Final Submittal

(Blue Paper)

SEQUOYAH APRIL/MAY 2007 EXAM

EXAM NOS. 05000327/2007301
AND 05000328/2007301

APRIL 9 - 11, 2007 AND
MAY 9, 2007 (written)

1. Administrative JPMs
2. In-plant JPMs
3. Control Room JPMs (simulator JPMs)

SEQUOYAH NUCLEAR PLANT
JOB PERFORMANCE MEASURE

B.1.i JPM 80-U2

Local Control of Charging Flow
(2-FCV-62-93)

Original Signatures on File

PREPARED/ REVISED BY: _____ Date/ _____

VALIDATED BY: * _____ Date/ _____

APPROVED BY: _____ Date/ _____
(Operations Training Manager)

CONCURRED: ** _____ Date/ _____
(Operations Representative)

* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.
** Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

NUCLEAR TRAINING

REVISION/USAGE LOG

REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
0	Initial Issue	Y	2/19/2007	All	

V - Specify if the JPM change will require another validation (Y or N).
See cover sheet for criteria.

SEQUOYAH NUCLEAR PLANT
AUO/RO/SRO
JOB PERFORMANCE MEASURE

Task:
Local Control of Charging Flow (2-FCV-62-93)

JA/TA TASK #:
0040390104 (**AUO**)

K/A Ratings:

011A4.04	(3.2/2.9)	011K3.01	(3.2/3.4)	011K6.08	(2.1/2.4)
028AA1.07	(3.3/3.3)	028AA2.03	(2.8/3.3)	011A1.02	(3.3/3.5)

Task Standard:
2-FCV-62-93 placed in local manual control and charging/seal flow has been adjusted to nominal values.

Evaluation Method : Simulator _____ In-Plant ____X____

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Performer: _____
NAME

Start Time _____

Performance Rating : SAT _____ UNSAT _____ Performance Time _____ Finish Time _____

Evaluator: _____/_____
SIGNATURE DATE

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COMMENTS

SPECIAL INSTRUCTIONS TO EVALUATOR:

1. Critical steps identified by CRITICAL STEP in **BOLD**.
2. Sequenced steps identified by an "s"
3. Any UNSAT requires comments
4. Insure operator performs the following required actions for **SELF-CHECKING;**
   a. Identifies the correct unit, train, component, etc.
   b. Reviews the intended action and expected response.
   c. Compares the actual response to the expected response.

Validation Time: CR. _____ **Local** 9 minutes

Tools/Equipment/Procedures Needed:
2-SO-62-1, section 8.4

References:

	Reference	Title	Rev No.
1.	2-SO-62-1	CVCS	49

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READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be simulated for this JPM. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. **Unit 2** is in Mode 1, 100% RTP
2. Pressurizer level is on program.
3. Normal letdown and charging are in service with 2A-A CCP running
4. Plant conditions require local control of 2-FCV-62-93 (charging) for maintenance on the normal controller.
5. All prerequisite actions are completed.
6. 2-HIC-62-93 charging flow controller is failing to properly control pressurizer level in automatic.
7. Troubleshooting has revealed that the flow modifier (2-FM-62-93B) must be replaced/repaired.

INITIATING CUES:

You are the Unit 2 Aux Bldg AUO and are to establish local control of 2-FCV-62-93 using 2-SO-62-1, section 8.4.

Adjust charging flow as necessary to as determined by the control room operator.

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
STEP 1.: Operator receives a copy of the appropriate procedure. STANDARD: Operator provided with a copy of 2-SO-62-1 section 8.4. COMMENTS:	Start Time____
STEP 2.: [1] **OBTAIN** permission from the U-2 US/SRO to locally control 2-FCV-62-93. ***Cue:*** ***US grants permission for local control.*** STANDARD: Operator requests permission from U-1 SRO to operate 2-FCV-62-93 locally. COMMENTS:	___ SAT ___ UNSAT
STEP 3.: [2] **ESTABLISH** communications between the local operator at panel 2-L-112A and the UO in the MCR operator. STANDARD: Operator calls the MCR and establishes communications with the OATC. COMMENTS:	___ SAT ___ UNSAT
STEP 4.: [3] **ENSURE** that a CCP is in service and that **[2-FCV-62-98]** and **[2-FCV-62-99]** are **OPEN**. ***Cue:*** ***2A-A CCP is running, status lights on M-6 indicate FCV-62-98 & 99 are open.*** STANDARD: Operator request UO to verify pump on and valves open. COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
STEP 5.: [4] **MATCH** the setpoint (red pen) and actual reading (black pen) using [2-HIC-62-93B]. **NOTE:** **Turning knob clockwise will raise setpoint. (Direction to turn during JPM depends on "as found" position of red pen in relation to black pen)** ***Cue:*** ***When CHECKED indicate that the black indicator READS 34% and the red indicator reads 0%. After ADJUSTED, indicate that the red indicator is matched with the black indicator.*** STANDARD: Operator matches red with black pen on 2-HIC-62-93B by rotating "increase" knob. **This step is critical to prevent change in setpoint when controller is swapped to manual.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 6.: [5] **PLACE** 2-HIC-62-93B in **MANUAL**. ***Cue:*** ***2-HIC-62-93B is in the manual position.*** STANDARD: Operator rotates HIC-62-93B to the MANUAL position. **This step is critical to establish manual control.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 7.: [6] **VERIFY** [2-XI-62-93] on panel 2-M-5 is illuminated. ***Cue:*** ***UO informs operator that the light is ON.*** STANDARD: Communicates with the OATC to verify light is ON. COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
EVALUATOR NOTE: Turning 1-HIC-62-93B clockwise reduces flow, counter-clockwise raises flow (**UP** is **CLOSED**, **DOWN** is **OPEN** on HIC)	
STEP 8.: [7] **ADJUST** charging flow as necessary to meet requirements of MCR operator. Note: Charging flow can be monitored on 2-FI-62-93B (panel 2-L-112A). ***Cue:*** ***When UO is contacted, state that current charging flow is 80 gpm and direct the performer to slowly raise charging flow to 87 gpm.*** STANDARD: Charging flow has been adjusted per UP directions (clockwise reduce flow/counter clockwise raise flow) with performer checking local indications for charging flow or requesting UO feedback for appropriate parameters. COMMENTS: This cue is correct according to the licensee.	___ SAT ___ UNSAT **Critical Step**
EVALUATOR NOTE: The following step is a continuation of p	
STEP 9.: [7] **ADJUST** charging flow as necessary to meet operator. ***Cue:*** ***After controller has been correctly adjusted state that charging flow is ≈87 gpm. No further adjustments will be needed at this time.*** STANDARD: Operator adjusts charging flow as necessary via communication with the UO in the MCR to establish/maintain pressurizer level on program. COMMENTS:	___ SAT ___ UNSAT Stop Time____

End of JPM

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Unit 2 is in Mode 1, 100% RTP

Pressurizer level is on program.

Normal letdown and charging are in service with 2A-A CCP running

Plant conditions require local control of 2-FCV-62-93 (charging) for maintenance on the normal controller.

All prerequisite actions are completed.

2-HIC-62-93 charging flow controller is failing to properly control pressurizer level in automatic.

Troubleshooting has revealed that the flow modifier (2-FM-62-93B) must be replaced/repaired

INITIATING CUES:

You are the Unit 2 Aux Bldg AUO and are to establish local control of 2-FCV-62-93 using 2-SO-62-1, section 8.4.

Adjust charging flow as necessary to as determined by the control room operator.

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT

SYSTEM OPERATING INSTRUCTION

2-SO-62-1

CHEMICAL AND VOLUME CONTROL SYSTEM

Revision 49

QUALITY RELATED

PREPARED/PROOFREAD BY: MARIE HANKINS

RESPONSIBLE ORGANIZATION: OPERATIONS

APPROVED BY: W. T. LEARY

EFFECTIVE DATE: 12/11/2006

LEVEL OF USE: **CONTINUOUS USE**

REVISION DESCRIPTION: Revised Attachment 3 to change location of 2-VLV-62-714 in accordance with DCN D21689. Also changed the position of 4 ERCW valves from throttle to full OPEN in accordance with NB 061027 and ENG CALC MDQ000-067-200-095-01. Reworded note 1 of step 1 of section 8.5 as minor editorial change. Incorporated PCF 028. PCF-029 was deliberately not incorporated.

THIS PROCEDURE COULD IMPACT REACTIVITY

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1.0 INTRODUCTION

1.1 Purpose

To provide instructions for the operation of the Chemical and Volume Control system.

1.2 Scope

A. Startup, operation, and shutdown of letdown, seal flow and charging.

B. Re-establishing letdown, seal flow, charging, and swapover of orifices.

C. Changing from one CCP to the other.

D. Local Manual Control of Charging Flow and Seal Flow.

E. Operation of Auxiliary Spray.

F. Operation of the CCP on Recirculation.

G. Local Manual Control of Letdown Pressure.

H. Filling/Venting CVCS System

2.0 REFERENCES

2.1 Performance References

A. 0-SO-62-7, *Boron Concentration Control*

B. 2–SO–62–9, *CVCS Purification System*

C. 2-SO-62-6, *Excess Letdown*

D. 0-SI-OPS-070-032.B and 2-SI-OPS-070-032.A, *Component Cooling Water Valves (Position Verification)*

E. 0-SI-SXX-068-127.0, *RCS and Pressurizer Temperature and Pressure Limits*

F. 0-SI-OPS-067-682, *ERCW Flow Balance Valves Position Verification*

2.2 Developmental References

A. 2–SO–62–1, *Chemical and Volume Control System*

B. SPP-10.1, System Status Control

C. Technical Specifications

1. 3.4.6.2
2. 3.4.8
3. 3.4.9
4. 3.5.6

D. Technical Requirements

1. 3.1.2.1
2. 3.1.2.2
3. 3.1.2.3
4. 3.1.2.4
5. 3.4.7

E. TVA Drawings

1. 47W809-1, 2, 3
2. 47W811-1, 2
3. 47W813-1
4. 47W845-4, 6
5. 47W859-1, 2, 4

F. FSAR

1. Section 5.2
2. Section 6.3
3. Section 9.3

3.0 PRECAUTIONS AND LIMITATIONS

A. Failure to observe all posted radiation control requirements may lead to unnecessary radiation absorbed doses.

B. The maximum design flowrate through the mixed bed demineralizers is 120 gpm, except during RCS cleanup in Modes 5 and 6. 0-GO-7 contains requirements for raising letdown flow to 180 gpm during outages.

C. 2-TCV-62-79 (letdown temperature divert valve) should be in bypass position if the temperature reaches 140°F or if hydrazine is being used for O_2 scavenging.

D. Decreasing VCT pressure below 13 psig when RCPs are operating may damage RCP seals. Westinghouse recommendation for minimum 15 psig backpressure for No. 1 RCP is satisfied with a VCT pressure of 13 psig. This is due to the pressure drop between No. 1 seal leakoff and the VCT, including seal return filter, seal return heat exchanger and piping delta p.

E. If the reactor coolant letdown filter is bypassed, the letdown demineralizers need to be bypassed to prevent resins from entering the RCS in the event of a resin screen failure. **[C.3]**

F. Whenever the plant is in solid water operation with letdown from RHR, the RHR letdown control valve 2-FCV-62-83 should be full open with pressure maintained with 2-PCV-62-81. COPS must be operable when RCS temperature is ≤ 350°F. If both trains of COPS are operable, then the letdown orifices may be closed. **[C.2]**

G. Seal injection flow to the RCPs should be maintained at all times when the loops are being filled and thereafter preventing any dirt or particles from entering the #1 seals. This precaution is not applicable when RCP seals are backseated and seal injection is isolated during outage periods.

H. When the RCS temperature is < 350°F in mode 4, 5 and 6 with vessel head installed, one centrifugal charging pump shall be incapable of injection into the RCS (LCO 3.4.12).

3.0 PRECAUTIONS AND LIMITATIONS

I. Centrifugal Charging Pump operation should be rotated periodically to equalize the run time on the pumps and to limit the difference in boron concentration between the idle CCP and the RCS. Engineering recommends swapping over to the standby pump on a quarterly basis in conjunction with Section XI Testing (2-SI-SXP-062-201.A,B).

J. Operation of a CCP with suction aligned to VCT is NOT recommended if automatic swapover to RWST on closure of VCT isolation valve or low-low VCT level is inoperable on both trains. CCP damage will occur if suction from VCT is lost. (PER 25749)

K. To minimize thermal shock of RCS piping, charging flow should NOT remain in service with no letdown flow when RCS temperature is greater than 350°F. This precaution does not apply when placing letdown in service or if letdown will be immediately restored to service.

L. Stopping a CCP during a boration or dilution will trap water in idle pump and stagnant piping which may cause a reactivity event when pump is restarted later.

M. Operation of a CCP is NOT recommended if the RWST level is less than 10% to protect the CCP if automatic swapover of the suction valves occurs.

N. Two CCPs may be in operation for the purpose of swapping pumps only if the RCS is NOT water solid and requirements of 3.4.12 (time for swapping pumps) are met.

Date_____

4.0 PREREQUISITE ACTIONS

NOTE Throughout this Section where an **IF/THEN** statement exists, the step should be **N/A** if the condition does not exist.

[1] **ENSURE** instruction to be used is a copy of the effective version. _____

[2] **ENSURE** "Precautions and Limitations," Section 3.0, have been reviewed. _____

[3] **IF** performing Sections 5.1, 8.3, 8.8, 8.9, 8.10 and/or 8.11 **THEN**

[a] **ENSURE** Power Checklists, 2-62-1.01 and 2-62-1.02, Attachments 1 and 2 have been completed. _____

[b] **ENSURE** Valve Checklists 2-62-1.03 and 2-62-1.04 Attachments 3 and 4 have been completed. _____

NOTE Steps [4] through [7] are applicable to Section 5.0 of this instruction. These steps may be N/A'd if entering this instruction to perform Sections 7.0 or 8.0.

[4] **VERIFY** N_2 supply to VCT and CVCS HUT available via local indicator **[0-PIS-77-66A/B]** on panel 0-L-2A or panel 0-XA-1099A window #4 N_2 Supply alarm clear. _____

[5] **VERIFY** VCT vent header aligned for service in accordance with Valve Checklist 0-77-11.02. _____

[6] **VERIFY** Rx makeup control in auto mode in accordance with 0-SO-62-7. _____

[7] **VERIFY** CVCS Purification System aligned in accordance with 2–SO–62–9. _____

Date_____

4.0 PREREQUISITE ACTIONS (Continued)

[8] **ENSURE** each performer documents their name and initials:

Print Name	Initials

[9] **INDICATE** below which performance section of this Instruction will be used and the reason for this performance:

☐ 5.0 STARTUP/STANDBY READINESS

☐ 6.0 NORMAL OPERATION

☐ 7.0 SHUTDOWN

☐ 8.0 INFREQUENT OPERATION

REASON

_____

_____

_____

Date_____

5.0 STARTUP/STANDBY READINESS

5.1 Establishing Charging and RCP Seal Injection Flow

NOTE 1 Letdown should be established upon completion of this section to prevent overfilling RCS and to minimize thermal shock concerns.

