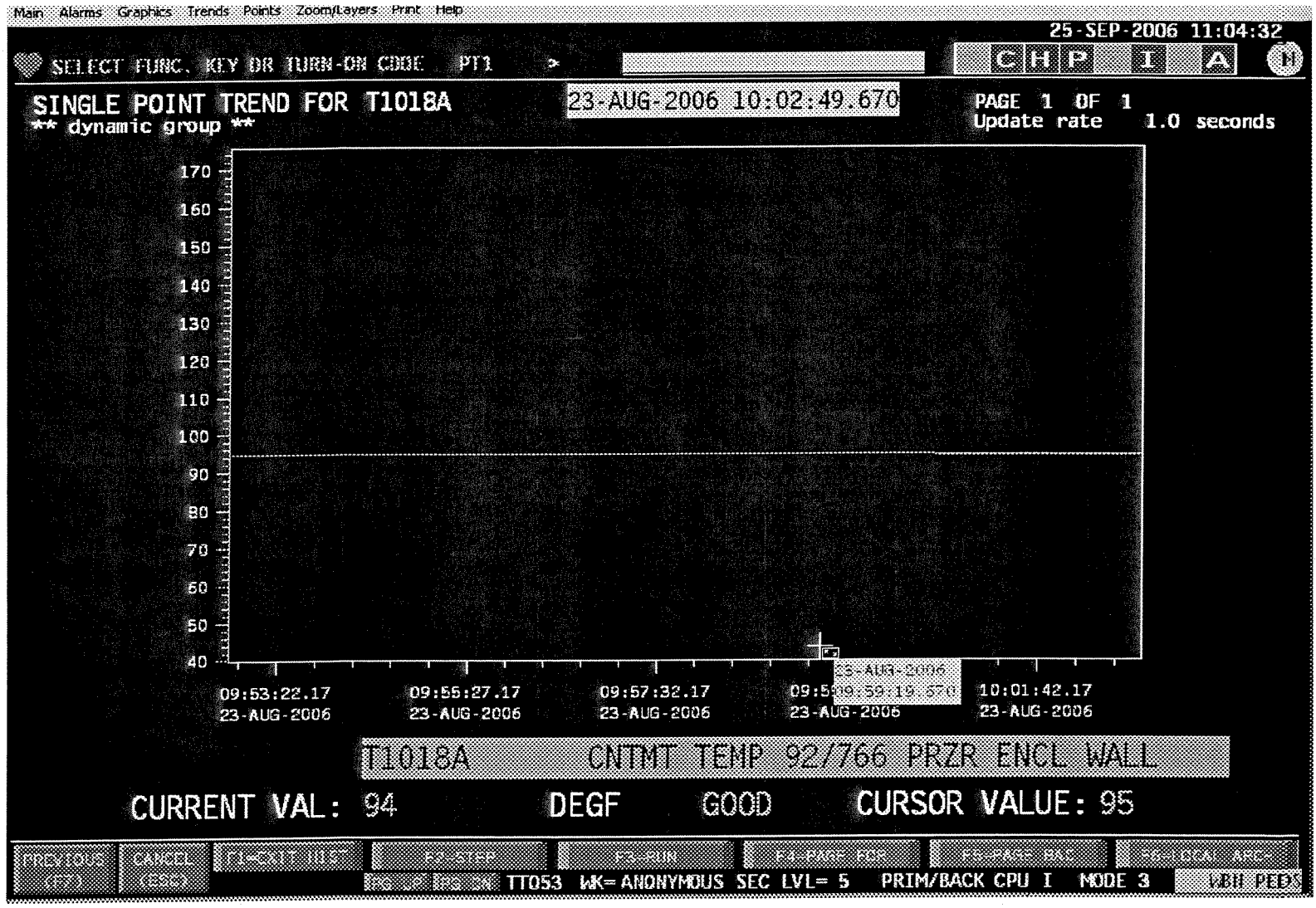
E. CRDM coolers must be in service BEFORE T_{hot} exceeds 180°F.

F. Personnel should be clear of CRDM cooler outlets before a cooler is started.

G. Upper CNTMT Average Air Temp must be maintained 87.1°F to 107.9°F , and Lower CNTMT 102.5°F to 117.5°F, in Modes 1,2,3,4. Maximum Lower Compartment average air temperature can be raised to 119°F, and Minimum Lower Compartment average air temperature can be lowered to 101°F, if ALL of the temperature inputs and U9020 are reliable (in other words, NONE of the computer points have a quality code of "BAD"). The points can be displayed on computer group display for LWR AVG.

H. Operating certain three-cooler combinations may not adequately cool EQ spaces in lower containment. During operation in this condition, added attention should be provided to the lower compartment EQ spaces, especially the pressurizer compartment temperature (computer point T1001A) to ensure the spaces are maintained at or below their maximum normal temperatures. EQ temperature limits are identified in 1-PI-OPS-1-MCR.

I. CNTMT press must be maintained -0.07 to +0.27 psid relative to the Annulus. Annulus ΔP should be maintained at least 5.4 in. H_2O.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PAGE 1 OF 1
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160
150
140
130
120
110
100
90
80
70
60
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09:57:32.17 23-AUG-2006
10:01:42.17 23-AUG-2006
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PREVIOUS (F7)
CANCEL (ESC)
F1-EXIT MENU
F2-STEP
F3-RUN
F4-PAGE FOR
F5-PAGE BAK
SPECIAL APPS
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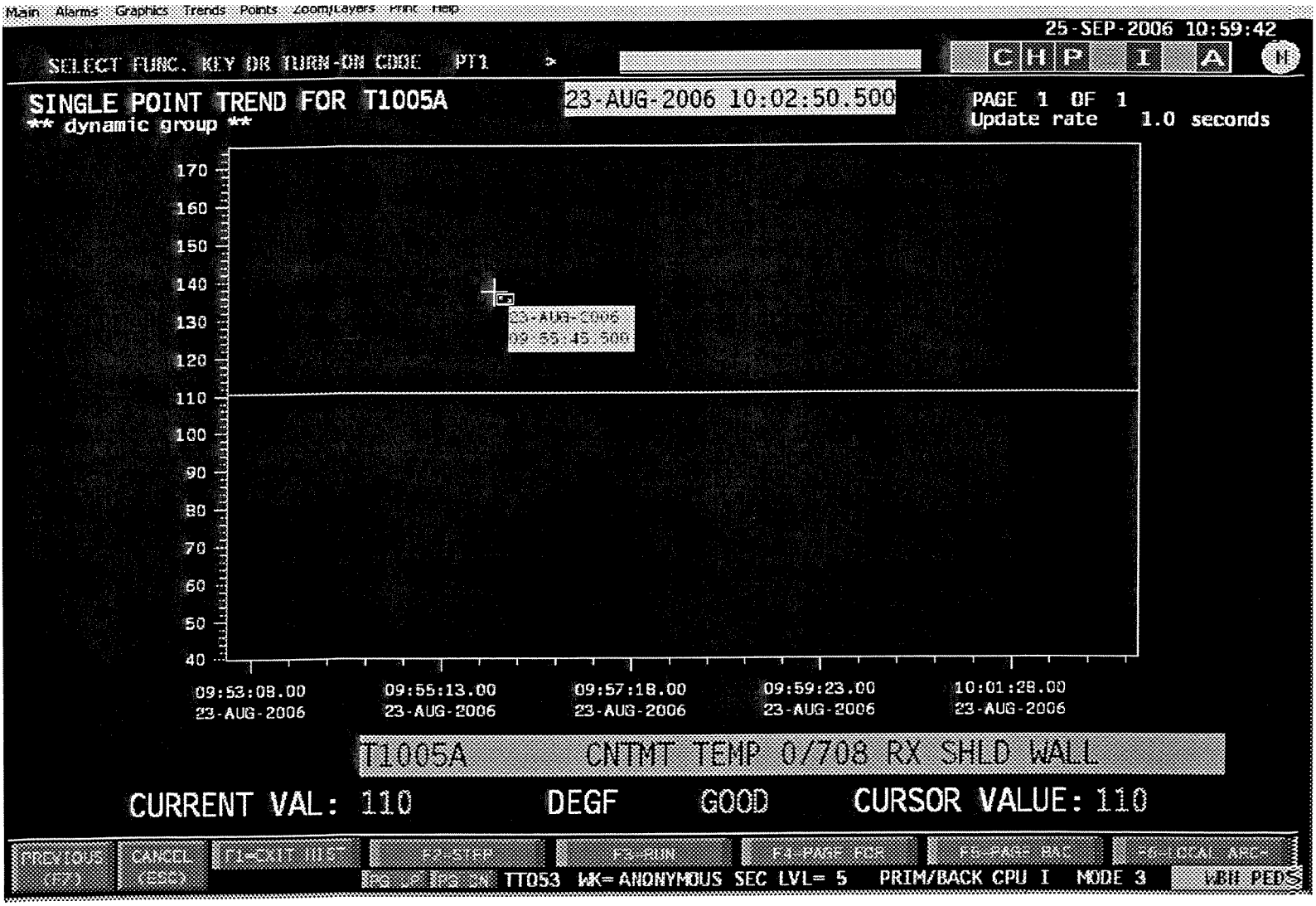
WBH PEDS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PAGE 1 OF 1
Update rate 1.0 seconds
170
160
150
140
130
120
110
100
90
80
70
60
50
40
09:53:08.00 23-AUG-2006
09:55:13.00 23-AUG-2006
09:57:18.00 23-AUG-2006
09:59:23.00 23-AUG-2006
10:01:28.00 23-AUG-2006
T1005A CNTMT TEMP 0/708 RX SHLD WALL
CURRENT VAL: 110 DEGF GOOD CURSOR VALUE: 110
PREVIOUS (F3)
CANCEL (ESC)
F1-EXIT TREND
F2-STEP
F3-RUN
F4-PAGE FOR
F5-PAGE BAC
F6-SCAN ARC
TT053 WK= ANONYMOUS SEC LVL= 5 PRIM/BACK CPU I MODE 3
WBH PED

Question 24

025AA2.05 006

The Unit is shut down and just completed cooling down to Mode 4 for a forced outage:

Plant conditions at 08:10 were as follows:

- RHR Train B in service, using 1-FCV-74-1 and 2, Loop 4 Hot Leg to RHR Suction valves, per SOI-74.01, Residual Heat Removal.
- 1B-B RHR Pump flow rate: 2800 gpm.
- RCS temp 240°F and stable.

At 08:15 a loss of RHR occurred due to a trip of the 1B-B RHR Pump.

- The crew entered AOI-14, Loss of RHR Shutdown Cooling.
- The RCS reached a maximum temperature of 295°F at 09:15 before Train A RHR cooling was restored.

Plant conditions at 09:45 were as follows:

- RHR Train A in service, using 1-FCV-74-1 and 2, Loop 4 Hot Leg to RHR Suction valves, per SOI-74.01, Residual Heat Removal.
- 1A-A RHR Pump flow rate 3500 gpm.
- RCS temp 260°F and decreasing.

Which of the following RHR system limitations was/were violated?

Reference Provided

A. Only the RHR administrative heatup rate limit was exceeded.

B. Only the RHR Pump 1A-A flow limit was exceeded.

C. Both the RHR administrative heatup limit and the RHR Pump 1A-A flow limits were exceeded.

D. Both the RHR administrative heatup and cooldown rate limits were exceeded.

Answer: A

Comments and Recommendations

Delete the question from the test due to technical inaccuracy.

SOI-74.01, Residual Heat Removal System, Precautions and Limitations contains the following:

> **G.** If operating RHR above 235°F, then the following limitations apply:9
> **1.** RHR system heatup and cooldown rate should not exceed 50°F per hour and must not exceed 100°F per hour (except for the initial transient when tying RHR onto hot RCS).

The 50°F per hour cooldown and heatup rate is not stated an Administrative limit. The limit stated is 100°F per hour. The 50°F is a target that should not be exceeded.

Reference

SOI-74.01, Residual Heat Removal System

3.0 PRECAUTIONS AND LIMITATIONS

A. Work in a Radiological Control Area (RCA) requires the use of existing RWPs, and may require additional ALARA Preplans. Failure to follow posted Rad control requirements can cause unnecessary radiation exposure. Rad Con should be notified of work having the potential to change radiological conditions.

B. Failure to have both trains of RHR System CB at the required value before placing the RHR System in service may result in unavailability of one train RHR due to inadequate CB. This is particularly important during midloop operation, due to the difficulty in adjusting CB on a Standby RHR train while in midloop.

C. With RHR Letdown isolated no operations shall reduce the CB in CVCS components below the CB in the RHR.[15]

D. RHR System chemistry shall meet RCS chemistry limits in accordance with CM-3.01.

E. Failure to comply with the WBN RCS Pressure and Temperature Limits Report (PTLR), could result in thermal shock to RCS components.

F. RHR operation at temperatures less than 235°F ensures RWST static head will maintain RHR suction pressure above saturation. In the event injection flow is required, with temperature greater than 235°F, voiding and subsequent RHR Pump damage may occur.

G. If operating RHR above 235°F, then the following limitations apply:[9]

1. RHR system heatup and cooldown rate should not exceed 50°F per hour and must not exceed 100°F per hour (except for the initial transient when tying RHR onto hot RCS).

2. If a running RHR pump trips, or is shutdown without cooling to less than 235°F as indicated on RHR Heat Exchanger inlet recorder, then both pumps handswitches must be placed in Pull-To-Lock, and remain in Pull-To-Lock while pumps are shutdown to preclude exceeding cooldown limits if inadvertently started.

