OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: CVCS

TASK: Take compensatory action for two or more control rods failing to insert during a reactor trip (TRIP-2)

TASK NUMBER: 1150030501

JPM NUMBER: India S-a

ALTERNATE PATH: [X]

K/A NUMBER: 004 A2.14

IMPORTANCE FACTOR: 3.8* (RO) 3.9 (SRO)

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: Simulator (Perform)

REFERENCES: 2-EOP-TRIP-2, REV. 26

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 8 Minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

APPROVAL:

BARGAINING UNIT REPRESENTATIVE	OPERATIONS TRAINING MANAGER	OPERATIONS DIRECTOR OR DESIGNEE

CAUTION: **No plant equipment shall be operated during the performance of a JPM without the following:**
1. **Permission from the OS or Unit CRS;**
2. **Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions).**
3. **Verification of the "as left" condition by a qualified individual.**

ACTUAL JPM COMPLETION TIME: _____ Minutes

ACTUAL TIME CRITICAL COMPLETION: _____ Minutes

JPM PERFORMED BY: _____ **GRADE:** [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____ **DATE:** _____

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: CVCS

TASK: Take compensatory action for two or more control rods failing to insert during a reactor trip (TRIP-2)

TASK NUMBER: 1150030501

INITIAL CONDITIONS:

1) At power IC-185 on Thumb Drive, which was developed by:

2) Insert MALF RD0064 to prevent insertion of three control rods, rods 2, 17, 48
3) Insert OVERRIDE B128=0 (Rapid Borate Flow = 0.0)
4) Trip the Rx and perform EOP's until CONTROL ROD INSERTION block of steps in TRIP-2
5) Mark up procedure to Step 7.

INITIATING CUE:

The reactor has tripped from 100% power. The operating crew has performed the steps of TRIP-2 to the point indicated by the procedure. Begin performing TRIP-2 at the indicated step.

Successful Completion Criteria:
1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: **CVCS**

TASK: **Take compensatory action for two or more control rods failing to insert during a reactor trip (TRIP-2)**

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide candidate with "Tear Off Sheet"	Candidate reviews conditions and the marked up EOP		
		START TIME:			
	1	HAVE TWO OR MORE CONTROL RODS FAILED TO INSERT	Notes three control rods not fully inserted		
	2	START AT LEAST ONE BORIC ACID PUMP IN MANUAL-FAST	Selects MANUAL and starts 21 and/or 22 BA Pump in FAST		
	3	OPEN 2CV175 (RAPID BORATE STOP VALVE)	Opens 2CV175		
	4	CLOSE 21 AND 22CV160 (BAT RECIRC VALVES)	Closes 21 and 22CV160		
	5	CONTROL CHARGING TO MAINTAIN >87 GPM	Verifies or raises charging flow to >87 gpm by adjusting the Master Flow Controller in Manual or 23 Charging pump speed controller in manual.		
	6	IS RAPID BORATION FLOW ESTABLISHED	Checks flow meter and answers NO		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: **CVCS**

TASK: **Take compensatory action for two or more control rods failing to insert during a reactor trip (TRIP-2)**

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	7	PERFORM THE FOLLOWING ACTIONS: • CLOSE 2CV175 • STOP BOTH BA PUMPS • PLACE ONE BA PUMP IN AUTO • THROTTLE 21 AND 22CV160 TO 10% DEMAND	• 2CV175 closed • 21 and 22 BA Pump stopped • 21 or 22 BA Pump in AUTO • 21 and 22CV160 demand set at no less than 10%		
* #	8	OPEN 2SJ1 AND 2SJ2 (RWST TO CHARGING PUMP VALVES)	Opens 2SJ1 and 2SJ2		
* #	9	CLOSE 2CV40 AND 2CV41 (VCT DISCHARGE STOP VALVES)	Closes 2CV40 and 2CV41		
*	10	CONTROL CHARGING TO MAINTAIN GREATER THAN 87 GPM	Verifies or adjusts charging >87 GPM		
*	11	BORATE 120 MINUTES FOR EACH CONTROL ROD NOT FULLY INSERTED	Determines 360 minutes required boration time. CUE: After determination of correct boration time, state the JPM is complete.		
		TERMINATE JPM			
		STOP TIME:			

Terminating Cue: Repeat back message from the operator on the status of the JPM, and then state "This JPM is complete"

INITIAL CONDITIONS:

1. The reactor has tripped from 100% power. The operating crew has performed the steps of 2-EOPTRIP-2 to the point indicated by the procedure.

INITIATING CUE:

Begin performing 2-EOP-TRIP-2 at step 7.

USER RESPONSIBLE FOR VERIFYING REVISION, STATUS AND CHANGES
PRINTED 20061011

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: Salem Generating Station

SYSTEM: ECCS

TASK: TCAF LBLOCA: transfer to Cold Leg Recirculation IAW LOCA-3

TASK NUMBER: 1150100501

JPM NUMBER: India S-b

ALTERNATE PATH: [ ]

K/A NUMBER: 006 A4.05

IMPORTANCE FACTOR: 3.9 (RO) 3.8 (SRO)

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Simulator/Perform

REFERENCES: 2-EOP-LOCA-3, Rev. 26

TOOLS, EQUIPMENT AND PROCEDURES: 2-EOP-LOCA-3 Rev. 26

VALIDATED JPM COMPLETION TIME: 9 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: See initiating Cue

APPROVAL:

BARGAINING UNIT REPRESENTATIVE	OPERATIONS TRAININ MANAGER OR DESIGNEE	OPERATIONS DIRECTOR OR DESIGNEE

CAUTION **No plant equipment shall be operated during the performance of a JPM without the following:**
1. **Permission from the SM or Unit CRS;**
2. **Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions).**
3. **Verification of the "as left" condition by a qualified individual.**

ACTUAL JPM COMPLETION TIME: _____ Minutes

ACTUAL TIME CRITICAL COMPLETION: TIME: _____ Minutes

JPM PERFORMED BY: _____ **GRADE:** [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____ **DATE:** _____

1. IC-190 on Thumb Drive – snapshot of LBLOCA with no malfunctions, immediately following actuation of the RWST LOW level alarm.

2. Should have a marked up version of LOCA-1 available for the operator to review.

3. This is a Time Critical task. The RH19s should be closed within 3 minutes and complete the shift to CL Recirc in 11.7 minutes when the SJ30, SJ1 and SJ2 are shut.

Initial Conditions:

A LBLOCA has occurred. All ECCS equipment functioned as designed. The vital buses are powered from the switchyard. The transition to LOCA-3 (from LOCA-1) was just made following actuation of the RWST LO Level alarm.

INITIATING CUE:
You are the RO/PO. Execute the steps of LOCA-3. This task is time critical. The clock begins when the simulator is taken out of freeze.

Successful Completion Criteria:

1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).**

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: ECCS

TASK: TCAF a LBLOCA: transfer to CL Recirculation IAW LOCA-3

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	2	Is Containment Recirc Sump level >62%?	***Evaluator: Log time for evaluation of critical time requirements:*** _____. Verifies either Ch. A or B Sump Level indication is >62%.		
*	3	Depress "SUMP AUTO ARMED" PB's on 21 and 22SJ44 Bezels	WHITE indicating light energizes and valves stroke OPEN. The RED OPEN indicating light energizes when each valve reaches full stroke.		
*	4	Remove lockouts for the following valves: • 2SJ67 • 2SJ68 • 2SJ69	On RP-4, position the valve lockout switches to: • 2SJ67 - VALVE OPERABLE • 2SJ68 - VALVE OPERABLE • 2SJ69 - VALVE OPERABLE		
	5	Are 21 and 22SJ 44 Open?	Verifies both valves open		
		Start 21 and 22 RHR Pump	Verifies both RHR Pumps are running		
*		Close 2SJ69	Depresses 2SJ69 CLOSE PB and verifies 2SJ69 closed indication		
	7	Reset SI	Verifies GREEN SI RESET PB illuminated on safeguards bezel.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: ECCS

TASK: TCAF a LBLOCA: transfer to CL Recirculation IAW LOCA-3

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
		Reset EMERGENCY LOADING for each SEC	Verifies WHITE EMERGENCY LOADING RESET PB on each DG bezel is illuminated		
		Reset 230V CONTROL CENTERS	Verifies WHITE 230V CONTROL CENTER RESET PB on each DG is illuminated.		
	8	Are Both CS Pumps running?	Verifies both CS pumps are running.		
*		Stop 22 CS PUMP.	Depress GREEN STOP PB for 22 CS PUMP and observe that RED START PB light extinguishes.		
*	9	Close 21 and 22RH19 (RHR HX DISCH X-CONN VALVES)	Depress GREEN CLOSE PB on 21 and 22RH19 and observe that RED OPEN PB light extinguishes and GREEN illuminates. ***Evaluator: Log time for evaluating completion of time critical task:_____ (< 3 minutes)***		
*		Stop 23 CHARGING PUMP	Depress GREEN STOP PB for 23 Charging pump and observe that RED START light extinguishes.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: ECCS

TASK: TCAF a LBLOCA: transfer to CL Recirculation IAW LOCA-3

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	10	Select appropriate flowpath transition step from TABLE B	Determines that all 4KV Vital Buses are energized and proceeds to Step 11, per TABLE B.		
	11	Is any 4KV Vital Bus energized by DG?	Determines that 4KV Vital Buses are being fed from the switchyard based on breaker position and/or the Mimic Bus.		
	11.1	Are at least three SW PUMPS running?	Verifies three SW PUMPS are running based on RED START LIGHT illuminated and/or amperage. **NOTE:** SW header pressure may drop to between 95-100 psig. Student may start a SW pump to raise header pressure.		
		Are 21 and 22 CCW HXs in service?	Determines 21 and 22 CCW HXs in service by observing CCW outlet temperature and verifying SW flow/valve alignment.		
	11.2	Are at least two CCW PUMPS running?	Verifies at least 2 CCW PUMPS running by observing RED START PB illuminated and/or running amps.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: ECCS

TASK: TCAF a LBLOCA: transfer to CL Recirculation IAW LOCA-3

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
		OPEN 21 and 22CC16 (CCW to RHR HX OUTLET VALVES)	Verifies 21 and 22CC16 OPEN by observing RED OPEN PB illuminated. *NOTE:* Normally AUTO ARMED to open at RWST LO LEVEL SETPT.		
*		CLOSE 2SJ67 and 2SJ68 (SI PUMP MINIFLOW VALVES)	Depresses GREEN CLOSE PB on 2SJ67 and 2SJ68, observes RED OPEN PB light extinguish and GREEN CLOSE light illuminate.		
		CLOSE 2RH1 and 2RH2 (COMMON SUCTION VALVES)	Verifies GREEN CLOSE PB light on 2RH1 and 2RH2 are illuminated.		
	11.3	Is 22 RHR pump running?	Verifies 22 RHR pump is running.		
*		OPEN 22SJ45 (RHR DISCHARGE TO CHARGING PUMPS VALVE)	Depresses RED OPEN PB on 22SJ45, observes GREEN CLOSE PB extinguish and RED OPEN PB illuminate.		
	11.4	Is 21 RHR pump running?	Verifies 21 RHR pump is running.		
*		OPEN 21SJ45 (RHR DISCHARGE TO SI PUMPS VALVE)	Depresses RED OPEN PB on 21SJ45, observes GREEN CLOSE PB extinguish and RED OPEN PB illuminate.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: ECCS

TASK: TCAF a LBLOCA: transfer to CL Recirculation IAW LOCA-3

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
		OPEN 21 and 22SJ113 (SI-CHG PUMPS X-OVER VALVES)	Verifies RED OPEN PB illuminated on 21 and 22SJ113. **NOTE:** Normally AUTO ARMED to open at RWST LO LEVEL SETPT.		
	12	START: • 21 and 22 SI PUMPS • 21 and 22 CHARGING PUMPS	Verifies RED START PB illuminated and/or running amps on 21 and 22 SI and CHARGING PUMPS..		
*	14	Remove Lockout for 2SJ30	Removes SJ30 LOCKOUT using switch on RP-4		
*		Isolate the RWST as follows: • CLOSE 2SJ30 • CLOSE 2SJ1 • CLOSE 2SJ2	For 2SJ30: Depress the GREEN CLOSE PB, observe the RED OPEN PB light extinguish and the GREEN CLOSE PB illuminate. For 2SJ1 and 2SJ2: Select MANUAL by depressing the BLUE PB, depress the GREEN CLOSE PB, observe the RED CLOSE PB light extinguish and the GREEN CLOSE PB illuminate. ***Evaluator: Log time for evaluating completion of time critical task_____ (< 11.7 minutes)***		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: ECCS

TASK: TCAF a LBLOCA: transfer to CL Recirculation IAW LOCA-3

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	15.0	Place controllers for recirculation valves 21 and 22RH29 in MANUAL and CLOSE the valves.	On each valve, select MANUAL by depressing the BLUE PB, depress the GREEN CLOSE PB, observe the RED OPEN PB light extinguish and the GREEN CLOSE PB illuminate. CUE: After Both RH29 valves have been placed in manual, state JPM is complete.		

TERMINATING CUE: 21 and 22RH29 close

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

1. A LBLOCA has occurred. All ECCS equipment functioned as designed. The vital buses are powered from the switchyard. The transition to LOCA-3 (from LOCA-1) was just made following actuation of the RWST LO Level alarm.

INITIATING CUE:

You are the RO/PO. Execute the steps of LOCA-3. This task is time critical. The clock starts with the reading of the first step.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM 1 & 2

SYSTEM: Reactor Coolant System

TASK: Take Corrective Action For Pressurizer Pressure Malfunctions

TASK NUMBER: N1140240401

JPM NUMBER: India Sim c.

ALTERNATE PATH: [X]

K/A NUMBER: 010 A2.03 / A4.03

IMPORTANCE FACTOR: 4.1 / 4.0 (RO) 4.2 / 3.8 (SRO)

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: SIMULATOR / PERFORM

REFERENCES: S2.OP-AB.PZR-0001, Rev. 15

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 6 MINUTES

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

APPROVAL:

Bargaining Unit Representative	OTM or designee	OPS Manager, or Designee

CAUTION: **No plant equipment shall be operated during the performance of a JPM without the following:**
1. **Permission from the SM or Unit CRS;**
2. **Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions).**
3. **Verification of the "as left" condition by a qualified individual.**

ACTUAL JPM COMPLETION TIME: _____ Minutes

ACTUAL TIME CRITICAL COMPLETION: N/A

JPM PERFORMED BY: _____ **GRADE:** [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____ **DATE:** _____

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Reactor Coolant System

TASK: Take Corrective Action For Pressurizer Pressure Malfunctions

TASK NUMBER: N1140240401

INITIAL CONDITIONS:

IC-182

100% power.

Malf PR0018A PR1 leak, Tied to Event 1 Final Value 60,000

VL0122 PR6 fails to position, tied to Event 1, final value 90

VL0297 PR1 fails to position, RT-1, Final Value 10%.

AN0663 SER 663 Fail OFF Overide OHA E-26 (To prevent alerting operator that 2PR1 is not full closed)

Event 1 KB201LCI This event is when the operator depresses the CLOSE PB for 2PR6 at step 3.42.A It inserts the PR6 fail to 90% open, and also inserts PR1 fails to the 10% open position.

INITIATING CUE:

You are the Reactor Operator. Respond to all indications and alarms.

Successful Completion Criteria:
1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

NAME: _____

DATE: _____

SYSTEM: **Reactor Coolant System**

TASK: **Take Corrective Action For Pressurizer Pressure Malfunctions**

# *	STEP NO.	STEP (* Denotes a Critical Step) (# Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			Operator states he has the watch.		
	1	Enter RT-1, VLV0297 PR1 fails to position, Final Value 10%.			
*	2		Operator recognizes PZR pressure dropping slowly by visual observation or by energization of the Back Up group 22 PZR heater. Operator may diagnose the partially open PORV initially, or during AB performance. Operator may attempt to place PORV in MANUAL and CLOSE the PORV to mitigate the pressure reduction.		
	3		Operator enters S2.OP-AB.PZR-0001, PRESSURIZER PRESSURE MALFUNCTION.		
	3.1		Operator initiates CAS.		

NAME: _____

DATE: _____

SYSTEM: **Reactor Coolant System**

TASK: **Take Corrective Action For Pressurizer Pressure Malfunctions**

# *	STEP NO.	STEP (* Denotes a Critical Step) (# Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	3.2	Is POPS in service?	Operator answers NO.		
*	3.3	Is controlling PZR pressure channel failed?	Operator answers NO, GOES TO STEP 3.11		
*	3.11	Is the MPC failed?	Operator answers NO, GOES TO Step 3.17		
*	3.17	Is a Spray Valve failed?	Operator answers NO, GOES TO Step 3.39		
*	3.39	Is a PORV failed?	Operator answers YES, 2PR1 is partially open		
*	3.40	Place the PORV in Manual	Operator depresses Manual PB for 2PR1.		
	3.41	Operate the PORV to control PZR IAW Att. 2	Operator discovers 2PR1 will not close.		
*	3.42	IF a PORV has failed to close: A. CLOSE the associated stop valve. B. Dispatch an operator to open the associated control power breaker.	Operator depresses close PB for 2PR6. **SIMULATOR OPERATOR: ENSURE ET-2 becomes TRUE** **PORV leakage rises, causing a corresponding rise in rate of pressure drop.** CUE: If requested, state that an operator has been dispatched to open breaker.		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: **Reactor Coolant System**

TASK: **Take Corrective Action For Pressurizer Pressure Malfunctions**

# *	STEP NO.	STEP (* Denotes a Critical Step) (# Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	CAS 1.0	IF AT ANY TIME, RCS pressure drops to 2000 psig and continues to drop, THEN: A. TRIP the Reactor, B. GO TO TRIP-1	Operator TRIPS the reactor before an automatic runback or trip on OT/DT occurs.		
		Evaluator terminate the JPM after the operator has tripped the Rx and started performing IMMEDIATE ACTIONS of TRIP-1			

Terminating Cue:

INITIAL CONDITIONS:

100% power, steady state.

INITIATING CUE:

You are the Reactor Operator. Respond to all indications and alarms

PSEG NUCLEAR L.L.C.
SALEM/OPERATIONS

S2.OP-AB.PZR-0001(Q) - REV. 15

PRESSURIZER PRESSURE MALFUNCTION

A. Biennial Review Performed: Yes___ No_√_
B. Change Packages and affected document numbers incorporated into this revision. None
C. OTSC incorporated into this revision. None

REVISION SUMMARY:

- Added Note prior to Step 3.27 and in Exhibit 3 stating :"Containment entry into areas >160°F (>147°F WBGT) are prohibited. Entry into areas >128°F (>114°F WBGT) require the approval of the Plant Manager, Department Manager, and Safety Department Representative, or their respective designee, IAW NC.IS-TM.ZZ-0001(Z), Nuclear Department Safety Manual." This change is editorial in nature as previously approved in S2.OP-PT.CAN-0001(Q). **[80074747-0020]**

IMPLEMENTATION REQUIREMENTS Effective Date 01/17/2006

None

APPROVED: MD Quint for
Operations Manager - Salem

1-11-06
Date

SELECTED CAS ITEMS

♦ IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

1. **TRIP** the Reactor.

2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

* Refer to the Briefing Sheet.

PRESSURIZER PRESSURE MALFUNCTION

1.0 ENTRY CONDITIONS

DATE: _____ TIME: _____

1.1 Any unexpected Pressurizer pressure transient

1.2 Failure of Pressurizer pressure instrument and control

1.3 Pressurizer PORV or Code Safety valve open or leaking

2.0 IMMEDIATE ACTIONS

2.1 None

3.0 SUBSEQUENT ACTION

3.1 **INITIATE** Attachment 1, Continuous Action Summary.

___ 3.2 Is POPS in service?

___ NO ___ YES ——> **GO TO** Attachment 3

V

_____ Time

___ 3.3 Is the controlling Pressurizer Pressure Control Channel (I or III) failed?

___ YES ___ NO ——> **GO TO** Step 3.11

V

_____ Time

___ 3.4 **PLACE** the Master Pressure Controller in MANUAL.

___ 3.5 **ADJUST** Master Pressure Controller demand signal to be consistent with Attachment 2, to restore pressure to program value.

___ 3.6 **SELECT** the other Pressure Control Channel.

___ 3.7 **RETURN** the Master Pressure Controller to AUTO.

___ 3.8 **NOTIFY** the SM/CRS to refer to Technical Specifications.

SELECTED CAS ITEMS

♦ IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

1. **TRIP** the Reactor.

2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

* Refer to the Briefing Sheet.

___ 3.9 **REMOVE** the failed Pressurizer Pressure Channel from service IAW S2.OP-SO.RPS-0003(Q), Placing Pressurizer Channel In Tripped Condition.

___ 3.10 **GO TO** Section 4.0.

___ 3.11 Is the Master Pressure Controller failed? (Refer to Attachment 2 for guidance) ____ Time

___ YES ___ NO ——> **GO TO** Step 3.17

V ____ Time

___ 3.12 **PLACE** the Master Pressure Controller in MANUAL.

___ 3.13 **ADJUST** Master Pressure Controller demand signal to be consistent with Attachment 2, to restore pressure to program value.

___ 3.14 IF unable to control Heaters and Sprays with the Master Pressure Controller in MANUAL,
THEN:

___ A. **PLACE** Sprays in MANUAL.

___ B. **PLACE** Heaters in MANUAL.

___ C. **ADJUST** pressure to program value to be consistent with Attachment 2.

___ 3.15 **NOTIFY** the SM/CRS to refer to Technical Specifications.

___ 3.16 **GO TO** Section 4.0.

___ 3.17 Is a Spray Valve(s) failed? (Refer to Attachment 2 for guidance) ____ Time

___ YES ___ NO ——> **GO TO** Step 3.39

V ____ Time

___ 3.18 **PLACE** the Spray Valve(s) in MANUAL.

SELECTED CAS ITEMS

♦ IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

1. **TRIP** the Reactor.

2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

* Refer to the Briefing Sheet.

___ 3.19 **OPERATE** the Spray Valves to control pressure consistent with Attachment 2.

___ 3.20 **PLACE** all Pressurizer heaters in MANUAL and ON.

___ 3.21 Has pressure control been regained?

___ Time

___ NO ___ YES ——> **GO TO** Step 3.26

V

___ 3.22 Is RCS pressure dropping rapidly?

___ YES ___ NO ——> **GO TO** Step 3.25

___ Time

V

___ 3.23 Are Reactor Trip Breakers CLOSED?

___ YES ___ NO ——> **GO TO** Step 3.33

___ Time

V

___ 3.24 **PERFORM** the following:

___ A. **TRIP** the Reactor.

___ B. Is Reactor Trip Confirmed?

___ YES ___ NO ——> **GO TO** 2-EOP-TRIP-1

___ Time

V

___ C. **STOP** 21 AND 23 RCPs: **[CAPR 70022203]**

___ D. IF Pressurizer Pressure continues to drop,
THEN **STOP** all but one RCP.

___ E. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection,
AND **CONTINUE** with this procedure.

___ Time

SELECTED CAS ITEMS

- IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

  1. **TRIP** the Reactor.

  2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

* Refer to the Briefing Sheet.

___ 3.25 IF the Unit is on line,
THEN **COMMENCE** a power reduction in anticipation of tripping the Reactor and stopping RCPs.

___ 3.26 **ATTEMPT** to identify the leaking Spray Valve by monitoring the follows:

- Valve demand indication
- Valve position indication
- Spray Line temperatures. Increasing OR elevated Spray Line temperature indicates spray valve leakage or failure.

MONITOR Spray Line Temp	Leaking Spray Valve	Applicable RCP
SPRAY LOOP 21 TEMP CONSOLE (TI451) (Plant Computer T0484A)	2PS1	21 RCP
SPRAY LOOP 23 TEMP CONSOLE (TI452) (Plant Computer T0483A)	2PS3	23 RCP

NOTE

Containment entry into areas >160°F (>147°F WBGT) are prohibited. Entry into areas >128°F (>114°F WBGT) require the approval of the Plant Manager, Department Manager, and Safety Department Representative, or their respective designee, IAW NC.IS-TM.ZZ-0001(Z), Nuclear Department Safety Manual.

___ 3.27 Is a Containment entry possible?

___ YES ___ NO ——> **GO TO** Step 3.29 ___ Time

V

___ 3.28 **SEND** an operator to make a Containment entry to isolate the leaking Spray Valve by closing the following associated valves. ___ Time

SPRAY VALE	INLET ISOL V	PZR SPRAY BYP V
2PS1	2PS24	2PS2
2PS3	2PS28	2PS4

SELECTED CAS ITEMS

♦ IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

1. **TRIP** the Reactor.

2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

* Refer to the Briefing Sheet.

___ 3.29 **WAIT** at this point until one of the following occurs OR is required, THEN **CONTINUE**:

___ A. The leaking Spray Valve is manually isolated.

OR

___ B. The SM/CRS determines a Reactor Trip is required.

OR

___ C. The SM/CRS determines stopping a RCP(s) is required.

___ 3.30 Is the leaking Spray valve manually isolated?

___ NO ___ YES ——> **GO TO** Step 3.43

V

_____ Time

___ 3.31 Are Reactor Trip Breakers CLOSED?

___ YES ___ NO ——> **GO TO** Step 3.33

V

_____ Time

___ 3.32 **PERFORM** the following:

___ A. **TRIP** the Reactor.

___ B. Is Reactor Trip Confirmed?

___ YES ___ NO ——> **GO TO** 2-EOP-TRIP-1

V

_____ Time

___ C. **STOP** 21 AND 23 RCPs: **[CAPR 70022203]**

___ D. IF Pressurizer Pressure continues to drop, THEN **STOP** all but one RCP.

___ E. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure, **GO TO** Step 3.35.

_____ Time

SELECTED CAS ITEMS

♦ IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

1. **TRIP** the Reactor.

2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

* Refer to the Briefing Sheet.

___ 3.33 **STOP** 21 AND 23 RCPs: **[CAPR 70022203]**

___ 3.34 IF Pressurizer Pressure continues to drop,
THEN **STOP** all but one RCP.

___ 3.35 **NOTIFY** the SM/CRS to refer to Technical Specifications.

___ 3.36 **RETURN** the Pressurizer Heaters to AUTO, or as directed by the SM/CRS.

___ 3.37 When conditions allow, **ISOLATE** the leaking Spray Valve.

___ 3.38 **GO TO** Section 4.0.

___ Time

___ 3.39 Is a PORV(s) failed?
(Refer to Attachment 2 for guidance)

___ YES ___ NO ——> **GO TO** Step 3.46

___ Time

V

___ 3.40 **PLACE** the PORV(s) in MANUAL.

___ 3.41 **OPERATE** the PORV(s) to control pressure consistent with Attachment 2.

___ 3.42 IF a PORV has failed to close,
THEN:

___ A. **CLOSE** the associated stop valve.

___ B. IF the associated stop valve fails to close,
THEN send an operator to **OPEN** the associated control power breaker.

- ♦ 2PR1: 2ADC2AX8, 2PR1 - 21 PRESSURIZER PORV CONTROL VALVE
- ♦ 2PR1: 2ADC2AX40, 2PR1 - 21 PRESSURIZER PORV AUXILIARY AIR CONTROL
- ♦ 2PR2: 2BDC2AX20, 2PR2 - 22 PRESSURIZER POWER RELIEF VALVE
- ♦ 2PR2: 2BDC2AX10, 2PR2 - 22 PRESSURIZER PORV AUXILIARY AIR CONTROL

___ 3.43 IF a load reduction is in progress,
THEN **EVALUATE** stopping the Load Reduction.

___ 3.44 **NOTIFY** the SM/CRS to refer to Technical Specification 3.4.5 and Event Classification Guide for Primary Leakage. **[C0543]**

___ 3.45 **GO TO** Section 4.0.

___ Time

SELECTED CAS ITEMS

♦ IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

1. **TRIP** the Reactor.

2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

* Refer to the Briefing Sheet.