NOTE 2 Seal injection flow may remain isolated if RCP seals are backseated during outage periods.

[1] **ENSURE** RCP standpipes are filled by absence of RCP Standby Level High-Low Alarm. (N/A if seal injection will remain isolated)

RCP	PNL 2-XA-55-5B WINDOW NUMBER	INITIALS
1	2	_____
2	9	_____
3	17	_____
4	23	_____

[2] **IF** RCS pressure is < 100 psig, **THEN**

ENSURE the following valves are **CLOSED:**

A. **[2-FCV-62-63]** Seal Return Isolation. _____

B. **[2-FCV-62-53]** RCP Seal bypass. _____

[3] **IF** a CCP is to be started, **THEN**

HAVE operator locally inspect pump to ensure it is ready for operation. _____

[4] **IF** a CCP is not running, **THEN**

PLACE [2-HIC-62-93A] in **MANUAL, AND**

CLOSE [2-FCV-62-93]. _____

Date_____

5.1 Establishing Charging and RCP Seal Injection Flow (Continued)

[5] **IF** normal charging is not established, **THEN**

CLOSE the following charging header isolation valves:

VALVE	INITIALS
2-FCV-62-90	_____
2-FCV-62-91	_____

[6] **VERIFY** CCP suction path aligned:

- **[2-LCV-62-132]** and **[2-LCV-62-133]** OPEN _____

  OR

- **[2-LCV-62-135]** and **[2-LCV-62-136]** OPEN. _____

[7] **IF** CCP suction is aligned to VCT,
THEN

PERFORM one of the following:

- **VERIFY** automatic swapover to RWST available on at least one train (LCV-62-135 or 136) _____

  OR

- **OBTAIN** SM permission and **STATION** a dedicated operator to monitor suction path from VCT (valves and VCT level) and to stop CCP if necessary. _____

Date_____

5.1 Establishing Charging and RCP Seal Injection Flow (Continued)

NOTE 1 When the RCS temperature is < 350°F or exception of LCO 3.5.2 is met, one centrifugal charging pump shall be incapable of injecting as specified in 2-SI-OPS-068-001.0, Low Temperature Overpressure Protection.

NOTE 2 When RCS temperature is < 350°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the Reactor and the limited core cooling requirements.

[8] **IF** a CCP is not running, **THEN**

PLACE one of the following hand switches in **START**:

(**N/A** the other)

PUMP	CONTROL	INITIALS
2A-A CCP	2-HS-62-108A	_____
2B-B CCP	2-HS-62-104A	_____

NOTE 1 Step 9 may be marked N/A if RCP seals are backseated and seal injection is isolated during outage periods.

NOTE 2 Technical Specification Figure 3.5.6-1, Seal Injection Flow Limits, depicts acceptable seal injection flow. Guidance on adjusting seal flows is contained in 0-SI-SXX-068-137.3.

NOTE 3 In Mode 5 seal injection flow may be increased to 13 gpm during vacuum fill operations.

[9] **ADJUST** RCP seal flow to 6-11 gpm each by using [2-HIC-62-93A] and/or [2-HIC-62-89A]. _____

[10] **IF** RCS pressure is > 100 psig, **THEN**

ENSURE [2-FCV-62-63] and [2-FCV-62-61] Seal Return Isolation valves are **OPEN**.

Date_____

5.1 Establishing Charging and RCP Seal Injection Flow (Continued)

[11] **IF** charging is not established,
THEN

ALIGN for service by **OPENING** the following valves:

A. **[2-FCV-62-91]** Charging Header Isolation. _____ 1st _____ IV

B. **[2-FCV-62-90]** Charging Header Isolation. _____ 1st _____ IV

[12] **IF** normal charging is to be placed in service,
THEN

OPEN [2-FCV-62-86] Normal Charging Isolation _____ 1st _____ IV

AND

ENSURE [2-FCV-62-85] Alternate Charging Isolation is **CLOSED**. _____ 1st _____ IV

[13] **IF** alternate charging is to be placed in service, **THEN**

OPEN [2-FCV-62-85] Alternate Charging Isolation _____ 1st _____ IV

AND

ENSURE [2-FCV-62-86] Normal Charging Isolation is **CLOSED**. _____ 1st _____ IV

[14] **VERIFY** VCT level maintaining between 20-41%. _____

END OF TEXT

Date_____

5.2 Establishing CVCS Letdown

[1] **VERIFY** charging and RCP seal injection flow established in accordance with Section 5.1 of this Instruction. _____

NOTE Placing cooling water on the Letdown heat exchanger before restoring letdown flow should prevent TIS-62-79B/A from actuating and fully opening 2-TCV-70-192.

[2] **PLACE** [2-HIC-62-78] in **MANUAL**, **AND**

OPEN [2-TCV-70-192] to ~100%. _____

CAUTION **Flashing in the letdown line may occur if 2-PCV-62-81 is opened excessively.**

[3] **PLACE** [2-HIC-62-81A] in **MANUAL**, **AND**

ADJUST [2-PCV-62-81] to 50-60% OPEN (40-50% output). _____

[4] **OPEN** the following letdown isolation valves:

A. [2-FCV-62-69]. _____

B. [2-FCV-62-70]. _____

C. [2-FCV-62-77]. _____

[5] **ENSURE** CVCS mixed beds **ALIGNED** for service **OR** [2-TCV-62-79] in **VCT** position. (Refer to 2-SO-62-9) _____

CAUTION **Step [7] needs to be performed immediately after step [6] is completed to prevent flashing in the letdown line.**

[6] **OPEN** one or more of the following letdown orifice isolation valves: (**N/A** ones not used)

A. [2-FCV-62-72]. _____

B. [2-FCV-62-73]. _____

C. [2-FCV-62-74]. _____

Date_____

5.2 Establishing CVCS Letdown (Continued)

NOTE Normal letdown pressure is 325 psig at operating temperature.

[7] **ADJUST** [2-HIC-62-81A] to obtain desired letdown pressure, as indicated on [2-PI-62-81]. _____

[8] **PLACE** [2-HIC-62-81A] in **AUTO.** _____

NOTE Normal letdown temperature is ~100°F.

[9] **ADJUST** [2-HIC-62-78A] to obtain desired letdown temperature, as indicated on [2-TI-62-78]. _____

[10] **PLACE** [2-HIC-62-78A] in **AUTO.** _____

NOTE Letdown temperature may swing due to repeated actuation of TIS-62-79B/A on high temperature causing TCV-70-192 to fully open.

[11] **IF** necessary to stabilize letdown temperature due to oscillations in CCS flow, **THEN** **PERFORM** the following to gain control of CCS flow through the letdown heat exchanger:

[a] **OPEN** the following breaker:

Board	Breaker	Position	Initials
Vital Instrument Power Bd 2-III	15	OPEN	_____/_____ 1st CV

[b] **WHEN** letdown heat exchanger outlet temperature is stabilized at approximately 100°F, **THEN**

CLOSE the following breaker:

Board	Breaker	Position	Initials
Vital Instrument Power Bd 2-III	15	CLOSE	_____/_____ 1st CV

Date_____

5.2 Establishing CVCS Letdown (Continued)

NOTE 2-TCV-62-79 (letdown temperature divert valve) should be in bypass position if the temperature reaches 140°F.

[12] **IF** Mixed Bed Hi Temperature Bypass valve **[2-TCV-62-79]**, auto bypasses the DI on high temperature, OR was placed in **VCT** position in step **[5]**, **THEN**

ENSURE letdown temperature returns **NORMAL AND**

PLACE demin in service in accordance with 2-SO-62-9, using **[2-HS-62-79A]**. _____

[13] **ADJUST** charging and letdown as needed to maintain RCP seal injection flow and desired PZR level. _____

[14] **IF** PZR level is on program and auto operation is desired, **THEN**

PLACE **[2-HIC-62-93A]** in **AUTO**. _____

[15] **PERFORM** Independent Verification for the following valve(s) that were **OPENED:** (**N/A** one(s) not used).

VALVE NO.	DESCRIPTION	INITIALS
2-FCV-62-69	Letdown Isol.	_____
2-FCV-62-70	Letdown Isol.	_____
2-FCV-62-77	Letdown Isol.	_____
2-FCV-62-72	Letdown Orifice Isol.	_____
2-FCV-62-73	Letdown Orifice Isol.	_____
2-FCV-62-74	Letdown Orifice Isol.	_____

END OF TEXT

6.0 NORMAL OPERATION

Normal routine surveillance of the Chemical and Volume Control System is accomplished on a day-to-day basis by the performance of 0-GO-14.

Date_____

7.0 SHUTDOWN

7.1 Removing Letdown From Service

[1] **OBTAIN** permission from the Unit 2 US/SRO to remove letdown from service. _____

[2] **IF** excess letdown is to be put in service prior to isolation of normal letdown, **THEN**

PERFORM 2-SO-62-6, **AND**

RETURN to step **[3]**. _____

[3] **ENSURE** the following letdown orifice valves **CLOSED:**

A. **[2-FCV-62-72]** _____

B. **[2-FCV-62-73]** _____

C. **[2-FCV-62-74]** _____

[4] **CLOSE** the following letdown isolation valves:

VALVE	INITIALS
2-FCV-62-69	_____
2-FCV-62-70	_____

[5] **IF** RCS temperature is greater than 350°F
AND normal letdown will NOT be immediately restored,
THEN

PERFORM Section 7.2 to isolate normal charging. _____

END OF TEXT

Date _____

7.2 Removing Charging From Service

NOTE RCP seal injection flow must be maintained at all times when the loops are filled, except when RCP seals are backseated during outages.

[1] **OBTAIN** permission from the Unit 2 US/SRO to remove charging from service. _____

[2] **ENSURE** letdown is out of service per Section 7.1. _____

NOTE Technical Specification Figure 3.5.6-1, Seal Injection Flow Limits, depicts acceptable seal injection flow.

[3] **PLACE** [2-HIC-62-93A] in **MANUAL**. _____

NOTE 1 Technical Specification Figure 3.5.6-1, Seal Injection Flow Limits, depicts acceptable seal injection flow.

NOTE 2 Steps 4, 5, and 8 may be marked N/A if RCP seals are backseated and seal injection is isolated during outage periods.

[4] **ADJUST** [2-HIC-62-93A] and [2-HIC-62-89A] until [2-FCV-62-89] is **CLOSED**, while maintaining seal flow at 6-11 gpm per RCP. _____

[5] **ENSURE** seal flow is at 6-11 gpm per RCP. _____

[6] **IF** normal charging is in service **THEN**

CLOSE [2-FCV-62-86] Normal Charging Isolation. _____

[7] **IF** alternate charging is in service **THEN**

CLOSE [2-FCV-62-85] Alternate Charging Isolation. _____

[8] **ENSURE** seal injection at 6-11 gpm. _____

Date_____

7.2 Removing Charging From Service (Continued)

[9] **CLOSE** the following charging hdr isolation valves:

VALVE	INITIALS
2-FCV-62-90	_____
2-FCV-62-91	_____

NOTE 1 When the RCS temperature is < 350°F or exception of LCO 3.5.2 is met, one centrifugal charging pump shall be incapable of injecting as specified in 2-SI-OPS-068-001.0, Low Temperature Overpressure Protection.

NOTE 2 – When RCS temperature is < 350°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the Reactor and the limited core cooling requirements.

[10] **IF** the CCP is to be stopped, **THEN**

PLACE one of the following hand switches in **STOP** (**N/A** the other).

PUMP	CONTROL	INITIALS
2A-A CCP	2-HS-62-108A	_____
2B-B CCP	2-HS-62-104A	_____

END OF TEXT

Date_____

8.0 INFREQUENT OPERATION

8.1 Re-establishing Letdown, Seal Flow, and Charging

NOTE 1 This Instruction may be used to re-establish letdown and charging if they were inadvertently isolated or taken out of service temporarily.

NOTE 2 Following this Instruction closely may prevent opening the letdown relief valve.

[1] **ENSURE** the following valves are **CLOSED**:

VALVE NO.	DESCRIPTION	INITIALS
2-FCV-62-72	Letdown Orifice Isol	_____
2-FCV-62-73	Letdown Orifice Isol	_____
2-FCV-62-74	Letdown Orifice Isol	_____
2-FCV-62-84	Auxiliary Spray	_____
2-FCV-62-86	Normal Charging	_____
2-FCV-62-85	Alternate Charging	_____

***********CRITICAL STEP*********

[2] **ENSURE** the following valves are **OPEN:**

VALVE NO.	DESCRIPTION	INITIALS
2-FCV-62-90	Charging Isol	_____
2-FCV-62-91	Charging Isol	_____
2-FCV-62-77	Letdown Isol	_____
2-FCV-62-69	Letdown Isol	_____
2-FCV-62-70	Letdown Isol	_____

Date_____

8.1 Re-establishing Letdown, Seal Flow, and Charging (Continued)

NOTE 1 Restarting a CCP which was previously idle may cause a small reactivity change if boron concentration in pump casing and suction/discharge piping is different than RCS. This reactivity change is normally negative due to drop in RCS boron over core life, but could be positive if RCS boron was lower when idle CCP was stopped.

NOTE 2 When the RCS temperature is < 350°F or exception of LCO 3.5.2 is met, one centrifugal charging pump shall be incapable of injecting as specified in 2-SI-OPS-068-001.0, Low Temperature Overpressure Protection.

NOTE 3 When RCS temperature is < 350°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the Reactor and the limited core cooling requirements.

[3] **IF** a CCP is not running, **THEN**

PERFORM the following:

[a] **PLACE** [2-HIC-62-93A] in MANUAL and

CLOSE [2-FCV-62-93]. _____

[b] **START** a CCP by PLACING one of the following hand switches in START (N/A the other):

PUMP	CONTROL	INITIALS
2A-A CCP	2-HS-62-108A	_____
2B-B CCP	2-HS-62-104A	_____

Date_____

8.1 Re-establishing Letdown, Seal Flow, and Charging (Continued)

[4] **OPEN** one of the following charging isolation valves (**N/A** the other):

A. **[2-FCV-62-86]** Normal Charging. _____

B. **[2-FCV-62-85]** Alternate Charging. _____

NOTE 1 Technical Specification Figure 3.5.6-1, Seal Injection Flow Limits, depicts acceptable seal injection flow.

NOTE 2 In Mode 5 seal injection flow may be increased to 13 gpm during vacuum fill operations.