3. RHR hot leg suction line must be cooled to less than 235°F before placing RHR System in ECCS Standby Mode.

H. RHR System may cause radiation in various parts of the Auxiliary Bldg to rise after changes in flow and piping alignment.

I. When RCS level is below the Pzr, the RHR System should be in one-loop operation.

Question 34

038EA1.29 009

Plant conditions are as follows:

- The Unit was operating at full power, with all equipment in a normal alignment.
- A 300 gpm SGTR occurred on #3 SG.
- While performing E-0, Reactor Trip or Safety Injection, the crew noted the following:
- 109-A, VCT Level Hi/Lo alarm was lit due to transmitter 1-LT-62-129 failing high.
- The crew has performed E-3, Steam Generator Tube Rupture, up to step 53, Go To appropriate Post-SGTR cooldown method.

Which one of the following correctly describes the source of water to the CVCS pumps for the plant conditions given above?

A. Charging pump suction is aligned to the RWST.
Initiate makeup to RWST as necessary per SOI-62-02, Boron Concentration Control.

B. Charging pump suction is aligned to the RWST.
When RWST level is less than 34%, then go to ES-1.3, Transfer to RHR Containment Sump.

C. Charging pump suction is aligned to the VCT.
Auto makeup to the VCT will occur on low VCT level.

D. Charging pump suction is aligned to the VCT.
Auto makeup to the VCT will NOT occur on low VCT level.

Answer: C

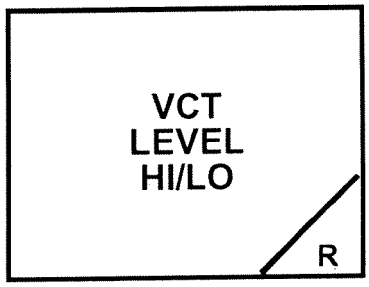
Comments and Recommendations

Accept both "A" and "C" as correct answers

The E-3 procedure would have the charging pump suction realigned to the VCT and automatic make-up available making choice "C" a correct answer.

Adding the failure of 1-LT-62-129 in the stem of the question results in full diversion of letdown flow. Depending on the letdown flow rate and the settings of the automatic makeup flow controllers for dilution and boric acid, the VCT level could continue to drop resulting in having to realign the VCT to the RWST in

SOURCE		SETPOINT
1-LS-62-129D/E	(HI)	65 inches (93%)
1-LS-62-130A/B	(HI)	
1-LS-62-129B/A	(LO)	9 inches (13%)
1-LS-62-130F	(LO)	



Probable Cause:

1. Divert valve malfunction or misalignment
2. Auto makeup malfunction
3. VCT level transmitter 1-LT-62-129A or -130A malfunction
4. Charging / Letdown Flow mismatched

CAUTION 1 **If either VCT level transmitter fails high, then auto swap over to RWST on low level is disabled.**

CAUTION 2 **1-LT-62-129A failing high will divert letdown flow but will not prevent auto makeup. 1-LI-62-129 will indicate offscale high; however, computer point L0112A will indicate actual level.**

CAUTION 3 **1-LT-62-130A failing high will divert letdown and prevent auto makeup; however, 1-LI-62-129 will indicate actual level.**

Corrective Action:

[1] **IF** high level, **THEN**
- **[a]** **ENSURE** 1-LCV-62-118 diverted to HUT and **OPEN**.
- **[b]** **ENSURE** NO VCT makeup in progress.

[2] **IF** low level, **THEN**
- **ENSURE** 1-LCV-62-118 aligned to VCT.
- **INITIATE** makeup in accordance with SOI-62.02, *BORON CONCENTRATION CONTROL*.
- **ENSURE** suction to the Centrifugal Charging Pump swaps over to the RWST at 7% VCT level.

[3] **VERIFY** letdown and charging in service and that Reactor Coolant Filter is not clogged.

[4] **IF** 1-LCV-62-118 diverted to HUT due to instrument failure, **THEN**
- **[a]** **PLACE** 1-HS-62-118 in VCT position until repairs completed.
- **[b]** **PLACE** 1-HS-62-118 in P-AUTO position when repairs completed.

[5] **IF** RCS leakage is suspected, **THEN**
GO TO AOI-6, *SMALL REACTOR COOLANT SYSTEM LEAK*.

References: 1-45W600-62-3, 1-47W610-62-3
AOI-6, SOI-62.02

Question 37

054AA1.04 011

Plant conditions are as follows:

- The Unit tripped from 100% power due to a loss of all main feedwater.
- 6.9 kV Shutdown Board 1A-A is deenergized and cannot be reenergized
- The 1B-B charging pump is out of service for motor bearing replacement.
- All S/G NR levels are 5% and lowering
- RCS pressure is 2235 psig and stable
- The crew has not been able to establish AFW flow per E-0, Reactor Trip or Safety Injection
- The SRO has just announced that the Heat Sink status tree is Red

Which one of the following correctly describes the actions the crew will take to establish RCS cooling after entering FR-H.1, Loss of Secondary Heat Sink

A. Establish flow to at least one S/G using the Standby MFW pump.

B. Depressurize at least one S/G and establish condensate flow to the depressurized S/G(s).

C. Depressurize at least one S/G and align HPFP to the depressurized S/G(s).

D. Establish RCS feed and bleed using the 1B-B SI pump and both pzr PORVs.

Answer: C

Comments and Recommendations

Delete the question from the test due to technical inaccuracy.

The question as written has 3 correct answers. All 4 choices describe actions the crew would take in FR-H.1 to establish RCS cooling. Choice D identifies the first action, however the stem did not specify the first action, only to describe actions the crew would take. Choices A and B are actions the crew would take, given the conditions of no AFW available, while the feed and bleed operation was ongoing. Establishing adequate water level in a S/G is the only way to terminate the feed and bleed.

Note prior to Step 29 states "The details of steps 4 through 15 may be referred to as necessary to establish feed flow in the following step but procedure performance must continue to terminate RCS bleed and feed."

Step 29 **Evaluate the following to restore level in at least one S/G:**

a. AFW pumps.
b. MFW pumps.
c. Condensate pumps.
d. RECW valves to AFW suction.
e. HPFP spool piece (AOI-7.06).

Step 30 **Check all RCS bleed and feed criteria met:**

- **At least one S/G NR level greater than 10% [25% ADV].**
- Incore T/C dropping.
- T-hot dropping.

Step 4 through 15 being used in accordance with the note prior to step 29 will result in the starting of the Standby Main Feed pump (Step 10 & Step 13) and if that is not successful then at least one steam generator will be depressurized and condensate flow established (Step 15)

Reference

FR-H.1, Loss of Heat Sink

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT

EMERGENCY OPERATING INSTRUCTIONS

FR-H.1

LOSS OF SECONDARY HEAT SINK

Revision 15

Unit 1

QUALITY RELATED

REQUESTED BY: S. Baker

SPONSORING ORGANIZATION: OPERATIONS

APPROVED BY: George Vickery

EFFECTIVE DATE: 9/25/02

LEVEL OF USE: CONTINUOUS

1.0 PURPOSE

This Instruction provides actions to respond to a loss of secondary heat sink in all steam generators.

2.0 SYMPTOMS AND ENTRY CONDITIONS

2.1 Indications

All S/G NR levels less than or equal to 10% [25% ADV] and total AFW flow less than or equal to 410 gpm.

2.2 Transitions

A. E-0, Reactor Trip or Safety Injection.

B. ES-0.1, Reactor Trip Response.

C. FR-0, Status Trees, FR-H in RED condition.

3.0 OPERATOR ACTIONS

Step	Action/Expected Response	Response Not Obtained

CAUTION
- **If total feed flow CAPABILITY of 410 gpm is available, this Instruction should NOT be performed.**
- **If an Intact S/G is available, feed flow should NOT be reestablished to any faulted S/G.**

1. **CHECK** if secondary heat sink is required:

   a. RCS pressure greater than any Intact S/G pressure.

   a. **RETURN TO** Instruction in effect.

   b. RCS temperature greater than 375°F [360°F ADV].

   b. **PLACE** RHR System in service while continuing in this instruction.
   - **REFER TO** SOI-74.01, Residual Heat Removal System.

   WHEN adequate RHR shutdown cooling established,
   THEN
   RETURN TO Instruction in effect.

2. **ENSURE** at least one charging pump RUNNING.

   IF at least one charging pump **NOT** RUNNING,
   THEN
   STOP all RCPs AND

   ** **GO TO** Cautions prior to Step 18 to initiate RCS bleed and feed.

Step	Action/Expected Response	Response Not Obtained

CAUTION **RCS bleed and feed criteria must be monitored for immediate response if the criteria is exceeded.**

3. **DETERMINE** if RCS bleed and feed required:

   a. **MONITOR** RCS bleed and feed criteria:

   - Any THREE S/G WR levels less than or equal to 34% [42% ADV].

     OR

   - RCS pressure greater than or equal to 2335 psig.

   a. ** **GO TO** Step 4.

   b. **STOP** all RCPs, and
   ** **GO TO** Cautions prior to Step 18 to initiate RCS bleed and feed.

4. **ENSURE** S/G blowdown ISOLATED.

Step	Action/Expected Response	Response Not Obtained
5.	**MONITOR** CST volume greater than 200,000 gal.	**INITIATE** CST refill USING SOI-59.01, Demineralized Water System. **IF** CST volume drops to less than 5000 gal, **THEN** **MONITOR** AFW pumps to ensure suction transfer.
	NOTE If the use of condensate flow is anticipated, then a higher pzr level will better accommodate the level shrink from S/G cooldown and depressurization.	
6.	**CONTROL** pzr level between 29% and 63% [47% and 57% ADV].	

Step	Action/Expected Response	Response Not Obtained

NOTE Feedwater flow to a dry S/G should not exceed 100 gpm UNTIL wide range level is greater than 15% [25% ADV] to minimize thermal stress.

7. **ESTABLISH** MD AFW pump flow:

a. **ENSURE** both MD AFW pumps RUNNING.

a. **START** pumps from the shutdown boards.

b. **ENSURE** AFW LCVs OPEN.

b. **OPEN** valves from the auxiliary control room,

OR

Locally **OPEN** valves USING SOI-3.02, Auxiliary Feedwater System.

c. **CHECK** MD AFW pump flow greater than 410 gpm.

c. **ENSURE** AFW valve alignment USING SOI-3.02, Auxiliary Feedwater System.

d. **IF** either of the following conditions are met:

- Total AFW flow greater than 410 gpm,

  OR

- NR level in at least one S/G greater than 10% [25% ADV].

THEN
RETURN TO Instruction in effect.

d. ** **GO TO** Step 8.

Step	Action/Expected Response	Response Not Obtained
8.	**ESTABLISH** TD AFW pump flow:	
	a. **ENSURE** turbine steam supply valves OPEN: • Either 1-FCV-1-15 or 1-FCV-1-16. • 1-FCV-1-17 and 1-FCV-1-18 • Trip and throttle valve.	a. **OPEN** steam supply valves from reactor MOV boards. **IF** trip and throttle valve 1-FCV-1-51 closed, **THEN** **CHECK** the following: • Valve latched to motor operator. • Mechanical overspeed reset. • Thermal overloads reset.
	b. **ENSURE** AFW LCVs OPEN.	b. **OPEN** LCVs at auxiliary control panel [TD pump room, 692], **OR** Locally **OPEN** LCVs: • S/G 1 and 4 [south vlv room]. • S/G 2 and 3 [Aux Bldg 737].
	c. **CHECK** TD AFW pump speed NORMAL.	c. Locally **CONTROL** TD AFW pump.
	d. **CHECK** TD AFW pump flow greater than 410 gpm.	d. **ENSURE** AFW valves aligned USING SOI-3.02, Auxiliary Feedwater System.
	e. **IF** either of the following conditions are met: • Total AFW flow greater than 410 gpm, **OR** • NR level in at least one S/G greater than 10% [25% ADV]. **THEN** **RETURN TO** Instruction in effect.	e. ** **GO TO** Step 9.

Step	Action/Expected Response	Response Not Obtained

9. **STOP** all four RCPs.

10. **IF** Standby MFW pump is available,
THEN
REFER TO Appendix A (FR-H.1), Establishing MFW following Reactor Trip, while continuing this Instruction.

Step	Action/Expected Response	Response Not Obtained

CAUTION
- **If offsite power is lost after SI reset, manual action will be required to restart the SI pumps and RHR pumps due to loss of SI start signal.**
- **If plant conditions degrade after automatic SI is blocked, manual actuation may be required.**

11. **BLOCK** SI signals:

a. **INITIATE** RCS depressurization to less than 1912 psig:

1) **IF** letdown available,
THEN
ALIGN aux pzr spray USING APPENDIX B (FR-H.1) ALIGN AUX SPRAY.

1) **IF** letdown is **NOT** available,
THEN
USE one pzr PORV.

b. **BLOCK** auto SI actuation signals [68-B], and [69-B]:

1) **ENSURE** RCS pressure less than 1962 psig (P-11) [69-A].
2) **BLOCK** Low steam pressure SI
3) **BLOCK** Low pzr pressure SI.

b. **IF** any SI signal can **NOT** be blocked,
THEN
NOTIFY IMs to block auto SI USING IMI-99.040, AUTO SI Block.

c. **ENSURE** high cntmt pressure SI signal CLEARED [78-G].

c. **IF** cntmt pressure SI signal can **NOT** be cleared,
THEN
NOTIFY IMs to block auto SI USING IMI-99.040, AUTO SI Block.

d. **CHECK** SI actuated.

d. ** **GO TO** Substep 11f.

e. **RESET** SI, and
CHECK the following:
- SI ACTUATED permissive DARK.
- AUTO SI BLOCKED permissive LIT.

e. **NOTIFY** IMs to block Auto SI USING IMI-99.040, AUTO SI Block, to allow MFW isolation reset.

f. **MAINTAIN** RCS pressure less than 1912 psig.