___ 3.46 Are PORV tailpipe temperatures elevated?

___ YES ___ NO ——> **GO TO** Step 3.58 ___ Time

V

___ 3.47 **CLOSE** 2PR6 AND 2PR7, Pressurizer Relief Stop Valves. **[C0543]**

___ 3.48 IF PORV tailpipe temperature does NOT lower sufficiently to allow a temperature rise to be seen when the leaking PORV is unisolated,
THEN:

___ A. **OPEN** 2PR6 AND 2PR7

___ B. **GO TO** Step 3.58. ___ Time

___ 3.49 When pressure stabilizes, **OPEN** 2PR6, Pressurizer Relief Stop Valve.

___ 3.50 Is tailpipe temperature rising?

___ YES ___ NO ——> **GO TO** Step 3.53

V

___ 3.51 **CLOSE** 2PR6.

___ 3.52 **WAIT** for pressure to stabilize.

___ 3.53 **OPEN** 2PR7.

___ 3.54 Is tailpipe temperature rising?

___ YES ___ NO ——> **GO TO** Step 3.56

V ___ Time

___ 3.55 **CLOSE** 2PR7.

___ 3.56 **NOTIFY** the SM/CRS to refer to Technical Specification 3.4.5 and the Event Classification Guide for Primary Leakage. **[C0543]**

___ 3.57 **GO TO** Section 4.0.

___ Time

SELECTED CAS ITEMS

- IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

  1. **TRIP** the Reactor.

  2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

* Refer to the Briefing Sheet.

___ 3.58 Are Pressurizer Code Safety Valve tailpipe temperatures elevated?

___ YES ___ NO ——> **GO TO** Step 3.67

Time

___ 3.59 Is RCS pressure dropping in an uncontrolled manner?

___ YES ___ NO ——> **GO TO** Step 3.64

Time

___ 3.60 Manually **TRIP** the Reactor.

___ 3.61 Is Reactor Trip Confirmed?

___ YES ___ NO ——> **GO TO** 2-EOP-TRIP-1

Time

___ 3.62 **INITIATE** Safety Injection.

___ 3.63 **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection.

___ 3.64 **INITIATE** S2.OP-ST.RC-0008(Q), Reactor Coolant System - Water Inventory Balance.

___ 3.65 **NOTIFY** the SM/CRS to refer to Technical Specifications and the Event Classification Guide for Primary Leakage.

___ 3.66 **GO TO** Section 4.0.

Time

___ 3.67 Is any Pressurizer Heater(s) failed?
(Refer to Attachment 2 for guidance)

___ YES ___ NO ——> **GO TO** Step 3.2 for rediagnosis

Time

___ 3.68 **PLACE** any malfunctioning Pressurizer Heaters in MANUAL.

SELECTED CAS ITEMS

- IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

  1. **TRIP** the Reactor.

  2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

* Refer to the Briefing Sheet.

___ 3.69 **ATTEMPT** to cycle heaters to control RCS pressure.

___ 3.70 Are any Backup Heaters de-energized or NOT able to be operated from the Control Room?

___ YES ___ NO ——> **GO TO** Step 3.74

Time

V

___ 3.71 IF local operation of the 21 Backup Heaters is required,
THEN **PERFORM** Attachment 4, 21 Backup Heater Local Operation.

___ 3.72 IF local operation of the 22 Backup Heaters is required,
THEN **PERFORM** Attachment 5, 22 Backup Heater Local Operation.

___ 3.73 IF Emergency Power is required for 21 or 22 Backup Heaters,
THEN **TRANSFER** power IAW S2.OP-SO.PZR-0010(Q),
Pressurizer Backup Heaters Power Supply Transfer.

___ 3.74 **NOTIFY** the SM/CRS to refer to Technical Specification 3.4.4.

___ 3.75 Is RCS pressure being controlled?

___ YES ___ NO ——> **GO TO** Step 3.2 for rediagnosis

Time

V

___ 3.76 When local operation of the 21 Backup Heaters is no longer required,
PERFORM Attachment 4, Section 6.0.

___ 3.77 When local operation of the 22 Backup Heaters is no longer required,
PERFORM Attachment 5, Section 6.0.

___ 3.78 IF 21 or 22 Backup Heaters are aligned to their Emergency Power source AND this alignment is no longer required to support plant operation,
THEN **TRANSFER** power IAW S2.OP-SO.PZR-0010(Q), Pressurizer Backup Heaters Power Supply Transfer.

___ 3.79 **GO TO** Section 4.0.

Time

SELECTED CAS ITEMS

- IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

  1. **TRIP** the Reactor.

  2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

* Refer to the Briefing Sheet.

4.0 COMPLETION AND REVIEW

___ 4.1 **COMPLETE** Attachment 6, Sections 1.0 and 2.0, AND **FORWARD** this procedure to the SM/CRS for review and approval.

___ 4.2 SM/CRS **PERFORM** the following:

___ A. **REVIEW** this procedure with Attachments 1 through 6 for completeness and accuracy.

___ B. **COMPLETE** Attachment 6, Section 3.0.

___ C. **FORWARD** completed procedure to Operations Staff.

END OF PROCEDURE

ATTACHMENT 1
(Page 1 of 1)

CONTINUOUS ACTION SUMMARY

1.0 IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN:

A. **TRIP** the Reactor.

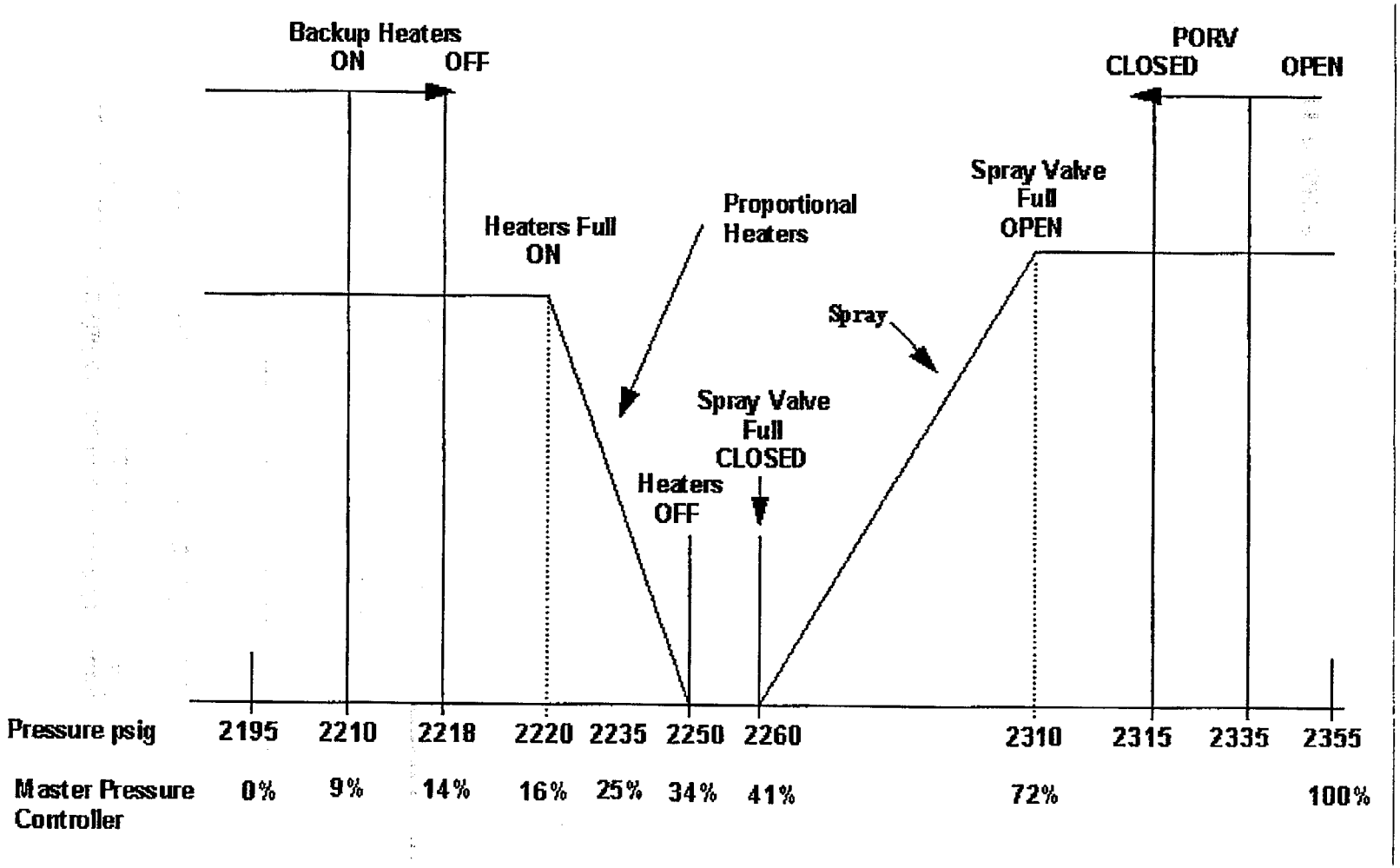
B. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.

_____
Time

USER RESPONSIBLE FOR VERIFYING REVISION, STATUS AND CHANGES
PRINTED 20061027

ATTACHMENT 2
(Page 1 of 1)

PRESSURIZER PRESSURE CONTROL



ATTACHMENT 3
(Page 1 of 3)

PORV MALFUNCTIONS DURING POPS OPERATIONS

NOTE
When one or more RCS cold leg temperature is ≤312°F, Technical Specification 3.4.10.3 is applicable. **[C0543]**

___ 1.0 Is a PORV open?

___ YES ___ NO ——> **GO TO** Step 8.0 _____ Time

V

___ 2.0 Is RCS pressure greater than 375 psig?

___ YES ___ NO ——> **GO TO** Step 5.0 _____ Time

V

___ 3.0 **VERIFY** PORV(s) close when pressure lowers to less than 375 psig.

___ 4.0 Are both PORVs closed?

___ NO ___ YES ——> **GO TO** Step 8.0 _____ Time

V

___ 5.0 **PLACE** the affected channel in OFF AND **CLOSE** the PORV.

___ 6.0 **CLOSE** the affected PORV Stop Valve.

___ 7.0 IF the associated stop valve fails to close,
THEN send an operator to **OPEN** the associated control power breaker.

- 2PR1: 2ADC2AX8, 2PR1 - 21 PRESSURIZER PORV CONTROL VALVE
- 2PR1: 2ADC2AX40, 2PR1 - 21 PRESSURIZER PORV AUXILIARY AIR CONTROL
- 2PR2: 2BDC2AX20, 2PR2 - 22 PRESSURIZER POWER RELIEF VALVE
- 2PR2: 2BDC2AX10, 2PR2 - 22 PRESSURIZER PORV AUXILIARY AIR CONTROL

ATTACHMENT 3
(Page 2 of 3)

PORV MALFUNCTIONS DURING POPS OPERATIONS

___ 8.0 Is a PORV leaking?

___ YES ___ NO ——> **GO TO** Step 23.0 _____ Time

___ 9.0 Is the leaking PORV identified?

___ NO ___ YES ——> **GO TO** Step 19.0 _____ Time

___ 10.0 **TURN** POPS Channel 1 and 2 off,
AND **CLOSE** 2PR6 AND 2PR7, Pressurizer Relief Stop Valves,
AND **EVALUATE** Technical Specification 3.4.10.3
AND **NOTIFY** the SM to refer to ECG EAL 11.2.2.b. **[C0543]**

___ 11.0 IF PORV tailpipe temperature does NOT lower sufficiently to allow a temperature rise to be seen when the leaking PORV is unisolated,
THEN:

___ 11.1 **OPEN** 2PR6 AND 2PR7

___ 11.2 **GO TO** Step 23.0.

___ 12.0 **OPEN** 2PR6, Pressurizer Relief Stop Valve.

___ 13.0 Is tailpipe temperature rising?

___ YES ___ NO ——> **GO TO** Step 15.0 _____ Time

___ 14.0 **CLOSE** 2PR6

___ 15.0 **OPEN** 2PR7.

ATTACHMENT 3
(Page 3 of 3)

PORV MALFUNCTIONS DURING POPS OPERATIONS

___ 16.0 Is tailpipe temperature rising?

___ YES ___ NO ——> **GO TO** Step 20.0 _____ Time

V

___ 17.0 **CLOSE** 2PR7.

___ 18.0 **GO TO** Step 20.0. _____ Time

___ 19.0 **TURN** off the associated POPS Channel,
AND **CLOSE** the Stop Valve for the affected PORV(s).

___ 20.0 **CLOSE** the Stop Valve for the affected PORV(s).

___ 21.0 **PLACE** any unisolated PORV in auto.

___ 22.0 **ARM** the appropriate POPS channel for any unisolated PORV.

___ 23.0 **ADJUST** Pressurizer heaters and Spray valves to control Pressurizer pressure.

___ 24.0 **NOTIFY** the SM/CRS to evaluate the following:

___ ♦ Technical Specification 3.4.10.3

___ ♦ Event Classification Guide for Primary Leakage. **[C0543]**

___ 25.0 **GO TO** Procedure Section 4.0. _____ Time

ATTACHMENT 4
(Page 1 of 2)
21 BACKUP HEATERS LOCAL OPERATION

NOTE

The following steps are to be performed by an operator locally in the 78' Electrical Penetration Room in communication with the Control Room.

___ 1.0 **PLACE** the PRESSURIZER HTRS 21 BACKUP GROUP LOCAL/REMOTE switch in the LOCAL position (the top switch on the end of 2GP bus).

___ 2.0 **OPERATE** the Pressurizer Htrs 21 Backup Group switch as directed by the Control Room (the bottom switch on the end of 2GP bus).

___ 3.0 IF breaker control power is available AND MANUAL control is desired,, THEN **OPERATE** breaker as directed by the Control Room as follows:

- **OPERATE** MANUAL TRIP button to open breaker
- **OPERATE** MANUAL CLOSE lever to close breaker

___ 4.0 IF manual operation (without Control Power available) of 21 backup heater supply breaker is required,
THEN:

CAUTION

With control power de-energized, the heaters will not automatically de-energize on Pressurizer low level at 17%. An Operator should be directed to manually OPEN Pressurizer heater breaker prior to Pressurizer level reaching 17%.

___ 4.1 **OPEN** 2GX2EP2GPX*, 2GP 480 PZR HTR BUS B/U SECT MN CTL PWR.

(Step continued on next page)

ATTACHMENT 4
(Page 2 of 2)
21 BACKUP HEATERS LOCAL OPERATION

4.0 (continued)

NOTE
Springs must be manually charged for manual breaker operation.
The cover plate over the manual close lever has to be removed prior to use. (Philips head screwdriver is required)

___ 4.2 **OPERATE** 2GX2EP2GPX, 2GP 480 PZR HTR BUS B/U SECT MN PWR, per the direction of the Control Room as follows:

- **OPERATE** MANUAL TRIP button to open breaker
- **OPERATE** MANUAL CLOSE lever to close breaker

___ 4.3 IF closing springs need to be manually charged to close 2GX2EP2GPX THEN:

___ A. **OPEN** front door of breaker cubicle.

___ B. **PLACE** removable maintenance handle in the two slots of the pawl carrier (Exhibit 1 and 2).

___ C. **RAISE** AND **LOWER** maintenance handle in a pumping motion until SPRINGS CHARGED/SPRINGS DISCHARGED indicator on breaker front indicates SPRINGS CHARGED.

___ D. IF maintenance handle will not move, THEN **ROTATE** motor crank arm (Exhibit 2) with a screwdriver until the maintenance handle can be raised and lowered.

___ E. **REMOVE** maintenance handle.

___ F. **CLOSE** front door of breaker cubicle.

___ 5.0 **RETURN** to procedure step in effect. _____ Time

___ 6.0 When local operation of pressurizer heaters is no longer required, **RESTORE** pressurizer heater control as follows:

___ 6.1 **CLOSE** 2GX2EP2GPX*, 2GP 480V PZR HTR BUS B/U SECT MN CTL PWR.

___ 6.2 **ENSURE** PRESSURIZER HTRS 21 BACKUP GROUP OFF/ON switch is in the OFF position.

___ 6.3 **ENSURE** PRESSURIZER HTRS 21 BACKUP GROUP LOCAL/REMOTE switch is in the REMOTE position.

___ 6.4 **RETURN** to procedure step in effect. _____ Time

ATTACHMENT 5
(Page 1 of 2)
22 BACKUP HEATERS LOCAL OPERATION

NOTE

The following steps are to be performed by an operator locally in the 78' Electrical Penetration Room in communication with the Control Room.

___ 1.0 **PLACE** the PZR-HTRS 22-BACK UP-GP switch, (the top switch on the end of 2EP bus), in the LOCAL position.

___ 2.0 **OPERATE** the PZR-HTRS 22-BACK UP-GP switch, (the bottom switch on the end of the 2EP bus), as directed by the Control Room.

___ 3.0 IF breaker control power is available AND MANUAL control is desired,,
THEN **OPERATE** breaker as directed by the Control Room as follows:

- **OPERATE** MANUAL TRIP button to open breaker
- **OPERATE** MANUAL CLOSE lever to close breaker

___ 4.0 IF manual operation (without Control Power available) of 22 Backup Heater Supply Breaker is required,
THEN:

CAUTION

With control power de-energized, the heaters will not automatically de-energize on Pressurizer low level at 17%. An Operator should be directed to manually OPEN Pressurizer heater breaker prior to Pressurizer level reaching 17%.

___ 4.1 **OPEN** 2EX1EP2EPX*, 2EP 480 PZR HTR BUS MN BKR CTL PWR.

(Step continued on next page)

ATTACHMENT 5
(Page 2 of 2)
22 BACKUP HEATERS LOCAL OPERATION

4.0 (continued)

> **NOTE**
>
> Springs must be manually charged for manual breaker operation.
>
> The cover plate over the manual close lever has to be removed prior to use. (Philips head screwdriver is required)

___ 4.2 **OPERATE** 2EX1EP2EPX, 2EP 480 PZR HTR BUS MN BKR, per the direction of the Control Room as follows:

- ♦ **OPERATE** MANUAL TRIP button to open breaker
- ♦ **OPERATE** MANUAL CLOSE lever to close breaker

___ 4.3 IF closing springs need to be manually charged to close 2EX1EP2EPX THEN:

___ A. **OPEN** front door of breaker cubicle.

___ B. **PLACE** removable maintenance handle in the two slots of the pawl carrier (Exhibit 1 and 2).

___ C. **RAISE** AND **LOWER** maintenance handle in a pumping motion until SPRINGS CHARGED/SPRINGS DISCHARGED indicator on breaker front indicates SPRINGS CHARGED.

___ D. IF maintenance handle will not move, THEN **ROTATE** motor crank arm (Exhibit 2) with a screwdriver until the maintenance handle can be raised and lowered.

___ E. **REMOVE** maintenance handle.

___ F. **CLOSE** front door of breaker cubicle.

___ 5.0 **RETURN** to procedure step in effect. _____ Time

___ 6.0 When local operation of pressurizer heaters is no longer required, **RESTORE** pressurizer heater control as follows:

___ 6.1 **CLOSE** 2EX1EP2EPX*, 2EP 480 PZR HTR BUS MN BKR CTL PWR.

___ 6.2 **ENSURE** PRESSURIZER HTRS 22 BACKUP GROUP OFF/ON switch is in the OFF position.

___ 6.3 **ENSURE** PRESSURIZER HTRS 22 BACKUP GROUP LOCAL/REMOTE switch is in the REMOTE position.

___ 6.4 **RETURN** to procedure step in effect. _____ Time

ATTACHMENT 6
(Page 1 of 2)

COMPLETION SIGN-OFF SHEET

1.0 **COMMENTS:**

(Include procedure deficiencies and corrective actions. Attach additional pages as necessary.)

ATTACHMENT 6
(Page 2 of 2)

COMPLETION SIGN-OFF SHEET

2.0 **SIGNATURES:**

Print	Initials	Signature	Date

3.0 **SM/CRS FINAL REVIEW AND APPROVAL:**

This procedure with Attachments 1 - 6 is reviewed for completeness and accuracy. Entry conditions and all deficiencies, including corrective actions, are clearly recorded in COMMENTS Section above.

Signature: _____ Date: _____
SM/CRS

EXHIBIT 1

PRESSURIZER HEATERS BACKUP GROUP LOCAL CONTROLS

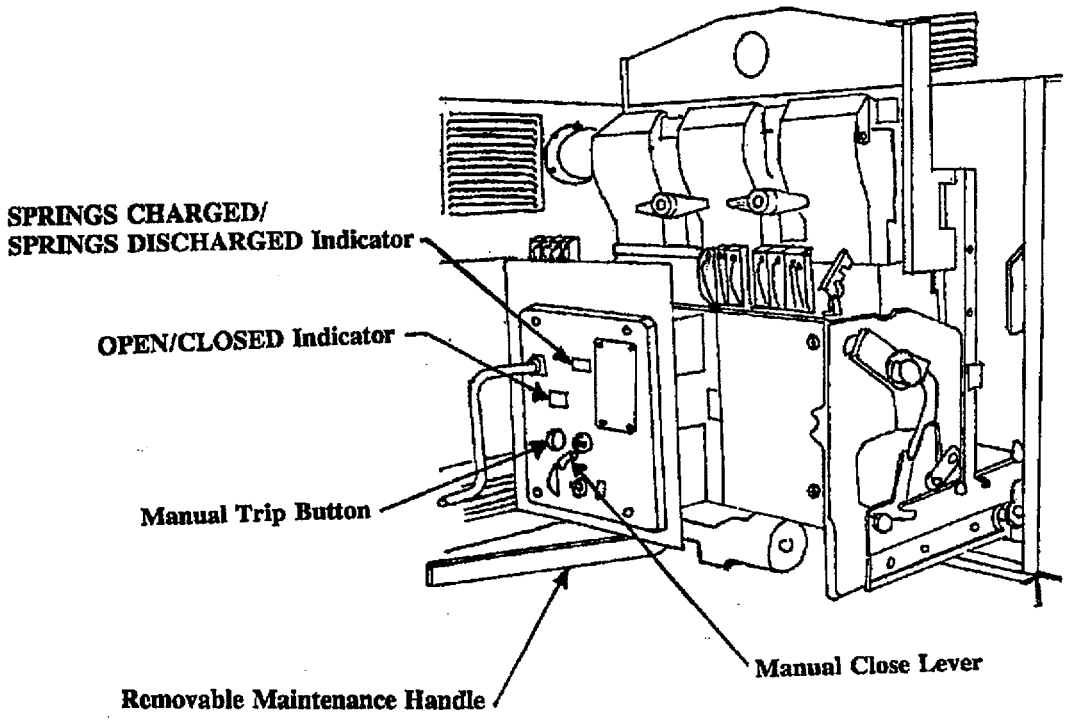


EXHIBIT 2

PRESSURIZER HEATERS BACKUP GROUP
PLACEMENT OF MAINTENANCE HANDLE ON ITE BREAKERS

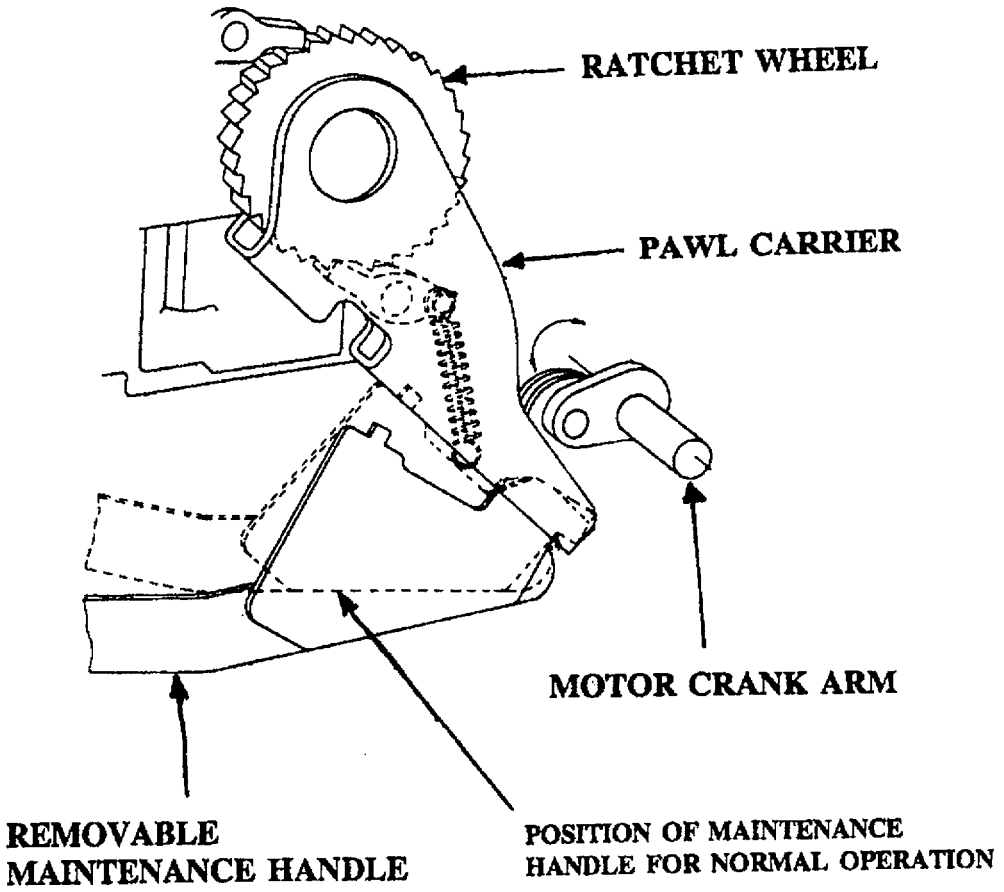


EXHIBIT 3
(Page 1 of 2)
BRIEFING SHEET

NOTE

- The following items are a list of potential topics which should be covered during the briefing at SM/CRS discretion.
- Containment entry into areas >160°F (>147°F WBGT) are prohibited. Entry into areas >128°F (>114°F WBGT) require the approval of the Plant Manager, Department Manager, and Safety Department Representative, or their respective designee, IAW NC.IS-TM.ZZ-0001(Z), Nuclear Department Safety Manual.

1) **SAFETY**

- If sending an operator in containment to isolate a leaking spray valve, Rad Pro support will be necessary.

2) **TECHNICAL SPECIFICATIONS and ECGs**

If a pressurizer pressure channel has failed, refer to Tech Spec 3.3.1.1 Action 6, and 3.3.2.1 Action 19, and Tech Spec 3.4.5 Action b.

If a PORV is leaking refer to Tech Spec 3.4.5 Action a.

If plant pressure lowered to <2185 psig, refer to Tech Spec 3.2.5.

If a safety valve is leaking, refer to Tech Spec 3.4.3 or 3.4.2, as applicable, and Tech Spec 3.4.7.2.

If POPS is in service, refer to Tech Spec 3.4.10.3 for applicability.

3) **PARAMETERS TO BE MONITORED**

- Plant pressure, pressurizer level, tailpipe temperature indications and PRT parameters.

1) **CHANNEL REMOVAL**

Remove failed pressurizer pressure instrument from service IAW S2.OP-SO.RPS-0003(Q).

4) **CONTINGENCIES**

- Reactor trip criteria.
- Brief local backup heater operation IAW Attachment 4 and 5, if necessary.
- Ensure necessary support organizations are contacted.
- Impact if plant experiences the following:
  - SGFP Trip/Runback
  - Down power
  - Reactor Trip
- Impact of a second channel failure/trip. (Channel failures which input into OTΔT could cause Tech Spec 3.0.3 to be applicable.)