[5] **ADJUST [2-HIC-62-93A]** and **[2-HIC-62-89A]** to establish 6-11 gpm per RCP. _____

[6] **IF** RCS pressure is greater than 100 psig, **THEN**

ENSURE the following seal water return valves are **OPEN:**

VALVE	INITIALS
2–FCV–62–61	_____
2–FCV–62–63	_____

NOTE Placing cooling water on the Letdown heat exchanger before restoring letdown flow should prevent TIS-62-79B/A from actuating and fully opening 2-TCV-70-192.

[7] **PLACE [2-HIC-62-78]** in **MANUAL, AND OPEN [2-TCV-70-192]** to ~50%. _____

Date_____

8.1 Re-establishing Letdown, Seal Flow, and Charging (Continued)

**********CRITICAL STEP**********

CAUTION **Flashing in the letdown line may occur if 2-PCV-62-81 is opened excessively.**

[8] **PLACE** [2-HIC-62-81A] in **MANUAL**, **AND**

ADJUST [2-PCV-62-81] to 50-60% OPEN (40-50% output). _____

CAUTION **Step [10] needs to be performed immediately after step [9] is completed to prevent flashing in the letdown line.**

[9] **OPEN** one or more of the Letdown Orifice Isolation Valve(s) (**N/A** one(s) not used):

A. [2-FCV-62-72] _____

B. [2-FCV-62-73] _____

C. [2-FCV-62-74] _____

**********CRITICAL STEP**********

NOTE Normal letdown pressure is 325 psig at operating temperature.

[10] **ADJUST** [2-HIC-62-81A] to obtain desired letdown pressure as indicated on **[2-PI-62-81]**. _____

[11] **PLACE** [2-HIC-62-81A] in **AUTO**. _____

NOTE Normal letdown temperature is ~100°F.

[12] **ADJUST** [2-HIC-62-78A] to obtain desired letdown temperature, as indicated on **[2-TI-62-78]**. _____

Date_____

8.1 Re-establishing Letdown, Seal Flow, and Charging (Continued)

[13] PLACE [2-HIC-62-78A] in **AUTO.** _____

NOTE Letdown temperature may swing due to repeated actuation of TIS-62-79B/A on high temperature causing TCV-70-192 to fully open.

[14] IF necessary to stabilize letdown temperature due to oscillations in CCS flow, **THEN**
PERFORM the following to gain control of CCS flow through the letdown heat exchanger:

[a] OPEN the following breaker:

Board	Breaker	Position	Initials
Vital Instrument Power Bd 2-III	15	OPEN	_____/_____ 1st CV

[b] WHEN letdown heat exchanger outlet temperature is stabilized at approximately 100°F, THEN

CLOSE the following breaker:

Board	Breaker	Position	Initials
Vital Instrument Power Bd 2-III	15	CLOSE	_____/_____ 1st CV

NOTE 2-TCV-62-79 (letdown temperature divert valve) should be in bypass position if the temperature reaches 140°F.

[15] IF Mixed Bed Hi Temperature Bypass valve [2-TCV-62-79], auto bypasses the DI on high temperature, **THEN**

ENSURE letdown temperature returns **NORMAL AND**

PLACE demin inservice using [2-HS-62-79A]. _____

[16] ADJUST charging and letdown as needed to maintain RCP seal injection flow and desired PZR level. _____

Date_____

8.1 Re-establishing Letdown, Seal Flow, and Charging (Continued)

[17] **IF** PZR level is on program and auto operation is desired, **THEN**

PLACE [2-HIC-62-93A] in **AUTO.** _____

[18] **PERFORM** Independent Verification for the following valve(s) that were **OPENED:** (**N/A** one(s) not used).

VALVE NO.	DESCRIPTION	INITIALS
2-FCV-62-90	Charging Isol	_____
2-FCV-62-91	Charging Isol	_____
2-FCV-62-69	Letdown Isol	_____
2-FCV-62-70	Letdown Isol	_____
2-FCV-62-77	Letdown Isol	_____
2-FCV-62-72	Letdown Orifice Isol.	_____
2-FCV-62-73	Letdown Orifice Isol.	_____
2-FCV-62-74	Letdown Orifice Isol.	_____
2-FCV-62-61	Seal Water Return Isol.	_____
2-FCV-62-63	Seal Water Return Isol.	_____
2-FCV-62-86	Normal Charging Isol.	_____
2-FCV-62-85	Alternate Charging Isol.	_____

END OF TEXT

Date_____

8.2 Re-establishing Letdown

NOTE 1 This Instruction is to be used if letdown has been taken out of service or has isolated and charging still remains in service.

NOTE 2 Following Instruction closely may prevent lifting letdown relief valve.

[1] **ENSURE** the following orifice isolation valves are **CLOSED**:

A. [2-FCV-62-72] _____

B. [2-FCV-62-73] _____

C. [2-FCV-62-74] _____

NOTE Placing cooling water on the Letdown heat exchanger before restoring letdown flow should prevent TIS-62-79B/A from actuating and fully opening 2-TCV-70-192.

[2] **PLACE** [2-HIC-62-78] in **MANUAL**, **AND** **OPEN** [2-TCV-70-192] to ~50%. _____

**********CRITICAL STEP**********

[3] **ENSURE** the following valves are **OPEN.**

A. [2-FCV-62-77] _____

B. [2-FCV-62-69] _____

C. [2-FCV-62-70] _____

**********CRITICAL STEP**********

CAUTION **Flashing in the letdown line may occur if 2-PCV-62-81 is opened excessively.**

[4] **PLACE** [2-HIC-62-81A] in **MANUAL**, **AND**

ADJUST [2-PCV-62-81] to 50-60% OPEN (40-50% output). _____

Date_____

8.2 Re-establishing Letdown

CAUTION **Step [6] needs to be performed immediately after step [5] is completed to prevent flashing in the letdown line.**

[5] **OPEN** one of the letdown orifice isolation valves (**N/A** ones not used).

A. [2-FCV-62-72] _____

B. [2-FCV-62-73] _____

C. [2-FCV-62-74] _____

NOTE Normal letdown pressure is 325 psig at operating temperature.

[6] **ADJUST** [2-HIC-62-81A] to obtain desired letdown pressure as indicated on [2-PI-62-81]. _____

[7] **PLACE** [2-HIC-62-81A] in **AUTO**. _____

NOTE Normal letdown temperature is ~100°F.

[8] **ADJUST** [2-HIC-62-78A] to obtain desired letdown temperature, as indicated on [2-TI-62-78]. _____

[9] **PLACE** [2-HIC-62-78A] in **AUTO**. _____

Date_____

8.2 Re-establishing Letdown (Continued)

NOTE Letdown temperature may swing due to repeated actuation of TIS-62-79B/A which causes TCV-70-192 to fully open.

[10] IF necessary to stabilize letdown temperature due to oscillations in CCS flow, **THEN**
PERFORM the following to gain control of CCS flow through the letdown heat exchanger:

[a] **OPEN** the following breaker:

Board	Breaker	Position	Initials
Vital Instrument Power Bd 2-III	15	OPEN	_____/_____ 1st CV

[b] **WHEN** letdown heat exchanger outlet temperature is stabilized at approximately 100°F, **THEN**

CLOSE the following breaker:

Board	Breaker	Position	Initials
Vital Instrument Power 2-III	15	CLOSE	_____/_____ 1st CV

NOTE 2-TCV-62-79 (letdown temperature divert valve) should be in bypass position if the temperature reaches 140°F.

[11] IF Mixed Bed Hi Temperature Bypass valve **[2-TCV-62-79]**, auto bypasses the DI on high temperature, **THEN**

ENSURE letdown temperature returns **NORMAL AND**

PLACE demin inservice using **[2-HS-62-79A]**. _____

Date_____

8.2 Re-establishing Letdown (Continued)

[12] **ADJUST** charging and letdown as needed to maintain RCP seal injection flow and desired PZR level. _____

[13] **IF** PZR level is on program and auto operation is desired, **THEN**

PLACE [2-HIC-62-93A] in **AUTO**. _____

[14] **PERFORM** Independent Verification for the following valve(s) that were **OPENED:** (**N/A** one(s) not used).

VALVE NO.	DESCRIPTION	INITIALS
2-FCV-62-69	Letdown Isolation	_____
2-FCV-62-70	Letdown Isolation	_____
2-FCV-62-77	Letdown Flow Isol	_____
2-FCV-62-72	Letdown Orifice Isol.	_____
2-FCV-62-73	Letdown Orifice Isol.	_____
2-FCV-62-74	Letdown Orifice Isol.	_____

END OF TEXT

Date_____

8.3 Letdown Orifice Isolation Valves Operation

NOTE 1 This section can be used to swap letdown orifice isolation valves, open additional valves, or close additional valves that were opened previously.

NOTE 2 Following this Instruction closely may prevent opening the letdown relief valve.

[1] **ENSURE** the following valves are **OPEN:**

VALVE NO.	DESCRIPTION	INITIALS
2-FCV-62-90	Charging Isol	_____
2-FCV-62-91	Charging Isol	_____
2-FCV-62-77	Letdown Isol	_____
2-FCV-62-69	Letdown Isol	_____
2-FCV-62-70	Letdown Isol	_____

[2] **IF** placing additional letdown orifice in service,
THEN
PERFORM the following:

[a] **PLACE [2-HIC-62-93A]** in MANUAL. _____

[b] **ADJUST [2-HIC-62-93A]** to ≈100-120 gpm charging flow as indicated on 2-FI-62-93A. _____

[c] **ADJUST [2-HIC-62-89A]** to maintain seal injection flow to each RCP at 6-11 gpm. (N/A if seal injection isolated during outage). _____

NOTE Normal letdown temperature is ≈ 100°F.

[d] **ADJUST [2-HIC-62-78A]** to obtain desired letdown temperature. _____

Date_____

8.3 Letdown Orifice Isolation Valves Operation(Continued)

CAUTION **Flashing in the letdown line may occur if 2-PCV-62-81 is opened excessively.**

[3] **PLACE** [2-HIC-62-81A] in **MANUAL, AND**

ADJUST [2-PCV-62-81] to 50-60% OPEN (40-50% output). _____

CAUTION **When swapping orifice valves, Step [5] needs to be performed immediately after Step [4] is completed to prevent flashing in the letdown line.**

[4] **IF** swapping letdown orifices
OR removing additional Letdown Orifices from service,
THEN

CLOSE one or more of the Letdown Orifice Isolation Valve(s): (**N/A** one(s) not used).

- [2-FCV-62-72]. _____
- [2-FCV-62-73]. _____
- [2-FCV-62-74]. _____

CAUTION **Maximum steady-state letdown flow is 120 gpm (except during RCS cleanup in Modes 5 or 6 in accordance with 0-GO-7 App. H).**

[5] **IF** swapping letdown orifices
OR placing additional Letdown Orifices in service,
THEN

OPEN one or more of the Letdown Orifice Isolation Valve(s): (**N/A** one(s) not used).

- [2-FCV-62-72]. _____
- [2-FCV-62-73]. _____
- [2-FCV-62-74]. _____

Date_____

8.3 Letdown Orifice Isolation Valves Operation(Continued)

NOTE Normal letdown pressure is 325 psig at operating temperature.

[6] **ADJUST** [2-HIC-62-81A] to obtain desired letdown pressure as indicated on **[2-PI-62-81]**. _____

[7] **PLACE** [2-HIC-62-81A] in **AUTO**. _____ / _____
1st IV

[8] **ADJUST** charging and letdown as needed to maintain: _____

- RCP seal injection flow (N/A if seal injection isolated during outage)
- desired PZR level.

[9] **IF** additional letdown orifice was placed in service, **AND**

WHEN plant conditions permit, **THEN**

PLACE [2-HIC-62-93A] in AUTO. _____ / _____
1st IV

[10] **PERFORM** Independent Verification for the following valve(s) that were **OPENED:** (**N/A** one(s) not used).

VALVE NO.	DESCRIPTION	INITIALS
2-FCV-62-72	Letdown Orifice Isol.	_____
2-FCV-62-73	Letdown Orifice Isol.	_____
2-FCV-62-74	Letdown Orifice Isol.	_____

END OF TEXT

Date_____

8.4 Local Manual Control of 2-FCV-62-93

[1] **OBTAIN** permission from the Unit 2 US/SRO to locally control 2-FCV-62-93. _____

[2] **ESTABLISH** communication between the local operator at panel 2-L-112A and the Unit operator. _____

[3] **ENSURE** that a CCP is in service and that **[2-FCV-62-98]** and **[2-FCV-62-99]** are **OPEN.** _____

NOTE Charging flow abnormal Annunciator may actuate during transfer.

[4] **MATCH** the setpoint (red pen) and the actual reading (black pen) using **[2-HIC-62-93B]**. _____

[5] **PLACE [2-HIC-62-93B]** charging flow control in **MANUAL.** _____

[6] **VERIFY [2-XI-62-93]** on panel 2-M-5 is illuminated. _____

NOTE Charging header flow can be monitored on 2-FI-62-93B on panel 2-L-112A.

[7] **ADJUST** charging flow as directed by Unit operator. _____

[8] **WHEN [2-HIC-62-93A]** is to be returned to service, **THEN**

[a] **ESTABLISH** communications between MCR and 2-L-112A panel. _____

[b] **RECORD** charging flow _____ gpm. _____

[c] **ADJUST [2-HIC-62-93A]** to ~ 15% open from the full closed position. _____

[d] **PLACE [2-HIC-62-93B]** charging header flow control on 2-L-112A to **AUTO.** _____ _____

1st IV

[9] **ENSURE [2-XI-62-93]** on 2-M-5 is **not** illuminated. _____

[10] **ADJUST [2-HIC-62-93A]** as necessary to control charging flow. _____

END OF TEXT

Date_____

8.5 Local Manual Control of Seal/Charging Flow With 2-FCV-62-93 Failed or Bypassed

NOTE 1 Valve wrench may be needed when manually operating CCP valves.

NOTE 2 Technical Specification Figure 3.5.6-1, Seal Injection Flow Limits, depicts acceptable seal injection flow.

[1] **ESTABLISH** communications between local operator and the Unit Operator. _____

[2] **ENSURE** a CCP is in service. _____

NOTE 1 With no letdown or excess letdown in service the PZR level will slowly increase.

NOTE 2 – Operators will be in separate rooms while performing the following step.