Step	Action/Expected Response	Response Not Obtained

NOTE
- Cycling reactor trip breakers to allow MFW Isolation reset is only required if SI or HI-HI S/G level has occurred.
- If any SI signal is present with Auto SI blocked, cycling reactor trip breakers will initiate SI.

12. **PREPARE** for MFW startup:

a. **PLACE** MFW pump controllers in MANUAL, and **SET** to zero.

b. **PLACE** MFW reg valve controllers in MANUAL, and **SET** to zero.

c. **PLACE** MFW reg bypass valve controllers in MANUAL, and **SET** to zero.

d. **CHECK** FW bypass isolation valves OPEN.

d. **PERFORM** the following:

1) **WHEN** SI signals are blocked **OR** cleared,
THEN
CYCLE reactor trip breakers to allow MFW Isolation reset.

2) **RESET** MFW isolation:

a. **PLACE** both MFW isol reset switches to RESET [M-3].

b. **ENSURE** MFW isol signal clears [M-6 Master Panel].

c. **PUSH** MFW isol reset push-buttons [M-3].

d. **ENSURE** MFW bypass isol valves OPEN.

3) **PLACE** 1-HS-3-45 in FORWARD FLUSH

IF no FW bypass isolation valve can be opened,
THEN
** **GO TO** Step 17.

Step	Action/Expected Response	Response Not Obtained

NOTE • If the standby feed pump will be used, only the hotwell pumps should be started to prevent an overpressure condition.

13. **ESTABLISH** feedwater flow:

a. **START** secondary plant pumps as necessary:
   1) Hotwell pumps.
   2) Condensate booster pumps.
   3) Cond DI booster pumps.

a. **IF** secondary plant pumps are **NOT** available,
THEN
** **GO TO** Step 14.

b. **CHECK** MSIVs OPEN.

b. **IF** MSIVs can be OPENED,
THEN:
   1) **OPEN** MSIV bypass valves.
   2) **OPEN** MSIVs as necessary.

c. **ESTABLISH** MFW pump flow:
   1) **START** MFW pump turbine OR standby feed pump.
   2) **CONTROL** MFW pump and bypass reg valve(s) to restore S/G level(s).

c. **IF** MFW pump flow is **NOT** established,
THEN:
   • **START** additional secondary plant pumps as necessary.
   • ** **GO TO** Step 14.

Step	Action/Expected Response	Response Not Obtained
14.	**CHECK** secondary heat sink restored: a. NR level in at least one S/G greater than 10% [25% ADV]	a. **IF** feed flow established to at least one S/G: • S/G Wide Range level rising, OR • Incore T/C dropping. **THEN** **MAINTAIN** flow to restore NR level to greater than 10% [25% ADV]. **IF** feed flow NOT established to at least one S/G, **THEN** ** **GO TO** Note prior to Step 15.
	b. **RETURN TO** Instruction in effect.	

Step	Action/Expected Response	Response Not Obtained

NOTE Feedwater bypass reg valves should be carefully controlled to prevent overfeeding the steam generators or condensate pump runout.

15. **ESTABLISH** condensate flow:

a. **ENSURE** condensate aligned to S/Gs:

1) **OPEN** MFW pump bypass valve 1-FCV-3-86.

2) **THROTTLE OPEN** bypass reg valves.

b. **DEPRESSURIZE** at least one S/G at maximum rate (25% demand) USING steam dump to condenser UNTIL condensate flow established.

b. **IF** condenser **NOT** available, **THEN**
USE S/G PORV(s) for at least one intact S/G at maximum rate.

c. **WHEN** condensate flow is established,
THEN
STOP S/G depressurization.

Step	Action/Expected Response	Response Not Obtained
16.	**CHECK** secondary heat sink restored: a NR level in at least one S/G greater than 10% [25% ADV]	a. **IF** feed flow established to at least one S/G, • S/G Wide Range level rising, OR • Incore T/C dropping. **THEN** **MAINTAIN** flow to restore NR level to greater than 10% [25% ADV] **IF** feed flow NOT established to at least one S/G, **THEN** ** **GO TO** Step 17.
	b. **RETURN TO** Instruction in effect.	
17.	**CHECK** for loss of secondary heat sink:	
	a. Any THREE S/G WR levels less than 34% [42% ADV]. OR RCS pressure greater than or equal to 2335 psig.	a. **RETURN** to Step 1.

Step	Action/Expected Response	Response Not Obtained

CAUTION

- **Step 18 Through 23 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed.**
- **Termination of bleed and feed is required prior to transitioning out of FR-H.1 when heat sink is restored.**

18. **ACTUATE** SI.

19. **ESTABLISH** at least one of the following RCS feed paths:
    - At least one charging pump injecting thru BIT,

      OR
    - At least one SI Pump running with its injection valves open.

    IF injection path **NOT** available, **THEN:**
    1) **CONTINUE** attempt to establish RCS feed path.
    2) ** **GO TO** Step 4.

NOTE 90 seconds must elapse after SI actuation before SI can be reset.

20. **RESET** SI, and CHECK the following:
    - SI ACTUATED permissive DARK.
    - AUTO SI BLOCKED permissive LIT.

    NOTIFY IMs to block AUTO SI USING IMI-99.040, Auto SI Block.

21. **RESET** Containment Isolation Phase A and Phase B.

Step	Action/Expected Response	Response Not Obtained
22.	**ENSURE** cntmt air in service:	
	a. Aux air press greater than 75 psig [M-15].	a. **DISPATCH** Operator to aux air compressors: 1) **ENSURE** affected compressor(s) running. 2) **ENSURE** affected train isolation valve CLOSED: • Train A, 0-FCV-32-82. • Train B, 0-FCV-32-85.
	b. Cntmt air supply valves OPEN [M-15]: • 1-FCV-32-80. • 1-FCV-32-102. • 1-FCV-32-110.	

Step	Action/Expected Response	Response Not Obtained

CAUTION

- **When the reactor vessel head vent block valve is opened, the throttle valve will cycle open and closed.**
- **Slowly opening (5 seconds stroke time) the head vent valve will prevent water hammer and pipe damage.**

23. **ENSURE** adequate RCS bleed path:

- Both pzr PORVs OPEN.
- Both pzr PORV block valves OPEN.

PERFORM the following:

1) **RESTORE** power to head vents:
   - **PLACE** 1-SW-68-394-A disconnect switch to ON [125V Vital Batt Bd Rm I].
   - **PLACE** 1-SW-68-395-B disconnect switch to ON [125V Vital Batt Bd Rm II].
2) **OPEN** all reactor vessel head vent and block valves.
3) **OPEN** ERCW valves to AFW pump suction,

   OR

   ALIGN HPFP to at least one Intact S/G USING the following:
   - AOI-7.06, Alignment of HPFP Water to the Steam Generators.
   - MI-17.018, Flood Preparation - HPFP System Spool Pieces.
4) **DEPRESSURIZE** at least one intact S/G to atmospheric press with S/G PORV.

24. **PERFORM** Steps 1 through 11of E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this Instruction.

Step	Action/Expected Response	Response Not Obtained

25. **MAINTAIN** RCS bleed and feed paths:
    - MAINTAIN charging pump injection thru BIT.
    - MAINTAIN SI pump flow.
    - MAINTAIN both pzr PORVs and block valves OPEN.

CAUTION If containment pressure rises to greater than 2.8 psig, containment spray should be verified.

26. **DETERMINE** if cntmt spray should be stopped:

a. Spray pumps running.	a. **IF** both spray pumps stopped, **THEN** ** **GO TO** Step 29.
b. **MONITOR** cntmt pressure less than 2.0 psig.	b. **WHEN** cntmt pressure is less than 2.0 psig, **THEN** ** **PERFORM** substeps 26c thru 26e.
c. **RESET** containment spray signal.	
d. **STOP** cntmt spray pumps and PLACE in A-AUTO.	
e. **CLOSE** cntmt spray discharge valves 1-FCV-72-2 and 1-FCV-72-39.	

27. **WHEN** RWST level is less than 34%
THEN
** **GO TO** ES-1.3, TRANSFER TO RHR CONTAINMENT SUMP.

Step	Action/Expected Response	Response Not Obtained

28. **ENSURE** CCS alignment for RHR operation:

    a. RHR heat exchanger B outlet 1-FCV-70-153 OPEN.

    b. RHR heat exchanger A outlet 1-FCV-70-156 OPEN.

    c. SFP heat exchanger A supply 0-FCV-70-197 CLOSED.

NOTE The details of Steps 4 through 15 may be referred to as necessary to establish feed flow in the following step but procedure performance must continue to terminate RCS bleed and feed.

29. **EVALUATE** the following to restore level in at least one S/G:

    a. AFW pumps.

    b. MFW pumps.

    c. Condensate pumps.

    d. ERCW valves to AFW suction.

    e. HPFP spool piece (AOI-7.06).

30. **CHECK** all RCS bleed and feed termination criteria met:

    - At least one S/G NR level greater than 10% [25% ADV].
    - Incore T/C dropping.
    - T-hot dropping.

CONTINUE RCS bleed and feed UNTIL all criteria met.

CONTINUE actions to restore secondary heat sink.

** **GO TO** Note prior to Step 29.

Step	Action/Expected Response	Response Not Obtained

CAUTION

- **The reactor head vent throttle valve position indication may not be accurate. Monitoring of the PRT level, pressure, and temperature is required to confirm throttle valve position.**
- **Isolation of a failed throttle valve requires both reactor vessel head vent block valves to be closed.**

31. **ENSURE** reactor head vent valves CLOSED.

32. **IF** head vents previously opened,
THEN
REMOVE power from head vents:
    - **PLACE** 1-SW-68-394-A disconnect switch to OFF [125V Vital Batt Bd Rm I]
    - **PLACE** 1-SW-68-395-B disconnect switch to OFF [125V Vital Batt Bd Rm II].

Step	Action/Expected Response	Response Not Obtained

NOTE After closing a pzr PORV, it may be necessary to wait for RCS pressure to rise before checking if SI can be terminated.

33. **CHECK** if SI can be terminated:

a. RVLIS greater than 60%. — a. ** **GO TO** Step 34.

b. RCS subcooling greater than required from Table: — b. ** **GO TO** Step 34.

RCS PRESSURE BETWEEN	REQUIRED SUBCOOLING
285 AND 585 psig	115°F [135°F ADV]
585 AND 1085 psig	102°F [123°F ADV]
1085 AND 1885 psig	97°F [117°F ADV]
Greater than 1885 psig	94°F [114°F ADV]

c. ** **GO TO** Step 35.

Step	Action/Expected Response	Response Not Obtained
34.	**CHECK** RCS bleed path status:	
	a. **CHECK** any pzr PORV and associated block valve OPEN.	a. ** **GO TO** E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
	b. **CLOSE** one pzr PORV	b. **CLOSE** PORV block valve. **IF** block valve can **NOT** be closed, **THEN** ** **GO TO** E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
	c. **RETURN TO** Note prior to Step 33.	
35.	**STOP** ECCS Pumps, AND **PLACE** in standby: • SI pumps. • All but one Charging Pump.	
36.	**CHECK** RCS bleed path status:	
	a. **CHECK** any pzr PORV and associated block valve OPEN.	a. ** **GO TO** Step 37.
	b. **CLOSE** all but one pzr PORV.	b. **CLOSE** associated PORV block valves. **IF** block valves can **NOT** be closed, **THEN** ** **GO TO** E-1, LOSS OF REACTOR OR SECONDARY COOLANT.

Step	Action/Expected Response	Response Not Obtained
37.	**TERMINATE** Bleed and Feed:	
	a. **CLOSE** both pzr PORVs.	a. **CLOSE** associated PORV block valves. **IF** block valve can **NOT** be closed, **THEN** ** **GO TO** E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
	b. **CLOSE** BIT outlet isolation valves 1-FCV-63-25 and 1-FCV-63-26.	
38.	**ALIGN** Charging:	
	a. **CLOSE** RCP seal flow control 1-FCV-62-89.	
	b. **OPEN** charging isolations 1-FCV-62-90 and 1-FCV-62-91.	
	c. **ENSURE** charging valve 1-FCV-62-85 or 1-FCV-62-86 **OPEN**.	
	d. **OPEN** seal return valves 1-FCV-62-61 and 1-FCV-62-63.	
	e. **ADJUST** 1-FCV-62-89 and 1-FCV-62-93 to maintain seal injection flow between 8 and 13 gpm for each RCP.	

Step	Action/Expected Response	Response Not Obtained
39.	**CHECK** T-hots STABLE or DROPPING.	**CONTROL** feed flow and steam dump as necessary to establish stable T-hots.
40.	**CHECK** if RHR pumps should be stopped:	
	a. **CHECK** RCS Pressure: 1) Greater than 150 psig. 2) Stable or rising.	a. ** **GO TO** E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
	b. **STOP** RHR Pumps, **AND PLACE** in A-AUTO.	
41.	**CONTROL** charging flow to maintain pzr level.	
42.	** **GO TO** ES-1.1, SI TERMINATION, Step 11.	