EXHIBIT 3
(Page 2 of 2)
BRIEFING SHEET

FAILURE	EFFECTS	COMPENSATORY ACTIONS
Master Pressure Controller	-No automatic pressure control available	- Place master pressure controller in manual and control IAW Attachment 2.
Pressurizer Pressure Channel 1 or 3 fail high	- If controlling channel, spray valves fully open and pressurizer heaters turn off. -2PR1 trip logic shifts to 1/1	- Take manual control of the master pressure controller and select alternate channel for control. - CLOSE 2PR6 and remove power. -RX trip logic is 1/3. - SI trip logic is 2/2 until bistables are tripped, then 1/2.
Pressurizer Pressure Channel 1 or 3 fail low	- If controlling channel, spray valves fully closed and pressurizer heaters turn on. -2PR1 will not auto open.	- Take manual control of the master pressure controller and select alternate channel for control. - CLOSE 2PR6 and remove power . -RX trip logic is 1/3. - SI trip logic is 1/2.
Pressurizer Pressure Channel 2 or 4 fail high	-2PR2 trip logic shifts to 1/1	- CLOSE 2PR7 and remove power -RX trip logic is 1/3. - SI trip logic is 2/2 until bistables are tripped, then 1/2 (only if channel 2 failed).
Pressurizer pressure Channel 2 or 4 fail low	-2PR2 will not auto open	- CLOSE 2PR7 and remove power -RX trip logic is 1/3. - SI trip logic is 1/2 (only if channel 2 failed).
Spray valve fails open/ leaking by	-Pressurizer pressure drops	-Take manual control of spray valve and CLOSE. -Send operator into containment to isolate leaking spray valve if necessary.
PORV fails open/ leaking by	-Pressurizer pressure drops	-Take manual control of the PORV and CLOSE. -CLOSE the associated block valve if necessary.
PT 403 or 405 fail high	-Pressurizer pressure drops if POPs is armed	-Place the affected channel in off, CLOSE the PORV, and CLOSE its stop valve. -Subcooling Margin Monitor (SMM) for associated channel will be inoperable. -RVLIS will be inoperable for associated channel. -RH1 or RH2 for associated channel will not be able to be opened.

PRESSURIZER PRESSURE MALFUNCTION
TECHNICAL BASIS DOCUMENT

1.0 REFERENCES

1.1 Technical Documents

A. Salem Generating Station Updated Final Safety Analysis Report

1. Section 5, Reactor Coolant System and Connected Systems
2. Section 7, Instrumentation and Controls

B. Salem Generating Station Technical Specifications - Unit 2

1.	3.2.5	DNB Parameters
2.	3.3.1.1	Reactor Trip System Instrumentation
3.	3.3.2.1	Engineered Safety Feature Actuation System Instrumentation
4.	3.3.3.5	Remote Shutdown Instrumentation
5.	3.4.1.1	Reactor Coolant Loops
6.	3.4.2.1	Safety Valves - Shutdown
7.	3.4.3	Safety Valves - Operating
8.	3.4.5	Relief Valves
9.	3.4.4	Pressurizer
10.	3.4.7.2	RCS Operational Leakage
11.	3.4.10.3	RCS Overpressure Protection Systems

1.2 Procedures

A. S2.OP-ST.RC-0008(Q), Reactor Coolant System - Water Inventory Balance
B. S2.OP-SO.RPS-0003(Q), Placing Pressurizer Channel In Tripped Condition
C. S2.OP-SO.PZR-0010(Q), Pressurizer Backup Heaters Power Supply Transfer
D. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
E. NC.NA-AP.ZZ-0024(Q), Radiation Protection Program

1.3 Drawings

A.	203348	No. 1 & 2 Units, Pressurizer Backup Heaters Schematic
B.	203349	No. 1 & 2 Units, Pressurizer Backup Heaters Schematic
C.	205301	No. 2 Unit, Reactor Coolant System
D.	220440	No. 1 & 2 Units, RCS Pressurizer Press Control and Protection Functional
E.	221060	No. 1 & 2 Units, RPS Pressurizer Pressure and Level Controls Logic
F.	221061	No. 1 & 2 Units, RPS Pressurizer Pressure Heater Control Logic
G.	231356	No. 1 & 2 Units, Pressurizer Relief Stop Valves Logic
H.	231357	No. 1 & 2 Units, Pressurizer Power Relief Valves Logic
I.	231359	No. 1 & 2 Units, Pressurizer Spray Control Valves Logic
J.	239985	No. 1 & 2 Units, Pressurizer Backup Heaters Logic
K.	244083	No. 2 Unit, PORV & Stop Valves Ch I Schematic
L.	244085	No. 2 Unit, PORV & Stop Valves Ch I Schematic
M.	241108	No. 1 & 2 Units Pressurizers Overpress. Prot. Syst. Ch. I & II

1.4 **Other**

A. DCP 2EC-3617, PORV cabling
B. SER 4-93, Reactor Coolant Pressure Transients Caused by Failed Open Pressurizer Spray Valves

1.5 **Commitments**

A. C0543, NRC VIOL 272/94-06-01, (TASK 2), Failure to declare PORV inoperable after closure of block valve
B. CAPR 70022203, 2PS3 Failed Open

2.0 DISCUSSION

2.1 This procedure is designed to provide the direction necessary for correcting the cause of a pressurizer pressure malfunction. This discussion is intended to provide the logic and reasoning behind the procedure flowpath to aid the user in understanding the basis for actions as they are presented. It is not intended to provide direction in addition to the procedure.

2.2 Entry Conditions - Entry into this procedure may be from alarms, other procedures, or operator observation of abnormal Pressurizer conditions indicating a failure of a controlling pressure instrument or controller. The following are symptoms of the entry condition:

Overhead Alarms

A. OHA-D-8, RC PRESS HI

B. OHA-D-16, RC PRESS LO

C. OHA-E-12, PZR PRESS LO

D. OHA-E-44, PZR SFTY VLV 2PR3-2PR5 NOT CLSD

E. OHA-E-36, PZR HTR OFF LVL LO

F. OHA-E-26, 2PR1 NOT FULL CLSD

G. OHA-E-27, 2PR2 NOT FULL CLSD

H. OHA-E-28, PZR HTR ON PRESS LO

I. OHA-E-42, 2PR1 ½ TRIP

J. OHA-E-43, 2PR2 ½ TRIP

Control Console Alarms

A. 2CC2 3-14, RC PRESS DEVIATION HI
RC PRESSURE HI

Other Symptoms

A. Any pressurizer pressure malfunction as indicated by alarms on the aux alarm typewriter.

B. Any pressurizer pressure malfunction as indicated by recorders/indicators in the Control Room.

2.3 Immediate Actions - None

2.4 Subsequent Actions - This procedure is written to address the identification and corrective actions for high and low RCS pressure.

If POPs is in service, the user is sent to Attachment 3 to bypass all of the steps for normal pressure.

In all cases where an automatic reactor trip is possible, no additional conservatism was added to the procedure. Adding this type of step was thought to unnecessarily complicate the procedure without appreciably aiding the operator.

Pressurizer pressure should be maintained ≥2224 psig to ensure a minimum DNBR is maintained IAW Technical Specification 3.2.5. ≥2224 psig is derived from the minimum DNB plus instrument inaccuracies.

The procedure is separated into specific subsections for specific malfunctions. Once the operator has identified the event, each is addressed by the subsequent steps to avoid skipping pages to steps. The subsections direct actions for pressure instrument failure, Master controller failure, Spray valve leakage, PORV/Code Safety leaks, and heater malfunction. The procedure does not address Code Safety leakage when RHR is in service.

Steps 3.3 through 3.9 - Failure of an instrument

This requires action quickly, therefore was placed first in the procedure. The Master Pressure Controller is placed in manual and pressure adjusted to the desired value. This stops the erroneous control action on the spray valves and heaters. Next, the other channel is selected for control and the Master Pressure Controller is returned to auto. Technical Specifications are referred to and the failed channel is removed from service per the appropriate procedure.

Steps 3.11 through 3.15 - Master Press Ctrl Failure

The Master Pressure Controller is placed in manual and pressure is adjusted as desired. If the Master Pressure Controller is still malfunctioning in manual, then heaters and spray valves are not receiving a correct signal. Direction is provided to place heaters and sprays in manual and adjust pressure to the desired value.

Steps 3.17 through 3.37 - Spray Valve Malfunction

First, the controllers are placed in manual and the valves are manually operated. If this is successful, then the procedure may be exited. For a leaking or stuck open spray valve, a judgement is required of the user. For a rapid pressure reduction, the reactor is tripped, (since further actions would not prevent the low pressure, OT/OPΔT trip), and 21 and 23 RCPs are stopped. If pressure continues to decrease, all but one RCP are stopped, and the user is directed to the EOPs. Tripping RCPs should prevent, or at least extend the time to reach an automatic SI initiation from low Pressurizer pressure.

If a slow pressure reduction exists, two parallel paths are followed: 1) power reduction to reduce the plant transient if a Reactor or RCP trip is subsequently required, and 2) Containment entry for manual isolation of spray. The RCP trip is designed to reduce the d/p across the leaking valve, and thus reduce the leak rate. It will not stop the leak, but may reduce it to a manageable level which could prevent an SI actuation and allow a normal shutdown, (Required within 1 hour per T/S). The operator attempts to identify the leaking spray valve so the valve may be isolated. If the leaking valve cannot be determined, 21 and 23 RCPs will be stopped since they contribute to the majority of spray flow. IF pressure continues to drop, all but one RCP is stopped to reduce spray flow further. Tripping the reactor is required because minimum time exists to shutdown the plant prior to stopping the RCP(s). After the Reactor has been tripped, 21 and 23 RCPs can be stopped. Tripping the Reactor prior to stopping the RCP(s) precludes an automatic plant trip when the Reactor is greater than 36% (P8) on a low RCS flow condition which represents an unnecessary chalenge to installed safety features. Tripping the Reactor, prior to stopping the RCP(s), when power is less than 36% (P8), eliminates the need for the operators to deal with stabilizing the plant after an unnecessary transient following the loss of an RCP at power. If Spray is isolated before the RCP trip, then the procedure may be exited.

Steps 3.39 through 3.56 - PORV malfunctions

The PORV(s) are placed in manual and operated to control pressure consistent with Attachment 2. Thus, if they are open at too low a pressure, or closed at too high a pressure, manual control will correct the problem. If a PORV cannot be closed in manual, then it's Stop valve is closed. Technical Specifications are referred to and the procedure is exited.

Since there is no way to distinguish which valve is leaking, both PORV Stop valves are closed. If temperature does not lower, the user is directed to reopen the stop valves and go to steps to check safety valve tailpipe temperatures. If the temperature does lower, the user is directed to reopen one PORV Stop (2PR6). If temperature does not rise, then the procedure is exited. If it does, then that stop valve is closed and the other opened. Then the procedure is exited. Technical Specifications are referred to for PORV and PORV Stop valve operability.

Steps 3.58 through 3.65 - Code Safety Leak

A Code Safety leak cannot be isolated. If, in the judgement of the operator, the leak is severe, an SI will be initiated and the AB will be exited for the EOP. If the leak is not severe, a leak rate calculation will be initiated. Technical Specifications re referred to and the procedure is exited. Directions for responding to the leak will be provided outside this procedure.

Steps 3.67 through 3.74 - Pressurizer Heater Malfunction

Heaters are placed in manual and cycled as necessary to maintain pressure. There are two attachments for abnormal operation of the Backup Heaters. These provide required actions for local operation. If necessary, these attachments can be referred to. Technical Specifications are referred to and the procedure is exited.

Attachment 1 - Continuous Action Summary addresses the pressure the Reactor should be tripped to prevent an automatic trip due to OTΔT. Scenarios were run on the simulator and determined the Reactor will trip between 1950 and 1975 psig on OTΔT. A failed open spray valve and a failed open PORV are the bases for establishing this value. The failed open spray valve resulted in an OTΔT Reactor Trip at 1985 psig at about the 5 minute mark. The failed open PORV resulted in an OTΔT Reactor Trip at 1950 psig at about the 30 second mark. Based on this testing the recommended Manual trip value is 2000 psig and decreasing.

Attachment 2 is a representation of the Pressurizer Pressure Control Program, with an overlay of the Master Pressure Controller setpoints. This is to be used to diagnose the operation of Sprays, PORVs and Heaters.

Attachment 3 deals with PORV leaks during POPS operation. This was placed as an Attachment, rather than text, due to its special nature and expected infrequent use. This allows addressing plant condition other than Modes 1 through 3 in a separate section of steps.

END OF DOCUMENT

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM 1 & 2

SYSTEM: Reactor Coolant System

TASK: Identify the RCS leakrate

TASK NUMBER: N1140260401

JPM NUMBER: India Sim d.

ALTERNATE PATH: [ ]

K/A NUMBER: 002 A2.01

IMPORTANCE FACTOR: RO ____ SRO 4.4

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: SIMULATOR / PERFORM

REFERENCES: S2.OP-AB.RC-0001 Rev. 9

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 13 MINUTES

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

APPROVAL:

Bargaining Unit Representative	OTM or designee	OPS Manager, or Designee

CAUTION: **No plant equipment shall be operated during the performance of a JPM without the following:**
1. **Permission from the SM or Unit CRS;**
2. **Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions).**
3. **Verification of the "as left" condition by a qualified individual.**

ACTUAL JPM COMPLETION TIME: _____ Minutes

ACTUAL TIME CRITICAL COMPLETION: N/A

JPM PERFORMED BY: _____ **GRADE:** [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____ **DATE:** _____

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Reactor Coolant System

TASK: Identify the RCS leakrate

TASK NUMBER: N1140260401

INITIAL CONDITIONS:

IC-181 Thumb Drive

100% power.

Malf RC RC00002D, Final Value 40, RT-1

INITIATING CUE:

You are the Reactor Operator. Respond to all indications and alarms.

Successful Completion Criteria:
1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

NAME: _____

DATE: _____

SYSTEM: **Nuclear Instrumentation System**

TASK: **Perform a calorimetric calculation (Adjust PR NIS Gain)**

# *	STEP NO.	STEP (* Denotes a Critical Step) (# Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
			Operator states he has the watch.		
	1	Enter RT-1 MALF RC0002 (40 gpm RCS leak)			
* *	2		Operator notices some or all of the following indications: • Charging flow rising • PZR level dropping • R11A rising Operator enters S2.OP-AB.RC-0001, REACTOR COOLANT SYSTEM LEAK.		
	3.1	Initiate ATT. 1 Continuous Action Summary	Operator reviews CAS.		
	3.2	Is RCS temp < 350 degrees?	Operator answers no, at NOT. GOES TO Step 3.8.		
	3.8	Is the Unit in Mode 3.....	Operator answers no, in MODE 1. GOES TO Step 3.12.		
*	3.12	Is PZR level being maintained stable or rising?	Operator answers no due to charging flow rising and PZR level dropping.		

NAME: _____
DATE: _____

SYSTEM: **Nuclear Instrumentation System**
TASK: **Perform a calorimetric calculation (Adjust PR NIS Gain)**

# *	STEP NO.	STEP (* Denotes a Critical Step) (# Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.13	Is a centrifugal charging pump running?	Operator answers NO, 23 positive displacement charging pump is running.		
*	3.14	Transfer to a centrifugal pump as follows.....	• Ensures Master Flow Controller in AUTO • Closes 2CV55 • Start 21 or 22 charging pump • Place 23 Charging pump speed control in Manual. • Lowers 23 speed while adjusting CV55 to maintain charging flow. • Stops 23 charging pump when its at minimum flow. • Adjusts 2CV55 to attempt to stabilize PZR level. • Keeps 2CV55 in Manual while attempting to quantify leak. • Ensures no RCP seal flow lo/hi alarms are lit by adjusting 2CV71 as necessary.		

NAME: _____

DATE: _____

SYSTEM: **Nuclear Instrumentation System**

TASK: **Perform a calorimetric calculation (Adjust PR NIS Gain)**

# *	STEP NO.	STEP (* Denotes a Critical Step) (# Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	3.15	Evaluate leak rate by attempting to stabilize PZR level as follows:			
*		1. Adjust charging flow as necessary…..			
*		2. Reduce letdown flow to minimum as follows: A. Place 2CV18 in MANUAL and control letdown pressure~300 psig while performing the following: 1. Open 2CV3, 45 gpm orifice 2. Close 2CV4 and 5 3. Return 2CV18 to Auto	Operator places 2CV18 in Manual. As the operator opens the 2CV3, letdown pressure will rise, and the 2CV18 will require adjustment in the CLOSED (Decrease Pressure) direction. When the 2CV3 is fully open, the operator closes the open 75 gpm orifice. Again, as the valve closes, adjustment in the OPEN (Increase pressure) direction will be required. When the operator has adjusted letdown pressure to ~300 psig, places the 2CV18 in Auto.		
*		3. When PZR level is stable, Evaluate leak rate.	Operator adjusts 2CV55 position to stabilize PZR level. Operator determines leakrate. Acceptable leakrate 35-45 gpm.		
			Terminate JPM when operator has stated the leak rate.		

Terminating Cue: None

INITIAL CONDITIONS:

100% power, steady state.

INITIATING CUE:

You are the Reactor Operator. Respond to all indications and alarms.

PSEG NUCLEAR L.L.C.

SALEM/OPERATIONS

S2.OP-AB.RC-0001(Q) - REV. 9

REACTOR COOLANT SYSTEM LEAK

A. Biennial Review Performed: Yes ___ No _√_ N/A ___
B. Change Package(s) and Affected Document Number(s) incorporated into this revision:
   ♦ None
C. OTSC incorporated into this revision.
   ♦ None

REVISION SUMMARY:

♦ The following changes made to ensure procedure identifies Boric Acid Corrosion Management requirements made in response to NRC Generic Letter 88-05: **(80062543-10)**

- Added Attachment 2, Step 4.0 to direct RP to monitor 2R11A/2R12A and report any abnormal indications to SM/CRS.
- Added bullet ot Attachment 2, Step 5.0 that accumulation of boric acid is an indication of an RCS leak.
- Added Attachment 2, Step 6.2 to perform walkdown of affected area for boric acid accumulation and if any found to implement SH.RA-AP.ZZ-8805(Q).
- Added "Pressure Boundary Leakage" to Attachment 2, Table 1 as a source of leakage to Containment atmosphere.
- Added Attachment 3, Step 2.0 to implement SH.RA-AP.ZZ-8805(Q) if evidence of boric acid accumulation is observed.
- Revised TBD to clarify that if boric acid accumulation is found, SH.RA-AP.ZZ-8805(Q) is implemented to ensure commitment to NRC Generic Letter 88-05 is met.
- Added SH.RA-AP.ZZ-8805(Q) to TBD references. This change is editorial in nature as described in NC.DM-AP.ZZ-0001(Q).

♦ Added "Selected CAS Items" to every other page as an enhancement to Operators to serve as a reminder of actions to be taken for various conditions. Due to number of editorial changes rev bars not used. These changes are editorial as previously approved in Attachment 1 of this procedure. **(70037601-560)**

♦ Added Exhibit 1 to provide guidance for SM/CRS briefing. This change is editorial in nature as described in NC.DM-AP.ZZ-0001(Q). **(70037601-560)**

IMPLEMENTATION REQUIREMENTS Effective Date July 25, 2004

None

APPROVED: [signature] for
Operations Manager - Salem

7/12/04
Date

SELECTED CAS ITEMS

- **IF AT ANY TIME**, RCS temperature is >350°F
  AND:
  - PZR level cannot be maintained >17%

    OR
  - VCT level cannot be maintained >4%

  THEN **TRIP** the Reactor.
  - Is Reactor Trip Confirmed?

    ___ YES ___ NO ——> **GO TO** 2-EOP-TRIP 1, Reactor Trip or Safety Injection. _____ Time

    ↓
  - **INITIATE** a Safety Injection.
  - **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection. _____ Time
- **IF AT ANY TIME**, the leak is determined to be into a Steam Generator,
  THEN **INITIATE** S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak.
- **IF AT ANY TIME**, the leak is determined to be from a PORV,
  OR a Pressurizer Code Safety Valve,
  THEN **INITIATE** S2.OP-AB.PZR-0001(Q), Pressurizer Pressure Malfunction.
- **IF AT ANY TIME**, CNTMT pressure or temperature is rising,
  OR the leak is suspected to be into CNTMT,
  THEN **PLACE** 2 CFCUs in slow speed AND 2 CFCUs in fast speed.
- IF the Unit is in Mode 5 OR 6,
  THEN **INITIATE** Containment Closure IAW S2.OP-AB.CONT-0001(Q),
  Containment Closure. **[C0330]**

REACTOR COOLANT SYSTEM LEAK

1.0 ENTRY CONDITIONS

DATE: _____ TIME: _____

1.1 Any indication of an RCS leak.

1.2 Any indication of an interconnecting ECCS leak affecting RCS inventory.

2.0 IMMEDIATE ACTIONS

2.1 None

3.0 SUBSEQUENT ACTIONS

___ 3.1 **INITIATE** Attachment 1, Continuous Action Summary.

3.2 Is RCS temperature <350°F?
(Mode 4, 5, or 6 LOCA)

___ YES ___ NO ——> **GO TO** Step 3.8 (Mode 1, 2, or 3 LOCA) _____ Time

V

3.3 Is RCS temperature >200°F?
(Mode 4)

___ NO ___ YES ——> **GO TO** Step 3.9 (Mode 4 LOCA) _____ Time

V

3.4 Is the RCS leak causing a loss or reduction in RHR System cooling?
(Mode 5 or 6 LOCA)

___ YES ___ NO ——> **GO TO** Step 3.10 (Mode 5 or 6 RCS LEAK) _____ Time

V

SELECTED CAS ITEMS

- **IF AT ANY TIME**, RCS temperature is >350°F
  AND:
  - PZR level cannot be maintained >17%

    OR
  - VCT level cannot be maintained >4%

  THEN **TRIP** the Reactor.
  - Is Reactor Trip Confirmed?

    ___ YES ___ NO ——> **GO TO** 2-EOP-TRIP 1, Reactor Trip or Safety Injection. _____ Time

    |
    V
  - **INITIATE** a Safety Injection.
  - **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection. _____ Time
- **IF AT ANY TIME**, the leak is determined to be into a Steam Generator,
  THEN **INITIATE** S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak.
- **IF AT ANY TIME**, the leak is determined to be from a PORV,
  OR a Pressurizer Code Safety Valve,
  THEN **INITIATE** S2.OP-AB.PZR-0001(Q), Pressurizer Pressure Malfunction.
- **IF AT ANY TIME**, CNTMT pressure or temperature is rising,
  OR the leak is suspected to be into CNTMT,
  THEN **PLACE** 2 CFCUs in slow speed AND 2 CFCUs in fast speed.
- IF the Unit is in Mode 5 OR 6,
  THEN **INITIATE** Containment Closure IAW S2.OP-AB.CONT-0001(Q),
  Containment Closure. **[C0330]**

3.5 Is RCS aligned for Reduced Inventory operation?
(Mode 5 or 6 LOCA)

___ YES ___ NO ——> **GO TO** Step 3.7

Time

V

___ 3.6 While performing Attachment 2, Guidelines for Locating An RCS Leak,
GO TO S2.OP-AB.RHR-0002(Q), Loss of RHR at Reduced Inventory.

Time

___ 3.7 While performing Attachment 2, Guidelines for Locating An RCS Leak,
GO TO S2.OP-AB.RHR-0001(Q), Loss of RHR.

Time

3.8 Is the Unit in Mode 3 after the accumulators are isolated?

___ YES ___ NO ——> **GO TO** Step 3.12
(Mode 1, 2 or 3 RCS LEAK)

Time

V

___ 3.9 **GO TO** S2.OP-AB.LOCA-0001(Q), Shutdown LOCA.
(Mode 3 with Accumulators isolated or Mode 4 LOCA) **[C0354]**

Time

3.10 Is PZR level being maintained stable or rising?
(Mode 5 or 6 RCS LEAK)

___ NO ___ YES ——> **GO TO** Step 3.18

Time

V

CAUTION

Exceeding ONE train of ECCS Pump operation raises the probability for cold overpressurization of the RCS.

___ 3.11 **START** one Centrifugal Charging or Safety Injection pump to maintain Pressurizer Level between 11 and 50%,
AND **GO TO** Step 3.19

Time

SELECTED CAS ITEMS

- **IF AT ANY TIME**, RCS temperature is >350°F
  AND:
  - PZR level cannot be maintained >17%

    OR
  - VCT level cannot be maintained >4%

  THEN **TRIP** the Reactor.
  - Is Reactor Trip Confirmed?

    ___ YES ___ NO ——> **GO TO** 2-EOP-TRIP 1, Reactor Trip or Safety Injection. ____ Time

    |
    V
  - **INITIATE** a Safety Injection.
  - **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection. ____ Time
- **IF AT ANY TIME**, the leak is determined to be into a Steam Generator,
  THEN **INITIATE** S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak.
- **IF AT ANY TIME**, the leak is determined to be from a PORV,
  OR a Pressurizer Code Safety Valve,
  THEN **INITIATE** S2.OP-AB.PZR-0001(Q), Pressurizer Pressure Malfunction.
- **IF AT ANY TIME**, CNTMT pressure or temperature is rising,
  OR the leak is suspected to be into CNTMT,
  THEN **PLACE** 2 CFCUs in slow speed AND 2 CFCUs in fast speed.
- IF the Unit is in Mode 5 OR 6,
  THEN **INITIATE** Containment Closure IAW S2.OP-AB.CONT-0001(Q),
  Containment Closure. **[C0330]**

3.12 Is PZR level being maintained stable or rising?

___ NO ___ YES ——> **GO TO** Step 3.18 _____ Time

3.13 Is a Centrifugal Charging Pump running?

___ NO ___ YES ——> **GO TO** Step 3.15 _____ Time

___ 3.14 **TRANSFER** to a Centrifugal Charging Pump as follows:

___ 3.14.1. **ENSURE** Charging Master Flow Controller in AUTO.

___ 3.14.2. **CLOSE** 2CV55, CHARGING FLOW CONTROL VALVE.

___ 3.14.3. **START** 21 OR 22 Charging Pump.

___ 3.14.4. **PLACE** 23 Charging Pump Speed Controller in MANUAL.

___ 3.14.5. While lowering 23 Charging Pump speed to minimum, **ADJUST** 2CV55 to maintain desired flow.

___ 3.14.6. When 23 Charging Pump is at minimum flow, **STOP** 23 Charging Pump.

___ 3.14.7. **ADJUST** 2CV55 to control Pressurizer level.

___ 3.14.8. **PLACE** 2CV55 in AUTO OR remain in MANUAL until directed by the SM/CRS.

___ 3.14.9. **ENSURE** RCP Seal Injection flows are 6-12 gpm per pump, NOT to exceed 40 gpm total RCP Seal Injection Flow.

SELECTED CAS ITEMS

- **IF AT ANY TIME**, RCS temperature is >350°F
  AND:
  - PZR level cannot be maintained >17%

    OR
  - VCT level cannot be maintained >4%

  THEN **TRIP** the Reactor.
  - Is Reactor Trip Confirmed?

    ___ YES ___ NO ——> **GO TO** 2-EOP-TRIP 1, Reactor Trip or Safety Injection. _____ Time

    YES ↓ V
  - **INITIATE** a Safety Injection.
  - **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection. _____ Time
- **IF AT ANY TIME**, the leak is determined to be into a Steam Generator,
  THEN **INITIATE** S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak.
- **IF AT ANY TIME**, the leak is determined to be from a PORV,
  OR a Pressurizer Code Safety Valve,
  THEN **INITIATE** S2.OP-AB.PZR-0001(Q), Pressurizer Pressure Malfunction.
- **IF AT ANY TIME**, CNTMT pressure or temperature is rising,
  OR the leak is suspected to be into CNTMT,
  THEN **PLACE** 2 CFCUs in slow speed AND 2 CFCUs in fast speed.
- IF the Unit is in Mode 5 OR 6,
  THEN **INITIATE** Containment Closure IAW S2.OP-AB.CONT-0001(Q),
  Containment Closure. **[C0330]**

___ 3.15 **EVALUATE** leak rate by attempting to stabilize Pressurizer level as follows:

___ 3.15.1. **ADJUST** Charging flow, as necessary, to maintain Pressurizer level stable or rising while performing step 3.15.2.