[3] **IF** CCP 2A-A is in service, **THEN**

THROTTLE OPEN [2-62-526] the 2-FCV-62-93 bypass valve located in the 2A-A pump room, **WHILE CLOSING [2-62-535]**, the CCP header isolation valve (2B-B pump room). _____

[4] **IF** CCP 2B-B is in service, **THEN**

THROTTLE OPEN [2-62-534] the 2-FCV-62-93 bypass valve located in the 2B-B pump room, **WHILE CLOSING [2-62-535]**, the CCP header isolation valve (2B-B pump room). _____

[5] **ENSURE** the CCP header isolation valve, **[2-62-535]** is **FULLY CLOSED**. _____

[6] **ADJUST** one of the following valves to maintain proper seal/charging flow in coordination with the UO (**N/A** the other):

PUMP	VALVE	INITIALS
2A-A CCP	2-62-526	_____
2B-B CCP	2-62-534	_____

Date_____

8.5 Local Manual Control of Seal/Charging Flow With 2-FCV-62-93 Failed or Bypassed (Continued)

[7] **WHEN** [2-FCV-62-93] is to be returned to service, **THEN**

OPEN [2-FCV-62-93] as necessary to allow flow. _____

[8] **ESTABLISH** communications between local operator and the Unit Operator. _____

NOTE The next two (2) steps, **[9]** and **[10]**, should be performed concurrently.

[9] **THROTTLE OPEN** [2-62-535] the CCP header isolation valve. _____

[10] **SLOWLY CLOSE** the bypass valve on the CCP that is in service (**N/A** the other):

PUMP	VALVE	INITIALS
2A-A CCP	2-62-526	_____
2B-B CCP	2-62-534	_____

[11] **ENSURE** the following valves are in their required position (**N/A** valve which was not used.):

PUMP	VALVE	POSITION	INITIALS
2A-A CCP	2-62-526	CLOSED	____ ____ 1st IV
2B-B CCP	2-62-534	CLOSED	____ ____ 1st IV

[12] **ENSURE** [2-62-535] CCP header isolation valve is **FULL OPEN AND LOCKED**.

_____ _____
1st CV

END OF TEXT

Date_____

8.6 Local Manual Control of 2-FCV-62-89

NOTE 2-FCV-62-89 has no local control station, therefore control of seal flow will be accomplished by using the manual bypass valve 2-62-538.

[1] **ESTABLISH** communication between the local operator and the Unit Operator. _____

NOTE Valve handwheels are on reachrods in the 669 penetration room.

[2] **SLOWLY OPEN** [2-62-538] bypass valve until a decrease in seal injection flow is seen. _____

[3] **SLOWLY CLOSE** [2-62-539] isolation valve while opening [2-62-538] to maintain proper seal injection flow. _____

[4] **ENSURE** [2-62-539] isolation valve **FULLY CLOSED.** _____

[5] **CLOSE** [2-62-537] isolation valve. _____

[6] **THROTTLE** [2-62-538] as necessary to maintain proper flows in coordination with the Unit Operator. _____

[7] **WHEN** local control of [2-FCV-62-89] is no longer required, **THEN**

OPEN [2-62-537] isolation valve. _____ 1st _____ IV

[8] **SLOWLY OPEN** [2-62-539] isolation valve while closing [2-62-538] to maintain proper seal injection flow. _____

[9] **ENSURE** [2-62-539] isolation valve **FULLY OPEN.** _____ 1st _____ IV

[10] **ENSURE** [2-62-538] bypass valve **FULLY CLOSED.** _____ 1st _____ IV

[11] **NOTIFY** Unit Operator that remote control is available. _____

END OF TEXT

Date_____

8.7 Operation of Auxiliary Spray

[1] **VERIFY** the ΔT between pressurizer vapor temperature using **[2-TI-68-324]** or **[2T0481A]** and regenerative heat exchanger outlet temperature using **[2-TI-62-87]** or **[2T0126A]** is ≤ 320°F. _____

NOTE 1 0-SI-SXX-068-127.0, Appendix B, will need to be performed during auxiliary spray operation.

NOTE 2 Cycling the Auxiliary Spray Supply Valve 2-FCV-62-84 to control RCS pressure should be avoided; leaving the spray valve open and adjusting charging and letdown is the preferred method.

[2] **IF** RCP's are off, **THEN**

THROTTLE **[2-FCV-68-340D]** and/or **[2-FCV-68-340B]** normal pressurizer sprays to provide backflow through the spray lines. (Circle one used) _____

[3] **OPEN** **[2-FCV-62-84]** Auxiliary Spray Supply Valve, to admit water to the pressurizer. _____

[4] **ADJUST** RCS pressure by one or more of the following: (**N/A** method not used.)

[a] **IF** a CCP is in service, **THEN**

ADJUST **[2-FCV-62-93]**. _____

[b] **CYCLE** **[2-FCV-62-86]** normal charging and/or **[2-FCV-62-85]** alternate charging. _____

[c] **THROTTLE** **[2-FCV-68-340D]** and/or **[2-FCV-68-340B]** normal pressurizer sprays. (Circle one used) _____

Date_____

8.7 Operation of Auxiliary Spray (Continued)

[5] **ADJUST** [2-HIC-62-89A] to maintain 6-11 gpm seal injection flow to each RCP. _____

[6] **WHEN** Auxiliary Spray is no longer needed, **THEN**

CLOSE [2-FCV-62-84]. _____

END OF TEXT

Date_____

8.8 Operation of the Centrifugal Charging Pump (CCP) on Recirculation

NOTE 1 This Instruction allows the operation of a CCP when charging and/or letdown is out of service.

NOTE 2 When the RCS temperature is < 350°F or exception of LCO 3.5.2 is met , one centrifugal charging pump shall be incapable of injecting as specified in 2-SI-OPS-068-001.0, Low Temperature Overpressure Protection.

[1] **NOTIFY** the local operator to inspect the charging pump to be run to ensure it is ready for operation. _____

[2] **ENSURE** [2-FCV-62-98] and [2-FCV-62-99] are **OPEN.** _____

[3] **START** the CCP by PLACING one of the following hand switches to **START** (**N/A** the other):

PUMP	HAND SWITCH	INITIALS
2A-A CCP	2-HS-62-108A	_____
2B-B CCP	2-HS-62-104A	_____

[4] **WHEN** ready to shutdown the CCP, **THEN**

PLACE one of the following hand switches in **STOP** (**N/A** the other):

PUMP	HAND SWITCH	INITIALS
2A-A CCP	2-HS-62-108A	_____
2B-B CCP	2-HS-62-104A	_____

END OF TEXT

Date_____

8.9 Operation of the Centrifugal Charging Pump (CCP) on Recirculation With Manual Discharge Valve Closed

NOTE This instruction should be used if a CCP must be operated on recirculation and no discharge flow (to RCP seals or charging) is permitted via this pump.

[1] **NOTIFY** the local operator to inspect the charging pump to be run to ensure it is ready for operation. _____

[2] **ENSURE** [2-FCV-62-98] and [2-FCV-62-99] are **OPEN.** _____

[3] **EVALUATE** LCOs associated with CCP and charging flowpath. _____

[4] **CLOSE** the discharge isolation valve for the CCP to be started on recirculation (**N/A** the other):

PUMP	DISCHARGE VALVE	INITIALS
2A-A CCP	2-62-527	_____
2B-B CCP	2-62-533	_____

[5] **START** the CCP by PLACING the applicable hand switch to **START** (**N/A** the other):

PUMP	HAND SWITCH	INITIALS
2A-A CCP	2-HS-62-108A	_____
2B-B CCP	2-HS-62-104A	_____

Date_____

8.9 Operation of the Centrifugal Charging Pump (CCP) on Recirculation With Manual Discharge Valve Closed (Continued)

[6] **WHEN** ready to shutdown the CCP on recirculation,
THEN

PLACE the applicable hand switch in **STOP** (**N/A** the other):

PUMP	HAND SWITCH	INITIALS
2A-A CCP	2-HS-62-108A	_____
2B-B CCP	2-HS-62-104A	_____

[7] **LOCK OPEN** the discharge valve that was closed in step **[4]** (**N/A** the other):

PUMP	DISCHARGE VALVE	1st	CV
2A-A CCP	2-62-527	_____	_____
2B-B CCP	2-62-533	_____	_____

[8] **EVALUATE** exiting action statements associated with CCP and charging flowpath. _____

END OF TEXT

Date_____

8.10 Changing From 2A-A CCP to 2B-B CCP

CAUTION **Stopping a CCP during a boration or dilution will trap water in idle pump and stagnant piping which may cause a reactivity event when pump is restarted later.**

NOTE 1 Two CCPs may be in operation for the purpose of swapping pumps only if the RCS is NOT water solid and requirements of 3.4.12 (time for swapping pumps) are met.

NOTE 2 Starting idle CCP may cause a small reactivity change if boron concentration in pump casing and suction/discharge piping is different than RCS. This reactivity change is normally negative due to drop in RCS boron over core life, but could be positive if RCS boron was lower when idle CCP was stopped.

[1] **ENSURE** "B" Train CCS and ERCW in service. _____

[2] **NOTIFY** the local operator to inspect the 2B-B pump to ensure it is ready for operation. _____

NOTE When RCS temperature is less than 350°F or exception of LCO 3.5.2 is met, LCO 3.4.12 requires one CCP to be incapable of injection into RCS. During pump swapover, two CCPs may be capable of injecting into the RCS for ≤ 1 hour.

NOTE 2 When RCS temperature is < 350°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the Reactor and the limited core cooling requirements.

[3] **IF** RCS temperature is < 350°F and reactor head is on, **THEN**

[a] **REMOVE** hold order and rack in **[2-BCTA-62-104-B]** for 2B-B CCP. _____

[b] **RECORD** time. _____ _____

Date_____

8.10 Changing From 2A-A CCP to 2B-B CCP (Continued)

[4] **WHEN** ready to start 2B-B CCP,
THEN

PLACE [2-HS-62-104A] 2B-B CCP in **START**. _____

[5] **WHEN** ready to shutdown 2A-A CCP,
THEN

PLACE [2-HS-62-108A] 2A-A CCP in **STOP**. _____

[6] **IF** in Modes 1-3, **THEN**

ENSURE [2-HS-62-108A] in A-AUTO. _____ / _____
1st IV

NOTE If RCS temperature is <350°F, the following step must be completed within one hour of the time recorded in step **[3]**.

[7] **IF** RCS temperature is < 350°F and reactor head is on,
THEN

[a] **PLACE [2-HS-62-108A]** for 2A-A CCP in **PULL-TO-LOCK**. _____ _____
1st IV

[b] **ENSURE [2-BCTA-62-108-A]** CCP 2A-A breaker RACKED OUT and tagged with a hold order. _____

[8] **IF** reactor is critical,
THEN

MONITOR core thermal power and T-avg. _____

END OF TEXT

Date_____

8.11 Changing From 2B-B CCP to 2A-A CCP

CAUTION **Stopping a CCP during a boration or dilution will trap water in idle pump and stagnant piping which may cause a reactivity event when pump is restarted later.**

NOTE 1 Two CCPs may be in operation for the purpose of swapping pumps only if the RCS is NOT water solid and requirements of 3.4.12 (time for swapping pumps) are met.

NOTE 2 Starting idle CCP may cause a small reactivity change if boron concentration in pump casing and suction/discharge piping is different than RCS. This reactivity change is normally negative due to drop in RCS boron over core life, but could be positive if RCS boron was lower when idle CCP was stopped.

[1] **ENSURE** "A" Train CCS and ERCW in service. _____

[2] **NOTIFY** the local operator to inspect the 2A-A pump to ensure it is ready for operation. _____

NOTE 1 When RCS temperature is less than 350°F or exception of LCO 3.5.2 is met, LCO 3.4.12 requires one CCP to be incapable of injection into RCS. During pump swapover, two CCPs may be capable of injecting into the RCS for ≤ 1 hour.

NOTE 2 When RCS temperature is < 350°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the Reactor and the limited core cooling requirements.

[3] **IF** RCS temperature is < 350°F and reactor head is on, **THEN**

[a] **REMOVE** hold order and rack in **[2-BCTA-62-108-A]** for 2A-A CCP. _____

[b] **RECORD** time. _____ _____

Date_____

8.11 Changing From 2B-B CCP to 2A-A CCP (Continued)

[4] **WHEN** ready to start 2A-A CCP,
THEN PLACE [2-HS-62-108A] 2A-A CCP in **START**. _____

[5] **WHEN** ready to shutdown 2B-B CCP,
THEN

PLACE [2-HS-62-104A] 2B-B CCP in **STOP**. _____

[6] **IF** in Modes 1-3, **THEN**

ENSURE [2-HS-62-104A] in A-AUTO.

1st _____/IV

NOTE – If RCS temperature is <350°F, the following step must be completed within one hour of the time recorded in step **[3]**.

[7] **IF** RCS temperature is < 350°F and reactor head is on,
THEN

[a] **PLACE** [2-HS-62-104A] for CCP 2B-B in PULL-TO-LOCK.

_____ _____
1st IV

[b] **ENSURE** [2-BCTA-62-104-B] CCP 2B-B breaker RACKED OUT and tagged with a hold order. _____

[8] **IF** reactor is critical,
THEN

MONITOR core thermal power and T-avg. _____

END OF TEXT

Date_____

8.12 Swapping Normal and Alternate Charging Valves

NOTE This section is to be used for swapping of the Normal and Alternate Charging Valves after charging has previously been established.

[1] **NOTIFY** US of Charging valve swapover. _____

[2] **VERIFY** at least one CCP in service. _____

[3] **ENSURE** the following valves are **OPEN**:

A [2-FCV-62-90] Charging Flow isolation valve. _____

B [2-FCV-62-91] Charging Flow Isolation valve. _____

NOTE Perturbations in charging may occur during swapover if valve swapping is not done in an expeditious manner.

[4] **IF** Normal Charging is in service and Alternate Charging is required **THEN**

[a] **VERIFY** [2-FCV-62-86] Normal Charging isolation valve is OPEN. _____

[b] **RECORD** charging flow from [2-FI-62-93A] _____ gpm. _____

[c] **PLACE** [2-FCV-62-93A] in MANUAL. (Operator discretion - N/A if not required.) _____

[d] **OPEN** [2-FCV-62-85] Alternate Charging isolation valve. _____

Date_____

8.12 Swapping Normal and Alternate Charging Valves (Continued)

[e] **VERIFY [2-FCV-62-85]** Alternate Charging isolation valve is OPEN, **THEN**

CLOSE [2-FCV-62-86] Normal Charging isolation valve. _____

[f] **RECORD** charging flow from **[2-FI-62-93A]** _____ gpm. _____

[g] **IF [2-FCV-62-93A]** in manual, **THEN**

PLACE [2-FCV-62-93A] in **AUTO** as plant conditions permit. _____

[h] **ENSURE** plant in stable condition and notify US that swapover is complete. _____

[i] **PERFORM** Independent Verification for the following:

[2-FCV-62-85] Alternate Charging isolation valve **OPEN**. _____ IV

[2-FCV-62-86] Normal Charging isolation valve **CLOSED**. _____ IV

[5] IF Alternate Charging is in service and Normal Charging is required **THEN**

[a] **VERIFY [2-FCV-62-85]** Alternate Charging isolation valve is OPEN. _____

[b] **RECORD** charging flow from **[2-FI-62-93A]** _____ gpm. _____

Date_____

8.12 Swapping Normal and Alternate Charging Valves (Continued)

[c] **PLACE** [2-FCV-62-93A] in MANUAL.
(Operator discretion - N/A if not required.) _____

[d] **OPEN** [2-FCV-62-86] Normal Charging isolation valve. _____

[e] **VERIFY** [2-FCV-62-86] Normal Charging isolation valve is OPEN, **THEN**

CLOSE [2-FCV-62-85] Alternate Charging isolation valve. _____

[f] **RECORD** charging flow from [2-FI-62-93A]
_____ gpm. _____

[g] **IF** [2-FCV-62-93A] in manual, **THEN**

PLACE [2-FCV-62-93A] in **AUTO** as plant conditions permit. _____

[h] **ENSURE** plant in stable condition and notify US that swapover is complete. _____

[i] **PERFORM** Independent Verification for the following:

[2-FCV-62-86] Normal Charging isolation valve **OPEN**. _____ IV

[2-FCV-62-85] Alternate Charging isolation valve **CLOSED**. _____ IV

END OF TEXT

Date_____

8.13 Filling And Venting CVCS After Outage

8.13.1 Filling CVCS Letdown Piping

NOTE This Section is to be performed as necessary to fill and vent the CVCS suction piping. Section 8.13.2 Filling CCP Discharge Piping may be performed prior to filling the letdown piping.