– End –

APPENDIX A
(FR-H.1)
Page 1 of 1

ESTABLISHING MFW FOLLOWING REACTOR TRIP

CAUTION
- **Rx trip breakers must be cycled to allow reset of MFW when isolated by SI or HI-HI S/G level or Valve Vault Room level switches.**
- **If any SI signal is present with AUTO SI blocked, cycling Rx trip breakers will initiate SI actuation.**

1. **ENSURE** MFW mode switch, 1-HS-3-45, in FORWARD FLUSH.
2. **ENSURE** MFW reg valves controllers in MANUAL, and **SET** to ZERO demand.
3. **ENSURE** bypass reg valves controllers in MANUAL, and **SET** to ZERO demand.
4. **WHEN** SI signals blocked OR cleared,
   THEN
   CYCLE reactor trip breakers to allow MFW Isolation reset.
5. **RESET** MFW isolation:
   a. **PLACE** both MFW isolation reset switches to RESET [M-3].
   b. **ENSURE** MFW isolation signal clears [M-6 Master Panel].
   c. **PUSH** MFW isolation reset push-buttons [M-3].
6. **ENSURE** MFW bypass isolation valves OPEN.
7. **ENSURE** standby MFW pump RUNNING.
8. **CONTROL** S/G levels with MFW bypass reg controllers.

APPENDIX B
(FR-H.1)
Page 1 of 1

ALIGN AUX SPRAY

1. **ENSURE** at least one charging pump running.
2. **ALIGN** charging:
   a) **OPEN** charging isolation 1-FCV-62-90 and 1-FCV-62-91.
   b) **ENSURE** charging 1-FCV-62-85 or 1-FCV-62-86 OPEN.
   c) **OPEN** seal return 1-FCV-62-61 and 1-FCV-62-63.
3. **ENSURE** BIT outlet valves 1-FCV-63-25 AND 1-FCV-63-26 CLOSED.
4. **CONTROL** aux spray flow:
   a) **OPEN** aux spray 1-FCV-62-84.
   b) **CLOSE** charging 1-FCV-62-85 and 1-FCV-62-86.
   c) **MODULATE** Pzr Spray valves as needed to control Pzr pressure.
   d) **ADJUST** aux spray flow rate with 1-FCV-62-93 and 1-FCV-62-89 as needed.

Question 44

061K5.05 047

Which one of the following conditions could result in damage to a Motor Driven Auxiliary Feedwater (MDAFW) pump per SOI-3.02, Auxiliary Feedwater System?

A. Pump suction pressure falls below 2 psig due to low CST level.

B. One Steam Generator Level Control Valve fails to auto close when feedwater header pressure drops below 500 psig.

C. Backleakage in the AFW loop supply piping has caused pump casing temperature to rise to 200°F

D. The 2" intermediate (170 gpm) recirculation line flow control valve fails to automatically close when a MDAFW pump start signal is generated.

Answer: C

Comments and Recommendations

Accept both "A" and "C" as correct answers

If the B AFW pump suction pressure fell below 2 psig it could be deduced that the automatic swap over to ERCW which should have occurred at 2 psig failed and that the B AFW pump would be damaged due to loss of suction.
No damage to the A AFW pump could be assumed from the condition since the pressure had not dropped to the swapover setpoint, but he question does not specify which pump or pumps, only "damage to a pump" and B could be damaged.

SOI-3.02, Auxiliary Feedwater System 3.0 Precautions and Limitations D

> If Motor-Driven AFW Pump's suction pressure falls below 1.2 psig (A Train) or 2.0 psig (B Train) for 10 seconds, the suction will shift to ERCW supply. The Turbine-Driven AFW Pump suction ERCW supply will shift at the same time the associated trains MDAFW Pump suction shifts.

Reference

SOI-3.02, Auxiliary Feedwater System

3.0 PRECAUTIONS AND LIMITATIONS

A. Work in Radiologically Controlled Areas (RCAs) requires the use of existing Radiation Work Permits (RWPs) and may require additional ALARA Preplans. Failure to follow posted Rad control requirements can cause unnecessary radiation exposure. Rad Con should be notified of work having the potential to change radiological conditions.

B. Instrument maintenance department should be notified to ensure required instrumentation is placed in service to support system operation.

C. Pump recirculation valves must remain LOCKED-OPEN.

D. If Motor-Driven AFW Pump's suction pressure falls below 1.2 psig (A Train) or 2.0 psig (B Train) for 10 seconds, the suction will shift to ERCW supply. The Turbine-Driven AFW Pump suction ERCW supply will shift at the same time the associated trains MDAFW Pump suction shifts.

E. AFWT rated speed is 3950 rpm; minimum speed is 2076 rpm.
- Electrical Overspeed TRIP at 4345 rpm (110%).
- Mechanical Overspeed TRIP at 4937.5 rpm (125%).

F. A visual check is required to verify Trip and Throttle (T&T) valve motor operator is latched to the valve stem after resetting is to ensure the valve will OPEN on an automatic pump start signal. [3,5,8]

G. When charging a cold steam line to AFWT, the valve should be locally throttled to warm the line slowly to avoid water hammer.

H. Tech Spec LCOs require all AFW Pumps OPERABLE in MODES 1, 2, and 3, and only 1 MD AFW Pump required OPERABLE in MODE 4.

I. Main Steam must be at or above 125 psig for T-D Pump to be OPERABLE.

J. The following computer points indicate backleakage in each loop supply piping:
- Loop 1 - log T-2425 (variable)
- Loop 2 - log T-2426 (190°F)
- Loop 3 - log T-2427 (190°F)
- Loop 4 - log T-2428 (variable)

Backleakage may cause steam binding of AFW Pump(s) or water/steam hammer on pump start. If loop piping exceeds the computer high temp alarm limit, total flow rate to affected loop should be minimized until temp is below the high limit, unless a valid emergency start condition exists. Consideration should be given to periodic operation of appropriate AFW Pump(s) to maintain cooling for affected piping. (Memo T28 950512 812)

K. After each AFWP start, 6.9kV ACB closing spring must be checked to ensure it is charged.[10]

L. An operator with no other duties will be assigned to initiate AFW any time the auto initiation circuits are inoperable. Engineering or Maintenance personnel must notify the Shift Manager (SM) if this condition exists.[8]

Question 59

G2.1.3 067

An extra Unit Operator is preparing to temporarily relieve the on-shift OAC for approximately 10 minutes in order to meet with the Plant Manager.

Which one of the following describes the minimum actions that must take place, per OPDP-1, Conduct of Operations, before the on-shift operator leaves the duty station?

A. The relieving operator is not required to perform the three day Operating Log review.
   A log entry is not required when the on-shift operator is relieved.

B. The relieving operator is not required to perform the three day Operating Log review.
   A log entry must be made when the on-shift operator is relieved.

C. The relieving operator must review the Operating Logs for the last 3 days.
   A log entry is not required when the on-shift operator is relieved.

D. The relieving operator must review the Operating Logs for the last 3 days.
   A log entry must be made when the on-shift operator is relieved.

Answer: B

Comments and Recommendations

Delete the question from the test due to technical inaccuracy.

None of the choices identify the **minimum** actions that must take place, per OPDP-1. The OPDP requires the operator to be acquainted with job information such as any abnormal or unusual conditions existing, any actions anticipated during his absence, and where he may be reached in the plant during his absence, in addition to the requirement for a log entry.

The question would have been correct if the stem had not contained the word "**minimum.**"

OPDP 1, Attachment J contains the following:

Temporary relief shall be limited in duration and frequency to that of absolute necessity. When temporary relief is necessary, the person being relieved shall

acquaint the oncoming person with job information such as any abnormal or unusual conditions existing, any actions anticipated during his absence, and where he may be reached in the plant during his absence. Temporary relief as described here does not require completion of a shift turnover checklist. A log entry must be made when the individual is relieved and when he reassumes the watch. The log must include the names of relieving person and relieved person.

Reference

OPDP-1, Conduct of Operations

Attachment J
Shift Turnover

1. **Shift Turnover**

Operating personnel shall conduct shift turnovers in a professional manner. Oncoming operators shall review documents specified on their checklists before assuming responsibility for their shift position. Walk downs of appropriate control boards shall be conducted by each shift watch stander. The individual being relieved is responsible for passing on all pertinent information concerning work under his jurisdiction to his relief.

The following shift positions will document shift turnover:

- Shift Manager
- Unit Supervisors (MCR)
- Unit Operators
- Assistant Unit Operators (assigned duty stations)
- Shift Technical Advisor (or position assigned STA function)
- Fire OPS Supervisor (FOS)

The following general requirements apply to all watchstanders;

- Relief shall, as a minimum, consist of reviewing the information provided in the Shift Turnover Checklist for the watch station which are provided in Attachment A of this procedure.
- Reviews turnover checklist with off-going watchstander including; Safety-related equipment status; running equipment, train alignments; inoperable equipment, LCOs & SIs required; reasons for alarms; abnormal conditions & problem areas; clearance, caution order and other abnormal indications; activities in progress; recent load changes; recent Standing Order and evolutions planned during the shift.
- Oncoming operations personnel shall review documents and historical information as specified on their turnover checklist when assuming responsibility for their positions.
- Operations personnel performing shift turnover activities will not be involved in plant evolutions/activities during performance of the shift turnover activities.
- The individual being relieved is responsible for passing on all pertinent information concerning work under his jurisdiction to his relief.
- The individual being relieved shall address abnormalities which have occurred or exist and significant journal entries.
- The individual being relieved shall retain the responsibilities of the job until he has fully informed his relief of the status of all equipment under his jurisdiction.
- Unless emergency conditions exist, the relief operator/supervisor will perform no on-watch duties until he completes established relief requirements.
- The off-going operator shall explain all items noted on the turnover checklist, and the oncoming operator should ask any questions he might have. When both operators are satisfied that the oncoming operator is fully cognizant of the plant conditions, the oncoming operator shall state that he is assuming responsibility for the shift position.
- All operators will inform their immediate supervisor of their location if other than their duty station.
- Temporary relief shall be limited in duration and frequency to that of absolute necessity. When temporary relief is necessary, the person being relieved shall acquaint the oncoming person with job information such as any abnormal or unusual conditions existing, any actions anticipated during his absence, and where he may be reached in the plant during his absence. Temporary relief as described here does not require completion of a shift turnover checklist. A log entry must be made when

the individual is relieved and when he reassumes the watch. The log must include the names of relieving person and relieved person.

- Each individual is personally responsible for ensuring their "Active Status" is in good standing prior to assuming duty. This status includes proper number of shifts / hours worked per quarter, training qualifications, and up-to-date medical status.
- No person shall assume a shift position unless they are physically and mentally fit to competently assume the responsibilities.
- No person shall permit their relief to assume the shift if any doubt exists concerning the on-coming person's alertness, coherence, and capability of performing their assigned duties.
- The off-going operator shall not be relieved until the equipment they are responsible for is stable or the condition has been discussed and understood by the on-coming operator

Persons assigned to specific tasks shall remain on them until properly relieved by someone of equal or higher qualification or released by their supervisor.

The Shift Manager will inform the MCR he is leaving the Control Room and designates a qualified SRO as replacement for the control room command function.

Relief occurring during the shift will require completion of the appropriate shift relief checklist.

Refueling shift turnover will be conducted between the off-going and oncoming FHS. The oncoming FHS will be made aware of refueling status, any problems encountered during the previous shift, any abnormal conditions in existence, any abnormal radiological conditions or hazards, and all entries made in the FHS narrative log. When the oncoming FHS has a clear understanding of the status of all activities, he will assume the shift. The FHS will inform the Shift Manager and the Unit Supervisor of the current refueling status and the objectives of his shift. The FHS will brief his refueling crew of all pertinent conditions and the shift objectives before the refueling operation commences.

2. Shift Turnover Brief

A shift turnover brief for the on-coming shift shall be facilitated by the SM as discussed in Attachment H of this procedure.

3. Control Board Walkdown

Walk downs of appropriate control boards shall be conducted by each control room watch station. The purpose of a board walkdown is to determine plant status through observation of plant system lineups, switch positions, lighted annunciators, chart recorders, and status lights.

4. Distinctive Identification of On-Shift Operations Personnel

Operations personnel should wear the TVA issued fire retardant articles of clothing when on-shift. The Operations Superintendent determines what positions and what conditions require fire retardant clothing. A shift manning chart maybe obtained from the clerk if needed to identify on shift crew by job assignment.

5. Observations

The form below contains expectations for Shift Turnover.

- OPDP-1-1 Shift Turnover Checklist

Question 89

061G2.4.10 008

Given the following plant conditions:

- The unit is in Mode 5 following a refueling
- Movement of irradiated fuel assemblies is in progress in the fuel handling area
- The following annunciators just alarmed:
- 184-B, SFP 0-RM-90-102/103 Rad Hi
- 184-D, SFP 0-RM-90-102/103 Instr Malf
- An Operator investigating the alarms reported the following:
- The Red and Amber lights for 0-RM-90-103 at panel 0-M-12 are LIT
- The Operate green light for 0-RM-90-103 at panel 0-M-12 is DARK
- 0-RM-90-102 green operate light only is LIT
- Auxiliary Building Gas Treatment System (ABGTS) fans are running
- Fuel Handling Area Exhaust fans are running

Which one of the following correctly lists the action the crew must take in accordance with Annunciator Response Instructions and the Technical Specification that must be entered for the given plant conditions?