___ 3.15.2. **REDUCE** Letdown flow to minimum as follows:

___ A. **PLACE** 2CV18, NON-REGEN HX OUTLET VALVE, in MANUAL, and control Letdown pressure at ≈300 psig while performing the following:

___ 1. **OPEN** 2CV3, 45 GPM ORIFICE

___ 2. **CLOSE** 2CV4 AND 2CV5, 75 GPM ORIFICE

___ 3. **RETURN** 2CV18 to AUTO

___ 3.15.3. When pressurizer level is stable, **EVALUATE** leak rate.

3.16 Can PZR level be maintained stable or rising?

___ NO ___ YES ——> **GO TO** Step 3.18 ____ Time

V

___ 3.17 **TRIP** the Reactor.

3.17.1. Is Reactor Trip Confirmed?

___ YES ___ NO ——> **GO TO** 2-EOP-TRIP 1, Reactor Trip or Safety Injection ____ Time

V

___ 3.17.2. **INITIATE** a Safety Injection.

___ 3.17.3. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection. ____ Time

___ 3.18 **PLACE** CVC Makeup Control System in service as necessary to control VCT level.

___ 3.19 **INITIATE** S2.OP-ST.RC-0008(Q), Reactor Coolant System Water Inventory Balance.

SELECTED CAS ITEMS

- **IF AT ANY TIME**, RCS temperature is >350°F
  AND:
  - PZR level cannot be maintained >17%

    OR
  - VCT level cannot be maintained >4%

  THEN **TRIP** the Reactor.
  - Is Reactor Trip Confirmed?

    ___ YES ___ NO ——> **GO TO** 2-EOP-TRIP 1, Reactor Trip or Safety Injection. ____ Time

    |
    V
  - **INITIATE** a Safety Injection.
  - **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection. ____ Time
- **IF AT ANY TIME**, the leak is determined to be into a Steam Generator,
  THEN **INITIATE** S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak.
- **IF AT ANY TIME**, the leak is determined to be from a PORV,
  OR a Pressurizer Code Safety Valve,
  THEN **INITIATE** S2.OP-AB.PZR-0001(Q), Pressurizer Pressure Malfunction.
- **IF AT ANY TIME**, CNTMT pressure or temperature is rising,
  OR the leak is suspected to be into CNTMT,
  THEN **PLACE** 2 CFCUs in slow speed AND 2 CFCUs in fast speed.
- IF the Unit is in Mode 5 OR 6,
  THEN **INITIATE** Containment Closure IAW S2.OP-AB.CONT-0001(Q),
  Containment Closure. **[C0330]**

___ 3.20 **PERFORM** the following to identify location of leak:

___ 3.20.1. **INITIATE** actions to locate and isolate the leak IAW Attachment 2, Guidelines for Locating An RCS Leak.

___ 3.20.2. **INITIATE** action to identify and isolate interconnecting ECCS System leakage IAW Attachment 3, Guidance For Locating Interconnecting ECCS Leakage.

___ 3.21 **NOTIFY** SM/CRS to refer to the following:

- Technical Specifications

NOTE

Any leakage that is unisolable or affects Pressurizer level should be considered Reactor Coolant System (RCS) Leakage when reviewing the Salem ECG for classification assessment.

- Event Classification Guide

___ 3.22 **WAIT** at this point until one of the following occurs:

___ ♦ RCS leak is located and reduced below Technical Specification limits.

___ ♦ Continued operation with leakage in excess of 2100 cc/hr and below Technical Specification limits has been evaluated.

___ ♦ SM/CRS directs Reactor shutdown.

3.23 Is Reactor shutdown and cooldown required?

___ YES ___ NO ——> **GO TO** Section 4.0

↓

V

___
Time

___ 3.24 **COMMENCE** normal Plant shutdown and cooldown IAW appropriate IOPs, using the following guidelines:

- **MAINTAIN** RCS pressure as low as possible to minimize leak rate.
- When RCS temperature is <200°F, complete depressurization may be desirable.

SELECTED CAS ITEMS

- **IF AT ANY TIME**, RCS temperature is >350°F
  AND:
  - PZR level cannot be maintained >17%

    OR
  - VCT level cannot be maintained >4%

  THEN **TRIP** the Reactor.
  - Is Reactor Trip Confirmed?

    ___ YES ___ NO ——> **GO TO** 2-EOP-TRIP 1, Reactor Trip or Safety Injection. ____ Time

    V
  - **INITIATE** a Safety Injection.
  - **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection. ____ Time
- **IF AT ANY TIME**, the leak is determined to be into a Steam Generator,
  THEN **INITIATE** S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak.
- **IF AT ANY TIME**, the leak is determined to be from a PORV,
  OR a Pressurizer Code Safety Valve,
  THEN **INITIATE** S2.OP-AB.PZR-0001(Q), Pressurizer Pressure Malfunction.
- **IF AT ANY TIME**, CNTMT pressure or temperature is rising,
  OR the leak is suspected to be into CNTMT,
  THEN **PLACE** 2 CFCUs in slow speed AND 2 CFCUs in fast speed.
- IF the Unit is in Mode 5 OR 6,
  THEN **INITIATE** Containment Closure IAW S2.OP-AB.CONT-0001(Q),
  Containment Closure. **[C0330]**

___ 3.25 In conjunction with System Engineering **DETERMINE** a long term course of action for RCS inventory control. The following items should be considered:

- Estimated duration for repairs
- RCS Leak Rate
- Available Boric Acid inventory (BASTs, RWST, Accumulators, HUTs, Concentrates Storage Tanks, etc.)
- CNTMT Sump inventory
- CNTMT Sump pH control
- Boric Acid production/reprocessing capacity

___ 3.26 When directed, **ESTABLISH** the long-term lineups and take other approved actions to maintain RCS inventory.

4.0 COMPLETION AND REVIEW

___ 4.1 **COMPLETE** Attachment 4, Sections 1.0 and 2.0, AND **FORWARD** this procedure to SM/CRS for review and approval.

4.2 SM/CRS **PERFORM** the following:

___ 4.2.1. **REVIEW** this procedure with Attachments 1, 2, 3 and 4 for completeness and accuracy.

___ 4.2.2. **COMPLETE** Attachment 4, Section 3.0.

___ 4.2.3. **FORWARD** completed procedure to Operations Staff.

END OF PROCEDURE

ATTACHMENT 1
(Page 1 of 1)

CONTINUOUS ACTION SUMMARY

___ 1.0 **IF AT ANY TIME**, RCS temperature is >350°F
AND:

- PZR level cannot be maintained >17%

  OR

- VCT level cannot be maintained >4%

THEN **TRIP** the Reactor.

1.1 Is Reactor Trip Confirmed?

___ YES ___ NO —> **GO TO** 2-EOP-TRIP 1, Reactor Trip or Safety Injection

Time

V

___ 1.2 **INITIATE** a Safety Injection.

___ 1.3 **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection.

Time

___ 2.0 **IF AT ANY TIME**, the leak is determined to be into a Steam Generator,
THEN **INITIATE** S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak.

___ 3.0 **IF AT ANY TIME**, the leak is determined to be from a PORV,
OR a Pressurizer Code Safety Valve,
THEN **INITIATE** S2.OP-AB.PZR-0001(Q), Pressurizer Pressure Malfunction.

___ 4.0 **IF AT ANY TIME**, CNTMT pressure or temperature is rising,
OR the leak is suspected to be into CNTMT,
THEN **PLACE** 2 CFCUs in slow speed and 2 CFCUs in fast speed.

___ 5.0 IF the Unit is in Mode 5 OR 6,
THEN **INITIATE** Containment Closure IAW S2.OP-AB.CONT-0001(Q),
Containment Closure. **[C0330]**

___ 6.0 **IF AT ANY TIME**, RCS Temperature is <200°F,
AND Pressurizer Level cannot be maintained >11%,
THEN concurrently **PERFORM** Attachment 2, Guidelines for Locating An RCS Leak
AND Attachment 3, Guidance For Locating Interconnecting ECCS Leakage,
AND **GO TO** S2.OP-AB.RHR-0001(Q), Loss of RHR.

Time

ATTACHMENT 2
(Page 1 of 5)

GUIDELINES FOR LOCATING AN RCS LEAK

NOTE

- If an indicator shows rising trend or is reading unusually high, then equipment on the right side of Table 1 may be source of RCS leakage.
- When potentially leaking equipment has been identified, further investigation should be performed to ensure affected equipment is the source of leakage. Investigation should be performed using available instrumentation and by local observation: sound, visual, temperature, radiation survey, or other appropriate methods.

___ 1.0 **MONITOR** indicators on the left side of Table 1 for high or rising readings.

___ 2.0 **ENSURE** leak is not due to sampling activities in progress.

___ 3.0 **REQUEST** Chemistry Department sample the following for RCS inleakage:

- Steam Generators
- Component Cooling

___ 4.0 **DIRECT** Radiation Protection to increase monitoring of 2R11A/2R12A and report any abnormal indications to SM/CRS.

___ 5.0 **INSPECT** Plant areas with the following guidelines:

- An RCS leak into another system may result in higher pressure in that system and may result in steam/water leaks, or unusual system response during normal evolutions. Other indications of abnormal pressure include:
  - Accumulation of boric acid
  - Excessive valve packing leaks
  - Pump seal leaks
  - Relief valves lifting
  - Rising tank levels
  - Excessive sump pump run times
- An RCS leak into another system may result in higher temperature in that system. Abnormal temperatures may be identified by temperature alarms, water hammer, or piping that is unusually hot to the touch.
- Particular attention should be given to interconnecting systems with on-going maintenance, or that have recently been operated, cleared for maintenance, or had valve alignments performed.

ATTACHMENT 2
(Page 2 of 5)

GUIDELINES FOR LOCATING AN RCS LEAK

___ 6.0 IF leak is determined to be from the CVCS letdown piping located in any of the following areas:

- Piping penetration Areas (EL. 78')

  OR

- Pipe Alley (EL. 84')

  OR

- Letdown Heat Exchanger Room (EL. 84')

  OR

- Safety Injection Pump Room (EL. 84')

THEN:

___ 6.1 **SECURE** Letdown IAW S2.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Return.

___ 6.2 **PERFORM** a walkdown of the affected area for boric acid accumulation, and if any found, implement SH.RA-AP.ZZ-8805(Q), Boric Acid Corrosion Management Program.

___ 6.3 Send an Operator to **INSPECT** the blowout panels on the four sides of the Pressure Relief Penthouse (Comp. ID: 2PENTHELB at the penetration area roof EL. 141', southwest side of containment on left side of plant vent).

___ 6.4 IF the panels are found to be dislodged from the penthouse structure or the panels appear to be damaged,
THEN:

___ A. **NOTIFY** the SM/CRS to refer to the ECG

___ B. **NOTIFY** Radiation Protection to survey the area around the vent penthouse,

___ C. **INITIATE** an Notification to have the panels reattached and/or repair panels as required.

ATTACHMENT 2
(Page 3 of 5)

GUIDELINES FOR LOCATING AN RCS LEAK

TABLE 1

INDICATOR/ITEM TO OBSERVE	POSSIBLE SOURCES OF LEAKAGE
Tailpipe Temperatures TI463, Relief Valves TI465, Safety Valve TI467, Safety Valve TI469, Safety Valve	PORV/Pressurizer Code Safety Valve
PRT Indications LI470, Level PI472, Pressure TI471, Temperature	Sources Discharging to PRT: Seal Water Relief Valve PORV/Pressurizer Code Safety Valves Reactor Vessel Head Vents Letdown Line Relief Valve Leakoff
RV Flange Leakoff Temperature - TI401	RV Flange Leakoff
Condensate Polish Filter Rad Monitor - 2R40 Condensate Air Ejector Rad Monitor - 2R15 Steam Generator Blowdown Radiation Monitor 2R19A, 21 Steam Generator 2R19B, 22 Steam Generator 2R19C, 23 Steam Generator 2R19D, 24 Steam Generator	Steam Generator Tube Leak
RWST Level 2LI960 - LI963	Sources of RWST Inleakage: <u>RCS, CVCS, SI</u>: Valve Leakby

ATTACHMENT 2
(Page 4 of 5)

GUIDELINES FOR LOCATING AN RCS LEAK

TABLE 1

INDICATION/ITEM TO OBSERVE	POSSIBLE SOURCES OF LEAKAGE
SI Accumulator Level LI934A - LI934D LI935A - LI935D Press PI936A - PI936D PI937A - PI937D	Sources of Inleakage: <u>RCS, CVCS</u>: Valve Leakby
CNTMT Differential Pressure - PA9607 CNTMT Temperature (Plant Computer) (U1304) CNTMT Pressure - PI948A/B/C/D CNTMT Rad Monitors 2R2 2R11A 2R7 2R12A/B CFCU Leak Detection - LI730 Rx Vessel Sump Pump Frequency CNTMT Sump Pump Frequency CNTMT Dewpoint - TA6124	Leak To CNTMT Atmosphere: Pressure Boundary Leakage <u>RCS, CVCS, RHR, SI</u>: Pipe/Tubing Rupture/Break PRT Rupture Disk Mechanical Joint Leakage Valve Stem Leakage RCP #3 Seal Leakoff Excess Letdown HX Relief Charging Pump Reliefs RHR Reliefs SI Pump Reliefs CNTMT Spray Reliefs RV Flange Leakoff (If aligned to sump)

ATTACHMENT 2
(Page 5 of 5)

GUIDELINES FOR LOCATING AN RCS LEAK

TABLE 1

INDICATION/ITEM TO OBSERVE	POSSIBLE SOURCE OF LEAKAGE
Aux Bldg Rad Monitors Unit 1: Unit 2: 1R3 2R4 1R6A 2R34 1R20B Aux Bldg Sump Level/Sump Pump Frequency RHR Sump Pumps Frequency	Leakage to Aux Bldg Atmosphere: CVCS, RHR, SI, Sampling: Pump Seal Leakage Mechanical Joint Leakage Valve Stem Leakage Relief Valves Lifting/Leaking
CC Surge Tank Level LI628A LI628C CC Rad Monitors 2R17A 2R17B	Leakage into CC System Letdown HX RCP Thermal Barrier HX RCP Seal Return HX Excess Letdown HX RHR HXs PASS HXs Pump Seals (CHG, SI, RHR) Sample System HXs * * (Cooled by Unit 1 CC)
RCDT Level LA4144 Panel 104-2: Level 2LI1003 Pressure 2PI1004 Temperature 2TI1058	Sources Discharging to RCDT RCP #2 and #3 Seal Leakoff Excess Letdown 3-Way Valve CVCS Valve Leakoff Reactor Coolant Loop Drains RV Flange Leakoff (If aligned to RCDT)

ATTACHMENT 3
(Page 1 of 2)

GUIDELINES FOR LOCATING AN INTERCONNECTING ECCS LEAK

NOTE

- SC.RA-AP.ZZ-0051(Q), Leakage Monitoring and Reduction Program, provides a program for monitoring the leakage from systems outside containment that could contain highly radioactive fluids following an accident IAW Technical Specification 6.8.4.a
- Exceeding the 2100 cc/hr leakage limit may result in exceeding GDC-19 limits for Control Room habitability.

___ 1.0 **INITIATE** walkdowns of the following systems to identify and isolate leak:

- RHR from RH4s to the Containment
- Containment Spray from CS2s to the Containment
- High Head Safety Injection from SJ1 and SJ2 to the Containment
- Intermediate Head Safety Injection - Cold Leg and Hot Leg from SJ30 to the Containment
- CVCS - Charging and Seal Injection and Seal Return
  (Includes 1CV462, CHARGING CROSS TIE MOV, header and leakoff located on Unit 1)
- Liquid Waste
- Gaseous Waste
- PASS

___ 2.0 IF evidence of boric acid accumulation is observed,
THEN **IMPLEMENT** SH.RA-AP.ZZ-8805(Q), Boric Acid Corrosion Management Program.

___ 3.0 IF leak cannot be isolated,
THEN **QUANTIFY** any identified leaks IAW SC.RA-AP.ZZ-0051(Q), Leakage Monitoring and Reduction Program.

___ 4.0 IF total ECCS leakage is >2100 cc/hr,
THEN:

___ 4.1 **INITIATE** ECG RAL 11.2.1.a OR 11.2.2.b, as applicable.

___ 4.2 **ATTEMPT** to reduce leakage to ≤2100 cc/hr.

ATTACHMENT 3
(Page 2 of 2)

GUIDELINES FOR LOCATING AN INTERCONNECTING ECCS LEAK

___ 5.0 IF isolation is required,
THEN **REFER** to the following applicable Technical Specifications:

- 3.1.2.1, Boration Systems - Flow Paths - Shutdown
- 3.1.2.2, Boration Systems - Flow Paths - Operating
- 3.1.2.3, Charging Pumps - Shutdown
- 3.1.2.4, Charging Pumps - Operating
- 3.4.1.3, Reactor Coolant System - Shutdown
- 3.4.1.4, Reactor Coolant System - Cold Shutdown
- 3.5.2, Emergency Core Cooling Systems - ECCS Subsystems - Tave ≥350°F
- 3.5.3, Emergency Core Cooling Systems - ECCS Subsystems - Tave <350°F
- 3.6.2.1, Depressurization and Cooling Systems - Containment Spray System
- 3.6.2.2, Depressurization and Cooling Systems - Spray Additive System
- 3.9.8.1, Refueling Operation - All Water Levels
- 3.9.8.2, Refueling Operation - Low Water Level

___ 6.0 IF total ECCS leakage is ≤2100 cc/hr,
THEN no additional action is required.

ATTACHMENT 4
(Page 1 of 2)

COMPLETION SIGN-OFF SHEET

1.0 **COMMENTS** **(INCLUDE** procedure deficiencies and corrective actions. Attach additional pages as necessary.)

ATTACHMENT 4
(Page 2 of 2)

COMPLETION SIGN-OFF SHEET

2.0 **SIGNATURES**

Print	Initials	Signature	Date

3.0 **SM/CRS FINAL REVIEW AND APPROVAL**

This procedure with Attachment 1-4 is reviewed for completeness and accuracy. Entry conditions and all deficiencies, including corrective actions, are clearly recorded in the COMMENTS Section of this attachment.

Signature: _____ Date: _____
SM/CRS

EXHIBIT 1
(Page 1 of 1)

SM/CRS BRIEFING SHEET

NOTE

The following items are a list of potential topics which should be covered during the briefing, at SM/CRS discretion.

1) **SAFETY:**

- If sending Operators to inspect for suspected leaks, obtain Radiation Protection support due to potential elevated radiation levels.

2) **TECHNICAL SPECIFICATIONS and ECGs:**

- If unidentified RCS leakage exceeds 1 gpm or if total RCS leakage exceeds 10 gpm refer to T.S. 3.4.7.2.
- If Containment pressure rises to >0.3 psig, refer to T.S. 3.6.1.4.
- If Containment avg air temperature exceeds 120°F, refer to T.S. 3.6.1.5.

3) **PARAMETERS TO BE MONITORED:**

- PZR and VCT levels
- Containment and Auxiliary Building radiation levels.

4) **SOURCES OF LEAKAGE:**

- Refer to Attachment 2, Guidelines for Locating an RCS Leak.

4) **CONTINGENCIES:**

- Reactor Trip/SI criteria IAW CAS.
- Brief reactivity plan for power reduction, if required.
- Long term course of action for RCS inventory control.
- Estimated leak rate and TS/ECG considerations.

REACTOR COOLANT SYSTEM LEAK
TECHNICAL BASES DOCUMENT

1.0 REFERENCES

1.1 Technical Documents

A. Salem Generating Station Updated Final Safety Analysis Report:
- Section 15.2.12, Accidental Depressurization of the RCS
- Section 15.3.1, Loss of Reactor Coolant
- Section 15.4.1, Major RCS Rupture

B. Salem Generating Station Technical Specifications Unit 2:
- 3.1.2.6, Borated Water Sources - Operating
- 3.4.7.2, RCS Operational Leakage
- 3.6.1.4, Containment Systems - Internal Pressure
- 3.6.1.5, Containment Systems - Air Temperature

1.2 Procedures

A. SC.RA-AP.ZZ-0051(Q). Leakage Monitoring and Reduction Program
B. S2.OP-AB.LOCA-0001(Q), Shutdown LOCA
C. S2.OP-AB.CONT-0001(Q), Containment Closure
D. S2.OP-AB.PZR-0001(Q), Pressurizer Pressure Malfunction
E. S2.OP-AB.RHR-0001(Q), Loss of RHR
F. S2.OP-AB.RHR-0002(Q), Loss of RHR at Reduced Inventory
G. S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak
H. S2.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Return
I. S2.OP-SO.CVC-0002(Q), Charging Pump Operation
J. S2.OP-SO.RHR-0001(Q), Initiating RHR
K. S2.OP-ST.RC-0008(Q), Reactor Coolant System Water Inventory Balance
L. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
M. SH.RA-AP.ZZ-8805(Q), Boric Acid Corrosion Management Program

1.3 Drawings

A. 205301 No 2 Unit, RCS P&ID
B. 205328 No 2 Unit, CVCS P&ID
C. 205331 No 2 Unit, CC P&ID
D. 205332 No 2 Unit, RHR P&ID
E. 205334 No 2 Unit, SIS P&ID

1.4 Conformance Documents

A. C0330, NRC GL 88-17-F1, Task 0005, develop procedures for Containment Closure
B. C0354, Westsalepse-86-532, ECCS Performance During Mode 4 Operations, Shutdown LOCA

1.5 **Other**

A. DCP 1EC-3308
B. SGS Emergency Classification Guide
C. DCP 2EC-3388
D. PSBP 320832, EOP Setpoint Document
E. CR#70000992, Lost VCT Level
F. DCPs 80029150 and 80029155, Unit CVCS Cross-Connect
G. Safety Evaluation S00-019, Removal of PDP from Normal Operation
H. DCP 80065299, Restoration of PDP for Normal Operation

2.0 DISCUSSION

2.1 This procedure is intended to provide the direction necessary for responding to a primary leak in the RCS and interconnecting systems outside Containment. If the RCS is initially at or above 350°F (Modes 1, 2, or 3 with accumulators in service) the crew utilizes Attachment 2, Guidelines for Locating An RCS Leak. The crew is directed to the Shutdown LOCA procedure for RCS leaks that occur while the plant is in Mode 3 with the accumulators isolated or while in Mode 4. In all cases where RCS is being cooled by RHR in Mode 5, 6, or defueled; this procedure is used to locate and isolate the leak. RCS leaks in Modes 5, 6, or defueled where the RHR system cooling is challenged and a loss of RHR is imminent require this procedure to be performed concurrently with the appropriate loss of RHR procedure.

2.2 This procedure is written for leaks that are smaller than the capacity of a centrifugal Charging Pump with Letdown flow at a minimum. For large uncontrolled leaks the correct procedure guidance will depend on plant mode and amount of operable ECCS equipment. Direction is provided by 2-EOP-TRIP-1, Reactor Trip or Safety Injection and S2.OP-AB.LOCA-0001(Q), Shutdown LOCA.

2.3 Entry Conditions Entry into this procedure may be from alarms, other procedures, or Operator observation of an RCS leak OR interconnecting ECCS leak outside Containment. There are no distinct symptoms associated with the entry condition other than direct visual observation or calculation. RCS leakage must be inferred from several simultaneous symptoms (higher Charging with Letdown and Pressurizer level constant and no cooldown in progress).

2.4 Immediate Actions None

2.5 Subsequent Actions The major steps of this procedure are designed to stabilize the RCS (Pressurizer level), and then attempt to locate and isolate the leak. For leaks smaller than Technical Specification limits, the procedure is exited and the Plant remains at power. For all other sizes, a Plant shutdown and cooldown is initiated. If leak isolation does not occur, the procedure puts the Plant in a condition that allows long term core cooling and inventory control. If a Reactor Trip or Safety Injection occurs while performing this procedure, the Operator would go to 2-EOP-TRIP-1.

Step 3.1 directs the Operator to initiate Attachment 1 which captures all the continuous action steps into a single summary. The intent is for the Operator to remove the attachment from the procedure and allow another person (Operator/STA) to monitor for the following conditions so the Control Room Operator's attention is not diverted:

- RCS Temperature >350°F with either PZR level ≤17% or VCT level ≤4%. In this case, the Operator is directed to manually trip the reactor, initiate SI, and proceed to 2-EOP-TRIP-1. Pressurizer level at 17% corresponds to the low level interlock for Pressurizer heaters. If Pressurizer pressure/level is already lowering and the heaters are lost, recovering pressure is not possible. VCT level at 4% indicates that Makeup capacity has been exceeded and a transfer to the RWST is required. Direction from Salem management is that this is a severe enough leak size to require a manual reactor trip and SI.

- If the leak is determined to be into a Steam Generator, then the Operator is directed to proceed to the Steam Generator Tube Leak procedure. The Steam Generator Tube Leak procedure contains all the necessary actions required to cope with a leak into this secondary system.

- If the leak is determined to be from a PORV or a Pressurizer Code Safety Valve, then the Operator is directed to proceed to the Pressurizer Pressure Malfunction procedure. The Pressurizer Pressure Malfunction procedure contains all the necessary actions to deal with this situation.

- If the leak is suspected to be into Containment, then the Operator is directed to place 2 CFCUs in slow speed and 2 CFCUs in fast speed. This is to attempt to prevent an automatic Safety Injection and minimize the potential for off-site releases when the leak is in Containment. Aligning CFCUs to 2 slow and 2 fast is the optimum configuration to maintain ring duct pressure low enough to accommodate slow speed fans.

- When the plant is in Mode 5 or 6, the operator is direct to initiate Containment Closure to limit the potential release of radioactive material.

- If the RCS leak is large enough where pressurizer level cannot be maintained on scale and the plant is in Mode 5, 6, or defueled; the operator is directed to leave this procedure and go to LOSS OF RHR. The magnitude of RCS inventory loss will cause RHR pump cavitation or Core Exit Thermocouple temperatures to rise.

This procedure is entered if the RCS has a leak. Steps 3.2 through 3.9 direct the Operator to the appropriate procedure if the RCS is experiencing: a RCS leak while in Modes 1, 2, or 3 with the accumulators in service; a S/D LOCA while in Mode 3 with the accumulators isolated, or Mode 4. Also, a RCS leak (mode 5, 6, or defueled) which potentially causes a Loss of RHR, or Loss of RHR At Reduced Inventory.

Blocking SI, and isolating the accumulators, are not addressed in this procedure. If the leak is slow enough and under control, the normal IOPs will perform this function. If the leak is too fast or uncontrolled for the IOPs to accomplish these tasks, then their ECCS function will be needed in order to mitigate the accident.

Step 3.10 evaluates Pressurizer level. If Pressurizer level is being maintained or rising, the Operator is directed to Step 3.19 to conduct an RCS inventory balance. At step 3.11, if Pressurizer level is lowering the operator starts <u>one</u> centrifugal charging or safety injection pump to cope with a Mode 5 or 6 RCS leak. Steps 3.12 through 3.16 address a Mode 1, 2 or 3 RCS leak. This is accomplished by directing the operator to evaluate the leak rate by transferring to a centrifugal charging pump and a 45 gpm letdown orifice, and by adjusting charging flow to stabilize pressurizer level. Step 3.16 evaluates Pressurizer level again. If level is being maintained or rising, the Operator is directed to Step 3.18. If level is still lowering, Step 3.17 directs the Operator to manually trip the reactor and confirm the Reactor trips. If the Reactor trips, Safety Injection is initiated and the Operator goes to 2-EOP-TRIP-1, Reactor Trip or Safety Injection. A manual reactor trip and Safety Injection is initiated from normal operating pressure with a leakrate greater than ≈ 93 gpm. This value comes from the capacity of a centrifugal Charging Pump (≈ 150 gpm), subtracting minimum Letdown (≈ 45 gpm) and RCP seal water return flow (≈12 gpm). If the Reactor does not trip, the Operator is directed to 2-EOP-TRIP-1 to address the ATWS.