CAUTION **RHR must be in service before opening 2-FCV-62-83.**

[1] **ENSURE** applicable portions of valve checklist 2-62-1.03 are complete. _____

[2] **ENSURE** [2-LCV-62-135] and [2-LCV-62-136], CCP Suction from RWST, **CLOSED** and in **A-AUTO.** _____

[3] **ENSURE** [2-LCV-62-132] and [2-LCV-62-133], VCT Outlet Isolation LCV's, **CLOSED** and in **A-AUTO**. _____

NOTE Either the letdown piping or charging piping can be initially Filled and Vented.

[4] **ENSURE** RHR has been filled and vented in accordance with 0-SO-74-1. _____

[5] **ENSURE** following in required position:

VALVE	DESCRIPTION	POSITION	INITIALS
2-FCV-62-83	RHR Letdown	CLOSED	_____
2-LCV-62-118	Letdown Divert to HUT	VCT POSITION	_____
2-TCV-62-79	Letdown Temp Divert	VCT POSITION	_____
2-FCV-62-77	Letdown Isolation	OPEN	_____
2-PCV-62-81	Letdown Pressure	≅25% OPEN	_____

NOTE: The following steps, **[6]** and **[7]**, will vent the VCT. Assistance from Chem Lab will be needed for Step **[7]**.

[6] **OPEN** [2-62-689], VCT Sample Valve (located in 690 Penet Rm above VCT Rm.) to vent air to Hot Sample Room. _____

Date_____

8.13.1 Filling CVCS Letdown Piping (Continued)

[7] **NOTIFY** Chem Lab to perform 0-TI-CEM-000-016.3, to establish Volume Control Tank vent path. _____

NOTE Step 8 may be performed out of sequence or in parallel with Step 9 if required due to plant conditions.

[8] **IF** Letdown Orifice piping is available for Filling and Venting, **THEN**

PERFORM the following: (NA if not available)

[a] **PLACE** the following transfer handswitches to the AUX position:

VALVE	HANDSWITCH	POSITION	INITIALS
2-FCV-62-69	2-XS-62-69C	AUX	_____
2-FCV-62-70	2-XS-62-70C	AUX	_____

[b] **ENSURE** following handswitches on 2-L-10 in required position:

VALVE	DESCRIPTION	POSITION	INITIALS
2-FCV-62-69	Loop 3 Letdown	OPEN	_____
2-FCV-62-70	Letdown FCV	OPEN	_____

[c] **PLACE** one of the following transfer switches to **AUXILIARY** (**N/A** others):

SWITCH	DESCRIPTION	INITIALS
2-XS-62-72	Letdown Orifice Isol	_____
2-XS-62-73	Letdown Orifice Isol	_____
2-XS-62-74	Letdown Orifice Isol	_____

Date_____

8.13.1 Filling CVCS Letdown Piping (Continued)

[d] **HOLD** valve corresponding to transfer switch place in auxiliary to **OPEN** for ~2 minutes to vent upstream piping (**N/A** others):

VALVE	DESCRIPTION	INITIALS
2-FCV-62-72	Letdown Orifice Isol	_____
2-FCV-62-73	Letdown Orifice Isol	_____
2-FCV-62-74	Letdown Orifice Isol	_____

[e] **CLOSE** the following valves utilizing Aux Control Room Handswitches:

VALVE	HANDSWITCH	POSITION	INITIALS
2-FCV-62-69	2-HS-62-69C	CLOSED	_____
2-FCV-62-70	2-HS-62-70C	CLOSED	_____

[f] **CLOSE** valve corresponding to transfer switch placed in auxiliary (**N/A** others):

VALVE	DESCRIPTION	INITIALS
2-FCV-62-72	Letdown Orifice Isol	_____
2-FCV-62-73	Letdown Orifice Isol	_____
2-FCV-62-74	Letdown Orifice Isol	_____

[g] **ENSURE** the following transfer switches returned to **NORMAL**:

SWITCH	DESCRIPTION	INITIALS	IV
2-XS-62-69	Loop 3 Letdown	_____	_____
2-XS-62-70	Letdown FCV	_____	_____
2-XS-62-72	Letdown Orifice Isol	_____	_____
2-XS-62-73	Letdown Orifice Isol	_____	_____
2-XS-62-74	Letdown Orifice Isol	_____	_____

Date_____

8.13.1 Filling CVCS Letdown Piping (Continued)

CAUTION 1 **Do not overpressurize the VCT while filling, the relief valve setpoint is 75 psig.**

CAUTION 2 **RHR must be in service before opening 2-FCV-62-83.**

NOTE For an effective vent, the VCT level should be maintained between 85 to 90%, and the pressure as low as reasonably achievable. The following steps may need to be repeated to establish the level and pressure parameters for venting VCT.

[9] **SLOWLY OPEN** [2-FCV-62-83] and establish a level in VCT. _____

[10] **IF** VCT pressure increases to 50-60 psig before an 85-90% level is attained **THEN**

[a] **CLOSE** [2-FCV-62-83] and allow pressure to decrease. _____

[b] **WHEN** pressure has decreased **THEN**

REPEAT step [9] to establish VCT level. _____

[11] **WHEN** VCT level has been established between 85-90%, **THEN**

CLOSE [2-FCV-62-83]. _____

[12] **CLOSE** [2-62-689] VCT Sample Valve after air is vented

_____ _____
1st IV

[13] **OPEN** [2-62-692], VCT Nitrogen Isolation.

_____ _____
1st IV

[14] **NOTIFY** Chem Lab to terminate 0-TI-CEM-000-016.3, which had established a Volume Control Tank vent path. _____

END OF TEXT

Date_____

8.13.2 Filling CCP Suction and Discharge Piping

NOTE 1 The discharge piping is normally gravity filled from the RWST; therefore the performance of this section should occur when sufficient head pressure from the RWST is available. If level is within the Rx vessel it may be increased to greater than flange level if 0-GO-13 and outage requirements are met.

NOTE 2 Filling and Venting of the CCP discharge piping will add inventory to the RCS. Monitor RCS level during performance of this section. The level limitations will be determined by 0-GO-13 or outage conditions.

[1] **ENSURE** applicable portions of valve checklist 2-62-1.03 and 2-63-5.02 are complete. _____

[2] **IF** RCS level to be raised greater than Reactor Flange level **THEN,**

ENSURE requirements for Rx Cavity fill per 0-GO-13 are complete. _____

[3] **PERFORM** the following: (NA if previously performed)

[a] **ENSURE** [2-LCV-62-135] and [2-LCV-62-136], CCP Suction from RWST, CLOSED and in A-AUTO. _____

[b] **ENSURE** [2-LCV-62-132] and [2-LCV-62-133], VCT Outlet Isolation LCVs, CLOSED and in A-AUTO. _____

[c] **ENSURE** the following valves are OPEN:

VALVE	DESCRIPTION	POSITION	INITIALS
2-FCV-62-85	Alt Charging Loop 1	OPEN	_____
2-FCV-62-86	Charging Loop 4	OPEN	_____
2-FCV-62-89	Charging Seal Flow	OPEN	_____
2-FCV-62-90	Charging Flow Isol	OPEN	_____
2-FCV-62-91	Charging Flow Isol	OPEN	_____
2-FCV-62-93	Charging Flow Cont	OPEN	_____

Date_____

8.13.2 Filling CCP Suction and Discharge Piping (Continued)

[d] **OPEN** [2-LCV-62-135] and [2-LCV-62-136] CCP Suction from RWST and

VERIFY RCS level increase. _____

NOTE Reactor Vessel Level requirements are controlled by 0-GO-13.

[e] **WHEN** desired RCS level increase is verified, **THEN**

CLOSE [2-LCV-62-135] and [2-LCV-62-136]

AND

ENSURE [2-LCV-62-135] and [2-LCV-62-136] CCP Suction from RWST in **A-AUTO.** _____

[f] **CLOSE** [2-FCV-62-85] Alt Charging Valve. _____

[4] **IF** CVCS Letdown piping has NOT been Filled and Vented in accordance with Section 8.13.1 **THEN**

GO TO Section 8.13.1 to Fill and Vent Letdown Piping. _____

CAUTION **Do not proceed until CVCS letdown piping is filled and vented.**

[5] **ENSURE** VCT level >13%. _____

[6] **OPEN** [2-LCV-62-132] VCT Outlet Valve and

PLACE handswitch [2-HS-62-132] in **PULL A-P-AUTO.** _____ _____
1st IV

[7] **OPEN** [2-LCV-62-133] VCT Outlet Valve and

PLACE handswitch [2-HS-62-133] in **PULL A-P-AUTO.** _____ _____
1st IV

[8] **ENSURE** [2-LCV-62-135] RWST to CCP **CLOSED** and [2-HS-62-135] in **PULL-A-P-AUTO.** _____ _____
1st IV

Date_____

8.13.2 Filling CCP Suction and Discharge Piping (Continued)

[9] **ENSURE** [2-LCV-62-136] RWST TO CCP **CLOSED** and [2-HS-62-136] in **PULL A-P-AUTO.**

_____ _____
1st IV

NOTE Section 8.14 Venting Emergency Boration Piping to Suction of CCP, is performed to vent CCP suction piping downstream of 2-FCV-63-138.

[10] **PERFORM** Section 8.14 Venting Emergency Boration Piping to Suction of CCP, **AND**

RETURN to step **[11]**.

_____

NOTE: Section 8.14 Filling/Venting Charging Pump Suction Piping Below 2-FCV-63-8 is performed to vent the CCP suction piping downstream of 2-FCV-63-8. The venting of the suction piping must be performed prior to starting the first CCP. **[C.4]**

[11] **PERFORM** Section 8.15 Filling/Venting Charging Pump Suction Piping Below 2-FCV-63-8. **AND**

RETURN to step **[12]**. **[C.4]**

_____

NOTE Section 8.19, *Filling/Venting Charging Pump Discharge Piping to the CCPIT,* is performed to vent CCP discharge piping to the CCPIT. The preferred method of filling the CCPIT and piping is to gravity fill at this point. Filling this section may be deferred until later, if required.

[12] **IF** CCPIT is available to fill and vent, **THEN**

PERFORM Section 8.19, Filling/Venting Charging Pump Discharge Piping to CCPIT, **AND**

RETURN to step **[13]**.

_____

Date_____

8.13.2 Filling CCP Suction and Discharge Piping (Continued)

NOTE If available both CCPs should be vented, but only the one to be started is necessary. If a pump casing is not vented at this time evaluate utilizing a Caution Order to denote the condition.

[13] **VENT** Charging Pumps casing in accordance with the following (NA if a pump casing is not vented):

[a] 2A-A CCP

2-SI-OPS-062-040.A _____

[b] 2B-B CCP

2-SI-OPS-062-040.B _____

[14] **ESTABLISH** RHR Letdown using **[2-FCV-62-83]** as required to maintain normal VCT level. _____

[15] **START** selected CCP in accordance with Section 5.1. _____

[16] **REDUCE** level in VCT to ~40%, **AND**

ENSURE pressure ~20 psig. _____

NOTE VCT pressure should not decrease below 13 psig.

[17] **BURP** VCT. as needed, to ensure a Nitrogen atmosphere by performing the following:

[a] **OPERATE [HS-62-125]**, VCT Vent Header Isol VLV, as required, to prevent VCT pressure from exceeding 30 psig. ☐

[b] **ADJUST** VCT level between 85 and 90 percent as follows:

PLACE [HIC-62-93A], Charging Flow Control in MANUAL,

AND

LOWER charging flow. ☐

Date_____

8.13.2 Filling CCP Suction and Discharge Piping (Continued)

[c] **VERIFY** pressurizer level is decreasing and VCT level is increasing. ☐

[d] **ENSURE** VCT pressure is maintained between 13 and 30 psig. ☐

[e] **WHEN** VCT level increases to 85-90 percent, **THEN**

OPEN [FSV-62-125], VCT Vent Header Isol Vlv UNTIL VCT pressure is 20 psig. ☐

[f] **WHEN** VCT pressure is 20 psig, **THEN**

CLOSE [FSV-62-125], VCT Vent Header Isol Vlv. ☐

[18] **ADJUST** VCT level to normal operating range of 20-41 percent by performing the following:

[a] **ENSURE [HIC-62-93A]**, Charging Flow Control is in MANUAL, AND

INCREASE charging flow. ☐

[b] **PLACE [LCV-62-118]**, Letdown Divert to HUT in P-AUTO position. ☐

[c] **VERIFY** vessel level is increasing, and VCT level is decreasing ☐

[19] **ENSURE** VCT pressure equal to or greater than 13 psig _____

[20] **FLUSH** Mixed bed and Cation bed in accordance with 2-SO-62-9. _____

END OF TEXT

Date_____

8.13.3 Filling CCP Suction and Discharge Piping Using RHR Letdown

NOTE The discharge piping is normally gravity filled from the RWST. This section will be performed when the RWST is not available or level is not sufficient for complete filling of system.