A. Stop Fuel Handling Area Exhaust Fans
Enter Technical Specification 3.7.12, Auxiliary Building Gas Treatment System

B. Immediately suspend movement of irradiated fuel assemblies in the fuel handling area.
Enter Technical Specification 3.3.8, ABGTS Actuation Instrumentation

C. Stop Fuel Handling Area Exhaust Fans
Enter Technical Specification 3.3.8, ABGTS Actuation Instrumentation

D. Stop ABGTS fans
Enter Technical Specification 3.7.12, Auxiliary Building Gas Treatment System

Answer: C

Comments and Recommendations

Accept both "B" and "C" as correct answers

The annunciator response instructions for 184-B, SFP 0-RM-102/103 RAD HI include the following Corrective Actions:

[1] **ENSURE** ABGTS fans start.
[2] **ENSURE** the following fans stop:
Aux Bldg General Supply fans.
Aux Bldg General Exhaust fans.
Fuel Handling Area Exhaust fans.
[3] **CHECK** 1-RM-90-1, 2-RM-90-1, 0-RM-90-101.
[4] **NOTIFY** RADCON to investigate alarm.
[5] **REFER TO** AOI-31, Abnormal Release of Radioactive Material.
[6] **REFER TO** AOI-29, Dropped or Damaged Fuel or Refueling Cavity Seal Failure.
[7] **REFER TO** Tech Specs.

Referring to either AOI-31 or AOI-29 will result in steps to evacuate the general/immediate area. This evacuation would result in the suspension of movement of irradiated fuel assemblies in the fuel handling area. Choice B is a correct answer

AOI-31
3.2 Abnormal Release of Radioactive Material in Auxiliary Building
1. **EVACUATE** affected area.

AOI-29
3.4 Dropped or Damaged Irradiated Fuel Assembly in Spent Fuel Pit Area
1. **EVACUATE** affected area:
Fuel Handling SRO **NOTIFY** personnel in the general area of radiation
concern.
ANNOUNCE for all personnel to evacuate the affected area.

Reference

AOI-29, Dropped or Damaged Fuel or Refueling Cavity Seal Failure

AOI-31, Abnormal Release of Radioactive Material

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT

ABNORMAL OPERATING INSTRUCTION

AOI-31

ABNORMAL RELEASE OF RADIOACTIVE MATERIAL

Revision 18

Unit 1

QUALITY RELATED

PREPARED BY: Jared Hobbs

SPONSORING ORGANIZATION: Operations

APPROVED BY: Patrick Salkeld

Effective Date: 01/19/06

LEVEL OF USE: CONTINUOUS

REVISION LOG

REVISION OR CHANGE NUMBER	EFFECTIVE DATE	AFFECTED PAGES	DESCRIPTION OF REVISION/CHANGE
Rev 13	2/2/99	2,7,11,19	Incorporate CN-1. Minor change to incorporate DCN M-39911-A which replaces the P2500 and ERFDS computers with ICS computer.
14	9/2/99	2,22	Non-intent. Updated references per shift review comments.
15	8/13/01	2,3,13	Non-intent. Added guidance to address taking note of inservice air pumps for RE-90-106 and RE-90-112 to facilitate system restoration. Made editorial corrections. Source of comments self assessment SA-OPS-01-010.
16	2/10/03	2, 3, 7, 8, 10-16, 18-24	Non-intent. Changed EPIP-16 to EPIP-13 to reflect EPIP number changes. Added step to section 3.3 to initiate containment closure if in Modes 5 or 6 (an operator feedback item). Made various editorial corrections.
17	12/5/03	2, 8	Non-intent. Added sub-section to Step 8 RNO to check for indication of LOCA outside containment as initiator of ABI per operator training feedback.
18	01/19/06	2, 4 8, 9, 10, 14, 19, 21 12, 13, 15-19	Added 175-B to list of possible alarms. Clarified section 3.2 step 7 RNO to include all three substeps. Added step to stop one train of ABGTS. Added Radcon/Chemistry coordination step. Closed cntmt press relief, (Rocket Filters) in RNO Step 6. Enhanced step 7. Added ref. to containment pressure Tech Spec. Added guidance to determine plant release rate prior to referring to the REP & ODCM. Clarified step 5.c. and deleted redundant substep in Section 3.4 and corrected number sequence.

1.0 PURPOSE

To provide a response to valid annunciations or indications of an abnormal release of radioactive material.

2.0 SYMPTOMS

2.1 Alarms

NOTE SHLD BLDG VENT RE-400 RAD HI [268-B] in alarm should be accompanied by higher indicated radiation levels or alarm on additional monitor(s) which indicates the source of the release.

A. Auxiliary Building:

1) 1-RR-90-1 AREA RAD HI [174-B].
2) ERCW DISCH HDR A 0-RM-133/140 LIQ RAD HI [180-B].
3) WDS RELEASE LINE 0-RM-122 LIQ RAD HI [181-A].
4) ERCW DISCH HDR B 0-RM-134/141 LIQ RAD HI [181-B].
5) AB VENT 0-RM-101 RAD HI [183-C].
6) WGDT REL LINE 0-RM-118 RAD HI [184-A].
7) SFP 0-RM-102/103 RAD HI [184-B].
8) 0-RR-90-12 PARTICULATE RAD HI [185-B].

B. Reactor Building:

1) UPR CNTMT AIR 1-RM-112 RAD HI [173-A].
2) LWR CNTMT AIR 1-RM-106 RAD HI [173-B].
3) CNTMT PURGE EXH 1-RM-130/131 RAD HI [174-A].

2.1 Alarms (Continued)

C. Control Building:

1) MCR INTAKE 0-RM-125/126 RAD HI [186-A].

2) MCR AREA 0-RM-135 RAD HI [186-B].

D. Turbine Building:

1) SG BLDN 1-RM-120/121 LIQ RAD HI [178-A].

2) TB SUMP DISCH 0-RM-212 LIQ RAD HI [182-B].

3) CNDS DEMIN REL 0-RM-225 LIQ RAD HI [182-C].

4) VAC PMP EXH 1-RM-119 RAD HI [175-B].

E. Service Building:

1) SERV BLDG VENT 0-RM-132 RAD HI [185-A].

2.2 Automatic Actions

A. 0-RM-102 or 103: Auxiliary Building Isolation

B. 0-RM-90-122: Isolation of Radwaste liquid discharge.

C. 0-RM-90-118: Isolation of Waste Gas Decay Tank discharge.

D. 1-RM-90-130 or 131: Containment Vent Isolation.

E. 0-RM-90-125 or 126: Main Control Room Isolation.

F. 0-RM-90-225: Isolation of Cond DI waste discharge.

G. 1-RM-90-120 or 121: S/G Blowdown diverted from CT to Cond Demin inlet.

3.0 OPERATOR ACTIONS

3.1 Diagnostics

IF RADIATION PROBLEM ASSOCIATED WITH:	GO TO Subsection
Aux Bldg.	3.2
Reactor Bldg.	3.3
Turbine Bldg.	3.4
Service Bldg.	3.5

3.2 Abnormal Release of Radioactive Material in Auxiliary Building

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. **EVACUATE** affected area.	
2. **NOTIFY** RADCON to monitor affected area for radiological hazards.	
3. **DETERMINE** point of release, and **TERMINATE** release.	
4. **IF** planned release in progress, **THEN**:	
a. **STOP** release.	
b. **NOTIFY** Chemistry to resample batch.	
5. **EVALUATE** plant release rate:	
• Plant Computer [EFF1 on TSC menu].	
• EPIP-13, Initial Dose Assessment For Radiological Emergencies.	
6. **REFER TO** EPIP-1, Emergency Plan Classification Flowchart.	

3.2 **Abnormal Release of Radioactive Material in Auxiliary Building** (Continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	**CHECK** ABI actuated: • ABI Train A window LIT [MISSP], OR • ABI Train B window LIT [MISSP]	**DETERMINE** if ABI required: (condition a ,b or c below) a. **CHECK** Spent fuel pit radiation monitor, 0-RM-90-102, in alarm. b. **CHECK** Spent fuel pit radiation monitor, 0-RM-90-103, in alarm. c. **CHECK** any Aux. Bldg. radiation monitor in alarm and evaluate as an indication of a LOCA outside containment. **IF** ABI **NOT** required, **THEN** **RETURN TO** instruction in effect. **IF** ABI required, **THEN** **PLACE** 1-HS-30-101A and 1-HS-30-101B to ACTUATE [1-M-6].
8.	**ANNOUNCE** Aux Bldg Isolation over PA.	
9.	**CHECK** ABGTS fans RUNNING.	**START** ABGTS fans.

3.2 Abnormal Release of Radioactive Material in Auxiliary Building (Continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	**IF** ABGTS started, **THEN** **SHUTDOWN** one train after 30 minutes and place in **P-AUTO**: • **REFER TO** SOI-30.06, Auxiliary Building Gas Treatment System, section on Auto Start of ABGTS	
11.	**CHECK** following fans STOPPED [1-M-9]: • Aux Bldg gen supply fans. • Aux Bldg gen exhaust fans. • Fuel handling exh fans.	**STOP** fans as necessary.
12.	**IF** RADCON determines radiation hazard exists to main control room, **THEN** **PERFORM** Attachment 1.	
13.	**CLOSE** Unit 2 Reactor Building equipment hatch temporary door.	
14.	**NOTIFY** Operations Duty Manager of plant conditions.	
15.	**REFER TO** SPP-3.5, Regulatory Reporting Requirements, as necessary.	

3.2 **Abnormal Release of Radioactive Material in Auxiliary Building** (Continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16.	**CLOSE** elevation 757 refuel floor equipment hatches to lower elevations.	
17.	**WHEN** RADCON advises that Aux Bldg within acceptable limits, **THEN** **RETURN** Aux Bldg ventilation system to normal, • **REFER TO** SOI-30.05, Auxiliary Bldg HVAC System.	
18.	**COORDINATE** with RADCON/Chemistry to determine total release.	
19.	**REFER TO** Offsite Dose Calculation Manual for release limits and required actions.	
20.	**RETURN TO** instruction in effect.	

- END OF SUBSECTION -

3.3 Abnormal Release of Radioactive Material in Reactor Building

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. **EVACUATE** Reactor Bldg.	
2. **NOTIFY** RADCON to monitor affected area for radiological hazards.	
3. **EVALUATE** plant release rate: • Plant Computer [EFF1 on TSC menu]. • EPIP-13, Initial Dose Assessment For Radiological Emergencies.	
4. **IF** release from RCS leak, **THEN** **REFER TO** AOI-6, Small Reactor Coolant System Leak.	
5. **REFER TO** EPIP-1, Emergency Plan Classification Flowchart.	

3.3 Abnormal Release of Radioactive Material in Reactor Building (Continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	**CHECK** CVI actuated: • CVI Train A window LIT [MISSP], OR • CVI Train B window LIT [MISSP]	**DETERMINE** if CVI required: (condition a or b below) a. **CHECK** Purge air exhaust radiation monitor, 1-RM-90-130, in alarm [1-M-12]. b. **CHECK** Purge air exhaust radiation monitor, 1-RM-90-131, in alarm [1-M-12]. **IF** CVI **NOT** required, **THEN** **RETURN TO** instruction in effect. **IF** CVI required, **THEN** a. **STOP** purge air supply and exhaust fans [1-M-9]. b. **CLOSE** all purge air cntmt isolation dampers [1-M-9]. c. **CLOSE** Cntmt Press Relief Valves [1-M-9]. d. **MONITOR** containment pressure.
7.	**IF** purge was in progress, **THEN** **NOTIFY** Chemistry to evaluate if a new purge permit is required prior to restarting containment purge.	
8.	**IF** in Mode 5 or 6, **THEN** **INITIATE** containment closure USING TI-68.002, Containment Penetration and Closure Control.	

3.3 **Abnormal Release of Radioactive Material in Reactor Building** (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE Noting which air pumps are in service when RE-90-106 and 112 are shutdown will facilitate system restoration later in this procedure and may prevent equipment damage.

9. Locally **STOP** 1-RE-90-106 and 1-RE-90-112 air pumps [A4U/737].

   OR

   PLACE air pump breakers OFF:

   - C & A Vent Bd 1A1-A Cmpt 3F1.
   - C & A Vent Bd 1B1-B Cmpt 6F1.

10. **REFER TO** Tech Specs:

    - 3.6.4, Containment Pressure
    - 3.4.15, RCS Leakage Detection Instrumentation.
    - 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation.

11. **IF** RADCON determines radiation hazard exists to main control room, **THEN** **PERFORM** Attachment 1.

12. **NOTIFY** Operations Duty Manager of plant conditions.

13. **REFER TO** SPP-3.5, Regulatory Reporting Requirements, as necessary.

3.3 **Abnormal Release of Radioactive Material in Reactor Building** (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14. **WHEN** RADCON advises that Reactor Building within acceptable limits, **THEN**: a. **RESET** cntmt vent isolation signal with 1-HS-30-65A and 1-HS-30-65B [1-M-6]. b. **OPEN** 1-RM-90-106 and 1-RM-90-112 cntmt isol valves [0-M-12]. c. Locally **START** 1-RM-90-106 and 1-RM-90-112 previously running air pumps [A4U/737]. d. **NOTIFY** RADCON of monitor indications.	
15. **COORDINATE** with RADCON/Chemistry to determine total release.	
16. **REFER TO** Offsite Dose Calculation Manual for release limits and required actions.	
17. **RETURN TO** instruction in effect.	