The procedure does not place the BIT flowpath in service for several reasons. First, the BIT is no longer a highly borated source that would expedite the shutdown. Second, substantial control of Charging flowrate is available through the 2CV55 path than through the BIT. This control is vital on small break LOCAs where Charging can easily repressurize the RCS. Finally, even though the total Charging flowrate may be slightly less, (due to the head loss of the 2CV55 path), the difference is not appreciable and the manual SI option is still available if insufficient Charging flow exists.

If Pressurizer level is being maintained or is rising, Step 3.18 directs the Operator to place CVC Makeup Control System in service as necessary to control VCT level. This should already exist, therefore this step is a reminder to monitor VCT level.

Step 3.19 directs the Operator to initiate a leak rate calculation. This will be necessary to classify the event and aids in subsequent procedure direction.

At Step 3.20, 3.20.1, 3.20.2, efforts are initiated to locate and isolate the leak using Attachment 2, Guidelines for Locating An RCS Leak AND Attachment 3, Guidelines for Locating An Interconnecting ECCS Leak. If evidence of boric acid accumulations are observed during the conduct of walkdowns, procedure SH.RA-AP.ZZ-8805(Q), Boric Acid Corrosion Management Program is implemented to meet commitments made in response to NRC Generic Letter 88-05.

At Step 3.21, the SM/CRS is notified to refer to the Event Classification Guide and Technical Specifications, for classifying the event and determining applicable LCOs. RCS Leakage definition for ECG classification purposes is "Any leakage that is unisolable or affects Pressurizer level should be considered Reactor Coolant System (RCS) Leakage when reviewing the Salem ECG for classification assessment".

Step 3.22 directs the Operator to wait until either the leak rate is reduced below the Technical Specification limit, or the SM/CRS directs a Reactor shutdown. If the leak is located and reduced below Technical Specification limits, then the procedure may be exited. If not, Step 3.24 directs a normal Reactor shutdown and cooldown IAW the appropriate IOPs.

During the Reactor shutdown, efforts will continue to locate the leak. If the leak is reduced to less than Technical Specification limits during the shutdown, then the procedure may be exited. If the leak has not been isolated by the time the shutdown is completed, a strategy needs to be developed to maintain core cooling and inventory control while at the same time completing repairs. With the leak rate less than 138 gpm, adequate time exists to develop a strategy for long term inventory control. Step 3.25 assigns System Engineering this task. Step 3.26 implements the System Engineering recommendations. The procedure is then exited in Section 4.0.

END OF DOCUMENT

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE:

STATION: Salem Generating Station

SYSTEM: Containment Spray

TASK: Perform Actions for a Loss of Emergency Recirculation

TASK NUMBER: 115 012 05 01

JPM NUMBER: India SIM e.

ALTERNATE PATH: [ ]

K/A NUMBER: E11 EA1.1 / 026 A4.01

IMPORTANCE FACTOR: 3.9 / 4.5 (RO) 4.0 / 4.3 (SRO)

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: Simulator/Perform

REFERENCES: 2-EOP-LOCA-5 Rev 24

TOOLS, EQUIPMENT AND PROCEDURES: None

VALIDATED JPM COMPLETION TIME: 3 Minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: NA

APPROVAL:

BARGAINING UNIT REPRESENTATIVE	OTM OR DESIGNEE	OPERATIONS DIRECTOR OR DESIGNEE

CAUTION: **No plant equipment shall be operated during the performance of a JPM without the following:**
1. **Permission from the SM or Unit CRS;**
2. **Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions).**
3. **Verification of the "as left" condition by a qualified individual.**

ACTUAL JPM COMPLETION TIME: _____ Minutes

ACTUAL TIME CRITICAL COMPLETION: _____ Minutes

JPM PERFORMED BY: _____ **GRADE:** [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____ **DATE:** _____

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE:

NAME: _____

DATE: _____

SYSTEM: Containment Spray

TASK: Perform Actions for a Loss of Emergency Recirculation

TASK NUMBER: 115 012 05 01

INITIAL CONDITIONS:

IC-187 Thumb Drive

RWST level~30'
Cont pressure 15-47psig
4 CFCU running in SLOW speed.
BOTH RHR pumps not running.

A LBLOCA has occurred in coincidence with a loss of power to 2A 4KV Vital Bus.
2-EOP-LOCA-5 is in effect because both RHR Pumps are unavailable.

INITIATING CUE:

You are the board operator. Beginning @ Step 13, implement LOCA-5.

Successful Completion Criteria:
1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____
DATE: _____

SYSTEM: Containment Spray
TASK: Perform Actions for a Loss of Emergency Recirculation

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		START TIME: _____	**CUE**: Inform operator that other operators are performing cooldown and makeup to RWST		
*	1 LOCA-5 Step 13	Determine the required number of CS Pumps from Table C	Determines that, based on RWST level and 4 CFCU's running, no CS Pumps are required.		
	2 LOCA-5 Step 13	If any pump is to be stopped:	Determines 22 CS Pp can be stopped.		
*	3 LOCA-5 Step 13	Reset Spray Actuation	Resets both trains of Spray Actuation		
*	4 LOCA-5 Step 13	Stop Pump	Stops 22 CS Pp		
*	5 LOCA-5 Step 13	Close associated 21 or 22CS2 (Pump Discharge Valve)	Closes 22CS2		
		STOP TIME:_____			

Terminating Cue: Receives 22CS2 closed indication, and then state "This JPM is complete"

JOB PERFORMANCE MEASURE
SIMULATOR SETUP INSTRUCTIONS

1. IC-187 Thumb Drive
2. 100% power Initial Condition

3. Enter Malfunctions:

    a. RC0001A
    b. EL0144

4. Carry out the steps of the EOP Network until RWST level is 30'

5. Ensure RWST level >15.2', Containment Pressure between 15-47 psig, 4 CFCU running in Slow Speed

6. Enter Malfunction RH0026B

INITIAL CONDITIONS:

A LBLOCA has occurred in coincidence with a loss of power to 2A 4KV Vital Bus.
2-EOP-LOCA-5 is in effect because both RHR Pumps are unavailable.

INITIATING CUE:

You are the board operator. Beginning @ Step 13, implement LOCA-5.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM 1 & 2

SYSTEM: Nuclear Instrumentation System

TASK: Perform a calorimetric calculation (Adjust PR NIS Gain)

TASK NUMBER: 015 003 02 01

JPM NUMBER: India Sim f.

ALTERNATE PATH: [ ]

K/A NUMBER: 015 000 A1.01

IMPORTANCE FACTOR: 3.5 RO, 3.8 SRO

APPLICABILITY:
EO [ ] RO [X] STA [ ] SRO [X]

EVALUATION SETTING/METHOD: SIMULATOR / PERFORM

REFERENCES: SC.RE-ST.ZZ-0001, Rev.22

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 5

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

APPROVAL:

Bargaining Unit Representative	OTM or designee	OPS Manager, or Designee

CAUTION: **No plant equipment shall be operated during the performance of a JPM without the following:**
1. **Permission from the SM or Unit CRS;**
2. **Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions).**
3. ***Verification of the "as left" condition by a qualified individual.***

ACTUAL JPM COMPLETION TIME: Minutes

ACTUAL TIME CRITICAL COMPLETION: N/A

JPM PERFORMED BY: _____ GRADE: [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____ DATE: _____

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Nuclear Instrumentation System

TASK: Perform a calorimetric calculation (Adjust PR NIS Gain)

TASK NUMBER: 015 003 02 01

INITIAL CONDITIONS:

Any 100% power IC. Ensure PR NIS drawer NI currents are set to the values in Attachment 6.

INITIATING CUE:

A daily calorimetric has been performed IAW SC.RE-ST.ZZ-0001. Results indicate that PR NIS channels need to be adjusted.

The CRS directs you to adjustment channels N41, N43, and N44 by starting at step 5.2.6.A, and adjust to the values stated on Attachment 6, Part II.

Successful Completion Criteria:
1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made.**

NAME: _____
DATE: _____

SYSTEM: **Nuclear Instrumentation System**
TASK: **Perform a calorimetric calculation (Adjust PR NIS Gain)**

# *	STEP NO.	STEP (* Denotes a Critical Step) (# Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide Operator with a marked up copy of SC.RE-ST.ZZ-0001, Daily Power Range Channel Calibration by Calorimetric.			
			Operator reviews procedure.		
*	5.2.6.A	ENSURE the Rod Control Selector Switch is in Manual BEFORE adjusting NIS potentiometers.	Operator places Rod Control in MANUAL.		
			NOTE: The following 5 steps will be performed for each of the three channels requiring adjustment.		
*	5.2.6.B	ENSURE that all High Rate Flux Trips are clear BEFORE adjustment.	Operator checks High Flux Rate Trip lights deenergized on all 4 channels at PR NI racks. Operator may also point out that no F Window OHAs are present.		
	5.2.6.C	For the channel to be adjusted, UNLOCK the Gain Potentiometer on the "Power Range B" NIS drawer.	Operator locates correct channel and drawer, and unlocks potentiometer.		
*	5.2.6.D	ADJUST the Gain Potentiometer so the NIS Indicated RTP matches the new value recorded in Attachment 6, Part II.	Operator adjusts the potentiometer to required new reading. **CUE**: Current reads 100.0		

NAME: _____
DATE: _____

SYSTEM: **Nuclear Instrumentation System**

TASK: **Perform a calorimetric calculation (Adjust PR NIS Gain)**

# *	STEP NO.	STEP (* Denotes a Critical Step) (# Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.2.6.E	LOCK the Gain Potentiometer.	Operator locks the potentiometer.		
	5.2.6.F	IF a High Flux Rate Trip occurs, THEN RESET, as necessary.	High Flux Rate trip will not occur.		
*	5.2.6.G	IF the other Power Range NIS channels need to be adjusted, THEN REPEAT Steps 5.2.6.B through 5.2.6.F.	Operators perform steps for N43 and N44.		
	5.2.6.H	COMPLETE Attachment 6, PART III.	Operator fills out Att. 6 Part III.		
	5.2.6.I	RETURN the Rod Control Selector Switch to the position required for the current operating conditions.	Operator places Rod Control in AUTO.		

Terminating Cue: When ROD CONTROL is placed in automatic, terminate JPM.

INITIAL CONDITIONS:

100% power, steady state.

INITIATING CUE:

A daily calorimatric has been performed IAW SC.RE-ST.ZZ-0001. Results indicate that PR NIS channels need to be adjusted.

The CRS directs you to perform the adjustments at step 5.2.6.A, and adjust N41, N43, and N44 to the values stated on Attachment 6.

PSEG Internal Use Only

PSEG NUCLEAR L.L.C.
SALEM GENERATING STATION/REACTOR ENGINEERING
SC.RE-ST.ZZ-0001(Q) - REV. 22 10/2/6
DAILY POWER RANGE CHANNEL CALIBRATION BY CALORIMETRIC

USE CATEGORY: I

A. Biennial Review performed: Yes___ No __ NA _X_

B. Change Package(s) and Affected Document Number(s) Incorporated in this Revision:

- CP No. _____, CP Rev. No. _____, AD No. _____, Rev. No. _____

C. OTSC(s) Incorporated Into this revision:
- None

REVISION SUMMARY:

Revised Step 5.2.6 to include additional signoff spots for each channel adjusted. This is an editorial change. [70059846]

Also, revised record retention procedure number in section 6.0 and 7.0.

IMPLEMENTATION REQUIREMENTS Effective Date 8/18/06

APPROVED: _____ 8/18/06
Manager-Reactor Engineering (or Designee) Date

DAILY POWER RANGE CHANNEL CALIBRATION BY CALORIMETRIC

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1.0 PURPOSE

1.1 Calculation of steady state Reactor Thermal Power as a percentage of Rated Thermal Power (RTP) by performing a secondary-side energy balance and adjusting the result to yield only the energy produced by the reactor core (Calorimetric).

1.2 Channel Calibration of the Power Range NIS when the Reactor is operating above 15 % RTP per Technical Specification Surveillance 4.3.1.1.1 [Table 4.3-1 Item 2 D(2)]. This calibration SHALL be based on a Calorimetric and SHALL be completed at least once per 24 hours. **[C0265, C0560]**

2.0 PREREQUISITES

2.1 The Reactor is STABILIZED and operating in a Steady State Condition. For this procedure, a Steady State Condition exists when the trends of the following parameters are changing less than the indicated amount in a 5-minute interval. The criteria do not apply to signal noise or short-term variation in the values.

2.1.1	Reactor Power:	0.5 %RTP
2.1.2	RCS Average Temperature (Tave):	0.5 °F
2.1.3	RCS Pressure:	25 psi
2.1.4	Steam Generator (S/G) Narrow Range Levels:	2 %

2.2 RCS Temperature Error (Terr) is ≤ ± 0.5 °F, where Terr = Auct Hi Tave - Tref. IF Terr is not available on the Control Console recorder, THEN the Auctioneered High RCS Average Temperature (Auct Hi Tave) can either be determined from the Plant Computer (T0499A) or by taking the highest value of the four loop Tavgs. The RCS Reference Temperature (Tref) can be determined from the Plant Computer (T0496A) or from Figure 11 of S1(2).RE-RA.ZZ-0012(Q), Figures. IF Plant Computer points are used, THEN they must be GOOD quality.

2.3 Actual S/G Blowdown Flow is ≤ 120,000 lbm/hr.

2.4 Reactor Power is ≥ 15 %RTP.

2.5 Plant conditions can be maintained per Prerequisites 2.1, 2.2, 2.3, and 2.4 for the duration of Calorimetric Calculation and Power Range NIS Channel Calibration, as applicable.

2.6 When ≥ 85 % RTP, a valid Crossflow correction factor is used. The factor may be automatically calculated by the Crossflow System or manually calculated IAW SC.RE-RA.ZZ-0019(Q), Feedwater Flowrate Correction Factor.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Use of the Crossflow System reduces the core thermal power measurement uncertainty to ≤ 0.6%. Crossflow uses an ultrasonic flowmeter system to accurately calculate feedwater flowrate. The system compares the calculated feedwater flowrate to nozzle flowrate and generates a correction factor. This correction factor is applied to the nozzle flowrate to obtain a corrected mass flow signal. The corrected mass flow is used to determine power. Crossflow is designed to calculate a correction factor within the specified accuracy down to 80% power. However, the correction factor is conservatively set at 1.0 at < 85% RTP. It is for this reason that S1(2).OP-IO.ZZ-0004(Q), Power Operation, requires a calorimetric between 85% RTP and 90% RTP.

3.2 Adjustments of the Power Range NIS in the downward (non-conservative) direction are limited due to calorimetric uncertainties. At power levels below 50% RTP, the uncertainty may exceed 2% RTP. An additional conservatism of 10% is used for restricting such adjustments. Power Range NIS power level adjustments in the downward direction (non-conservative) should **NOT** be made when Reactor Power is less than 60% RTP. This restriction does not apply during the initial return to 100% RTP following a Refueling Outage or following activities that impacted the Power Range Detector geometry or channel gain (e.g. detector replacement, potentiometer repair).

3.3 All Power Range NIS **channel** readings should be taken from the NIS Rack Meters and not from the Control Console or Plant Computer. When reading the power level from the NIS Rack meter, the motion of the needle should be visually averaged and recorded to the nearest 0.5% RTP.

3.4 All data should be taken at approximately the same time unless otherwise specified.

3.5 RCS Tave affects the Power Range NIS Indication strongly due to moderator density effects between the core and the detectors. Therefore, it is important that Terr is maintained within ± 0.5°F during data collection and Power Range NIS Channel Calibration, if applicable. For each 1.8°F drop in temperature, the Power Range NIS Indication will read about 1% low (non-conservative).

3.6 FW temperature Resistance Temperature Detector (RTD) readings are normally obtained from a device inside a cabinet in the Turbine Building. The UP and DOWN buttons are used to select one of the four loops for display. This cabinet contains equipment that can cause a Main Turbine trip and should be accessed carefully.

3.7 There is a hierarchy for feedwater temperature instrument usage in the calorimetric. Readings for the dual-element RTDs are: 1) on the Plant Computer On-line Calorimetric Screen and 2) Turbine Building El. 100 at the Data Bucket. The Thermocouples (TCs) are read from the Plant Computer via Advanced Digital Feedwater Control System (ADFCS). The below lists show the approved configurations from highest to lowest preference for the different types of calorimetric.

On-Line Calorimetric

NOTE
If any (1) RTD input to On-line is INOP, then the On-Line Program will not operate.

Four (4) RTDs

Manual Calorimetric

1. Four (4) RTDs **[PREFERRED]**
2. Three (3) RTDs, the average of the (3) RTDs for the loop with the inoperable RTD
3. Four (4) TCs
4. Three (3) TCs, the average of the (3) TCs for the loop with the inoperable TC
5. Mix of RTDs and TCs so that each loop has a separate reading

3.8 The On-Line Calorimetric, Attachments 4, 5 and 6, shall **ONLY** be used when Reactor Power is ≥ 40% as indicated on the Power Range NIS Rack Meters (average).

3.9 This procedure shall **NOT** be used to determine Technical Specification Operability of the Power Range NIS Channels. Operability is based on the monthly functional test. **[C0523]**

3.10 This procedure shall **NOT** be used to adjust Reactor Power. S1(2).OP-IO.ZZ-0004(Q), Power Operation, govern Reactor Power adjustments.

3.11 In Steady State Conditions, the plant parameters and thus the Calorimetric are slowly changing. A variation of about ±0.1% RTP around an average is within expectations. Monitoring the On-Line Calorimetric displays this behavior. It is possible to temporarily show Reactor Power above 100.0% RTP and maintain a "Shift Average" of 100.0% RTP. IAW S1(2).OP-IO.ZZ-0004(Q), Power Operation, small unintentional "excursions" above 100.0% RTP are allowed within the specified guidance.

3.12 The SM/CRS shall be **IMMEDIATELY** notified if a Calorimetric above 100.0% RTP is calculated.

3.13 In addition to obtaining Feedwater Flow Delta P readings from the normal source in the Turbine Building, it is possible to obtain the signals from the Reactor Protection Racks. Attachment 8 provides guidance for this alternate data collection method.

3.14 The units of the data collected on the attachments are important to ensure accuracy of the calculation. For example, if Blowdown indicates 39.5 X1000 lbm/hr on the Control Console, then it should be recorded as 39.5E3 or 39500 lbm/hr.

3.15 The recommended number of significant digits with data collection and calculation activities are shown in the attachments and forms using the "#" symbol. For example, "###.##" means that a value of 653.455 should be rounded to 653.46. This recommendation improves the repeatability of the calorimetric calculation and the consistency of the various approved methodologies.

3.16 The NAME, INITIALS, and SIGNATURE of all personnel performing steps in this procedure, and the DATE of performance, should be recorded on Attachment 9.

3.17 Feedwater Nozzle Fouling/Defouling may result in changes in Calorimetric Power indication, however, PT505 & PT506 and Average ΔT values will not be affected, and therefore, can be used as an alternate indication of Reactor Power.

3.18 IF the Average NIS Power is < 85% RTP, THEN all Loop Correction Factors should be set to 1.0, IAW Attachment 5 or S1(2).OP-IO.ZZ-0004(Q), Power Operation, Attachment 5 and SC.RE-RA.ZZ-0019(Q), Feedwater Flowrate Correction Factor.

3.19 IF the approved Excel spreadsheet, SCRE-STZZ-0001(Q), will be used, THEN the revision number should be validated with the revision number listed in Section 4.0, Equipment/Material Required, of this procedure to ensure configuration control.

4.0 EQUIPMENT/MATERIAL REQUIRED

4.1 **Data Analysis Equipment**

4.1.1 Plant Computer (On-Line Calorimetric, Step 5.1.2) **OR**

N/A 4.1.2 Approved Excel Spreadsheet SCRE-STZZ-0001(Q), Revision 0 (Manual Calorimetric, Step 5.1.3) **OR**

N/A 4.1.3 Calculator (Manual Calorimetric, Step 5.1.3)

> **NOTE**
>
> In the event installed instrument(s) is unavailable, consult with SM/CRS to identify alternate sources.

4.2 **Installed Instrumentation**

4.2.1 On-Line Calorimetric with Reactor Power ≥ 40% as indicated on the Power Range NIS Rack Meters (average).

	Loop 1	Loop 2	Loop 3	Loop 4
S/G Pressure 1	P514A	P524A	P534A	P544A
S/G Pressure 2	P515A	P525A	P535A	P545A
S/G Pressure 3	P516A	P526A	P536A	P546A
S/G Blowdown	FA5836	FA5837	FA5838	FA5839
FW Temperature RTD	T2402N	T2403N	T2404N	T2405N
FW Flow Delta P	FL8924Z	FL8925Z	FL8926Z	FL8927Z
RCS Delta T	TE411A	TE421A	TE431A	TE441A
NIS Power	N41	N42	N43	N44

OR

N/A 4.2.2 Manual Calorimetric

	Loop 1	Loop 2	Loop 3	Loop 4
S/G Pressure 1	P514A	P524A	P534A	P544A
S/G Pressure 2	P515A	P525A	P535A	P545A
S/G Pressure 3	P516A	P526A	P536A	P546A
S/G Blowdown	FA5836	FA5837	FA5838	FA5839
FW Temperature RTD	TA647	TA649	TA651	TA653
FW Temperature TC	TA648PC	TA650PC	TA652PC	TA654PC
FW Flow Delta P	FL8924I	FL8925I	FL8926I	FL8927I
RCS Delta T	TE411A	TE421A	TE431A	TE441A
NIS Power	N41	N42	N43	N44

5.0 PROCEDURE

NOTE

The On-Line Calorimetric (Step 5.1.2) may only be used if reactor power is greater than or equal to 40% RTP as indicated on the Power Range NIS Racks.

5.1 Calorimetric Calculation

5.1.1 **SELECT** the applicable step (e.g., 5.1.2) below and **MARK** the other steps in Section 5.1 "N/A."

5.1.2 IF the **On-Line Calorimetric** is to be used, THEN:

A. **ENSURE** Reactor Power is ≥ 40% RTP.

B. **ENSURE** actual S/G Blowdown flow is ≤ 120K lbm/hr. Actual S/G Blowdown flow may **NOT** be > 120K lbm/hr during the performance of this procedure.

C. **ENSURE** the following IAW Attachment 5 **OR** S1/S2.OP-IO.ZZ-0004(Q), Power Operation, Attachment 5:

1. Steady State Conditions have been established.
2. The Validation Criteria for all Plant Computer Points is SAT.
3. The Quality for all Computer Points is "Good," as applicable.

D. **REQUEST** a second Operator to **PERFORM** an Independent Verification of Steps 5.1.2.C.1 through 5.1.2.C.3 above **AND COMPLETE** Attachment 9 Section 3.0.

E. **COMPLETE** Attachment 4, On-Line Calorimetric Work Sheet **OR ATTACH** the Calorimetric Worksheet plant computer screen. (Equivalent computer print-outs may be attached.)

N/A 5.1.3 IF the **Manual Calorimetric** has been selected, THEN **PERFORM** the following;

A. **COLLECT** the required plant data and **RECORD** on Attachment 3.

NOTE

If the approved Excel spreadsheet, SCRE-STZZ-0001(Q), will be used, then the revision number should be validated with the revision number listed in Section 4.0, Equipment/Material Required, of this procedure to ensure configuration control.

N/A B. **PERFORM** data analysis by **COMPLETING** the appropriate attachment;

___ 1. IF Salem Unit 1, THEN **COMPLETE** Attachment 1.

___ 2. IF Salem Unit 2, THEN **COMPLETE** Attachment 2.

C. **DIRECT** another Qualified Individual IAW NC.NA-AP.ZZ-0014(Q), Training Qualification and Certification, to **PERFORM** an Independent Verification of Attachment 1 or 2 **AND COMPLETE** Attachment 9 Section 3.0. **[C0284]**

NOTE

Section 5.2 is used to satisfy Technical Specifications per Purpose 1.2 and is performed by Operations personnel following completion of Section 5.1. Otherwise, it does **NOT** have to be performed.

5.2 **Power Range NIS Channel Calibration**

5.2.1 **COMPLETE** Attachment 6, **Part I.**

5.2.2 **DETERMINE** if any Power Range NIS channel requires adjustment by applying the following criteria:

A. The average of the **Operable** Power Range NIS channel % RTPs should be equal to or greater than the Calorimetric % RTP.

B. The difference between each Power Range NIS channel's % RTP and the Calorimetric % RTP (NIS - Calorimetric) should be no more negative than –1.0 %.

C. Each of the Power Range Channels should be ≤ 100.5 % RTP.

5.2.3 IF adjustment of the Power Range NIS channel(s) is necessary, THEN **COMPLETE** Attachment 6, **Part II. DETERMINE** New Desired NIS RTP values by selecting the nearest .5% RTP level ≥ the Calorimetric Power.

Examples (A, B & C)	A	B	C
- NIS Meter Power	99.0%	100%	99.5%
- Calorimetric Power	99.2%	99.2%	99.2%
- Adjust NIS to nearest .5% RTP ≥ Calorimetric Power	99.5%	99.5%	No adjustment req'd

NOTE

Power Range NIS adjustment in the downward direction (non-conservative) should **NOT** be made when Reactor Power is less than 60% RTP. This restriction does not apply during the initial return to 100% RTP following a Refueling Outage or following activities that impacted the Power Range Detector geometry or channel gain.

5.2.4 IF any of the Power Range NIS channels are to be adjusted downward (non-conservative), THEN **PERFORM** the following:

A. **COMPLETE** Attachment 7.

B. **REQUEST** the SM/CRS to **PERFORM** an Independent Verification of Attachment 7. **[C0284]**

N/A C. IF the Calorimetric Confirmation is **unsatisfactory**, IAW Attachment 7, Section 3.0, THEN **CONTACT** Reactor Engineering.

5.2.5 **DIRECT** the SM/CRS to **CONTINUE** performance of this procedure to completion.

NOTE

It is difficult to verify small adjustments to the gain potentiometers due the Power Range NIS meter resolution and the detector signal variation. The Plant Computer one-minute averages of the Power Range NIS signals can be used to monitor any adjustments.

N41: N0049N
N42: N0050N
N43: N0051N
N44: N0052N

CAUTION

The gain potentiometers are very sensitive. To avoid a high flux rate reactor trip, adjust only ONE channel at a time and adjust it SLOWLY.

J 5.2.6 IF adjustment of the Power Range NIS channel(s) is necessary as determined in Step 5.2.2, THEN **REQUEST** the RO/PO to **ADJUST** each applicable channel as follows:

N41	N42	N43	N44		
		___		A.	**ENSURE** the Rod Control Selector Switch is in Manual **BEFORE** adjusting the NIS Potentiometers.
___	N/A	___	___	B.	**ENSURE** that all High Flux Rate Trips are clear **BEFORE** adjustment.
___	N/A	___	___	C.	For the channel to be adjusted, **UNLOCK** the Gain Potentiometer on the "Power Range B" NIS drawer.
___	N/A	___	___	D.	**ADJUST** the Gain Potentiometer so the NIS Indicated RTP matches the new value recorded in Attachment 6, **Part II**.
___	N/A	___	___	E.	**LOCK** the Gain Potentiometer.
___	N/A	___	___	F.	IF a High Flux Rate Trip occurs, THEN **RESET**, as necessary.
		___		G.	IF the other Power Range NIS channel(s) need to be adjusted, THEN **REPEAT** Steps 5.2.6.B through 5.2.6.F.
		___		H.	**COMPLETE** Attachment 6, **Part III**.
		___		I.	**RETURN** the Rod Control Selector Switch to the position required for current operating conditions.
		___		J.	**RETURN** to SM/CRS.

___ 5.2.7 IF none of the Power Range NIS channels are to be adjusted, THEN **MARK** Attachment 6, **Part II & III,** "N/A."

___ 5.2.8 **REVIEW** and **SIGN** Attachment 6.

___ 5.2.9 **REQUEST** the RO to log the Time and Indicated % RTP in the Control
$ Room Log when Attachment 6 is completed.

___ 5.3 **Completion and Review**

___ 5.3.1 **COMPLETE** Attachment 9, Section 1.0 and 2.0, and **FORWARD** this procedure to the SM/CRS for review and approval.