[1] **ENSURE** RHR letdown available through 2-FCV-62-83, RHR Letdown. _____

[2] **ENSURE** applicable portions of valve checklist 2-62-1.03 and 2-63-5.02 are complete. _____

[3] **NOTIFY** MSB to remove flanges and install hoses at the following vent valves (located in #4 Acc. Rm, El. 707' above panel 2-L-176) using 2-PI-MXX-000-200.0:

VALVE NO.	FUNCTION	HOSE INSTALLED
2-62-544	Ncr Chrg Test Vent	☐
2-62-545	Ncr Chrg Test Conn	☐

[4] **PERFORM** the following:

[a] **ENSURE** [2-LCV-62-135] CCP Suction from RWST, CLOSED and [2-HS-62-135A] in A-AUTO. _____

[b] **ENSURE** [2-LCV-62-136], CCP Suction from RWST, CLOSED and [2-HS-62-136A] in A-AUTO. _____

[c] **ENSURE** [2-LCV-62-132] VCT Outlet Isolation LCV's, CLOSED and [2-HS-62-132A] in A-AUTO. _____

[d] **ENSURE** [2-LCV-62-133], VCT Outlet Isolation LCV's, CLOSED and [2-HS-62-133A] in A-AUTO. _____

Date_____

8.13.3 Filling CCP Suction and Discharge Piping Using RHR Letdown(Continued)

[e] **ENSURE** the following valves are in the required position:

VALVE	DESCRIPTION	POSITION	INITIALS
2-FCV-62-85	Alt Charging Loop 1	OPEN	_____
2-FCV-62-86	Charging Loop 4	OPEN	_____
2-FCV-62-89	Charging Seal Flow	OPEN	_____
2-FCV-62-90	Charging Flow Isol	OPEN	_____
2-FCV-62-91	Charging Flow Isol	OPEN	_____
2-FCV-62-93	Charging Flow Cont	OPEN	_____

[5] **IF** CVCS Letdown piping has NOT been Filled and Vented in accordance with Section 8.13.1 **THEN**

GO TO Section 8.13.1 to Fill and Vent Letdown Piping. _____

[6] **PERFORM** the following to partially fill CVCS from RWST:

[a] **ENSURE** operator stationed at **[2-VLV-62-544]**, Nor Chrg Test Vent **AND** **[2-VLV-62-545]**, Nor Chrg Test Conn (located in #4 Acc. Rm, El. 707' above panel 2-L-176) _____

[b] **OPEN** **[2-LCV-62-135]** CCP Suction from RWST. _____

[c] **OPEN** **[2-LCV-62-136]** CCP Suction from RWST. _____

[d] **OPEN** **[2-VLV-62-544]**, Nor Chrg Test Vent. _____

[e] **OPEN** **[2-VLV-62-545]**, Nor Chrg Test Conn. _____

Date_____

8.13.3 Filling CCP Suction and Discharge Piping Using RHR Letdown(Continued)

[f] **WHEN** air stops issuing from **[2-VLV-62-544]** and **[2-VLV-62-545]**, **THEN**

1. **CLOSE [2-LCV-62-135]**, CCP Suction from RWST, **AND** **PLACE** in **[2-HS-62-135A]** in A-AUTO. _____
2. **CLOSE [2-LCV-62-136]**, CCP Suction from RWST, **AND** **PLACE [2-HS-62-136A]** in A-AUTO. _____

CAUTION – **Do not proceed until CVCS letdown piping is filled and vented.**

NOTE VCT level may be obtained from LI-62-129 or ICS point L0112A.

[7] **ENSURE** VCT level ≥ 65% _____

[8] **ENSURE [2-FCV-62-93]**, Charging Flow Control, CLOSED. _____

NOTE VCT Pressure may be obtained from PI-62-122 or ICS point P0139A.

[9] **ENSURE [2-PCV-62-119]** VCT N_2 Blanket (located in 690 Pen Room, above VCT Room) set to maintain VCT pressure at approximately 20 psig. _____

[10] **OPEN [2-LCV-62-132]** VCT Outlet Valve and **PLACE** handswitch **[2-HS-62-132A]** in A-AUTO. _____

[11] **OPEN [2-LCV-62-133]** VCT Outlet Valve and **PLACE** handswitch **[2-HS-62-133A]** in A-AUTO. _____

[12] **OPEN [2-FCV-62-93]**, Charging Flow Control, to begin CVCS piping fill. _____

Date_____

8.13.3 Filling CCP Suction and Discharge Piping Using RHR Letdown(Continued)

[13] **CONTROL** VCT level between 30% and 65% by:

- **THROTTLING** [FCV-62-83] RHR pump letdown to CVCS ☐
- **ADJUST** [PCV-62-81] to maintain desired flow rate ☐

[14] **WHEN** steady stream of water issues from **[2-VLV-62-544]**, Nor Chrg Test Vent **AND** **[2-VLV-62-545]**, Nor Chrg Test Conn (located in #4 Acc. Rm, EL 707'above panel 2-L-176), **THEN**

PERFORM the following:

[a] **CLOSE** [2-VLV-62-544], Nor Chrg Test Vent. _____

[b] **CLOSE** [2-VLV-62-545], Nor Chrg Test Conn. _____

[c] **CLOSE** [2-FCV-62-85] Alt Charging Valve. _____

[d] **INDEPENDENTLY VERIFY** the following:

1. [2-VLV-62-544], Nor Chrg Test Vent CLOSED. _____
2. [2-VLV-62-545], Nor Chrg Test Conn CLOSED. _____

[15] **ENSURE** [2-LCV-62-132] VCT Outlet Valve OPEN, **AND**

PLACE handswitch [2-HS-62-132A] in PULL A-P-AUTO. _____

[16] **ENSURE** [2-LCV-62-133] VCT Outlet Valve OPEN, **AND**

PLACE handswitch [2-HS-62-133A] in PULL A-P-AUTO. _____

[17] **ENSURE** [2-LCV-62-135] CCP Suction from RWST CLOSED, **AND**

PLACE handswitch [2-HS-62-135A] in PULL A-P-AUTO. _____

[18] **ENSURE** [2-LCV-62-136] CCP Suction from RWST CLOSED, **AND**

PLACE handswitch [2-HS-62-136A] in PULL A-P-AUTO. _____

Date_____

8.13.3 Filling CCP Suction and Discharge Piping Using RHR Letdown(Continued)

[19] **INDEPENDENTLY VERIFY** the following:

[a] [2-LCV-62-132] VCT Outlet Valve OPEN, **AND**
[2-HS-62-132A] in PULL A-P-AUTO. _____

[b] [2-LCV-62-133] VCT Outlet Valve OPEN, **AND**
[2-HS-62-133A] in PULL A-P-AUTO. _____

[c] [2-LCV-62-135] CCP Suction from RWST CLOSED, **AND**
[2-HS-62-135A] in PULL-A-P-AUTO. _____

[d] [2-LCV-62-136] CCP Suction from RWST CLOSED, **AND**
[2-HS-62-136A] in PULL A-P-AUTO. _____

NOTE Sect. 8.14 Venting Emergency Boration Piping to Suction of CCP, is performed to vent CCP suction piping downstream of 2-FCV-63-138.

[20] **PERFORM** Section 8.14 Venting Emergency Boration Piping to Suction of CCP, **AND**
RETURN to step [21]. _____

NOTE Section 8.15 Filling/Venting Charging Pump Suction Piping Below 2-FCV-63-8 is performed to vent the CCP suction piping downstream of 2-FCV-63-8. The venting of the suction piping must be performed prior to starting the first CCP. **[C.4]**

[21] **PERFORM** Section 8.15 Filling/Venting Charging Pump Suction Piping Below 2-FCV-63-8. **AND**
RETURN to step [22]. **[C.4]** _____

Date_____

8.13.3 Filling CCP Suction and Discharge Piping Using RHR Letdown(Continued)

NOTE Section 8.19, *Filling/Venting Charging Pump Discharge Piping to the CCPIT,* is performed to vent CCP discharge piping to the CCPIT. This section requires approximately 1000 gallons of borated water to fill. The preferred method of filling the CCPIT and piping is to gravity fill at this point. Filling this section may be deferred until later, if required.

[22] **IF** CCPIT is available to fill and vent, **THEN**

PERFORM Section 8.19, Filling/Venting Charging Pump Discharge Piping to CCPIT, **AND**

RETURN to step **[23]**.

_____

NOTE – If available both CCPs should be vented, but only the one to be started is necessary. If a pump casing is not vented at this time evaluate utilizing a Caution Order to denote the condition.

[23] **VENT** Charging Pumps casing in accordance with the following (NA if a pump casing is not vented):

[a] 2A-A CCP

2-SI-OPS-062-040.A

_____

[b] 2B-B CCP

2-SI-OPS-062-040.B

_____

[24] **ENSURE** RHR Letdown established using **[2-FCV-62-83]** as required to maintain normal VCT level.

_____

[25] **START** selected CCP in accordance with Section 5.1.

_____

[26] **REDUCE** level in VCT to ~40%, **AND**

ENSURE **[2-FCV-62-119]** VCT N_2 Blanket set to maintain VCT pressure at approximately 20 psig.

_____

Date_____

8.13.3 Filling CCP Suction and Discharge Piping Using RHR Letdown(Continued)

NOTE VCT pressure should not decrease below 13 psig.

[27] BURP VCT, as needed, to ensure a Nitrogen atmosphere by performing the following:

[a] OPERATE [2-HS-62-125], VCT Vent Header Isol VLV, as required, to prevent VCT pressure from exceeding 30 psig. ☐

[b] ADJUST VCT level between 85 and 90 percent as follows:

PLACE [2-HIC-62-93A], Charging Flow Control in MANUAL,

AND

LOWER charging flow. ☐

[c] VERIFY VCT level is increasing. ☐

[d] ENSURE VCT pressure is maintained between 13 and 30 psig. ☐

[e] WHEN VCT level increases to 85-90 percent, **THEN**

OPEN [2-FSV-62-125], VCT Vent Header Isol Vlv until VCT pressure is 20 psig. ☐

[f] WHEN VCT pressure is 20 psig, **THEN**

CLOSE [2-FSV-62-125], VCT Vent Header Isol Vlv. ☐

[28] ADJUST VCT level to normal operating range of 20-41 percent by performing the following:

[a] ENSURE [2-HIC-62-93A], Charging Flow Control is in MANUAL, **AND**

INCREASE charging flow. ☐

[b] PLACE [2-LCV-62-118], Letdown Divert to HUT in AUTO position. ☐

[c] MONITOR Vessel and VCT levels. ☐

Date_____

8.13.3 Filling CCP Suction and Discharge Piping Using RHR Letdown(Continued)

[29] **ENSURE** VCT pressure equal to or greater than 13 psig. _____

[30] **NOTIFY** MSB to remove hoses and install flanges at the following vent valves (located in #4 Acc. Rm, above panel 2-L-176) using 2-PI-MXX-000-200.0:

VALVE NO.	FUNCTION	HOSE REMOVED
2-62-544	Nor Chrg Test Vent	☐
2-62-545	Nor Chrg Test Conn	☐

[31] **FLUSH** Mixed bed and Cation bed in accordance with 2-SO-62-9. _____

END OF TEXT

Date _____

8.14 Venting Emergency Boration Piping to Suction of CCP

CAUTION **Venting of Emergency Boration piping may release hydrogen gas unless VCT cover gas has been changed to nitrogen.**

NOTE This section may be performed as a stand-alone section or in conjunction with filling of CCP suction piping to ensure piping downstream of 2-FCV-62-138 is full.

[1] **ENSURE** Valve Checklist 2-62-1.03, Attachment 3 has been completed. _____

[2] **ATTACH** a vent hose to **[2-62-811]**. _____

[3] **NOTIFY** RADCON that Chemical and Volume Control System will be opened for filling and venting. _____

[4] **OPEN** **[2-62-810]**. _____

[5] **OPEN** **[2-62-811]** until a steady stream of water issues, **THEN**

CLOSE **[2-62-811]** _____ 1st _____ IV

[6] **CLOSE** **[2-62-810]** _____ 1st _____ IV

[7] **REMOVE** hose from **[2-62-811]**. _____

END OF SECTION

Date _____

8.15 Filling/Venting Charging Pump Suction Piping Below 2-FCV-63-8

NOTE The section may be used as a stand-alone section or in conjunction with filling of CCP suction piping to ensure piping up to FCV-63-8 is full.

[1] **OBTAIN** SRO approval to begin CCP Suction Piping Venting. _____

[2] **ENSURE** following valve checklists completed and deviations evaluated for Instruction performance:

A. 2-62-1.03 _____

B. 2-63-1.07 _____

C. 2-63-5.02 _____

[3] **NOTIFY** ISI to report to U2 690 pipe chase with ultrasonic level instrumentation to support piping fill. _____

[4] **ESTABLISH** communications between UO and AUO during performance of this section. _____

NOTE The following valve positions may be verified by valve position lights at handswitches on 2-M-6, by monitor lights on 2-XX-55-6K and 2-XX-55-6L, or by local visual inspection of valves.

[5] **VERIFY** following valves **CLOSED**:

A. **[2-FCV-63-71]**, SIS Test Hdr Isol to Hut. _____

B. **[2-FCV-63-84]**, SIS Test Hdr Isol to Hut. _____

[6] **VERIFY [2-63-601]** SIS Test Header Isolation to HUT, **OPEN**. _____

Date _____

8.15 Filling/Venting Charging Pump Suction Piping Below 2-FCV-63-8 (Continued)

CAUTION **IF SI signal occurs while venting is in progress, vent valve, 2-63-599 should be closed immediately.**

NOTE To ensure 8" piping downstream of FCV-63-8 is filled up to the vent connection, ISI will place an ultrasonic level indicating device on piping downstream of FCV-63-8 near 63-706 vent valve.

[7] **OPEN** [2-63-599], SIS Test Line Test Vt Valve. _____

[8] **VENT** suction piping until the following criteria **[a]** & **[b]** are met:

[a] Vent of 2 minutes has been performed. _____

[b] ISI reports piping below 2-FCV-63-8 is filled up to the 1" vent line connection approximately 14" below 2-FCV-63-8. _____

[9] **CLOSE** [2-63-599], SIS Test Line Test Vt Valve. _____ _____
1st IV

[10] **NOTIFY** Unit 2 SRO venting is complete. _____

END OF SECTION

Date _____

8.16 Burping the VCT

NOTE Steps **[1]** through **[8]** may be repeated as necessary to achieve the desired VCT H_2 or N_2 concentration.

[1] **ENSURE** CVCS in operation with Letdown and Charging flow. _____

[2] **NOTIFY** Radwaste Operator to manually start a Waste Gas Compressor prior to vent VCT. _____

[3] **PLACE** [2-HS-62-118A], Letdown Divert to HUT in **VCT**. _____

[4] **OPEN** 2-FCV-62-125 Volume Control Tank WDS Vent Header Isolation **USING** [2-HS-62-125A] as necessary to maintain VCT pressure 17 to 30 psig in following steps. _____

[5] **RAISE** VCT level to 85 - 90%, **WHILE** maintaining Pressurizer level in an acceptable range. _____

[6] **CLOSE** 2-FCV-62-125 Volume Control Tank WDS Vent Header Isolation **USING** [2-HS-62-125A]. _____

CAUTION **Minimum VCT pressure is 13 psig.**

[7] **PLACE** [2-HS-62-118A], Letdown Divert to HUT in **DIVERT** and
REDUCE VCT Level to 20%. _____

[8] **WHEN** VCT Level less than or equal to 20%, **THEN**

PLACE [2-HS-62-118A], Letdown Divert to HUT in **P-AUTO**. _____

[9] **REQUEST** Chemistry sample VCT for Hydrogen or Nitrogen (as applicable) **AND**
NOTIFY OO of results. _____

[10] **ENSURE** Waste Gas Compressors are stopped. _____

END OF SECTION

Date_____

8.17 Local Control of Letdown Pressure with 2-PCV-62-81 bypassed

NOTE This section allows bypassing 2-PCV-62-81 for maintenance while normal letdown is in service.