- END OF SUBSECTION -

3.4 Abnormal Release of Radioactive Material in Turbine Building

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. **EVACUATE** affected area.	
2. **NOTIFY** RADCON to monitor affected area.	
3. **EVALUATE** plant release rate: • Plant Computer [EFF1 on Plant computer/TSC menu]. • EPIP-13, Initial Dose Assessment For Radiological Emergencies.	
4. **REFER TO** EPIP-1, Emergency Plan Classification Flowchart.	

3.4 Abnormal Release of Radioactive Material in Turbine Building (Continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	**CHECK** station sump 0-RM-90-212 NORMAL.	**CONTROL** sump effluent: a. **DISPATCH** AUO and RADCON to station sump area. b. **STOP** both station sump pumps. c. **ALIGN** chemical header to Unlined Pond using SOI-14.03, Section 8.11. d. Locally **OPERATE** pumps to prevent overflowing sump into condenser waterbox areas. **NOTIFY** Chemistry to sample station sump. **IF** RADCON advises evacuation of area, **THEN** **PLACE** sump pumps in AUTO and leave area. **DETERMINE** point of release, and **TERMINATE** release.

3.4 **Abnormal Release of Radioactive Material in Turbine Building** (Continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	**CHECK** S/G blowdown monitors 1-RM-90-120 and 1-RM-90-121 NORMAL.	Locally **ENSURE** S/G blowdown release to cooling tower blowdown terminated: • 1-FCV-15-44, SG BLOWDOWN DISCH TO CTBD, CLOSED [708/T8J]. • 1-FCV-15-8, SG BLOWDOWN DISCH TO CTBD, CLOSED [685/T7H]. • 1-FCV-15-6, SG BLOWDOWN TO CNDS DEMIN, OPEN [685/T7H]. Locally **SHUTDOWN** Cond DI USING SOI-14.01, Condensate Demineralizer Polisher Operation. **NOTIFY** Chemistry to sample S/G blowdown. **REFER TO** AOI-33, Steam Generator Tube Leak.

3.4 Abnormal Release of Radioactive Material in Turbine Building (Continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	**CHECK** Cond DI release monitor 0-RM-90-225 NORMAL.	**NOTIFY** Cond DI operator, and Locally **ENSURE** release terminated: 1) **OPEN** 0-FCV-14-345, CNDS DEMIN NRW TANK RECIRC [708/T7D]. 2) **CLOSE** the following FCVs: • 0-FCV-14-451, CNDS DEMIN NON-RECLAIM WASTE HDR FLOW CNTL [708/T7D]. • 0-FCV-14-187, CNDS DEMIN NEUT HDR DISCH FLOW CNTL [708/T7D]. • 0-FCV-14-288, CNDS DEMIN HCF DISCH TO COOL TWR BLDN [685/T6D]. • 0-FCV-14-360, CNDS DEMIN NEUT/NRW PMP DISCH TO CLG TWR BLDN [685/T6D]. **COORDINATE** with Chemistry to evaluate batch being released.

3.4 **Abnormal Release of Radioactive Material in Turbine Building** (Continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8.	**IF** RADCON determines radiation hazard to main control room exists, **THEN** **PERFORM** Attachment 1.	
9.	**NOTIFY** Operations Duty Manager of plant conditions.	
10.	**WHEN** RADCON advises that Turbine Building is within acceptable limits, **THEN** **RETURN** affected system(s) and area(s) to normal.	
11.	**COORDINATE** with RADCON/Chemistry to determine total release.	
12.	**REFER TO** Offsite Dose Calculation Manual for release limits and required actions.	
13.	**RETURN TO** instruction in effect.	

- END OF SUBSECTION -

3.5 Abnormal Release of Radioactive Material in Service Building

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. **EVACUATE** affected area.	
2. **NOTIFY** RADCON and Chemistry of abnormal condition.	
3. **DETERMINE** point of release, and **TERMINATE** release.	
4. **EVALUATE** plant release rate: • Plant Computer [EFF1 on TSC menu]. • EPIP-13, Initial Dose Assessment For Radiological Emergencies.	
5. **REFER TO** EPIP-1, Emergency Plan Classification Flowchart.	
6. **IF** RADCON determines radiation hazard exist to main control room, **THEN** **PERFORM** Attachment 1.	
7. **NOTIFY** Operations Duty Manager of plant conditions.	

3.5 Abnormal Release of Radioactive Material in Service Building (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. **WHEN** RADCON advises that Service Building is within acceptable limits, **THEN** **RETURN** affected system(s) and area(s) to normal.	
9. **COORDINATE** with RADCON/Chemistry to determine total release.	
10. **REFER TO** Offsite Dose Calculation Manual for release limits and required actions.	
11. **RETURN TO** instruction in effect.	

- END OF SUBSECTION -

4.0 DISCUSSION

This instruction provides actions to be taken for evaluation of radiation monitor annunciations or indications which may indicate a potential abnormal release of radiation. This Instruction will be implemented due to a transition from annunciator responses, upon operator judgment or when notified by RADCON of abnormal plant survey results.

5.0 REFERENCES

5.1 Performance

A. AOI-6, Small Reactor Coolant System Leak.

B. AOI-33, Steam Generator Tube Leak.

C. EPIP-1, Emergency Plan Classification Flowchart.

D. EPIP-13, Initial Dose Assessment For Radiological Emergencies.

E. SOI-30.05, Auxiliary Bldg HVAC System.

F. SOI-31.01, Control Bldg HVAC System.

G. SOI-14.01, Condensate Demineralizer Polisher Operation.

H. SPP-3.5, Regulatory Reporting Requirements.

I. Offsite Dose Calculation Manual (ODCM).

J. TI-68.002, Containment Penetrations and Closure Control

5.2 Technical Specifications

A. 3.4.15, RCS Leakage Detection Instrumentation.

B. 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation.

ATTACHMENT 1
Page 1 of 2

SECURING MAIN CONTROL ROOM

1. **EVACUATE** all personnel below elevation 755 Control Building.
2. **NOTIFY** RADCON to monitor affected areas.
3. **DETERMINE** if CRI required:

   a. **CHECK** alarms on any of the following:

   - 0-RM-90-125, MCR INTAKE.
   - 0-RM-90-126, MCR INTAKE.
   - 0-RM-90-135, MCR AREA.
   - CRI Train A OR Train B window LIT [MISP].

   b. **IF** CRI **NOT** required,
   THEN
   RETURN TO instruction in effect.

   c. **IF** CRI required,
   THEN
   PLACE CRI 1-HS-31-177A, MCR ISOL TR A, and 1-HS-31-177B, MCR ISOL TR B, to ACTUATE.

   d. **ENSURE** emergency control building air cleanup and pressurizing fans RUNNING.

ATTACHMENT 1
Page 2 of 2

SECURING MAIN CONTROL ROOM

NOTE Main control room radiation doors are recessed into a holding structure, located inside control building, el. 755, coming from turbine building. These are not pressure boundary doors.

4. **ENSURE** door C-36, Unit 1, (C-54, Unit 2 side) CLOSED.
   a. **REMOVE** pins securing Unit 1 radiation door in open position.
   b. **CLOSE** radiation door.
   c. **SECURE** radiation door with pins in CLOSED position.[1]
   d. **PERFORM** steps 4a through 4c for Unit 2 door.

5. **COORDINATE** MCR access with RADCON:.
   a. **RESTRICT** MCR ingress and egress to ONLY one entryway.
   b. **SEAL** all other MCR doors with heavy tape.

6. **WHEN** abnormal radiological conditions no longer exist **AND** RADCON advises radiation levels are within acceptable limits, **THEN**:
   a. **REMOVE** pins securing Unit 1 side radiation door in closed position.
   b. **OPEN** radiation door.
   c. **SECURE** radiation door with pins in OPEN position.[1]
   d. **PERFORM** steps a through c for Unit 2 side door.
   e. **RETURN** control building ventilation system to normal:
      - **REFER TO** SOI-31.01, Control Bldg HVAC System.

7. **RETURN TO** instruction in effect.

SOURCE NOTES

Page 1 of 1

SOURCE NOTE	DOCUMENT	SUMMARY	AFFECTED STEP/NOTE
1	WBFIR920052	Add seismic requirements for the main Control Room radiological shield doors.	Attachment 1, Steps 4c and 6c

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT

ABNORMAL OPERATING INSTRUCTION

AOI-29

DROPPED OR DAMAGED FUEL OR REFUELING CAVITY SEAL FAILURE

Revision 17

Unit 1

QUALITY RELATED

REQUESTED BY: R. E. Bates

SPONSORING ORGANIZATION: Operations

APPROVED BY: Craig Faulkner

Effective Date: 03/10/04

LEVEL OF USE: CONTINUOUS

REVISION LOG

REVISION NUMBER	EFFECTIVE DATE	AFFECTED PAGES	DESCRIPTION OF REVISION
10	1/29/99	2,13,16,23	Non-intent change to incorporate DCN M-39911-A which deletes theP2500 and ERFDS computer with the ICS computer. Added notification to Maintenance for performance of MI-88.003.
11	9/1/99	2, 5, 7, 13, 19, 21	Non-intent. Eliminated references to confined space for transfer tube valve room, and editorial corrections per shift review comments.
12	5/3/00	2, 5-7, 11	Non Intent. Revised for wording enhancements to address WANO comments (PER 99014332).
13	9/8/00	2, 11, 13, 15, 28	Intent. Added CAUTION to Sections 3.3 and 3.4 regarding closing of containment penetrations, and added TI-68.002 for closure of penetrations by Maintenance for DCN D-50378. Also added step to Sections 3.3 and 3.4 to initiate ABI if personnel air locks are open or annulus is open to containment.
14	2/21/02	2, 12, 15, 16	Non-intent. Corrected UNID numbers for 0-RM-90-101A, B, & C in Sections 3.3 & 3.4. Added unit designation numbers to components in Steps 5 & 10 in Section 3.4.
15	11/20/02	2, 11	Non-intent. Revised Section 3.3 Step 1 to make more consistent with other AOI's requiring containment closure. WBN PER 02-011592-000
16	2/11/03	2, 14, 17	Non-intent. Revised EPIP-16 to EPIP-13 to reflect EPIP number changes. Made various editorial changes.
17	03/10/04	2, 20	Non-intent. Changed pressure reading on 0-PI-79-160A to indicated control air available and consistent with AOI-45. Gauge does not read seal pressure.

1.0 PURPOSE

To provide a response to a refueling cavity seal failure or a dropped or damaged fuel assembly.

2.0 SYMPTOMS

2.1 Alarms

A. SFP LEVEL HI/LO [128-A].
B. LWR CNTMT AIR 1-RM-106 RAD HI [173-B].
C. UPR CNTMT AIR 1-RM-112 RAD HI [173-A].
D. CNTMT PURGE EXH 1-RM-130/131 RAD HI [174-A].
E. 1-RR-90-1 AREA RAD HI [174-B].
F. SFP 0-RM-102/103 RAD HI [184-B].
G. AB VENT 0-RM-101 RAD HI [183-C].
H. CONTAINMENT PIT SUMP ALARM [Incore Inst Rm].

2.2 Automatic Actions

A. Auxiliary Bldg Isol from:

0-RM-90-102, Spent Fuel Pit.
0-RM-90-103, Spent Fuel Pit.

B. Containment Vent Isol from:

1-RM-90-130, Tr A Purge Air Exh.
1-RM-90-131, Tr B Purge Air Exh.

3.0 OPERATOR ACTIONS

3.1 Diagnostics

NOTE • Visual confirmation of a dropped or damaged fuel assembly or Refueling Cavity Seal failure will come from the Refueling SRO or his designee.

• If fission products are released into the refuel water, the RHR and Spent Fuel Pool Cooling Systems may exhibit HI radiation levels.

IF	**GO TO** Subsection:
Refueling Cavity Seal has failed.	3.2
IRRADIATED fuel assembly has been dropped or damaged INSIDE containment.	3.3
IRRADIATED fuel assembly has been dropped or damaged OUTSIDE containment.	3.4
NEW fuel assembly has been dropped or damaged.	3.5
Spent Fuel Pit Gate leakage.	3.6

3.2 Refueling Cavity Seal Failure

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION **IF refueling cavity level is dropping rapidly cntmt should be immediately evacuated.**

1. Fuel Handling SRO **NOTIFY** personnel in the general area of radiation concern.

2. **ANNOUNCE** to the plant for non–essential personnel to evacuate the area.

3. **ALIGN** SFP makeup in accordance with SOI-78.01, Spent Fuel Pool Cooling and Cleaning System, Section 8.1.

CAUTION **IF irradiated fuel is in the Transfer Tube the Fuel Transfer Tube Isol Valve room will be a high exposure area.**

4. **DISPATCH** two operators, with radio, to close 1-ISV-78-600, Fuel Transfer Tube Isol [729, Post Acc Sampling Rm].

5. **REQUEST** Radcon to monitor cntmt refuel area, aux bldg refueling floor area and el 729.