___ 5.3.2 SM/CRS **REVIEW** this procedure with Attachments 1 through 9 for completeness and accuracy, and **COMPLETE** Attachment 9, Section 4.0.

END OF PROCEDURE SECTION

ATTACHMENT 6
POWER RANGE NIS CHANNEL CALIBRATION WORK SHEET

Salem Unit 2

NOTE

Values for Part I are obtained from the below sources based on the selected calorimetric methodology.

NIS Power	Calorimetric Power
Manual Calorimetric: Attachment 3	Manual Calorimetric: Attachment 1/2
On-Line Calorimetric: Attachment 4	On-Line Calorimetric: Attachment 4

PART I: AS-FOUND VALUES (at time of calorimetric data collection)

	N41	N42	N43	N44	AVERAGE
NIS Meter Power (%) ###.#	100.5	100.0	100.5	101.0	100.5
$ Calorimetric Power (%) ###.#	99.9	99.9	99.9	99.9	
Difference = NIS-Calorimetric (%) #.#					

CAUTION

The AVERAGE of the OPERABLE Power Range NIS Channel % RTP should be equal to or greater than the calorimetric % RTP.

The difference between each Power Range NIS Channel's % RTP and the calorimetric % RTP (NIS-calorimetric) should be no more negative than –1.0%.

Each of the Power Range Channels should be ≤ 100.5% RTP.

Any downward adjustment of the Power Range NIS requires completion of Attachment 7 BEFORE adjustment.

PART II: New Desired NIS Meter RTP values (nearest .5 % RTP level ≥ the Calorimetric Power)

	N41	N42	N43	N44
$ Calorimetric Power (%) ###.#	99.9	99.9	99.9	99.9
New Desired NIS Meter RTP (%) ###.#	100.0	100.0	100.0	100.0

PART III: AS-LEFT VALUES (after any adjustment of potentiometers)

	N41	N42	N43	N44
NIS Meter after adjustment (%) ###.#				

Completed By: _____ Date: _____ Time: _____

Reviewed By: _____ Date: _____ Time: _____ **[C0284]**
SM/CRS

ATTACHMENT 9
COMPLETION/SIGN-OFF SHEET
Page 1 of 1

1.0 COMMENTS:

(Procedure deficiencies shall be documented with corrective actions in this section.)

2.0 SIGNATURES:

Name (Print)	Initials	Signature	Date
G Gaudry	G	[illegible]	10/1/6
[illegible]	[illegible]		10/1/6

3.0 INDEPENDENT VERIFICATION: **[CO284]**

Name (Print)	Initials	Signature	Date

4.0 FINAL REVIEW AND APPROVAL: **[CO283]**

This procedure has been reviewed for completion and accuracy. All deficiencies with their associated corrective actions are clearly recorded in the COMMENTS section above.

Reviewed By: _____ Date: _____
SM/CRS

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Component Cooling Water (CCW)

TASK: Perform Actions for CCW Restoration

TASK NUMBER: N1150420501

JPM NUMBER: INDIA NRC SIM g.

K/A NUMBER: 008 A4.01

IMPORTANCE FACTOR: 3.3 (RO) 3.1 (SRO)

APPLICABILITY:
EO [ ] RO [X] SRO [X]

EVALUATION SETTING/METHOD: Simulator

REFERENCES: 2-EOP-APPX-1, Rev. 23

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 6 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

APPROVED:

BARGAINING UNIT REPRESENTATIVE	OPERATIONS TRAINING MANAGER	OPERATIONS DIRECTOR OR DESIGNEE

CAUTION: **No plant equipment shall be operated during the performance of a JPM without the following:**

1. **Permission for the SM Or Unit CRS;**
2. **Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions).**
3. **Verification of the "as left" condition by a qualified individual.**

ACTUAL JPM COMPLETION TIME: _____

ACTUAL TIME CRITICAL COMPLETION TIME: _____

JPM PERFORMED BY: _____ **GRADE:** [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____ **DATE:** _____

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Component Cooling Water (CCW)

TASK: Perform Actions for CCW Restoration

TASK NUMBER: N1150420501

INITIAL CONDITIONS:

1. IC-189 Thumb Drive
2. Post trip, SI, LOOP, 2A vital 4kv bus deenergized on bus diff, NO CCW pumps running

INITIATING CUE:

The reactor was manually tripped and a SI initiated. A Loss of Off-Site power occurred coincident with the Rx trip. 2B and 2C 4KV Vital busses are energized from their respective EDG's. 2A 4KV Vital bus is deenergized and locked out on bus differential. NO CCW pumps are running. You have been directed to start ONE CCW pump IAW 2-EOP-APPX-1.

Successful Completion Criteria:

1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).**

NAME: _____

DATE: _____

SYSTEM: Component Cooling Water (CCW)

TASK: Perform Actions for CCW Restoration

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
		Operator obtains 2-EOP-APPX-1	Control room/Simulator procedures are controlled copy documents, and are presumed to be correct revision .		
	1	**CHECK** 4 KV vital bus status: a. **CHECK AT LEAST ONE** vital bus ENERGIZED by station power transformers.	Checks energized 4KV vital busses and determines NO 4KV vital bus is being supplied from station power transformer. RNO- GOES TO step 2.		
	2.a.	**CHECK** ECCS pump (CVC,SI, orRHR) and AFW pump status: **a.** CHECK all ECCS pumps AND motor driven AFW pumps running on energized vital buses.	Checks running pumps and determines that ALL ECCS and MDAFW pumps are running on energized vital buses.		
	2.b.	**CHECK** one CCW pump running.	Checks CCW pump status and determines NO CCW pumps are running. RNO- GOES TO step 3.		
	3	**SELECT** CCW pump start stategy: a. **IF ALL** 4 KV vital busses energized, **THEN GO TO** Step 4. b. **IF** 2A Vital Bus de-energized, **THEN GO TO** Step 7.	Answers N/A since no CCW pumps are running. Determines 2A bus is de-energized, and GOES TO Step 7.		

NAME: _____

DATE: _____

SYSTEM: Component Cooling Water (CCW)

TASK: Perform Actions for CCW Restoration

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	7	**IF** 2B **AND** 2C Vital Buses energized, **THEN START** 22 CCW Pump as follows:			
		a. **CHECK** 22 CCW Pump AVAILABLE.	Operator determines 22 CCW pump available.		
*		b. **BLOCK** 2B SEC.	Operator BLOCKS 2B SEC on 2RP1 by rotating switch to BLOCK and releasing switch.		
*		c. **RESET** 2B SEC	Operator RESETS 2B SEC by depressing the RESET SEC LOADING PB on 2B EDG Control bezel.		
*		d. **STOP** the following: 22 **OR** 24 CFCU. 22 Aux Bldg Supply Fan.	Operator depresses STOP PB for 22 OR 24 CFCU. Operator notes 22 Aux Building Supply fan is C/T		
*		e. **START** 22 CCW Pump.	Operator depresses start PB for 22 CCW pump and verifies it starts.		
		f. **SEND** operator to 84' elev. Aux Bldg to place **ONLY** 22 CCW Heat Exchanger in service IAW S2.OP-SO.CC-0002(Q) "21 & 22 Component Cooliong Heat Exchanger Operation."	Operator contacts NEO and dispatches them to place ONLY 22 CCW HX in service IAW S2.OP-SO.CC-0002.		

NAME: _____

DATE: _____

SYSTEM: Component Cooling Water (CCW)

TASK: Perform Actions for CCW Restoration

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	(Cont) 7	g. **CLOSE** 22CC3 (pump outlet cross-connect valve) h. **RETURN** to procedure in effect.	Operator depresses 22CC3 CLOSE PB on 2CC1, and verifies valve closes. Operator announces returning to EOP-TRIP-1.		

Terminating Cue: Operator announces return to EOP-TRIP-1.

INITIAL CONDITIONS:

Post trip, SI, LOOP, 2A vital 4kv bus deenergized on bus diff, NO CCW pumps running.

INITIATING CUE:

The reactor was manually tripped and a SI initiated. A Loss of Off-Site power occurred coincident with the Rx trip. 2B and 2C 4KV Vital busses are energized from their respective EDG's. 2A 4KV Vital bus is deenergized and locked out on bus differential NO CCW pumps are running. You have been directed to start ONE CCW pump IAW 2-EOP-APPX-1.

PSEG NUCLEAR L.L.C.
SALEM/OPERATIONS

2-EOP-APPX-1 – Rev. 23

COMPONENT COOLING WATER RESTORATION

- Biennial Review performed Yes___ No____ NA__X___
- Change Package (s) incorporated into this revision:

REVISION SUMMARY

The following changes were included in this revision:

- Inserted "(CVC, SI or RHR)" in Step 2 to provide clarification to the operator as to which pumps are to be considered in the step.
- Underlined the "de" in the word de-energized in Step 3 for emphasis.
- Grouped actions performed at RP2 together in Steps 4 and 5 to reduce potential for human error.
- Grouped stop and start actions performed at CC1 together in Steps 4 and 5 to reduce potential for human error.
- Inserted the word "ONLY" in Steps 6.a., 7.f. and 8.h. to clarify when only one CC heat exchanger is to be put in service.
- Revised Commitment C0623 in Steps 7 and 8 of Basis Document to indicate "22CC3" versus "2CC3". Typographical error.
- Revised Commitment C0623 in Step 9 of Basis Document to indicate "21CC3" versus "2CC3". Typographical error.

These changes address the revision requests in Order 80075658, Operation 0010, and comments regarding human error traps in Order 70042187, Operation 0040.

These changes are considered editorial in accordance with Attachment 3 of NC.NA-AP.ZZ-0001(Q), Attachment 3.

IMPLEMENTATION REQUIREMENTS: Effective Date: 02/05/05

None

APPROVED: [signature] for
Operations Manager – Salem

2/01/05
Date

EMERGENCY OPERATING PROCEDURE
2-EOP-APPX-1
COMPONENT COOLING WATER RESTORATION

1.0 Entry Conditions

See Procedure

2.0 Operator Actions

2.1 Immediate Actions

None

2.2 Subsequent Actions

See Procedure

3.0 Attachment List

3.1 Tables

None

3.2 Figures

None

3.3 Graphs

None

3.4 Checkoff Sheets

None

3.5 Attachments

None

2-EOP-APPX-1

STEP	ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED
1.	**CHECK** 4 KV vital bus status:		
	a. **CHECK AT LEAST ONE** vital bus ENERGIZED by station power transformers.		a. **GO TO** step 2.
	b. **START** one CCW pump on bus energized by station power transformer.		
	c. **GO TO** Step 6.		
2.	**CHECK** ECCS pump (CVC, SI or RHR) and AFW pump status:		
	a. **CHECK** all ECCS pumps **AND** motor-driven AFW pumps running on energized vital buses.		a. **PERFORM** the following: 1) **BLOCK** the SEC on the bus with **ANY** ECCS pump or motor-driven AFW pump stopped. 2) **RESET** affected SEC. 3) **IF** affected SEC can **NOT** be reset, **THEN SEND** operator to 100 ft elev relay room to de-energize SEC by opening the appropriate breaker: • 2AVIB24 • 2BVIB27 • 2CVIB9 4) **START** one CCW pump on the bus with a stopped ECCS or AFW pump.
	b. **CHECK** one CCW pump running.		b. **GO TO** step 3.
	c. **GO TO** step 6.		

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.	**SELECT** CCW pump start strategy:	
	a. **IF ALL** 4 KV vital buses energized, **THEN GO TO** Step 4.	
	b. **IF** 2A Vital Bus de-energized, **THEN GO TO** Step 7.	
	c. **IF** 2B Vital Bus de-energized, **THEN GO TO** Step 8.	
	d. **IF** 2C Vital Bus de-energized, **THEN GO TO** Step 9.	
4.	**START** 22 CCW Pump as follows:	
	a. **CHECK** 22 CCW Pump AVAILABLE.	a. **GO TO** Step 5.
	b. **BLOCK** 2B **AND** 2C SECs.	
	c. **RESET** 2B **AND** 2C SECs.	c. **SEND** operator to 100 ft elev relay room to de-energize 2B **AND** 2C SEC at 115V VAC vital instrument cabinet by opening the following breakers: • 2BVIB27 • 2CVIB9
	d. **PERFORM** the following at RP2: 1) **STOP** 22 Switchgear Room Supply Fan. 2) **START** 23 Switchgear Room Supply Fan.	
	e. **STOP** the following equipment at CC1: • 22 CFCU • 24 CFCU • 22 Aux Bldg Exhaust Fan	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	f. **START** 22 CCW Pump.	f. 1) **START** 22 **OR** 24 CFCU. 2) **GO TO** Step 5.
	g. **GO TO** Step 6.	
5.	**START** 21 CCW Pump as follows:	
	a. **BLOCK** 2A **AND** 2B SECs.	
	b. **RESET** 2A **AND** 2B SECs.	b. **SEND** operator to 100 ft elev relay room to de-energize 2A **AND** 2B SEC at 115V VAC vital instrument cabinets by opening the following breakers: • 2AVIB24 • 2BVIB27
	c. **SEND** operator to 100 ft elev chiller area to lock out 21 Chiller by placing the keyswitch in OFF (LOCKOUT) position.	
	d. **PERFORM** the following at RP2: 1) **STOP** 21 Switchgear Room Supply Fan. 2) **START** 22 Switchgear Room Supply Fan.	
	d. **STOP** the following equipment at CC1: • 21 CFCU • 21 Aux Bldg Exhaust Fan	
	e. **START** the following equipment at CC1: • 22 **OR** 24 CFCU • 22 FHB Exhaust Fan	
	f. **START** 21 CCW Pump.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	**PLACE** 21 **AND** 22 CCW Heat Exchangers in service as follows:	
CO623	a. **CHECK AT LEAST THREE** SW pumps running.	a. **PERFORM** the following: 1) **IF** 22 CCW Pump is running, **THEN**: • SEND an operator to 84 ft elev Aux Bldg to place **ONLY** 22 CCW Heat Exchanger in service IAW S2.OP-SO.CC-0002(Q), "21 & 22 Component Cooling Heat Exchanger Operation". • **CLOSE** 21CC3 (pump outlet cross-connect valve). 2) **IF** 21 or 23 CCW Pump is running, **THEN:** • SEND an operator to 84 ft elev Aux Bldg to place **ONLY** 21 CCW Heat Exchanger in service IAW S2.OP-SO.CC-0002(Q), "21 & 22 Component Cooling Heat Exchanger Operation". • **CLOSE** 22CC3 (pump outlet cross-connect valve). 3) **RETURN TO** procedure in effect.
	b. **SEND** an operator to 84 ft elev Aux Bldg to place 21 **AND** 22 CCW Heat Exchangers in service IAW S2.OP-SO.CC-0002(Q) "21 & 22 Component Cooling Heat Exchanger Operation".	
	c. **RETURN TO** procedure in effect.	

STEP	ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED
7.	**IF** 2B **AND** 2C Vital Buses energized, **THEN START** 22 CCW Pump as follows:		
	a. **CHECK** 22 CCW Pump AVAILABLE.		a. **RETURN TO** procedure in effect.
	b. **BLOCK** 2B SEC.		
	c. **RESET** 2B SEC.		c. **SEND** operator to 100 ft elev relay room to de-energize 2B SEC at 115V VAC vital instrument cabinet by opening breaker 2BVIB27.
	d. **STOP** the following: • 22 **OR** 24 CFCU • 22 Aux Bldg Supply Fan.		
	e. **START** 22 CCW Pump.		e. **PERFORM** the following: 1) **CONSULT** TSC for guidance in starting a CCW pump. 2) **RETURN TO** procedure in effect.
CO623	f. **SEND** operator to 84 ft elev Aux Bldg to place **ONLY** 22 CCW Heat Exchanger in service IAW S2.OP-SO.CC-0002(Q) "21 & 22 Component Cooling Heat Exchanger Operation".		
CO623	g. **CLOSE** 22CC3 (pump outlet cross-connect valve).		
	h. **RETURN TO** procedure in effect.		

STEP	ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED
8.	**IF** 2A **AND** 2C Vital Buses energized, **THEN START** 23 CCW Pump as follows:		
	a. **CHECK** 23 CCW Pump AVAILABLE.		a. **RETURN TO** procedure in effect.
	b. **BLOCK** 2C SEC.		
	c. **RESET** 2C SEC.		c. **SEND** operator to 100 ft elev relay room to de-energize 2C SEC at 115V VAC vital instrument cabinet by opening breaker 2CVIB9.
	d. **STOP** 22 CS Pump.		
	e. **START** 23 CCW Pump.		e. **PERFORM** the following: 1) **CONSULT** TSC for guidance in starting a CCW pump. 2) **RETURN TO** procedure in effect.
	f. **RESET** Containment Spray.		
	g. **CLOSE** 22CS2 (pump discharge valve).		
CO623	h. **SEND** operator to 84 ft Aux Bldg to place <u>ONLY</u> 21 CCW Heat Exchanger in service IAW S2.OP-SO.CC-0002(Q). "21 & 22 Component Cooling Heat Exchanger Operation".		
CO623	i. **CLOSE** 22CC3 (pump outlet cross-connect valve).		
	j. **RETURN TO** procedure in effect.		

STEP	ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED
9.	**IF** 2A **AND** 2B Vital Buses energized, **THEN START** 22 CCW Pump as follows:		
	a. **CHECK** 22 CCW Pump AVAILABLE.	a.	**RETURN TO** procedure in effect.
	b. **BLOCK** 2B SEC.		
	c. **RESET** 2B SEC.	c.	**SEND** operator to 100 ft elev relay room to de-energize 2B SEC at 115V VAC vital instrument cabinet by opening breaker 2BVIB27.
	d. **STOP** 22 AFW Pump.		
	e. **START** 22 CCW Pump.	e.	**PERFORM** the following: 1) **CONSULT** TSC for guidance in starting a CCW pump. 2) **RETURN TO** procedure in effect.
CO623	f. **SEND** operator to 84 ft elev Aux Bldg to place **ONLY** 22 CCW Heat Exchanger in service IAW S2.OP-SO.CC-0002(Q) "21 & 22 Component Cooling Heat Exchanger Operation".		
CO623	g. **CLOSE** 21CC3 (pump outlet cross-connect valve).		
	h. **RETURN TO** procedure in effect,		

End of Appendix

USER RESPONSIBLE FOR VERIFYING REVISION, STATUS AND CHANGES
PRINTED 20061027

SALEM GENERATING STATION

2-EOP-APPX-1
COMPONENT COOLING WATER RESTORATION

BASIS DOCUMENT

NOTES

- Since this appendix has no ERG equivalent, this basis does not follow the EOP basis format.

PURPOSE: To start one CCW pump when none are running.

STEP#	HIGH LEVEL STEP	BASIS
1.	**CHECK** 4KV vital bus status:	If at least one 4KV vital bus is energized from a station power transformer, then DG loading is not a concern on that bus, and one CCW pump should be started on that vital bus. If successful, then go to Step 6 to place one or two CCW heat exchangers in service, based on SW pump availability.
2.	**CHECK** ECCS (CVC, SI or RHR) and AFW pump status:	If this step is reached, then all 4KV vital buses are either de-energized or powered by their respective DGs. DG loading must now be taken into consideration. If any vital bus has a de-energized ECCS or AFW pump, then there is adequate capacity on that bus for starting a CCW pump. Approximate bus loads for these pumps are as follows: Pump — Load (bhp) CCW — 300 21 or 22 Charging — 625 SI — 390 RHR — 425 21 or 22 AFW — 600 The SEC must be reset to allow manual control of equipment. To reset the SEC, the SI signal must first be reset or blocked. For expediency the SEC is blocked to allow the EOPs in effect to control SI reset. If SEC malfunction prevents reset, then it is de-energized to allow manual control of equipment.

STEP#	HIGH LEVEL STEP	BASIS
3.	**SELECT** CCW pump start strategy:	If all 4KV vital buses are energized, then all safeguards equipment is available and the operator has the greatest flexibility in load shuffling to make room for starting a CCW pump. If any 4KV vital bus is energized, then some safeguards equipment is unavailable and load shuffling will have to be done while taking into account the loss of redundant safeguards equipment when shuffling loads to start a CCW pump. This step selects the appropriate strategy for starting a CCW pump, depending on 4KV vital bus status.
4.	**START** 22 CCW Pump as follows:	In this path, all vital buses are energized by the DGs, so DG loading must be considered. If 22 CCW Pump is available, then loads are stopped on Vital Bus 2B to make room to start 22 CCW Pump. Step 4.f.RNO restarts one CFCU since both were stopped in Step 4.e.AER. Only one CFCU is restarted. If 22 CCW Pump can NOT be started, then due to anticipated potential SW pump runout concerns a transition is made to Step 5 to start 21 CCW Pump.

STEP#	HIGH LEVEL STEP	BASIS
5.	**START** 21 CCW Pump as follows:	In this path, all vital buses are energized by the DGs AND 22 CCW Pump is NOT available. DG loading must be considered. SECs 2A and 2B must be reset to allow manual control of equipment. To reset the SECs, the SI signal must first be reset or blocked. For expediency the SECs are blocked to allow the EOPs in effect to control SI reset. If SEC malfunction prevents reset, then it is de-energized to allow manual control of equipment. Loads are reduced on Vital Bus 2A to make room for starting 21 CCW Pump. Redundant loads are started on Vital Bus 2B to compensate for the ones stopped on Vital Bus 2A.
6.	**PLACE** 21 and 22 CCW Heat Exchangers in service as follows:	In this path, all vital buses are energized by the DGs, so DG loading must be considered. Three or more SW pumps can supply both CCW heat exchangers. Two or less SW pumps can only one CCW heat exchanger. Note that this step may exit the procedure with one CCW pump supplying both CCW heat exchangers. However, all vital buses are energized, so it is assumed that the EOPs will either start a second CCW pump or reduce CCW loads in the near future to alleviate this situation. Commitment 0623: Revise EOP-APPX-1 to ensure only one CCW Hx is restored if only two SW pumps are running during a LOCA/LOOP.

STEP#	HIGH LEVEL STEP	BASIS
7.	**IF** 2B **AND** 2C Vital Buses energized, **THEN START** 22 CCW Pump as follows:	In this path, Vital Bus 2A is de-energized and two vital buses are energized by the DGs, so DG loading must be considered. SEC 2B must be reset to allow manual control of equipment. To reset the SEC, the SI signal must first be reset or blocked. For expediency the SEC is blocked to allow the EOPs in effect to control SI reset. If SEC malfunction prevents reset, then it is de-energized to allow manual control of equipment. Loads are reduced on Vital Bus 2B to make room for starting 22 CCW Pump. Only one CCW heat exchanger is placed in service due to degraded CCW pump availability. 22CC3 is closed to avoid pump runout concerns. If 22 CCW Pump can NOT be started, then the TSC is consulted for guidance in starting 23 CCW Pump (now the only available CCW pump). Commitment C0623: Revise EOP-APPX-1 to isolate the CCW side of the CCW Hx NOT being restored by closing valve 22CC3.

STEP#	HIGH LEVEL STEP	BASIS
8.	**IF** 2A **AND** 2C Vital Buses energized, **THEN START** 23 CCW Pump as follows:	In this path, Vital Bus 2B is de-energized and two vital buses are energized by the DGs, so DG loading must be considered. SEC 2C must be reset to allow manual control of equipment. To reset the SEC, the SI signal must first be reset or blocked. For expediency the SEC is blocked to allow the EOPs in effect to control SI reset. If SEC malfunction prevents reset, then it is de-energized to allow manual control of equipment. Loads are reduced on Vital Bus 2C to make room for starting 22 CCW Pump. Only one CCW heat exchanger is placed in service due to degraded CCW pump availability. 22CC3 is closed to avoid pump runout concerns. If 22 CCW Pump can NOT be started, then the TSC is consulted for guidance in starting 23 CCW Pump (now the only available CCW pump). Containment Spray is reset to allow closing 22CS2. This is done per DW-94-005 for containment isolation purposes. Commitment C0623: Revise EOP-APPX-1 to isolate the CCW side of the CCW Hx NOT being restored by closing valve 22CC3.

STEP#	HIGH LEVEL STEP	BASIS
9.	**IF** 2A **AND** 2B Vital Buses energized, **THEN START** 22 CCW Pump as follows:	In this path, Vital Bus 2C is de-energized and two vital buses are energized by the DGs, so DG loading must be considered. SEC 2B must be reset to allow manual control of equipment. To reset the SEC, the SI signal must first be reset or blocked. For expediency the SEC is blocked to allow the EOPs in effect to control SI reset. If SEC malfunction prevents reset, then it is de-energized to allow manual control of equipment. Loads are reduced on Vital Bus 2B to make room for starting 22 CCW Pump. Only one CCW heat exchanger is placed in service due to degraded CCW pump availability. 21CC3 is closed to avoid pump runout concerns. If 22 CCW Pump can NOT be started, then the TSC is consulted for guidance in starting 23 CCW Pump (now the only available CCW pump). Commitment C0623: Revise EOP-APPX-1 to isolate the CCW side of the CCW Hx NOT being restored by closing valve 21CC3.

End of Basis Document

JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: WASTE GAS
TASK: CONDUCT AN AUTHORIZED WASTE GAS RELEASE

TASK NUMBER: 071 507 01 04

ALTERNATE PATH YES

JPM NUMBER: INDIA NRC IP-~~8~~ 2 10/30/06

APPLICABILITY: NEO ☐ RO ☒ SRO ☒

K/A NUMBER: 071 000 A4.26

IMPORTANCE FACTOR: 3.1 RO — 3.9 SRO

EVALUATION /SETTING METHOD: Auxiliary Building/Simulate

REFERENCES: S2.OP-SO.WG-0008, Discharge of 21 Gas Decay Tank To The Plant Vent, Rev. 26

TOOLS AND EQUIPMENT: NONE
VALIDATED JPM COMPLETION TIME: 10 minutes

TIME PERIOD FOR TIME CRITICAL STEPS:

APPROVED: 10-26-06

BARGAINING UNIT REPRESENTATIVE	OPERATIONS TRAINING MANAGER	OPERATIONS DIRECTOR OR DESIGNEE

CAUTION:
No plant equipment shall be operated during the performance of a JPM without the following:
1. Permission from the SM or Unit CRS;
2. Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions).
3. Verification of the "as left" condition by a qualified individual.

ACTUAL TIME TO COMPLETE JPM: _____

CANDIDATE'S NAME: _____

GRADE: **SAT** ☐ **UNSAT** ☐
REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____ **DATE:** _____

JOB PERFORMANCE MEASURE

SYSTEM: WASTE GAS

TASK: CONDUCT AN AUTHORIZED WASTE GAS RELEASE

TASK NUMBER: 071 507 01 04

INITIAL CONDITIONS: 21 Gas Decay Tank is aligned for HOLDUP with 21WG31 tagged closed. Attachment 2, No. 21 GDT Release Form, has been completed through Part 4 with final release approval authorized by the CRS. Control Air, Auxiliary Building and Fuel Handling Building Ventilation are aligned as necessary to support the release. All Rad monitors and Sample Flow Rate monitors required to support the released are OPERABLE.