[1] **ESTABLISH** communications between MCR and AB el 714 outside the letdown heat exchanger room. ☐

CAUTION 1 **Letdown relief valve 2-62-662 will lift and discharge to the PRT if letdown pressure rises to ~600 psig.**

CAUTION 2 **Flashing and water hammer may occur in letdown line if letdown pressure falls below ~125 psig.**

NOTE – If RCS is at normal operating temp/pressure, letdown pressure should be maintained at ~300-350 psig.

[2] **MONITOR** letdown pressure using the following: ☐

- 2-PI-62-81 [M-6]
- temporary local indicator (if installed by WO)

[3] **ENSURE** [2-HIC-62-81A], Letdown Press Control in MANUAL.

_____

CAUTION **Valve manipulations should be performed slowly and deliberately in close communication with MCR to minimize pressure swings.**

NOTE 1 Operation of valves WITHOUT using reach rods is preferred. Radcon assistance will be required for entry into Letdown Heat Exch Room.

NOTE 2 If letdown pressure is above normal (greater than 325 psig), step [5] may be performed prior to Step [4].

[4] **THROTTLE CLOSED** [2-62-673], Letdown Pressure Control Isolation Valve [AB el. 714] until small pressure rise is indicated.

_____

Date_____

8.17 Local Control of Letdown Pressure with PCV-62-81 bypassed (continued)

CAUTION **Isolation of letdown with bypass valve open may result in flashing in letdown line. Bypass valve should immediately be closed using step [8] if isolation occurs.**

[5] **THROTTLE OPEN** [2-62-672], Letdown Press Cont Bypass [AB el. 714] to maintain desired letdown pressure. _____

[6] **CONTINUE** throttling isolation valve **[2-62-673]** in CLOSE direction and throttling bypass valve **[2-62-672]** OPEN to maintain desired letdown pressure. ☐

[7] **WHEN** isolation valve [2-62-673] is CLOSED, **THEN**

ADJUST bypass valve **[2-62-672]** as necessary to maintain desired letdown pressure. _____

NOTE 1 If letdown is isolated, it should NOT be restored with 2-PCV-62-81 bypassed. Normal letdown should be restored AFTER 2-PCV-62-81 is ready to return to service.

NOTE 2 Substeps 8[b] and 8[c] may be marked "N/A" if PCV-62-81 is unavailable and configuration of 2-62-673 is controlled by a clearance or other work document.

[8] **IF** letdown isolation occurs while 2-PCV-62-81 is bypassed, **THEN**
PERFORM the following:

[a] **ENSURE** [2-62-672], Letdown Pressure Control Bypass Valve CLOSED. [AB el. 714].

_____ 1st _____ IV

[b] **ENSURE** [2-HIC-62-81A] Letdown Press Controller in MANUAL with valve CLOSED (full output). _____

[c] **ENSURE** [2-62-673], Letdown Pressure Control Isolation Valve OPEN. [AB el. 714].

_____ 1st _____ IV

[d] **MARK** remaining step in this section as "N/A." ☐

Date_____

8.17 Local Control of Letdown Pressure with PCV-62-81 bypassed (continued)

CAUTION **Valve manipulations should be performed slowly and deliberately in close communication with MCR to minimize pressure swings.**

[9] **WHEN** desired to restore 2-PCV-62-81 with letdown in service,
THEN
PERFORM the following:

[a] **ENSURE** [2-HIC-62-81A] Letdown Press Controller in MANUAL with valve CLOSED (full output). _____

[b] **OPEN** [2-62-673], Letdown Pressure Control Isolation Valve [AB el. 714]. _____ _____
1st IV

NOTE Substeps [c] and [d] should be performed simultaneously while maintaining desired letdown pressure.

[c] **THROTTLE CLOSED** [2-62-672], Letdown Pressure Control Bypass [AB el. 714]. _____

[d] **THROTTLE OPEN** [2-PCV-62-81], Letdown Pressure Control Valve to maintain desired letdown pressure. _____

[e] **WHEN** bypass valve [2-62-672] is CLOSED,
THEN
ADJUST [2-PCV-62-81] as necessary to maintain desired letdown pressure. _____

[f] **VERIFY** [2-62-672], Letdown Pressure Control Bypass Valve CLOSED. _____
IV

[g] **IF** automatic operation of [2-PCV-62-81] is desired,
THEN
PLACE [2-HIC-62-81A] in AUTO. _____

END OF SECTION

Date_____

8.18 CCP Low Lube Oil Pressure

NOTE If the running CCP cannot be immediately stopped (i.e. during an accident or during solid water operations), then an operator should be dispatched to locally check oil pressure without delay.

[1] **IF** plant conditions do NOT allow swapping CCPs,
THEN
DISPATCH operator to verify adequate oil pressure on affected CCP as soon as possible:

PUMP	OIL PRESSURE INDICATOR	≥8.5 psig
2A-A CCP	2-PI-62-247A	☐
2B-B CCP	2-PI-62-244A	☐

CAUTION **Stopping a CCP during a boration or dilution will trap water in idle pump and stagnant piping which may cause a reactivity event when pump is restarted later.**

NOTE Starting idle CCP may cause a small reactivity change if boron concentration in pump casing and suction/discharge piping is different than RCS. This reactivity change is normally negative due to drop in RCS boron over core life, but could be positive if RCS boron was lower when idle CCP was stopped.

[2] **IF** 2A-A CCP red light for low lube oil pressure illuminates while pump is in service, **AND** 2B-B CCP is available,
THEN

[a] **ENSURE** "B" Train CCS and ERCW in service. _____

Date_____

8.18 CCP Low Lube Oil Pressure (Continued)

NOTE When RCS is less than 350°F, LCO 3.4.12 requires one CCP to be incapable of automatic injection into RCS. While swapping running CCPs, two CCPs may be capable of injecting for no more than one hour.

[b] **IF** RCS temperature is < 350°F and reactor head is on, **THEN**

1. **REMOVE** hold order and rack in [2-BCTA-62-104-B] for 2B-B CCP. _____
2. **RECORD** time. _____ _____

[c] **WHEN** ready to start 2B-B CCP, **THEN**
- **PLACE** [2-HS-62-104A] 2B-B CCP in START. _____

[d] **WHEN** ready to shutdown 2A-A CCP, **THEN**
PLACE [2-HS-62-108A] 2A-A CCP in STOP. _____

NOTE If RCS temperature is <350°F, the following step must be completed within one hour of the time recorded in step **[2][b.2]**.

[e] **IF** RCS temperature is < 350°F and reactor head is on, **THEN**

1. **PLACE** [2-HS-62-108A] for 2A-A CCP in **PULL-TO-LOCK**.

_____ _____
1st IV

2. **ENSURE** [2-BCTA-62-108-A] CCP 2A-A breaker RACKED OUT and TAGGED with HOLD ORDER. _____

Date_____

8.18 CCP Low Lube Oil Pressure (Continued)

[3] IF 2B-B CCP red light for low lube oil pressure illuminates while pump is in service, **AND** 2A-A CCP is available, **THEN**

[a] ENSURE "A" Train CCS and ERCW in service. _____

NOTE When RCS temperature is less than 350°F, LCO 3.4.12 requires one CCP to be incapable of injection into RCS. While swapping running CCPs, two CCPs may be capable of injecting for no more than one hour.

[b] IF RCS temperature is < 350°F and reactor head is on, **THEN**

1. **REMOVE** hold order and rack in [2-BCTA-62-108-A] for 2A-A CCP. _____
2. **RECORD** time. _____ _____

[c] WHEN ready to start 2A-A CCP, **THEN**

PLACE [2-HS-62-108A] 2A-A CCP in START. _____

[d] WHEN ready to shutdown 2B-B CCP, **THEN**

PLACE [2-HS-62-104A] 2B-B CCP in STOP. _____

NOTE If RCS temperature is <350°F, the following step must be completed within one hour of the time recorded in step **[3]b.2.**

[e] IF RCS is <350°F and Rx head is on, **THEN**

1. **PLACE** [2-HS-62-104A] for CCP 2B-B in PULL-TO-LOCK.

   _____ _____
   1st IV
2. **ENSURE** [2-BCTA-62-104-B] CCP 2B-B breaker RACKED OUT and TAGGED with a HOLD ORDER. _____

Date _____

8.18 CCP Low Lube Oil Pressure (Continued)

[4] **IF** reactor is critical,
THEN

MONITOR core thermal power and T-avg. _____

[5] **EVALUATE** CCP operability. _____

[6] **INITIATE** Maintenance on affected CCP. _____

END OF SECTION

Date _____

8.19 Filling and Venting CCP Discharge Piping to CCPIT

[1] **IF** NO CCP in service, **THEN**

PERFORM the following to fill and vent CCP discharge header to CCPIT:

[a] **ATTACH** a vent hose to [2-63-842]. _____

[b] **NOTIFY** RADCON that Chemical and Volume Control System will be opened for filling and venting. _____

[c] **ENSURE** [2-FCV-63-25], CCPIT Outlet valve, is **CLOSED** _____

[d] **ENSURE** [2-FCV-63-26], CCPIT Outlet valve, is **CLOSED**. _____

[e] **OPEN** [2-FCV-63-39], CCPIT inlet valve. _____

[f] **OPEN** [2-FCV-63-40], CCPIT inlet valve. _____

[g] **OPEN** [2-63-576], vent valve. _____

[h] **OPEN** [2-63-842], vent valve. _____

[i] **WHEN** a steady stream of water issues from vent, **THEN**

CLOSE [2-63-842].

[j] **CLOSE** [2-63-576], vent valve. _____ 1st _____ IV

[k] **CLOSE** [2-FCV-63-39], CCPIT inlet valve. _____ 1st _____ IV

[l] **CLOSE** [2-FCV-63-40], CCPIT inlet valve. _____ 1st _____ IV

NOTE Hose may remain installed on [2-63-842] if approved per SPP-10.7.

[m] **REMOVE** hose on [2-63-842]. _____

Date _____

8.19 Filling and Venting CCP Discharge Piping to CCPIT (Continued)

[2] **IF** a CCP is in service, **THEN**

PERFORM the following to fill and vent CCP discharge header to CCPIT:

[a] **ATTACH** a vent hose to **[2-63-842]** and **SECURE** hose at both ends to prevent hose whip. _____

[b] **NOTIFY** RADCON that CVCS will be opened for filling and venting. _____

[c] **ENSURE** [2-FCV-63-25], CCPIT Outlet valve, is **CLOSED** and tagged with power removed. _____

[d] **ENSURE** [2-FCV-63-26], CCPIT Outlet valve, is **CLOSED** and tagged with power removed. _____

[e] **OPEN** [2-63-576], vent valve. _____

CAUTION **2-FCV-63-39 or 2-FCV-63-40 should be cracked open to allow the CCPIT to pressurize in a controlled manner. Excessive opening may result in water hammer. Communication between the control room and U2 690 pipe chase is required.**

NOTE 2-FCV-63-39 or 2-FCV-63-40 must be manually opened with handwheel to establish charging flow. MOV breakers should remain tagged under a clearance.

[f] **MANUALLY CRACK OPEN [2-FCV-63-39] OR [2-FCV-63-40]**, CCPIT inlet valves, to pressurize CCPIT (2-PI-63-35). _____

NOTE Clearance will need to be temporarily removed from the CCPIT inlet valve breakers to stroke valves electrically.

[g] **WHEN** CCPIT pressure stabilizes, **THEN**

1. **OPEN** [2-FCV-63-39], CCPIT inlet valve. _____
2. **OPEN** [2-FCV-63-40], CCPIT inlet valve. _____

Date _____

8.19 Filling and Venting CCP Discharge Piping to CCPIT (Continued)

CAUTION **Use extreme caution to prevent hose whip or spray of contaminated water.**

[h] **CRACK OPEN** [2-63-842], vent valve, UNTIL a steady stream of water issues from vent. _____

[i] **CLOSE** [2-63-842]. _____

CAUTION **2-FCV-63-39 and 2-FCV-63-40 should be closed electrically. Manual closure requires performance of a stroke test to ensure operability.**

[j] **CLOSE** [2-FCV-63-39], CCPIT inlet valve. _____ _____
1st IV

[k] **CLOSE** [2-FCV-63-40], CCPIT inlet valve. _____ _____
1st IV

[l] **CRACK OPEN** [2-63-842], vent valve, UNTIL CCPIT depressurized. _____

[m] **CLOSE** [2-63-842]. _____ _____
1st IV

[n] **CLOSE** [2-63-575], vent valve. _____ _____
1st IV

NOTE Hose may remain installed on **[2-63-842]** if approved per SPP-10.7.

[o] **REMOVE** hose on [2-63-842]. _____

END OF SECTION

9.0 RECORDS

Completed copies of all sections and Attachments shall be transmitted to the Operations Superintendent's Secretary.