3.2 **Refueling Cavity Seal Failure** (continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION • **During the following steps, the CCP(s) and/or the RHR pump(s) will be aligned to the RWST. The level will already be lowered in the RWST due to filling of the Refueling Cavity. The CCP(s) or RHR pump(s) may lose suction if RWST level drops less than or equal to 8%.** • **If 1-FCV-63-1 is operated from the Control Room handswitch the valve will go from FULL CLOSED to FULL OPEN before it can be closed again. Valve travel may be stopped at any point of travel by opening the circuit breaker on the 480V Rx MOV Bd.**	
6. **CHECK** with the Refueling SRO to determine refueling cavity level is greater than or equal to el 748.	**IF** makeup from CVCS desired, **THEN**: a. **OPEN** FCV-62-85 or 62-86, Norm or Alt Charging. b. **OPEN** LCV-62-135 and 136, Charging Pump Flow RWST. c. **CLOSE** LCV-62-132 and 133, VCT to Charging Pmps Suct. d. **CLOSE** FCV-62-83, RHR Letdown Flow Cont. e. **START** CVCS charging pump. f. **ADJUST** makeup flow using FCV-62-89 and 62-93. **IF** makeup from RHR is desired, **THEN**: a. **THROTTLE OPEN** FCV-63-1, RWST Supply, as required [using 480V Rx MOV Bd 1A1-A c/10A or handwheel 692 pipechase]. b. **CLOSE** FCV-74-1 and -2, or FCV-74-8 and -9, HL Suction.

3.2 **Refueling Cavity Seal Failure** (continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION **When the water level drops to the level of the Rx Vessel flange, the Refueling Cavity upender, if vertical, will extend 1/4in. above water level.**	
7. **INSERT** any fuel assembly carried by the Refueling Machine into any analyzed core location, and **LEAVE** Refueling Machine lowered.	**LOWER** empty Refueling Machine.
8. **CHECK** irradiated fuel assembly removed from RCCA change fixture.	**PERFORM** the Following: a. **PICKUP** the assembly with the Refueling Machine. b. **INSERT** assembly into any analyzed core position.
9. **TRANSPORT** any fuel assembly in the Transfer Cart to the SFP side upender.	
10. **LEAVE** assembly horizontal.	
CAUTION **IF irradiated fuel is in the Transfer Tube the Fuel Transfer Tube Isol Valve pit will be a high exposure area.**	
11. **CLOSE** 1-ISV-78-600, Fuel Transfer Tube Isol [729, Post Acc Sampling Rm].	

3.2 Refueling Cavity Seal Failure (continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12.	**CHECK** SFP water level above SFP cooling pump suction. • El 749 ft 1.5 in. [Level scale on SFPCCS disch, east of piping as it enters SFP]	**STOP** all SFP Cooling Pumps, **FILL** SFP to normal level (greater than or equal to el 749 ft 1.5 in. and less than or equal to el 749 ft 2.5 in.) **START** a SFP Cooling pump. **ESTABLISH** SFP cooling flow.
13.	**CHECK** that irradiated fuel assembly removed from SFP bridge hoist.	**TRANSPORT** fuel assembly to any approved storage location in SFP, **THEN** **INSERT** fully into storage.
14.	**EVALUATE** need to evacuate lower containment based on RADCON recommendations.	
15.	**NOTIFY** Operations Duty Manager of Unit conditions.	

3.2 **Refueling Cavity Seal Failure** (continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Consideration should be given to pumping water in the Refueling Cavity to the RWST. This will conserve water and minimize leakage into the Containment Sump.	
16. **CHECK** RWST level greater than 8%, OR **MAKEUP** to Refueling Cavity still required. • Level is less than el 749 ft 1 in.	**IF** CCP(s) were used to makeup to Refueling Cavity, **THEN** **REALIGN** CCP to VCT. **IF** RHR pumps were used to makeup to Refueling Cavity, **THEN** **REALIGN** RHR to Loop 4 H L using SOI-74.01, Residual Heat Removal System.
CAUTION **Prior to lowering refueling cavity level, evaluation should be made of Rx vessel internals location and potential for increased exposure if uncovered.**	
17. **IF** all irradiated fuel assembles have been placed in the Rx vessel or safely stored in the Spent Fuel Pool, **THEN** **LOWER** refueling cavity level to the Rx flange (el 725) USING SOI-74.01, Residual Heat Removal System.	

3.2 Refueling Cavity Seal Failure (continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18. **REFER TO** EPIP-1, Emergency Plan Classification Flowchart.	
19. **REFER TO** the following Tech Specs: • 3.9.7, Refueling Cavity Water Level. • TR 3.1.1, Boration Systems Flow Paths, Shutdown.	
20. **GO TO** Section 3.7, RECOVERY.	

-END OF SUBSECTION-

3.3 Dropped or Damaged Irradiated Fuel Assembly in Containment

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION 1 **Maintenance must be notified to IMMEDIATELY ensure at least one door is closed on both upper and lower personnel air locks, and close any other open penetrations required per TI-68.002.**

CAUTION 2 **Entry into containment shall be coordinated with RADCON.**

1. Immediately **INITIATE** actions to establish cntmt closure:
   a. **EVACUATE** all non-essential personnel from containment.
   b. **ENSURE** Closure initiated in accordance with TI-68.002.
   c. **NOTIFY** RADCON to provide monitoring and Rad protection guidance for workers involved in containment closure.

2. **EVALUATE** conditions and necessary protective measures prior to reentry into affected area.

3.3 Dropped or Damaged Irradiated Fuel Assembly in Containment (continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3. **MONITOR** the following Rad Monitors for rising radiation levels: • 1-RM-90-400, U1 Shield Bldg Vent Monitor [1-M-30]. • 0-RM-90-101A, B, C, AB Vent [0-M-12]. • 1-RM-90-59, Upper Cntmt AZ 315° [0-M-12]. • 1-RM-90-60, Upper Cntmt AZ 225° [0-M-12].	**EVALUATE** need for limiting plant area access based on RADCON recommendations.
4. **CHECK** Containment Vent Isolation has occurred: • 1-XX-55-6C CVI Train A Window illuminated. • 1-XX-55-6D CVI Train B Window illuminated. • 1-XX-55-6E CVI Train A green. • 1-XX-55-6F CVI Train B green.	**STOP** the following fans [1-M-9]: • Cntmt Purge Sup & Exh. • Instr Room Clg A AHU. • Instr Room Clg B AHU. **THEN** **CLOSE** all purge air containment isolation dampers.
5. **CHECK** the following CLOSED: • U-2 Rx Bldg Equipment Hatch temporary doors. • El 757 equipment hatches to lower elevations	**CLOSE** hatches and doors.

3.3 Dropped or Damaged Irradiated Fuel Assembly in Containment (continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	**CHECK** containment ventilation isolated: • **REFER TO** Checklist 1, Containment Ventilation Isolation Dampers.	Manually **CLOSE** dampers as necessary.
7.	**CHECK** Tr. A and Tr. B ABGTS running [0-M-25].	**START** ABGTS Tr. A and Tr. B.
8.	**IF** both doors of either personnel air lock are open, or if the annulus is open to the Auxiliary Building, **THEN**	
	CHECK Auxiliary Building Isolation has occurred: a. 1-XX-55-6C ABI Train A Window illuminated. b. 1-XX-55-6D ABI Train B Window illuminated.	**PLACE** ABI HSs on 1-M-6 to ACTUATE: • 1-HS-30-101A, • 1-HS-30-101B.
9.	**CHECK** AB Gen Supply and Exhaust fans off.	**STOP** any running AB Gen Supply or Exhaust fan.
10.	**CHECK** Fuel Handling Area fans off [1-M-9].	**STOP** any running fan.

3.3 Dropped or Damaged Irradiated Fuel Assembly in Containment (continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION **IF irradiated fuel is in the Transfer tube the Fuel Transfer Tube Isol pit will be a high exposure area.**	
11. **DISPATCH** two operators to close 1-ISV-78-600, Fuel Transfer Tube Isol [729, Post Acc Sampling Rm].	
12. **REFER TO** EPIP-1, Emergency Plan Classification Flowchart.	
13. **EVALUATE** plant release rate: • Plant Computer [EFF1 on TSC menu]. • EPIP-13, Initial Dose Assessment For Radiological Emergencies.	**REFER TO** AOI-31, Abnormal Release of Radioactive Material.
14. **GO TO** Section 3.7, RECOVERY.	

-END OF SUBSECTION-

3.4 Dropped or Damaged Irradiated Fuel Assembly in Spent Fuel Pit Area

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION 1 **Maintenance must be notified to IMMEDIATELY ensure at least one door is closed on both upper and lower personnel air locks, and close any other open penetrations required per TI-68.002.**	
CAUTION 2 **Entry to the Refueling Floor and other affected areas shall be coordinated with RADCON.**	
1. **EVACUATE** affected area: • Fuel Handling SRO **NOTIFY** personnel in the general area of radiation concern. • **ANNOUNCE** for all personnel to evacuate the affected area.	
2. **NOTIFY** SM and RADCON of potential radiation release.	
3. **EVALUATE** conditions and necessary protective measures prior to reentry into affected area.	
4. **ENSURE** closure initiated for personnel air locks and any other open penetrations in accordance with TI-68.002.	
5. **CHECK** 0-RM-90-101A, B, C Aux Bldg Vent monitor NORMAL, [0-M-12].	**NOTIFY** RADCON to begin surveys and monitoring of Refuel Floor.

3.4 Dropped or Damaged Irradiated Fuel Assembly in Spent Fuel Pit Area (continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	**CHECK** SFP area monitors 0-RM-90-102 and -103 NORMAL, [0-M-12].	**STOP** and **LOCKOUT** FH Area Exh Fans.
7.	**CHECK** Auxiliary Building Isolation has occurred: a. 1-XX-55-6C ABI Train A Window illuminated. b. 1-XX-55-6D ABI Train B Window illuminated.	**PLACE** ABI HSs on 1-M-6 to ACTUATE: • 1-HS-30-101A, • 1-HS-30-101B.
8.	**CHECK** the following fans off [1-M-9]: • A B Gen Supply Fans. • A B Gen Exhaust Fans. • F H Area Exh Fans.	Manually **STOP** fans as necessary.
9.	**CHECK** Tr A and Tr B ABGTS running [0-M-25].	**START** ABGTS Tr A and Tr B.
10.	**CHECK** the following ABGTS dampers OPEN: • 1-FCO-30-146B, Tr A Suct. • 1-FCO-30-146A, Tr A Disch. • 2-FCO-30-157A, Tr B Disch. • 2-FCO-30-157B, Tr B Suct.	Manually **OPEN** dampers.

3.4 Dropped or Damaged Irradiated Fuel Assembly in Spent Fuel Pit Area (continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11. **CHECK** U-2 Rx Bldg Equip Hatch temporary doors, and el 757 equip. hatches to lower elevations CLOSED: • Railroad Bay Doors. • Equipment Hatch to el 737 [beside stairway to el 737].	Locally **CLOSE** doors and hatches.
12. **CHECK** Aux Bldg Isolation: • **REFER TO** Checklist 2, Auxiliary Building Isolation Dampers.	Manually **CLOSE** dampers as necessary.
13. **REFER TO** EPIP-1, Emergency Plan Classification Flowchart.	
14. **EVALUATE** plant release rate: • Plant Computer [EFF1 on TSC menu]. • EPIP-13, Initial Dose Assessment For Radiological Emergencies.	**REFER TO** AOI-31, Abnormal Release of Radioactive Material.
15. **GO TO** Section 3.7, RECOVERY.	

-END OF SUBSECTION-

3.5 Dropped or Damaged New Fuel Assembly

ACTION/EXPECTED RESPONSE **RESPONSE NOT OBTAINED**

CAUTION **If irradiated fuel is involved entry into area shall be coordinated with RADCON.**

1. **EVACUATE** affected area:

   - Fuel Handling SRO **NOTIFY** personnel in the general area of radiation concern.
   - **ANNOUNCE** for all personnel to evacuate the affected area.

2. **SUSPEND** all non–fuel handling related work on the Refuel Floor UNTIL damaged assembly is inspected and stored.

3. **TREAT** any injured personnel using EPIP-10, Medical Emergency Response.

4. **NOTIFY** SM of dropped or damaged fuel assembly.

5. **NOTIFY** RADCON of dropped or damaged fuel, and **REQUEST** survey of el 757, Refuel Floor.

6. **REFER TO** EPIP-1, Emergency Plan Classification Flowchart.

3.5 **Dropped or Damaged New Fuel Assembly** (continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. **WHEN** RADCON gives approval, **THEN** **INSPECT** fuel assembly visually and determine extent of damage.	
8. **HANDLE** fuel assembly USING FHI-1, "Receiving, Returning, Inspecting, and Storing New Fuel and Inserts".	
9. **GO TO** Section 3.7, RECOVERY.	

-END OF SUBSECTION-

3.6 Spent Fuel Pit Gate Leakage.

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	**ANNOUNCE** to the plant for non–essential personnel to evacuate the area.	
2.	**RETURN** any fuel elements to a safe location.	
3.	**CHECK** fuel transfer cars out of tube.	**MOVE** car out of tube.
4.	**DISPATCH** two operators to close 1-ISV-78-600, Fuel Transfer Tube Isol [729, Post Acc Sampling Rm].	
5.	**ALIGN** SFP makeup in accordance with SOI-78.01, Spent Fuel Pool Cooling and Cleaning System.	
6.	**CHECK** Spent Fuel Pool gate seal pressure available, 0-PI-79-160A, accumulator pressure > 30 psig [on accumulator behind Unit 2 Fuel Transfer System panel, el. 757].	**ENSURE** 0-ISV-32-3440, CNTL AIR ISOL TO FUEL TRANSFER CNTL CONSOLE, OPEN [A11W/757].