INITIATING CUE: You have been directed to conduct the release of 21 Gas Decay Tank to the Plant Vent, IAW Section 5.2 of S2.OP-SO.WG-0008, DISCHARGE OF 21 GDT TO PLANT VENT, starting at Step 5.2.10

SUCCESSFUL COMPLETION CRITERIA:

1. **ALL critical steps completed**
2. **ALL sequential steps completed in order**
3. **ALL time-critical steps completed within the allotted time**
4. **JPM completed within validated time. Completion may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).**

CANDIDATE'S NAME: _____ DATE: _____

SYSTEM: WASTE GAS
TASK: Conduct an Authorized Waste Gas Release

# *	STEP No.	STEP	STANDARD	EVAL S/U	COMMENTS
NOTES: 1) "*" denotes a Critical Step and "#" denotes a Sequential step. 2) COMMENTS must accompany an UNSAT Evaluation.					
	5.2.10	OBTAIN the CRS Tagging Release for 21WG31.	Discusses obtaining Tagging Release paperwork. *CUE*: Tagging Release granted and paperwork processed. **NOTE**: If candidate requests actual sampling/analysis paperwork, cue them that the CRS has retained the paperwork and that they are to continue with the release.		
	5.2.11	Perform the following preparations at PNL 104-2 for the GDT release: A. ENSURE 21 GDT is NOT in service B. ENSURE 21 GDT is NOT selected for "Standby" C. RECORD 21 GDT "Initial Pressure" on Att. 3	Proceeds to panel 104-2 and: • Verifies 21 WG 31 is C/T closed. • Verifies PNL 104 Standby Selector Switch NOT selected to 21 GDT. • Records initial pressure from PIS1036. ***CUE: Pressure is 90 PSIG.***		
	5.2.11.D	Latch and set 2WG41, GDT VENT CONT VALVE, as follows: 1. Turn controller fully COUNTERCLOCKWISE, until indicator <0%. 2. POSITION Selector Switch to OPEN AND RELEASE to AUTO position. (Spring return to AUTO) 3. TURN controller clockwise until indicator ≥100%	Tests 2WG41 as described ***CUE: Indicator <0%*** ***CUE: WG41 in AUTO*** ***CUE: Indicator >100%***		

CANDIDATE'S NAME: _____ DATE: _____

SYSTEM: WASTE GAS
TASK: Conduct an Authorized Waste Gas Release

# *	STEP No.	STEP	STANDARD	EVAL S/U	COMMENTS
NOTES: 1) "*" denotes a Critical Step and "#" denotes a Sequential step. 2) COMMENTS must accompany an UNSAT Evaluation.					
		4. ENSURE with Unit 2 Control Room that 2WG41 valve has lost the CLOSED indication AND audible alarm received. 5. TURN controller fully counterclockwise until indicator <0% 6. ENSURE with Unit 2 Control Room that 2WG41 has CLOSED.	***CUE: WG41 not closed and audible alarm received.*** ***CUE: Indicator <0%.*** ***CUE: WG41 indicates closed.***		
	5.2.11.E	PERFORM an Independent Verification of the 2WG41 Valve Position Controller AND RECORD the IV on Attachment 1, Section 2.0.	***CUE: IV of 2WG41 Valve Position Controller is satisfactory.***		
*	5.2.11.F	OPEN 21WG31, GDT Inlet Valve	Uses self verification techniques, removes Tag from valve, and OPENS valve.		
*	5.2.11.G	Slowly OPEN 21WG34	OPENS valve. ***CUE: 21WG34 is OPEN.***		
	5.2.11.H	RECORD IV of 21WG31 and 21WG34 on Attachment 1, Section 3.0	Requests IV. ***CUE: IV of 21WG31 and 21WG34 is satisfactory***		
*	5.2.12	COMMENCE 21 GDT Release as follows: A. Position 2WG41 Selector Switch to OPEN AND release to AUTO position	Places 2WG41 to OPEN and verifies spring return to AUTO. CUE: WG41 in AUTO.		

CANDIDATE'S NAME: _____ DATE: _____

SYSTEM: WASTE GAS
TASK: Conduct an Authorized Waste Gas Release

# *	STEP No.	STEP	STANDARD	EVAL S/U	COMMENTS
NOTES: 1) "*" denotes a Critical Step and "#" denotes a Sequential step. 2) COMMENTS must accompany an UNSAT Evaluation.					
		B. SLOWLY SET 2WG41 controller to ≤100% position which corresponds to a maximum release rate of 32 SCFM	Slowly opens 2WG41		
		C. PERFORM an Independent Verification of 2WG41 positioning on ATT. 1 Section 4.0	Requests IV CUE: IV of 2WG41 position is satisfactory.		
		D. RECORD In Progress Release Data on Attachment 2, Section 5.1	Records Data CUE: 2WG38 downstream pressure is **8.7 PSIG**. If requested, IV of 2WG38 pressure confirms **8.7 PSIG** and 2WG41 position at <100%. If requested Met data is: Wind Speed 14 mph @ 150' Wind Direction 45 deg at 150' D/T 150'-33' is 3 deg C AT this point, Operator should realize that the release rate is > 32 scfm due to the pressure downstream of WG38 being higher than 8 psig. **Operator should perform Step 5.2.13.D to terminate the release. (Con't)**		
*	5.2.13.D	IF at any time during the release the pressure downstream of 2WG38 is >8.0 psig, OR			

JOB PERFORMANCE MEASURE

CANDIDATE'S NAME: _____ DATE: _____

SYSTEM: WASTE GAS
TASK: Conduct an Authorized Waste Gas Release

# *	STEP No.	STEP	STANDARD	EVAL S/U	COMMENTS
NOTES: 1) "*" denotes a Critical Step and "#" denotes a Sequential step. 2) COMMENTS must accompany an UNSAT Evaluation.					
		2WG41 CLOSES, THEN TERMINATE the GDT as follows: 1. TURN 2WG41 controller fully counter-clockwise until indicator is <0 %. 2. PLACE 2WG41-SWT in CLOSE position, AND ENSURE 2WG41 is CLOSED. 3. CLOSE 21WG34.	TURN 2WG41 controller fully counter-clockwise until indicator is <0 %. CUE: 2WG41 Controller reads <0%. Places 2WG41-SWT in CLOSE position, AND ensures 2WG41 is CLOSED. CUE: 2WG41 indicates CLOSED. Closes 2WG34. CUE: 21WG34 is CLOSED. **CUE: JPM is COMPLETE**		

TERMINATING CUE: None

JOB PERFORMANCE MEASURE
FOLLOW - UP QUESTION

INITIAL CONDITIONS:

21 Gas Decay Tank is aligned for HOLDUP with 21WG31 tagged closed. Attachment 2, No.21GDTRelease Form, has been completed through Part 4 with final release approval authorized by the CRS. Control Air, Auxiliary Building and Fuel Handling Building Ventilation are aligned as necessary to support the release. All Rad monitors and Sample Flow Rate monitors required to support the released are OPERABLE.

INITIATING CUE: You have been directed to conduct the release of 21 Gas Decay Tank to the Plant Vent, IAW Section 5.2 of S2.OP-SO.WG-0008, DISCHARGE OF 21 GDT TO PLANT VENT, starting at Step 5.2.10.

PSEG NUCLEAR L.L.C.
SALEM/OPERATIONS 10/11/6

S2.OP-SO.WG-0008(Q) - REV. 26

DISCHARGE OF 21 GAS DECAY TANK TO PLANT VENT

USE CATEGORY : I

A. Biennial Review Performed: Yes ___ No _√_
B. Change Package(s) and Affected Document Number(s) incorporated into this revision: None
C. The following OTSC(s) were incorporated into this revision: None

REVISION SUMMARY:

The following changes were incorporated into this revision:

- Revised Prerequisite 2.2.1 to indicate Auxiliary Building Ventilation IAW S2.OP-SO.ABV-0001(Q), Auxiliary Building Ventilation Operation", and the Auxiliary Building is being maintained at a slightly negative pressure". This change supports implementation of Unit 2 Technical Specification Amendment 252 and SCN 03-031. **[80056801]**

- Incorporated Precaution and Limitation 3.9 indicating "With the Auxiliary Building Pressure NOT maintained slightly negative, suspend all operations involving radioactive gaseous releases via the Auxiliary Building immediately. This requirement is applicable at all times IAW T/S 3.7.7". This change supports implementation of Unit 2 Technical Specification Amendment 252 and SCN 03-031. **[80056801]**

- Revised Steps 6.1 and 7.6.4 to indicate "RM-AA-101" versus "NC.NA-AP.ZZ-0001(Q)". This change was incorporated to ensure current procedure references are indicated, and is considered to be editorial in nature.

IMPLEMENTATION REQUIREMENTS Effective Date 5/17/06

- Technical Specification Amendment 252 and UFSAR SCN

APPROVED: [signature] 5/12/06
Operations Director - Salem Date

DISCHARGE OF 21 GAS DECAY TANK TO PLANT VENT

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1.0 PURPOSE

1.1 To provide instructions necessary to:

1.1.1 Place 21 Gas Decay Tank (GDT) in Holdup.

1.1.2 Conduct a controlled Radioactive Gas Release from 21 GDT. [C0160]

1.2 This procedure satisfies Technical Specification 6.8.4.g.1 for Channel Operable and Source Check prior to each release.

2.0 PREREQUISITES

2.1 **REVIEW** Components "Off Normal and Off-Normal Tagged" List(s) for system and support system(s) associated with the evolution to be performed in this procedure.

2.2 The following systems are in service:

2.2.1 Auxiliary Building Ventilation IAW S2.OP-SO.ABV-0001(Q), Auxiliary Building Ventilation Operation, and the Auxiliary Building is being maintained at a slightly negative pressure.

2.2.2 Fuel Handling Building Ventilation System IAW S2.OP-SO.FHV-0001(Q), Fuel Handling Building Ventilation Operation.

2.3 **ENSURE** Plant Vent Flow Rate Monitor and Sample Flow Rate Monitor are OPERABLE (IAW the ODCM).

2.4 **ENSURE** Noble Gas Activity Monitor 2R41A & D is OPERABLE (IAW the ODCM).

2.5 **ENSURE** Iodine Sampler and Particulate Sampler (Chemistry Dept.) are OPERABLE (IAW the ODCM).

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Procedure Use and adherence policy as found in NC.NA-AP.ZZ-0001(Q), Nuclear Procedure Program, is applicable to this procedure.

3.2 DO NOT release more than one GDT at a time.

3.3 DO NOT transfer Waste Gas from one GDT to another during the GDT Release.

3.4 The actual maximum GDT release rate is 32 SCFM based on system design. The calculated maximum allowable release rate shall be >32 SCFM. Tanks with a calculated maximum allowable release rate of ≤32 SCFM shall not be released.

3.5 GDT Release shall be terminated if pressure downstream of 2WG38, Gas Decay Tank Vent Pressure Control Valve, is >8.0 psig once the gas release has stabilized following the initial start. This will ensure the actual release rate does not exceed 32 SCFM (IAW the ODCM).

3.6 The program requirements of Radiological Effluent Technical Specifications (RETS) are located in the Offsite Dose Calculation Manual (ODCM) and Process Control Program (PCP). **(80018643)**

3.7 Inoperability of the Noble Gas Activity Monitor (2R12A, 2R41A & D), Iodine Sampler, Particulate Sampler, Flow Rate Monitor, or Sampler Flow Rate Monitor for >30 days is reportable IAW NC.WM-AP.ZZ-0002(Q), Performance Improvement Process (IAW the ODCM).

3.8 The Independent Verification requirements contained in the ODCM SHALL BE PERFORMED prior to the release of radioactive waste gas to the environment. **(970630118)**

3.9 With the Auxiliary Building Pressure NOT maintained slightly negative, suspend all operations involving radioactive gaseous releases via the Auxiliary Building immediately. This requirement is applicable at all times IAW T/S 3.7.7. For the purposes of satisfying T/S 3.7.7, ACTION e, "radioactive gaseous releases" is defined as Waste Gas Decay Tank releases. **(80056801-0313)**

4.0 EQUIPMENT/MATERIAL REQUIRED

None

5.0 PROCEDURE

5.1 21 Gas Decay Tank (GDT) Release Preparation

5.1.1 ALIGN 21 GDT for Holdup as follows:

A. **OBTAIN** a CRS Tagging Request for 21WG31, GDT INLET VALVE, in the CLOSED position and with specific instructions that this tag should only be released IAW this procedure.

B. **PERFORM** 21 GDT Holdup Alignment IAW Attachment 1, Section 1.0.

C. **DIRECT** second operator to complete Independent Verification (IV) of 21 GDT Holdup Alignment IAW Attachment 1, Section 1.0.

5.1.2 **INITIATE** 21 GDT Radioactive Gaseous Release Form as follows:

A. **COMPLETE** Attachment 2, Section 1.0.

B. **FORWARD** entire procedure to Chemistry Department for completion of Attachment 2, Sections 2.0 and 3.0.

N/A 5.1.3 IF Chemistry has NOT granted permission for the release,
OR the release is no longer required,
THEN:

A. **OBTAIN** a CRS Tagging Release for 21WG31, GDT INLET VALVE.

B. **OPEN** 21WG28, 21 WASTE GAS DECAY TANK INLET VALVE.

C. **DIRECT** second operator to complete Independent Verification (IV) of valves manipulated IAW Attachment 1, Section 6.0.

D. **TERMINATE** this procedure.

5.2 **21 Gas Decay Tank Release**

5.2.1 **ENSURE** Attachment 2, Sections 2.0 and 3.0, is complete with approval for Radioactive Gaseous Release.

5.2.2 IF 2R41A & D, Plant Vent Noble Gas Monitors are OPERABLE, THEN:

A. **ENSURE** 2R41D and 2WG41, Gas Decay Tank Vent Control Valve, are OPERABLE, as required by ODCM, IAW SH.OP-AP.ZZ-0108(Q), Operability Assessment and Equipment Control Program.

B. **ENSURE** 2R41 sample system flow control is OPERABLE, as required by ODCM, IAW SH.OP-AP.ZZ-0108(Q), Operability Assessment and Equipment Control Program. **[C0332, C0333]**

C. **PERFORM** a source check and channel check (visual inspection of monitor read out).

D. **ENSURE** 2ND17572 - 2WG41 Waste Gas Decay Tank in NORMAL.

N/A 5.2.3 IF RMS Channel 2R41A or D is inoperable, THEN:

A. **ENSURE** Chemistry Department has documented completion of the following contingency actions on Attachment 2, Section 3.4 (IAW the ODCM):

1. **ANALYZE** at least two independent samples of 21 GDT contents.

2. **INDEPENDENTLY VERIFY** release rate calculations by at least two technically qualified members of the Facility Staff.

3. **OBTAIN** grab samples at least once per 8 hours, AND **ANALYZE** for gaseous principal gamma emitters within 24 hours.

N/A B. **PLACE** 2ND17572 - 2WG41 Waste Gas Decay Tank in BLOCK.

N/A 5.2.4 IF Iodine Sampler OR Particulate Sampler is inoperable, THEN **ENSURE** Chemistry Department is collecting a continuous sample of the effluent release pathway with auxiliary sampling equipment (IAW the ODCM).

ATTACHMENT 2
(Page 1 of 6)

21 GDT RADIOACTIVE GASEOUS RELEASE FORM

RELEASE NO. L-6101

1.0 SAMPLE REQUEST (Operations)

1.1 21 GDT has not been added to since (time) 0200 (date) 8/1/6

and is at 92 PSIG as indicated by 2PIS1036.

1.2 A pre-release sample of 21 GDT and release rate computation is requested.

1.3 21 Gas Decay Tank release will be concurrent with a Unit 2 Containment Purge:

- ___YES ✓ NO

1.4 21 Gas Decay Tank release will be concurrent with a Unit 2 VCT Purge/Release:

- ___YES ✓ NO

Signature: _____ Date 8/5/6
(SM/CRS)

2.0 SAMPLE POINT (Chemistry)

2.1 **PERFORM** gaseous discharge process IAW SC.CH-TLZZ-0145(Q), Radioactive Gaseous Effluent Permits.

2.2 After completion of SC.CH-TLZZ-0145(Q), **COMPLETE** Parts 3.1 through 3.4.

3.0 DOSE, VOLUME ESTIMATES AND APPROVAL (Chemistry)

3.1 Instrumentation:

♦ **INDICATE** if the following instruments are in service for release:

INSTRUMENTATION	IN SERVICE
Iodine Sampler	Y
Particulate Sampler	Y
Sampler Flow Rate Monitor	Y

ATTACHMENT 2
(Page 2 of 6)

21 GDT RADIOACTIVE GASEOUS RELEASE FORM

RELEASE NO. L-6101

3.0 DOSE, VOLUME ESTIMATES AND APPROVAL (continued)

3.2 Pressure:

L ♦ **COMPLETE** the following required data for 21 GDT:

Isolated Pressure 92 (PSIG)

Estimated Final Pressure 10 (PSIG)

3.3 Volume:

L ♦ **ESTIMATE** total volume of Waste Gas to be released:

1,340 (CU FT)

3.4 Approval:

NOTE

Calculated maximum allowable release rate must be >32 SCFM. Tanks with a calculated maximum allowable release rate of ≤32 SCFM cannot be released.

✓ ♦ Approval is granted to release 21 GDT at the Calculated Maximum Allowable Release Rate of 38 SCFM.

✓ ♦ This Release is consistent with the Limits set forth in the Offsite Dose Calculation Manual.

ATTACHMENT 2
(Page 3 of 6)

21 GDT RADIOACTIVE GASEOUS RELEASE FORM

RELEASE NO. L-6101

3.0 DOSE, VOLUME ESTIMATES AND APPROVAL (continued)

N/A ♦ IF RMS Channel 2R41A or D is inoperable,
THEN the following have been completed (IAW the ODCM):

A. At least two independent samples of 21 GDT contents have been analyzed.

B. Release rate calculations have been independently verified by at least two technically qualified members of the Facility Staff.

C. Grab samples are being obtained at least once per 8 hours, AND analyzed for gaseous principal gamma emitters within 24 hours.

N/A ♦ IF Iodine Sampler or Particulate Sampler is inoperable,
THEN a continuous sample of the effluent release pathway is being collected with auxiliary sampling equipment IAW SC.CH-AB.ZZ-1102(Q), Response to Inoperable Technical Specification Effluent Monitors and Equipment.

N/A ♦ IF Sampler Flow Rate Monitor is inoperable,
THEN flow rate is being estimated at least once per 4 hours IAW SC.CH-AB.ZZ-1102(Q), Response to Inoperable Technical Specification Effluent Monitors and Equipment.

✓ ♦ All Chemistry requirements for 21 GDT release to the Plant Vent are satisfied and authorization given.

Signature: [signature] Time 1600 Date 8/4/6
Chemistry

✓ ♦ **FORWARD** this Radioactive Gaseous Release Form to SM/CRS.

N/A 5.2.5 IF Plant Vent Flow Rate Monitor is inoperable,
THEN **ESTIMATE** the Plant Vent Flow Rate at least once per 4 hours IAW Attachment 4 and the ODCM.

N/A 5.2.6 IF Sampler Flow Rate Monitor is inoperable,
THEN **ENSURE** Chemistry Department is estimating flow rate at least once per 4 hours IAW SC.CH-AB.ZZ-1102(Q) and the ODCM.

5.2.7 **RECORD** the following on Attachment 2:

- Section 4.1, Release Verification
- Section 4.2, Ventilation Configuration
- Section 4.3, Radiation Monitor Release Data
- Section 4.4, Release Review

5.2.8 **PERFORM** Pre-Release Verification of 21 GDT Holdup Alignment IAW Attachment 1, Section 1.0.

5.2.9 SM/CRS **REVIEW** AND **COMPLETE** Attachment 2, Section 4.5.

CAUTION

DO NOT release 21WG31, GDT INLET VALVE, until commencing the release.

___ 5.2.10 **OBTAIN** the CRS Tagging Release for 21WG31.

___ 5.2.11 **PERFORM** the following preparations at Panel 104-2 for the GDT release:

___ A. **ENSURE** 21 GDT is NOT in service.

___ B. **ENSURE** 21 GDT is NOT selected for "Standby".

___ C. **RECORD** 21 GDT "Initial Pressure" (PIS1036) on Attachment 3.

(step continued on next page)

5.2.11 (continued)

___ D. **LATCH** AND **SET** 2WG41, GDT VENT CONT VALVE, as follows:

NOTE

2WG41 Controller (2HIC-14) must be set to <0% or 2WG41 will NOT latch.

___ 1. **TURN** controller fully counterclockwise until indicator <0%.

___ 2. **POSITION** Selector Switch to OPEN AND **RELEASE** to AUTO position (spring return to AUTO).

___ 3. **TURN** controller clockwise until indicator ≥100%.

NOTE

2WG41 will begin to open when the indicator is ≈20%.

___ 4. **ENSURE** with Unit 2 Control Room that 2WG41 valve has lost the CLOSED indication AND audible alarm received.

___ 5. **TURN** controller fully counterclockwise until indicator <0%.

___ 6. **ENSURE** with Unit 2 Control Room that 2WG41 has closed indication.

___ E. **PERFORM** an Independent Verification of the 2WG41 valve position controller, AND **RECORD** the Independent Verification on Attachment 1, Section 2.0.

___ F. **OPEN** 21WG31, GDT INLET VALVE.

NOTE

While 2WG41 is opening, pressure downstream of 2WG38 will fluctuate between "0" psig and "10" psig until 2WG41 is fully open (100%). Once 2WG41 is fully open, 2WG38 will throttle to maintain <8 psig during the release. **(20016988)**

___ G. Slowly **OPEN** 21WG34.

___ H. **RECORD** Independent Verification (IV) of 21 GDT discharge valves 21WG31 and 21WG34 on Attachment 1, Section 3.0, prior to commencing 21 GDT release.

___ 5.2.12 **COMMENCE** 21 GDT release as follows:

___ A. **POSITION** 2WG41 Selector Switch to OPEN
AND **RELEASE** to AUTO position (spring return to AUTO).

___ B. SLOWLY **SET** 2WG41 controller to ≤100% position which corresponds to a maximum release rate of 32 SCFM.

___ C. **PERFORM** an Independent Verification of the positioning of 2WG41 on Attachment 1, Section 4.0.

___ D. **RECORD** In Progress Release Data on Attachment 2, Section 5.1.

___ 5.2.13 **PERFORM** the following during 21 GDT release:

NOTE

An operator should be stationed at Panel 104-2 to immediately close 21WG34 upon receipt of a High Radiation Alarm or indication of 2WG41 closure.

___ A. **CALCULATE** 21 GDT Average Release Rate every 10 minutes on Attachment 3,
AND **ADJUST** 2WG41 controller position as required based on results.

___ B. IF Plant Vent Flow Rate Monitor is inoperable,
THEN **RECORD** Plant Vent Flow Rate Discharge Estimation on Attachment 4 at least once every four hours during GDT release.

(step continued on next page)

5.2.13 (continued)

___ C. **RECORD** Meteorological Data in Attachment 2, Section 5.2.

___ ♦ IF Meteorological Monitor is NOT OPERABLE,
THEN **NOTIFY** the SM/CRS (UFSAR 7.7.2.12).

___ D. IF at any time during the release pressure downstream of 2WG38 is >8.0 psig (2PL8678),
OR 2WG41 CLOSES,
THEN **TERMINATE** the GDT release as follows:

___ 1. **TURN** 2WG41 controller fully counter-clockwise until indicator is <0%.

___ 2. **PLACE** 2WG41-SWT in CLOSE position,
AND **ENSURE** 2WG41 is CLOSED.

___ 3. **CLOSE** 21WG34.

___ 4. **RECORD** Final Release Data in Attachment 2, Section 5.3.

___ 5. **INITIATE** a NOTF to correct the malfunction.

___ 5.2.14 When 21 GDT pressure ≈10 psig OR as directed by SM/CRS,
SECURE the GDT release:

___ A. **TURN** 2WG41 controller fully counter-clockwise until indicator is <0%.

___ B. **PLACE** 2WG41-SWT in CLOSE position,
AND **ENSURE** 2WG41 is CLOSED.

___ C. **CLOSE** 21WG34.

___ D. **RECORD** Final Release Data in Attachment 2, Section 5.3.

___ 5.2.15 IF GDT release is completed,
THEN **OPEN** 21WG28, 21 Waste Gas Decay Tank Inlet Valve.

___ 5.2.16 IF 2ND17572 - 2WG41 Waste Gas Decay Tank is in BLOCK,
THEN **PLACE** 2ND17572 in NORMAL.

___ 5.2.17 Direct second operator to **PERFORM** Independent Verification of valves manipulated in this procedure IAW Attachment 1, Section 5.0.

5.3 Completion and Review

___ 5.3.1 **COMPLETE** any additional paperwork required by the Chemistry Department AND **ATTACH** it with this procedure.

___ 5.3.2 **COMPLETE** Attachment 5, Sections 1.0 and 2.0, AND **FORWARD** this procedure to SM/CRS for review and approval.

___ 5.3.3 SM/CRS **PERFORM** the following:

___ A. **COMPLETE** Attachment 2, Section 5.4

___ B. **REVIEW** this procedure with Attachments 1-5 for completeness and accuracy.

___ C. **COMPLETE** Attachment 5, Section 3.0.

___ D. **FORWARD** completed procedure to Technical Supervisor - Chemistry for completion and record retention.

END OF PROCEDURE SECTION

ATTACHMENT 1
(Page 1 of 2)

21 GAS DECAY TANK ALIGNMENT/VERIFICATION

1.0 PRE - RELEASE ALIGNMENT/VERIFICATION

VALVE NO.	DESCRIPTION	POSITION	OPER INITIALS	IV INITIALS	PRE-RELEASE VERIF
21WG31	GDT INLET V	*CLOSED			
21WG32	GDT PRESS TAP	OPEN			
21WG34	GDT STOP TO PLNT V	CLOSED			
22WG34	GDT STOP TO PLNT V	CLOSED			
23WG34	GDT STOP TO PLNT V	CLOSED			
24WG34	GDT STOP TO PLNT V	CLOSED			
21WG35	GDT STOP V TO HUT	CLOSED			
21WG28	WG GDT INLET V	CLOSED			
21WG29	GDT INLET CONT V	CLOSED			
21WG56	GDT DR V	CLOSED			
21WG60	N2 SUP TO GDT STOP	CLOSED			
2WG41	GDT VENT CONT V	CLOSED			
2WG39	GDT TO VENT HDR STOP V	CLOSED			
2WG81	WG VENT PRESS TAP	OPEN			
21WG131 [C0317]	GDT PRESS TRANS V	OPEN			

* Cleared and Tagged for CRS.

2.0 2WG41 VALVE POSITION CONTROLLER

VALVE NO.	DESCRIPTION	POSITION	IV INITIALS
2WG41	GDT VENT CONT V	0%	

ATTACHMENT 1
(Page 2 of 2)

21 GAS DECAY TANK ALIGNMENT/VERIFICATION

3.0 PRE-RELEASE VERIFICATION

VALVE NO.	DESCRIPTION	POSITION	IV INITIALS
21WG31	GDT INLET V	OPEN	
21WG34	GDT STOP TO PLNT V	OPEN	

4.0 IN-PROGRESS VERIFICATION

VALVE NO.	DESCRIPTION	POSITION	IV INITIALS
2WG41	GDT VENT CONT V	≤100%	

5.0 POST RELEASE VERIFICATION

COMPONENT	DESCRIPTION	POSITION	IV INITIALS
21WG28	WG GDT INLET V	OPEN	
21WG31	GDT INLET V	OPEN	
21WG34	GDT STOP TO PLNT V	CLOSED	
2WG41	GDT VENT CONT V	CLOSED	
2ND17572	2WG41 WASTE GAS DECAY TANK	NORMAL	

6.0 RELEASE TERMINATION VERIFICATION

COMPONENT	DESCRIPTION	POSITION	IV INITIALS
21WG28	WG GDT INLET V	OPEN	
21WG31	GDT INLET V	OPEN	

ATTACHMENT 2
(Page 4 of 6)

21 GDT RADIOACTIVE GASEOUS RELEASE FORM

RELEASE NO. L-6101

4.0 RELEASE REVIEW AND APPROVAL (Operations)

4.1 Release Verification:

✓ ♦ Calculated Maximum Allowable Release Rate from Section 3.4: 38 SCFM.

✓ ♦ Calculated Maximum Allowable Release Rate is >32 SCFM.