3.6 Spent Fuel Pit Gate Leakage (continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. **CHECK** SFP water level above SFP cooling pump suction. • El 749 ft 1.5 in.	**STOP** all SFP Cooling Pumps, **FILL** SFP to normal level (greater than or equal to el 749 ft 1.5 in. and less than or equal to el 749 ft 2.5 in.). **START** a SFP Cooling pump. **ESTABLISH** SFP cooling flow.
8. **CHECK** irradiated fuel assembly removed from SFP bridge hoist.	**TRANSPORT** fuel assembly to any approved storage location in SFP, **THEN** **INSERT** fully into storage.
9. **CHECK** leak STOPPED.	**MAINTAIN** makeup flow.
10. **MONITOR** SFP level between 749' 1.5" and 749' 2.5"	**ADJUST** makeup flow. to maintain level STABLE between 749' 1.5" and 749' 2.5"
11. **INITIATE** corrective action.	
12. **NOTIFY** Operations Duty Manager of unit conditions.	

-END OF SUBSECTION-

3.7 RECOVERY

1. Instructions for the repair of the failed refueling cavity seal will be issued when required. The water in the Containment Pit Sump will be analyzed and processed accordingly. Following repair of the seal, the refueling cavity will be refilled normally.

2. RADCON will control entry into containment. Fuel movement may continue only after permission is received from the Operations Superintendent.

3. RADCON will control entry on to el 757, Refuel Floor. Instructions will be issued as required for the situation. Fuel movement may continue only after permission is received from the Operations Superintendent.

4. For extensive damage to new fuel assembly, instructions will be provided as required. Slightly damaged fuel may be moved following permission from the Operations Superintendent. Accounting for fuel shall be per SPP-5.8, Special Nuclear Material Control.

4.0 DISCUSSION

4.1 Section 3.2, Refueling Cavity Seal Failure, provides guidelines to:

A. Set down, into an approved storage location, any fuel assembly the Refueling machine may be carrying.

B. Pick up any fuel assembly in the RCCA Change Fixture and place it into any approved location in the Rx Vessel.

C. Make up to the SFP and/or refueling cavity.

D. Limit the loss of water from the SFP.

4.2 A maximum leak rate of 3176 gpm has been calculated assuming a deflated seal and a resulting 1/16" gap between the seal and vessel.
With the Fuel Transfer Tube valve closed, this provides 70 minutes for the refueling cavity to drain to the Rx Vessel flange elevation.

The following elevations and dimensions are provided to aid decision making in handling the seal failure:

A.	Refueling Floor	el 757'
	Rx Vessel Flange	el 725' 1.5"
	Top of Upender, vertical	el 725' 1.75"
	Top of Spent Fuel Pit racks	el 723' 3.75"
B.	Flange to Upper Internals storage area	11' 3"
	Flange to Transfer Canal	15' 10.75"
	Height of Rx Vessel head Guide Studs	26' 9.6"

4.3 Section 3.3, Dropped or Damaged Irradiated Fuel Assembly in Containment, provides guidelines to reduce the release of radioactivity if an irradiated fuel assembly is dropped or damaged during handling in the refueling cavity.

4.4 Section 3.4, Dropped or Damaged Irradiated Fuel Assembly in the Spent Fuel Pit Area, provides guidelines to reduce the release of radioactivity if an irradiated fuel assembly is dropped or damaged during handling in the Spent Fuel Pit or Transfer Canal areas.

4.5 Section 3.5, Dropped or Damaged New Fuel Assembly, provides guidelines to handle a non-irradiated fuel assembly. Radiation, in general, should not increase. Specifically, Alpha (α) radiation may be expected to be produced by release of tramp uranium and/or fuel.

5.0 REFERENCES

5.1 Performance

A. FHI-1, Receiving, Returning, Inspecting, and Storing New Fuel and Inserts.

B. EPIP-1, Emergency Plan Classification Flowchart.

C. EPIP-13, Initial Dose Assessment For Radiological Emergencies.

D. EPIP-10, Medical Emergency Response.

E. MI-88.003, Opening Primary Containment Penetrations And Shield Building Penetrations For Maintenance Activities

F. SOI-74.01, Residual Heat Removal System.

G. SOI-78.01, Spent Fuel Pool Cooling and Cleaning System.

H. SPP-5.8, Special Nuclear Material Control.

5.2 Developmental

A. TRM 3.1.1, Boration Systems Flow Paths, Shutdown.

B. TRM 3.1.3, Charging Pump, Shutdown.

C. TRM 3.1.5, Borated Water Sources, Shutdown.

D. Tech Spec 3.9.7, Refueling Cavity Water Level.

CHECKLIST 1

Page 1 of 2

CONTAINMENT VENTILATION ISOLATION DAMPERS

COMPONENT DESCRIPTION	REQUIRED POSITION	COMPONENT ID	VERIFIED BY

NOTE: The following damper positions are indicated left to right on the PURGE DAMPERS mimic [M-9].

ANNULUS PURGE SUPPLY	CLOSED	FCV-30-12	_____
UPR CNTMT PURGE	CLOSED	FCV-30-7	_____
UPR CNTMT PURGE	CLOSED	FCV-30-8	_____
UPR CNTMT PURGE	CLOSED	FCV-30-50	_____
UPR CNTMT PURGE	CLOSED	FCV-30-51	_____
UPR CNTMT PURGE	CLOSED	FCV-30-9	_____
UPR CNTMT PURGE	CLOSED	FCV-30-10	_____
UPR CNTMT PURGE	CLOSED	FCV-30-52	_____
UPR CNTMT PURGE	CLOSED	FCV-30-53	_____
LWR CNTMT PURGE	CLOSED	FCV-30-14	_____
LWR CNTMT PURGE	CLOSED	FCV-30-15	_____
LWR CNTMT PURGE	CLOSED	FCV-30-56	_____
LWR CNTMT PURGE	CLOSED	FCV-30-57	_____
LWR CNTMT PURGE SUP	CLOSED	FCV-30-16	_____
LWR CNTMT PURGE SUP	CLOSED	FCV-30-17	_____
LWR CNTMT PURGE EXH	CLOSED	FCV-30-40	_____
LWR CNTMT PURGE EXH	CLOSED	FCV-30-37	_____
INSTR RM PURGE	CLOSED	FCV-30-19	_____
INSTR RM PURGE	CLOSED	FCV-30-20	_____
INSTR RM PURGE	CLOSED	FCV-30-58	_____
INSTR RM PURGE	CLOSED	FCV-30-59	_____
ANNULUS PURGE EXH	CLOSED	FCV-30-54	_____

CHECKLIST 1

Page 2 of 2

CONTAINMENT VENTILATION ISOLATION DAMPERS

COMPONENT DESCRIPTION	REQUIRED POSITION	COMPONENT ID	VERIFIED BY

NOTE: Purge Fan damper indicators are mimicked with associated fan handswitches [M-9].

CNTMT PURGE SUP SUCT ISO	CLOSED	FCO-30-1A	_____
CNTMT PURGE SUP SUCT ISO	CLOSED	FCO-30-294	_____
CNTMT PURGE SUP SUCT ISO	CLOSED	FCO-30-295	_____
CNTMT PURGE SUP SUCT ISO	CLOSED	FCO-30-4A	_____
INST RM PURGE SUP	CLOSED	FCO-30-11A	_____
CNTMT PURGE SUP FAN A OUTLET	CLOSED	FCO-30-1B	_____
CNTMT PURGE SUP FAN B OUTLET	CLOSED	FCO-30-4B	_____
INST RM PURGE SUP FAN OUTLET	CLOSED	FCO-30-11B	_____

NOTE: Cntmt ΔP damper position indicators are on the handswitches [M-9].

CNTMT ANN ΔP XMTR ISOL	CLOSED	1-FSV-30-134	_____
CNTMT ANN ΔP XMTR ISOL	CLOSED	1-FSV-30-135	_____

CHECKLIST 2

Page 1 of 1

AUXILIARY BUILDING ISOLATION DAMPERS

COMPONENT DESCRIPTION	REQUIRED POSITION	COMPONENT ID	VERIFIED BY
FH AREA EXH FAN A	CLOSED	0-FCO-30-136	_____
CASK LOAD AREA SUPPLY	CLOSED	0-FCO-30-129	_____
CASK LOAD AREA SUPPLY	CLOSED	0-FCO-30-130	_____
CASK LOAD AREA EXHAUST	CLOSED	0-FCO-30-122	_____
CASK LOAD AREA EXHAUST	CLOSED	0-FCO-30-123	_____
AB GEN SUP FAN 1A DISCH	CLOSED	1-FCO-30-103	_____
AB GEN SUP FAN 1B DISCH	CLOSED	1-FCO-30-102	_____
AB GEN SUP FAN 2A DISCH	CLOSED	2-FCO-30-104	_____
AB GEN SUP FAN 2B DISCH	CLOSED	2-FCO-30-105	_____
U1 AB GEN SPACES & FH AREA SUP	CLOSED	1-FCO-30-106	_____
U1 AB GEN SPACES SUPPLY	CLOSED	1-FCO-30-86	_____
U2 AB GEN SUP OUTLET	CLOSED	2-FCO-30-108	_____
U2 AB GEN SPACES SUPPLY	CLOSED	2-FCO-30-21	_____
U1 AB GEN SPACES & FH AREA SUP	CLOSED	1-FCO-30-107	_____
U1 AB GEN SPACES SUPPLY	CLOSED	1-FCO-30-87	_____
U2 AB GEN SUP OUTLET	CLOSED	2-FCO-30-109	_____
U2 AB GEN SPACES SUPPLY	CLOSED	2-FCO-30-22	_____
AB GEN EXHAUST FAN 1A DISCH	CLOSED	1-FCO-30-159	_____
AB GEN EXHAUST FAN 1B DISCH	CLOSED	1-FCO-30-162	_____
AB GEN EXHAUST FAN 2A DISCH	CLOSED	2-FCO-30-274	_____
AB GEN EXHAUST FAN 2B DISCH	CLOSED	2-FCO-30-278	_____

SOURCE NOTES

SOURCE NOTE	DOCUMENT	SUMMARY	AFFECTED STEPS NOTE
1	NRC Bulletin 84-03,NCO920047113	Revise procedure to assist operator in diagnosing and mitigation of refueling cavity seal leakage.	Section 3.1, 3.2
2	IE Notice 88-092	Spent fuel pit gate leakage.	Section 3.6
3	Tech Spec Change Pkg TS-99-09 NCO000003001	Allow personnel air lock doors and ice charging penetrations to be open during fuel movement.	Section 3.3, 3.4

Question 97

G2.4.42 024

Initial Plant Conditions:

- Plant is operating 100% power

The following conditions/events have taken place:

- 0900 hrs: All Main Control Room (MCR) Annunciators (and Annunciator Monitor) become inoperable. SPDS and ICS Computer are unavailable.
- 0915 hrs: An **Alert** was declared.

Which one of the following correctly describes the activation requirements for the emergency facilities and the notification requirements for the Tennessee Emergency Management Agency if the ODS cannot be contacted?

Emergency facilities (TSC & OSC) are _____ to be activated.

If the ODS cannot be contacted within ____ minutes, then the Tennessee Emergency Management Agency must be notified of the Radiological Emergency Plan activation directly.

A. required
5

B. required
10

C. NOT required
5

D. NOT required
10

Answer: B

Comments and Recommendations

Change the correct answer to "A"

EPIP implementing instructions require that the ODS be notified within 5 minutes

EPIP-1, Emergency Plan Classification Flow Chart

3.3.8 The **ACCEPTABLE** time frame for notification to the Operation Duty
Specialist (ODS) is considered to be five (5) minutes. This is the time period between declaration of the emergency and notifying the ODS.

EPIP -2 Unusual Event, EPIP -3 Alert, EPIP -4 Site Area Emergency, and
EPIP -5 General Emergency All four procedures contain the following note

NOTE ODS should be notified within 5 minutes after declaration of the event.

The State notification time requirement is 15 minutes and if attempts have been made and the ODS cannot be notified within the acceptable time frame, then the State notification should be made without delay.

The reference to the 10 minutes in EPIP-2 through 5 is to ensure the 15 minute time period for making the State notification is met

Choice "A" is the correct answer

Reference

EPIP-1, Emergency Plan Classification Flow Chart
EPIP -2, Unusual Event
EPIP -3, Alert
EPIP -4, Site Area Emergency
EPIP -5, General Emergency

3.0 INSTRUCTIONS (continued)

3.3.4 After an Event classification, if the following investigation shows that Initiating Conditions were met that dictate a higher Event classification, the new event classification shall be declared at the clock time of the determination.

3.3.5 **IF** an EAL for a higher classification was exceeded but the present situation indicates a lower classification, the fact that the higher classification occurred SHALL be reported to the NRC and Central Emergency Control Center (CECC), but should not be declared.

3.3.6 **IF** the Parameter is indeterminate due to instrument malfunction and the existence of the condition **CAN NOT** be reasonably discounted (i.e., spurious or false alarm that can be substantiated within 15 minutes) the condition is considered **MET** and the SM/SED SHALL follow the indications provided until such time as the alarm is verified to be false.

3.3.7 **IF** an EAL was exceeded, but the emergency has been totally resolved (prior to declaration), the emergency condition that was appropriate **shall not** be declared but reported to the NRC and Operations Duty Specialist (ODS) at the same clock time.

3.3.8 The **ACCEPTABLE** time frame for notification to the Operation Duty Specialist (ODS) is considered to be five (5) minutes. This is the time period between declaration of the emergency and notifying the ODS.

4.0 RECORDS

4.1 Non-QA Records

None

4.2 QA Records

None