4.2 Ventilation Configuration:

Total number of Auxiliary Building Exhaust Fans In Service	Total Number of Fuel Handling Building Exhaust Fans In Service	Pressure Relief In Service (Yes/No)
2	2	NO

4.3 Radiation Monitor Release Data/Source Check/Channel Operable:

Time	Date	Radiation Monitor	Source Check	Monitor Prior to Release
1700	8/15/6	2R41A	OP/INOP	1.0698×10^{-4} µCi/cc
1700	8/15/6	2R41D	N/A	4.3714×10^{-7} µCi/sec

4.4 Release Review

[signature] Time 1900 Date 8/15/6
NCO

4.5 All requirements in Section 3.0 and subsections 4.1 thru 4.4 are met to authorize the release of the tank.

[signature] Time 1900 Date 8/15/6
SM/CRS

ATTACHMENT 2
(Page 5 of 6)

21 GDT RADIOACTIVE GASEOUS RELEASE FORM

RELEASE NO. L-6101

5.0 **RELEASE DATA** (Operations)

5.1 In Progress Release Data:

___ ♦ Release started: Time _____ Date _____

___ ♦ Pressure downstream of 2WG38:

2PL8678
PSIG*

* Shall be maintained ≤8.0 psig to ensure GDT release rate ≤32 SCFM.

___ ♦ **PERFORM** an Independent Verification of:

___ IV ♦ 2WG38 pressure (2PL8678) ≤8.0 psig.

___ IV ♦ 2WG41 controller positioned ≤100% (corresponds to a maximum gaseous release rate of ≤32 SCFM).

_____ Date _____ Time _____
Independent Verifier

5.2 Meteorological Data.

___ ♦ Meteorological conditions at time of Release.
(El. 33' is preferred channel and should be used if available)

___ ♦ Wind Speed _____ MPH at El. _____ '

___ ♦ Wind Direction _____ ° at El. _____ '

___ ♦ ΔT (____ ' - 33 ') _____ C°

ATTACHMENT 2
(Page 6 of 6)

21 GDT RADIOACTIVE GASEOUS RELEASE FORM

RELEASE NO. L-6101

5.0 RELEASE DATA (continued)

5.3 Final Release Data:

Time	Date	Radiation Monitor	Highest Reading during release	2PIS1036
		2R41A	µCi/cc	PSIG
		2R41D	µCi/sec	

___ ♦ Plant Vent Flow (F2253A) during Release (average):

_____ SCFM

5.4 21 GDT Radioactive Gaseous Release conducted under supervision of:

_____ Date _____
(SM/CRS)

ATTACHMENT 3
(Page 1 of 1)

21 GDT RELEASE RATE CALCULATION

Initial Pressure = _____ psig (2PIS1036) Time _____

Time (Min)	GDT Pressure (psig)	Average Release Rate (psig/min) *	Initials
+10			
+20			
+30			
+40			
+50			
+60			
+70			
+80			
+90			
+100			
+110			
+120			
+130			
+140			
+150			
+160			
+170			
+180			

$$Average\ Release\ Rate = \frac{Initial\ GDT\ Pressure - GDT\ Pressure}{Time\ (Min)}$$

* Maintain Average Release Rate ≤1.0 psig/min by reducing 2WG41 valve position. Average Release Rate at end of GDT release shall NOT exceed 1.0 psig/min (IAW the ODCM).

ATTACHMENT 4
(Page 1 of 1)

PLANT VENT FLOW RATE
DISCHARGE ESTIMATION

1.0 ESTIMATED FLOW RATE

NOTE

If Plant Vent Flow Rate Monitor is inoperable, Plant Vent Flow Rate shall be estimated at least once per four hours (IAW the ODCM).

AUX BLDG EXHAUST FANS IN SERVICE	# FHB EXHAUST FANS IN SERVICE	PRESS RELIEF IN SERVICE	EST. PLANT VENT FLOW RATE
2	1	N	68,540 (SCFM)
2	1	Y	70,940 (SCFM)
2	2	N	78,540 (SCFM)
2	2	Y	80,940 (SCFM)

___ 1.1 IF Plant Vent Flow Rate Monitor is inoperable,
THEN RECORD estimated flow rate at least once every 4 hours.

Time	Date	Estimated Plant Vent Flow Rate
		SCFM
		SCFM
		SCFM
		SCFM
		SCFM
		SCFM

ATTACHMENT 5
(Page 1 of 2)

COMPLETION SIGN-OFF SHEET

1.0 COMMENTS:

(Include procedure deficiencies and corrective actions.)

ATTACHMENT 5
(Page 2 of 2)

COMPLETION SIGN-OFF SHEET

2.0 SIGNATURES:

Print	Initials	Signature	Date
G Gaudry			8/4/6
			8/15/6
			8/15/6

INDEPENDENT VERIFICATION:

3.0 SM/CRS FINAL REVIEW AND APPROVAL:

This procedure with Attachments 1-5 is reviewed for completeness and accuracy. All deficiencies, including corrective actions, are clearly recorded in the COMMENTS Section of this attachment.

Signature:_____ Date:_____
(SM/CRS)

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: ABNORMAL PROCEDURES

TASK: TCAF Control Room Evacuation (Trip Turbine, Open Exciter Field Breaker, Trip SGFP's)

TASK NUMBER: 114 013 04 01

JPM NUMBER: INDIA NRC IP-3

K/A NUMBER: APE 068 AA1.04, EA1.23, AA1.27

IMPORTANCE FACTOR: All >3.0 (RO) All>3.0 (SRO)

APPLICABILITY: EO [X] RO [X] SRO [X]

EVALUATION SETTING/METHOD: In-Plant Simulate

REFERENCES: S2.OP-AB.CR-0001, Rev. 19 Att. 8

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 5 mins.

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

APPROVED: BARGAINING UNIT | OPERATIONS TRAINING MANAGER | OPERATIONS DIRECTOR OR DESIGNEE

CAUTION: No plant equipment shall be operated during the performance of a JPM without the following:

1. Permission from the sm Or Unit CRS;
2. Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions).
3. Verification of the "as left" condition by a qualified individual.

ACTUAL JPM COMPLETION TIME: _____

ACTUAL TIME CRITICAL COMPLETION TIME: _____

JPM PERFORMED BY: _____ **GRADE:** [ ] SAT [ ] UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____ **DATE:** _____

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: ABNORMAL PROCEDURES

TASK: TCAF Control Room Evacuation (Trip Turbine, Open Exciter Field Breaker, Trip SGFP's)

TASK NUMBER: 114 013 04 01

INITIAL CONDITIONS:

1. The control room has been evacuated due to a bomb threat.

INITIATING CUE:

You are assigned to carry out the actions of AB.CR-1, Attachment 8, Steps 2.0-4.0: trip the Main Turbine, open the Exciter Field Breaker, trip the SGFP's. Assume you have the equipment required by the procedure.

Successful Completion Criteria:

1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).**

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: ABNORMAL PROCEDURES

TASK: TCAF Control Room Evacuation: Trip MT, Open Exciter Field Breaker, Trip SGFP's

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	1	Operator reviews procedure.	Evaluator provides copy of AB.CR-0001, Att. 8.		
*	2	Proceed to Turbine Front Standard, and place the Reset-Normal-Trip Lever in the TRIP position.	Proceeds to turbine front standard, locates lever and points out TRIP position.		
*	3	Proceed to Excitation System Control Cubicle and open Generator Exciter Field Breaker.	Proceeds to Turb. Bldg., El. 120, locates breaker and discusses opening.		
*	4	Locally, trip the following: • 21 SGFP • 22 SGFP	Proceeds to Turb. Bldg., El. 100, locates each local trip PB and discusses operation of at least one. **CUE: JPM is complete**		

INITIAL CONDITIONS:

1. The control room has been evacuated due to a bomb threat.

INITIATING CUE: You are assigned to carry out the actions of AB.CR-1, Attachment 8, Steps 2.0-4.0: trip the main turbine, open the exciter field breaker, trip both SGFP's. Assume you have the equipment required by tbe procedure.

ATTACHMENT 8
(Page 1 of 3)

#2 NEO

___ 1.0 **OBTAIN** the following:

- One copy of this procedure.
- One radio (located in Appendix "R" Cabinet)
- Key ring set and tools (Security Master, Switchyard key, JA Master, Breaker Keyswitch, screwdriver and adjustable wrench). **[C0363]**

___ 2.0 **PROCEED** to Turbine Front Standard, AND **PLACE** the Reset-Normal-Trip lever in the TRIP position.

___ 3.0 **PROCEED** to Excitation System Control Cubicle (TB Elev 120') AND **OPEN** Generator Exciter Field Breaker.

___ 4.0 Locally, **TRIP** the following:

___ 4.1 21 Steam Generator Feed Pump

___ 4.2 22 Steam Generator Feed Pump

NOTE

All breaker operations will be accomplished utilizing the Manual Trip or Close button inside breaker cubicles.

___ 5.0 **PROCEED** to No. 2G 4160 Volt Group Bus, AND **PERFORM** the following:

___ 5.1 **ENSURE** that Breaker 2GD1TB2BGGD, 2A Aux Power Transformer Infeed Breaker, is OPEN.

___ 5.2 **ENSURE** that Breaker 2GD1TB22GSD, 22 Station Power Transformer Infeed Breaker, is CLOSED.

___ 5.3 **ENSURE** that Breaker 2GD1TB2D, 23 Heater Drain Pump, is OPEN.

ATTACHMENT 8
(Page 2 of 3)

#2 NEO

___ 6.0 **PROCEED** to No. 2F 4160 Volt Group Bus, AND **PERFORM** the following:

___ 6.1 **ENSURE** that Breaker 2FD1TB2BFGD, 2A Aux Power Transformer Infeed Breaker, is OPEN.

___ 6.2 **ENSURE** that Breaker 2FD1TB22FSD, 22 Station Power Transformer Infeed Breaker, is CLOSED.

___ 6.3 **ENSURE** that Breaker 2FD1TB2D, 22 Heater Drain Pump, is OPEN.

___ 7.0 **PROCEED** to No. 2E 4160 Volt Group Bus, AND **PERFORM** the following:

___ 7.1 **ENSURE** that Breaker 2ED1TB2AEGD, 2B Aux Power Transformer Infeed Breaker, is OPEN.

___ 7.2 **ENSURE** that Breaker 2ED1TB21ESD, 21 Station Power Transformer Infeed Breaker, is CLOSED.

___ 8.0 **PROCEED** to 2H 4160 Volt Group Bus, AND **PERFORM** the following:

___ 8.1 **ENSURE** that Breaker 2HD1TB2AHGD, 2B Aux Power Transformer Infeed Breaker, is OPEN.

___ 8.2 **ENSURE** that Breaker 2HD1TB21HSD, 21 Station Power Transformer Infeed Breaker, is CLOSED.

___ 8.3 **ENSURE** that Breaker 2HD1TB2D, 21 Heater Drain Pump, is OPEN.

___ 9.0 **TRIP** all BUT ONE of the following Condensate Pumps as directed by the CRS:

___ 9.1 Breaker 2ED1TB1D, 22 Condensate Pump

___ 9.2 Breaker 2FD1TB1D, 23 Condensate Pump

___ 9.3 Breaker 2HD1TB1D, 21 Condensate Pump.

___ 10.0 **PROCEED** to switchyard.

ATTACHMENT 8
(Page 3 of 3)

#2 NEO

___ 11.0 **OPEN** 500KV Bus Section Breakers 1-9, by performing the following at Phase B of Breaker:

___ 11.1 **OPEN** rear door of cabinet

___ 11.2 **PLACE** the local switch in OPEN position.

___ 11.3 **CLOSE** rear door of cabinet.

___ 12.0 **OPEN** 500KV Bus Section Breakers 9-10, by performing the following at Phase B of Breaker:

___ 12.1 **OPEN** rear door of cabinet

___ 12.2 **PLACE** the local switch in OPEN position.

___ 12.3 **CLOSE** rear door of cabinet.

NOTE

Copies of operating procedures may be obtained from the TSC.

___ 13.0 **PROCEED** to Steam Generator Feed Pumps, AND **PLACE** both SGFPs on the Turning Gears:

___ 13.1 21 Steam Generator Feed Pump

___ 13.2 22 Steam Generator Feed Pump.

___ 14.0 When the Main Turbine stops rotating, **PLACE** the Turning Gear in operation IAW S2.OP-SO.TRB-0004(Q), Turbine Turning Gear Operation.

___ 15.0 **NOTIFY** the CRS and STA that Steps 1 through 14 of Attachment 8 are completed.

___ 16.0 **PROCEED** to the Hot Shutdown Panel and provide assistance wherever directed.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Auxiliary Feedwater

TASK: TCAF Control Room Evacuation-Feed SG's using 21/22 AFW Pump.

TASK NUMBER: 1140130401

JPM NUMBER: India IP-1

K/A NUMBER: APE 068 AA1.03

IMPORTANCE FACTOR: 4.1 (RO) 4.3 (SRO)

APPLICABILITY:
EO [ ] **RO** [X] **SRO** [X]

EVALUATION SETTING/METHOD: In-Plant Simulate

REFERENCES: S2.OP-AB.CR-0001, Rev. 19
Control Room Evacuation

TOOLS AND EQUIPMENT: JAM Key

VALIDATED JPM COMPLETION TIME: 15 mins.

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

APPROVED: 10-26-06
Bargaining Unit Representative **OTM** **Operations Director or designee**

CAUTION: **No plant equipment shall be operated during the performance of a JPM without the following:**

1. **Permission for the SNSS Or Unit NSS;**
2. **Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions).**
3. **Verification of the "as left" condition by a qualified individual.**

ACTUAL JPM COMPLETION TIME: _____

ACTUAL TIME CRITICAL COMPLETION TIME: _____

JPM PERFORMED BY: _____ **GRADE:** [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____ **DATE:** _____

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Auxiliary Feedwater

TASK: TCAF Control Room Evacuation-Feed SG's using 21/22 AFW Pump.

TASK NUMBER: 1140130401

INITIAL CONDITIONS:

1. The control room has been evacuated.

INITIATING CUE:

The control room has been evacuated IAW S2.OP-AB.CR-0001. The CRS has assigned you to locally start 21 and 22 AFW Pumps and feed the SG's, and stop 23 AFW pump IAW Attachment 4. Neither 21 nor 22 AFP is operating.

Successful Completion Criteria:

1. **All critical steps completed.**
2. **All sequential steps completed in order.**
3. **All time-critical steps completed within allotted time.**
4. **JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).**

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Auxiliary Feedwater

TASK: TCAF Control Room Evacuation-Feed SG's using 21/22 AFW Pump.

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
		Evaluator provides copy of Attachment 4, S2.OP-AB.CR-0001, Control Room Evacuation.	Operator reviews Attachment 4 of S2.OP-AB.CR-0001, Control Room Evacuation.		
	1	Is 21 AFW Pump operating?	*CUE:* No, 21 AFW Pump is not operating.		
*	2	Perform the following to start 21 AFW Pump: • Place 21 AFW Pump Remote-Local Switch to LOCAL. • Place 21 AFW Pump Start-Stop Switch to START.	At Panel 205, selects LOCAL and START. *CUE*: If actions were proper-21AFW Pump is running.		
	3	Is 22 AFW Pump operating?	*CUE:* No, 22 AFW Pump is not operating.		
*	4	Perform the following to start 22 AFW Pump: • Place 22 AFW Pump Remote-Local Switch to LOCAL. • Place 22 AFW Pump Start-Stop Switch to START.	At Panel 206, selects LOCAL and START. *CUE*: If actions were proper-22AFW Pump is running.		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Auxiliary Feedwater

TASK: TCAF Control Room Evacuation-Feed SG's using 21/22 AFW Pump.

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5	Is 23 AFW Pump operating?	Determines 23 AFW pump is in service, from initial conditions or CUE if necessary.		
	6	Is 23 AFW pump required for Steam Generator Level control?	Determines from initial conditions that 23 AFW pump is to be removed from service.		
	7	Remove 23 AFP from service as follows:			
*		7.1 Place 23 AFP Remote-Local Switch to LOCAL.	Opens doors for 207-2, locates and places switch in LOCAL position		
		7.2 Reduce 23 AFP speed to minimum by slowly adjusting the 23 AFP INCREASE/OFF/DECREASE Switch to DECREASE.	Rotates switch to the DECREASE position. CUE: 23 AFP speed is decreasing		
*		7.3 Place the Start/Stop/Trip switch in TRIP.	Places switch to TRIP.		
*		7.4 Place 23 AFP Start/Stop/Trip in STOP.	Places switch to STOP.		
		7.5 GO TO Step 13.0	Goes to correct procedure step		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Auxiliary Feedwater

TASK: TCAF Control Room Evacuation-Feed SG's using 21/22 AFW Pump.

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	13	Perform the following to take MANUAL control of 21AF21, Aux Feed-S/G Level Control Valve: • Manually adjust hand jack for 21AF21 to the valve's present position. • Close manual isolation valve 21AF21 A/S to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2M. • Open the drain cock of the pressure regulator. • Manually adjust 21AF21 as required to maintain SG level at 15 to 33% NR level indicated on LI-517A.	• Locates AF21 and discusses operation of hand jack. • Locates Panel 700-2M and discusses operation of correct valve. • Discusses operation of drain cock. • Discusses how to open 21AF21. *CUE:* Open 21AF21 approx. 25%. *NOTE: If operation of 21AF21 was correct and confident, then the Evaluator may terminate the JPM after 21AF21 has been operated.*		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Auxiliary Feedwater

TASK: TCAF Control Room Evacuation-Feed SG's using 21/22 AFW Pump.

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	14	Perform the following to take MANUAL control of 22AF21, Aux Feed-S/G Level Control Valve: • Manually adjust hand jack for 22AF21 to the valve's present position. • Close manual isolation valve 22AF21 A/S to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2Y. • Open drain cock of the pressure regulator. • Manually adjust 22AF21 as required to maintain SG level at 15-33% NR level indicated on LI-527A.	• Locates AF21 and discusses operation of hand jack. • Locates Panel 700-2Y and discusses operation of correct valve. • Discusses operation of drain cock. • Discusses how to open 22AF21. *CUE:* Open 22AF21 approx. 25%. *NOTE: If operation of 22AF21 was correct and confident, then the Evaluator may terminate the JPM after operating 22AF21.*		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Auxiliary Feedwater

TASK: TCAF Control Room Evacuation-Feed SG's using 21/22 AFW Pump.

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	15	Perform the following to take MANUAL control of 23AF21, Aux Feed-S/G Level Control Valve: • Manually adjust hand jack for 23AF21 to the valve's present position. • Close manual isolation valve 23AF21 A/S to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2F. • Open drain cock of the pressure regulator. • Manually adjust 23AF21 as required to maintain SG level at 15-33% NR level indicated on LI-537A.	• Locates AF21 and discusses operation of hand jack. • Locates Panel 700-2F and discusses operation of correct valve. • Discusses operation of drain cock. • Discusses how to open 23AF21. *CUE:* Open 23AF21 approx. 25%. ***NOTE: If operation of 23AF21 was correct and confident, then the Evaluator may terminate the JPM after operating 23AF21.***		

OPERATOR TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Auxiliary Feedwater

TASK: TCAF Control Room Evacuation-Feed SG's using 21/22 AFW Pump.

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	16	Perform the following to take MANUAL control of 24AF21, Aux Feed-S/G Level Control Valve: • Manually adjust hand jack for 24AF21 to the valve's present position. • Close manual isolation valve 24AF21 A/S to pressure regulator in No. 2 Unit redundant Air Supply Panel 700-2E. • Open drain cock of the pressure regulator. • Manually adjust 24AF21 as required to maintain SG level at 15-33% NR level indicated on LI-547A.	• Locates AF21 and discusses operation of hand jack. • Locates Panel 700-2E and discusses operation of correct valve. • Discusses operation of drain cock. • Discusses how to open 24AF21. *CUE:* Open 24AF21 approx. 25%.		

TERMINATING CUE: Feeding Steam Generators via at least one AF21

JOB PERFORMANCE MEASURE

INITIAL CONDITIONS:

1. The control room has been evacuated IAW S2.OP-AB.CR-0001.

INITIATING CUE:

The CRS has assigned you to locally start 21 and 22 AFW Pumps and feed the SG's IAW S2.OP-AB.CR-0001, Att. 4.

ATTACHMENT 4
(Page 1 of 6)

AUXILIARY FEEDWATER

NOTE

♦ The following indications are available for local operation:

- Panel 205-2:
  - 21 AFW Pump REMOTE/LOCAL Switch
  - 21 AFW Pump START/STOP Switch
  - 21 AFW Pump Suction Pressure Indication
  - 21 AFW Pump Discharge Pressure Indication
- Panel 206-2:
  - 22 AFW Pump REMOTE/LOCAL Switch
  - 22 AFW Pump START/STOP Switch
  - 22 AFW Pump Suction Pressure Indication
  - 22 AFW Pump Discharge Pressure Indication
- Panel 207-2:
  - 23 AFW Pump REMOTE/LOCAL Switch
  - 23 AFW Pump START/STOP/TRIP Switch
  - 23 AFW Pump Suction Pressure indication
  - 23 AFW Pump Discharge Pressure
  - 23 AFW Pump Steam Pressure
  - 23 AFW Pump INCREASE/OFF/DECREASE Switch

1.0 Is 21 AFW Pump operating?

___ NO ___ YES ——> **GO TO** Step 3.0 _____ Time

V

NOTE

The following step will be performed at 21 Aux Feedwater Panel 205-2.

___ 2.0 **PERFORM** the following to start 21 AFW Pump:

___ 2.1 **PLACE** 21 AFW Pump Remote-Local switch to LOCAL position

___ 2.2 **PLACE** 21 AFW Pump Start-Stop switch to START position.

ATTACHMENT 4
(Page 2 of 6)

AUXILIARY FEEDWATER

3.0 Is 22 AFW Pump operating?

___ NO ___ YES ——> **GO TO** Step 5.0 ___ Time

V

NOTE

The following step will be performed at 22 Aux Feedwater Panel 206-2.

___ 4.0 **PERFORM** the following to start 22 AFW Pump:

___ 4.1 **PLACE** 22 AFW Pump Remote-Local switch to LOCAL position

___ 4.2 **PLACE** 22 AFW Pump Start-Stop switch to START position.

5.0 Is 23 AFW Pump operating?

___ YES ___ NO ——> **GO TO** Step 13.0 ___ Time

V

6.0 Is 23 AFW Pump required for Steam Generator level control?

___ NO ___ YES ——> **GO TO** Step 8.0 ___ Time

V

AUXILIARY FEEDWATER

NOTE

- The following step will be performed at 23 Aux Fdwtr Panel 207-2.
- Refer to Attachment 13, TURBINE-DRIVEN AFW PUMP RESTORATION; for guidance to RESET 2MS52, OVERSPEED TRIP MECHANISM.

___ 7.0 **REMOVE** 23 Auxiliary Feedwater Pump from service as follows:

___ 7.1 **PLACE** 23 AFW Pump Remote-Local switch to LOCAL position

___ 7.2 **REDUCE** 23 Auxiliary Feedwater Pump speed to minimum by slowly adjusting the 23 AFW Pump INCREASE/OFF/DECREASE Switch, to DECREASE.

___ 7.3 **PLACE** the Start/Stop/Trip switch in TRIP.

CAUTION

Failure to return the 23 AFW Pump START/STOP/TRIP switch to the STOP position will result in the destruction of the actuator solenoids for 2MS52 and 2MS132.

___ 7.4 **PLACE** 23 AFW Pump Start/Stop/Trip switch in STOP.

___ 7.5 **GO TO** Step 13.0. _____ Time

___ 8.0 **TRANSFER** 23 Auxiliary Feedwater Pump control to LOCAL as follows:

___ 8.1 **PLACE** 23 AFW Pump Remote-Local switch to LOCAL position.

___ 8.2 **ADJUST** 23 Auxiliary Feedwater Pump speed with the 23 AFW Pump INCREASE/OFF/DECREASE Switch, until discharge pressure indicates 1500 psig as indicated on PL-1686-2 at No. 2 Unit No. 23 Aux Feedwater Pump Panel 207-2.

AUXILIARY FEEDWATER

___ 9.0 **PERFORM** the following to take MANUAL control of 21AF11, Aux Feed-S/G Level Control Valve:

___ 9.1 **MANUALLY ADJUST** hand jack for 21AF11 to the valve's present position.

___ 9.2 **CLOSE** manual isolation valve to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2K.

___ 9.3 **OPEN** the drain cock of the pressure regulator.

___ 9.4 **MANUALLY ADJUST** 21AF11 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-517A.

___ 10.0 **PERFORM** the following to take MANUAL control of 22AF11, Aux Feed-S/G Level Control Valve:

___ 10.1 **MANUALLY ADJUST** hand jack for 22AF11 to the valve's present position.

___ 10.2 **CLOSE** manual isolation valve to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2X.

___ 10.3 **OPEN** the drain cock of the pressure regulator.

___ 10.4 **MANUALLY ADJUST** 22AF11 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-527A.

___ 11.0 **PERFORM** the following to take MANUAL control of 23AF11, Aux Feed-S/G Level Control Valve:

___ 11.1 **MANUALLY ADJUST** hand jack for 23AF11 to the valve's present position.

___ 11.2 **CLOSE** manual isolation valve to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2J.

___ 11.3 **OPEN** the drain cock of the pressure regulator.

___ 11.4 **MANUALLY ADJUST** 23AF11 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-537A.

ATTACHMENT 4
(Page 5 of 6)

AUXILIARY FEEDWATER

___ 12.0 **PERFORM** the following to take MANUAL control of 24AF11, Aux Feed-S/G Level Control Valve:

___ 12.1 **MANUALLY ADJUST** hand jack for 24AF11 to the valve's present position.

___ 12.2 **CLOSE** manual isolation valve to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2L.

___ 12.3 **OPEN** the drain cock of the pressure regulator.

___ 12.4 **MANUALLY ADJUST** 24AF11 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-547A.

___ 12.5 **GO TO** Step 17.0.

_____ Time

___ 13.0 **PERFORM** the following to take MANUAL control of 21AF21, Aux Feed-S/G Level Control Valve:

___ 13.1 **MANUALLY ADJUST** hand jack for 21AF21 to the valve's present position.

___ 13.2 **CLOSE** manual isolation valve 21AF21 A/S to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2M.

___ 13.3 **OPEN** the drain cock of the pressure regulator.

___ 13.4 **MANUALLY ADJUST** 21AF21 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-517A.

___ 14.0 **PERFORM** the following to take MANUAL control of 22AF21, Aux Feed-S/G Level Control Valve:

___ 14.1 **MANUALLY ADJUST** hand jack for 22AF21 to the valve's present position.

___ 14.2 **CLOSE** manual isolation valve 22AF21 A/S to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2Y.

___ 14.3 **OPEN** the drain cock of the pressure regulator.

___ 14.4 **MANUALLY ADJUST** 22AF21 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-527A.

AUXILIARY FEEDWATER

___ 15.0 **PERFORM** the following to take MANUAL control of 23AF21, Aux Feed-S/G Level Control Valve:

___ 15.1 **MANUALLY ADJUST** hand jack for 23AF21 to the valve's present position.

___ 15.2 **CLOSE** manual isolation valve 23AF21 A/S to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2F.

___ 15.3 **OPEN** the drain cock of the pressure regulator.

___ 15.4 **MANUALLY ADJUST** 23AF21 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-537A.

___ 16.0 **PERFORM** the following to take MANUAL control of 24AF21, Aux Feed-S/G Level Control Valve:

___ 16.1 **MANUALLY ADJUST** hand jack for 24AF21 to the valve's present position.

___ 16.2 **CLOSE** manual isolation valve 24AF21 A/S to pressure regulator in No. 2 Unit Redundant Air Supply Panel 700-2E.

___ 16.3 **OPEN** the drain cock of the pressure regulator.

___ 16.4 **MANUALLY ADJUST** 24AF21 as required to maintain Steam Generator level at 14 to 33% Narrow Range level indicated on LI-547A.

___ 17.0 **ADJUST** the AF11'S OR AF21 valves as necessary to maintain all Steam Generator levels between 14 and 33% Narrow Range as indicated on LI-517A through LI-547A.

___ 18.0 When 23 AFW Pump stops rotating,
RESET 2MS52, OVERSPEED TRIP MECHANISM IAW Attachment 13, TURBINE-DRIVEN AFW PUMP RESTORATION.