OPERATION OF 2-FCV-62-53 #1 SEAL BYPASS VALVE

[1] **IF** Pump Bearing Temperature (seal inlet temperature), **OR** No. 1 seal Leakoff Temperature approaches its alarm setpoint, **THEN**

PEFORM the following steps to **OPEN** [2-FCV-62-53]:

[a] **VERIFY** the following conditions exist:

1. RCS is > 100 psig but < 1000 psig. _____
2. #1 seal leakoff valve is open. _____
3. #1 seal leakoff flowrate is less than 1 gpm. _____
4. Seal injection water flowrate to each pump is > 6 gpm. _____

[b] **OPEN** # 1 seal manual bypass valves:

1. 2-62-592, #1 RCP Seal Bypass Isol. (Raceway at #1 Accumulator Rm.) _____
2. 2-62-596, #1 RCP Seal Bypass Isol. (Raceway at #1 Accumulator Rm.) _____
3. 2-62-593 #2 RCP Seal Bypass Isol. (Raceway at #2 Accumulator Rm.) _____
4. 2-62-597, #2 RCP Seal Bypass Isol. (Raceway at #2 Accumulator Rm.) _____
5. 2-62-594, #3 RCP Seal Bypass Isol. (Raceway at #2 Accumulator Rm. ladder) _____
6. 2-62-598, #3 RCP Seal Bypass Isol. (Raceway at #2 Accumulator Rm. ladder) _____
7. 2-62-595, #4 RCP Seal Bypass Isol. (Raceway at #4 Accumulator Rm. ladder) _____
8. 2-62-599, #4 RCP Seal Bypass Isol. (Raceway at #4 Accumulator Rm. ladder) _____

[c] **OPEN** [2-FCV-62-53] _____

[d] **VERIFY** that RCPs #1 seal bypass low flow alarm (1.2 gpm) has cleared. _____

[e] **IF** RCP seal flow is not between 6-11 gpm, **THEN**

ADJUST [2-FCV-62-89] to maintain proper seal flow. _____

[2] **WHEN** system conditions warrant closure of the #1 seal bypass valve, **THEN**

CLOSE [2-FCV-62-53]. _____

[3] **CLOSE** #1 seal manual bypass valves:

	1st	IV
A. 2-62-592, #1 RCP Seal Bypass Isol. (Raceway at #1 Accumulator Rm.)	_____	_____
B. 2-62-596, #1 RCP Seal Bypass Isol. (Raceway at #1 Accumulator Rm.)	_____	_____
C. 2-62-593, #2 RCP Seal Bypass Isol. (Raceway at #2 Accumulator Rm.)	_____	_____
D. 2-62-597, #2 RCP Seal Bypass Isol. (Raceway at #2 Accumulator Rm.)	_____	_____
E. 2-62-594, #3 RCP Seal Bypass Isol. (Raceway at #2 Accumulator Rm. ladder)	_____	_____
F. 2-62-598, #3 RCP Seal Bypass Isol. (Raceway at #2 Accumulator Rm. ladder)	_____	_____
G. 2-62-595, #4 RCP Seal Bypass Isol. (Raceway at #4 Accumulator Rm. ladder)	_____	_____
H. 2-62-599, #4 RCP Seal Bypass Isol. (Raceway at #4 Accumulator Rm. ladder)	_____	_____

END OF TEXT

SOURCE NOTES

Page 1 of 1

REQUIREMENTS STATEMENT	SOURCE DOCUMENT	IMPLEMENTING STATEMENT
For skid-mounted valves in process lines to and from skid equipment within the DBVP, Phase I, system boundaries, full compliance will be achieved with these valves identified and incorporated into appropriate procedures. This should be completed by April 1, 1989 for Unit 2.	L37 871221 81I NCO 870324011	**C.1**
Commitment to revise precaution to allow orifice valves to be closed if COPS is operable.	S13 890406 806 Reference to CAQR SQP 890159	**C.2**
Commitment to implement precautionary measure to prevent possible "resin intrusion" into the RCS.	B45 870406 837 Reference to NER INPO OER-86-1922.	**C.3**
Commitment to implement measures to ensure CCP suction piping is properly vented.	OE970759003 INPO SOER 97-001-003	**C.4**

SEQUOYAH NUCLEAR PLANT
JOB PERFORMANCE MEASURE

B.1.j JPM 96

Respond to Loss of Control Air System

Original Signatures on File

PREPARED/ REVISED BY: _____ Date/ _____

VALIDATED BY: * _____ Date/ _____

APPROVED BY: _____ Date/ _____
(Operations Training Manager)

CONCURRED: ** _____ Date/ _____
(Operations Representative)

* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.
** Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

NUCLEAR TRAINING

REVISION/USAGE LOG

REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
1	Transfer from WP.	N	9/13/94	All	HJ Birch
2	Incorporate Rev B changes.	N	9/21/95	All	HJ Birch
pen/ink	Chgd performance time based on 17 requal performances. Chg step 2 from bkr closed to racked in. If closed cmpsr would be running.	N	10/25/95	4	HJ Birch
	EA-32-2 Rev chg. Delete step verifying ECRW FCVs open. Delete steps referring to C & D comp and allowing use of position 2.	N	11/17/97	4,6,8	HJ Birch
3	Incorporated pen/ink changes	N	8/22/02	4,6,8	J P Kearney
4	Minor format changes	N	2/13/07	All	RH Evans

V - Specify if the JPM change will require another Validation (Y or N).
See cover sheet for criteria.

SEQUOYAH NUCLEAR PLANT
AUO/RO/SRO
JOB PERFORMANCE MEASURE

Task:
Respond to Loss of Control Air System

JA/TA TASK #: 0770980101 (**RO**)
0790020104 (**AUO**)
0790980404 (**AUO**)

K/A Ratings:
078000 A3.01 (3.1 - 3.2)
078000 G 7 (2.9 - 3.0)
079000 K1.01 (3.0 - 3.1)
000065 EA1.01 (2.7 - 2.5)
000065 G.6 (3.1 - 3.3)

Task Standard:
Restart Control & Service Air Compressor(s).

Evaluation Method : Simulator _____ In-Plant _____X_____

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Performer: _____
NAME
Start Time _____

Performance Rating : SAT _____ UNSAT _____ Performance Time _____ Finish Time _____

Evaluator: _____/_____
SIGNATURE DATE

==========

COMMENTS

SPECIAL INSTRUCTIONS TO EVALUATOR:

1. Critical steps identified by Critical Step in **Bold**.
2. Sequenced steps identified by an "s"
3. Any UNSAT requires comments
4. Insure operator performs the following actions for **SELF-CHECKING;**
   a. Identifies the correct unit, train, component, etc.
   b. Reviews the intended action and expected response.
   c. Compares the actual response to the expected response.

Validation Time: CR. _____ **Local** 17 minutes

Tools/Equipment/Procedures Needed:
EA-32-2, section 4.1 and 4.2

References:

	Reference	Title	Rev No.
1.	EA-32-2	Establishing Control and Service Air	2

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READ TO OPERATOR

Directions to Trainee:

I will explain the initial conditions, and state the task to be performed. All steps shall be simulated for this JPM. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. Approximately 45 minutes ago both units experienced a loss of offsite power.
2. All D/Gs started and tied to the board as expected.
3. All shutdown boards are energized from the D/Gs at this time.
4. The Aux. Bldg. AUO is responding to the Aux. Air Compressors, but has been unable to get them started at this time.
5. The operator has verified 1A2-A and 1B1-B shutdown boards are energized and that Compt 3D breaker, on both boards, is racked in and green light LIT.
6. 0-FCV-67-205 & 208 are open

INITIATING CUES:

1. You are the U1 Turb. Bldg AUO and the U1 CRO has directed you to go to the Control & Service Air compressors, MANUALLY start the compressors **AND** verify loading USING EA-32-2.
2. When you have performed the procedure and pressure is returning, notify the U1 CRO.

STEP 1.: Obtain a copy of the appropriate procedure and determine the applicable section. STANDARD: The operator obtains a copy of EA-32-2 and determines that section 4.2 is the applicable section COMMENTS:	___ SAT ___ UNSAT Start Time____
STEP 2.: [1] **CHECK** the following equipment power supplies available: Comp A; 1A2-A SD Bd Compt 3D Comp B; 1B1-B SD Bd Compt 3D ***Cue:*** ***Both breakers are racked in and green light LIT. (this was given in initiating cues)*** STANDARD: Operator verifies power is available. COMMENTS:	___ SAT ___ UNSAT
STEP 3.: [2] **CHECK** pressure in control air receivers No.1 and No.2. ***Cue:*** ***Air receiver pressures are 20 psig and decreasing.*** STANDARD: Operator checks air receiver pressures to determine pressure. COMMENTS:	___ SAT ___ UNSAT

STEP 4.: [3] **ENSURE** service air receiver isolation valve **[0-PCV-33-4]**,CLOSED. ***Cue:*** ***When operator locates 0-PCV-33-4 state limit switch actuator arm is touching the lower limit switch.*** ***If they look at the Handswitch; state: GREEN light is ON and RED light is OFF.*** STANDARD: The operator checks 0-PCV-33-4 and determines that it is closed by either the green local indicating light or the stem down on the valve. COMMENTS:	___ SAT ___ UNSAT
STEP 5.: [4] **ENSURE** compressor trip signals RESET, as follows: a. **DEPRESS [0-HS-32-25B]** to reset air compressor trip signals. ***Cue:*** ***0-HS-32-25B is depressed.*** STANDARD: Operator depresses 0-HS-32-25B to reset air comp trip signals. **This step is critical to reset the compressor trips.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 6. b. **CHECK** air compressor A LOW OIL PRESSURE, HIGH OIL TEMPERATURE, and HIGH DISCHARGE AIR PRESSURE trip lights DARK. ***Cue:*** ***Trip lights are dark.*** STANDARD: Operator checks comp A LOW OIL PRESSURE, HIGH OIL TEMPERATURE, and HIGH DISCHARGE AIR PRESSURE trip lights dark. COMMENTS:	___ SAT ___ UNSAT

STEP 7.: c. **CHECK** air compressor B LOW OIL PRESSURE, HIGH OIL TEMPERATURE, and HIGH DISCHARGE AIR PRESSURE trip lights DARK. ***Cue:*** ***Trip lights are dark.*** STANDARD: Operator checks comp B LOW OIL PRESSURE, HIGH OIL TEMPERATURE, and HIGH DISCHARGE AIR PRESSURE trip lights dark. COMMENTS:	___ SAT ___ UNSAT
STEP 8.: **[5]** **PLACE** Air Comp A AUTO/HAND switch, **[0-HS-32-25D]**, in HAND. ***Cue:*** ***0-HS-32-25D is in hand position.*** STANDARD: Operator places 0-HS-32-25D in HAND position. **This step is critical to allow manual start of air compressor.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 9.: **[6]** Place Air Comp B AUTO/HAND switch, **[0-HS-32-26A]**, in HAND. ***Cue:*** ***0-HS-32-26A is in hand position.*** STANDARD: Operator places 0-HS-32-26A in HAND position. **This step is critical to allow manual start of air compressor.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**

STEP 10.: [7] **PLACE [HS-32-25A]** in Position 1(AB Position). ***Cue:*** ***HS-32-25A is placed in position 1.*** STANDARD: Operator places HS-32-25A in position 1. COMMENTS:	___ SAT ___ UNSAT
STEP 11.: [8] **ENSURE [0-HS-32-25F]** for compressor A in PULL TO START. ***Cue:*** ***0-HS-32-25F is in PULL TO START.*** STANDARD: Operator places 0-HS-32-25F for comp A in PULL TO START position. **Step is critical to allow manual start of the air compressor.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 12.: [9] **DEPRESS [0-HS-32-25E]** to start Air Compressor A. ***Cue:*** ***0-HS-32-25E is depressed and you hear a compressor start*** STANDARD: Operator depresses 0-HS-32-25E to start comp A. **This step is critical to manual start air compressor.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**

STEP 13.: **[10]** **PLACE [0-HS-32-43A]** and **[0-HS-32-43B]** in ON to full load Air Compressor A. ***Cue:*** ***0-HS-32-43A and 0-HS-32-43B are in the ON position and comp A is fully loaded.*** STANDARD: Operator places 0-HS-32-43A and 0-HS-32-43B in ON position to fully load comp A. **This step is critical to manually load air compressor.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 14.: **[11]** **ENSURE [0-HS-32-26D]** for compressor B in PULL TO START. ***Cue:*** ***0-HS-32-26D is in PULL TO START.*** STANDARD: Operator places 0-HS-32-26D for comp B in PULL TO START position. COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 15.: **[12]** **DEPRESS [0-HS-32-26B]** to start comppressor B. ***Cue:*** ***0-HS-32-26B is depressed and you hear a compressor start.*** STANDARD: Operator depresses 0-HS-32-26B to start comp B. **This step is critical to start of air compressor.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**

STEP 13.: **[10]** **PLACE [0-HS-32-43A]** and **[0-HS-32-43B]** in ON to full load Air Compressor A. ***Cue:*** ***0-HS-32-43A and 0-HS-32-43B are in the ON position and comp A is fully loaded.*** STANDARD: Operator places 0-HS-32-43A and 0-HS-32-43B in ON position to fully load comp A. **This step is critical to manually load air compressor.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 14.: **[11]** **ENSURE [0-HS-32-26D]** for compressor B in PULL TO START. ***Cue:*** ***0-HS-32-26D is in PULL TO START.*** STANDARD: Operator places 0-HS-32-26D for comp B in PULL TO START position. COMMENTS:	___ SAT ___ UNSAT This Step is critical. *
STEP 15.: **[12]** **DEPRESS [0-HS-32-26B]** to start comppressor B. ***Cue:*** ***0-HS-32-26B is depressed and you hear a compressor start.*** STANDARD: Operator depresses 0-HS-32-26B to start comp B. **This step is critical to start of air compressor.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**

STEP 16.: **[13]** **PLACE [0-HS-32-38A]** and **[0-HS-32-38B]** in ON position to full load Air Compressor B. ***Cue:*** ***0-HS-32-38A and 0-HS-32-38B are in the ON position and comp B is fully loaded.*** STANDARD: Operator places 0-HS-32-38A and 0-HS-32-38B in ON position to fully load comp B. **This step is critical to manually load air compressor.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 17.: **[14]** **CHECK** operation of comps A and B: A. Comp A oil press on 0-PI-32-40 between 15 and 40 psig. B. Comp A cooling water flow indicated on 0-FG-32-44B. C. Comp B oil press on 0-PI-32-35 between 15 and 40 psig. D. Comp B cooling water flow indicated on 0-FG-32-24B. ***Cue:*** ***Oil pressure for both compressors is app. 35 psig*** ***Cooling water rotometer is turning on both compressors.*** STANDARD: Operator checks oil pressure for both compressors and checks cooling water flow indicated for both compressors. [EPM-4 implies these four items must be done in sequence] COMMENTS:	___ SAT ___ UNSAT
STEP 18.: **[15]** **MAINTAIN** air pressure in control air receiver tanks between 80 and 100 psig. ***Cue:*** ***Air pressure is 90 psig and holding at this time.*** STANDARD: Operator monitors and maintains air pressure in receiver tanks between 80 and 100 psig. COMMENTS:	___ SAT ___ UNSAT

STEP 19.:	Inform the U1 CRO that C & S air compressors A and B have been restarted and that air pressure is recovering at this time.	___ SAT ___ UNSAT
STANDARD:	Operator informs the U1 CRO that C & S air compressor(s) A and B have been restarted and that air pressure is recovering at this time.	
COMMENTS:		Stop Time____

End of JPM

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Approximately 45 minutes ago both units experienced a loss of offsite power. All D/Gs started and tied to the board as expected.

All shutdown boards are energized from the D/Gs at this time.

The Aux. Bldg. AUO is responding to the Aux. Air Compressors, but has been unable to get them started at this time.

The operator has verified 1A2-A and 1B1-B shutdown boards are energized and that Compt 3D breaker, on both boards, is racked in and green light LIT.

0-FCV-67-205 & 208 are open.

INITIATING CUES:

You are the U1 Turb. Bldg AUO and the U1 CRO has directed you to go to the Control & Service Air compressors, MANUALLY start the compressors AND verify loading USING EA-32-2.

When you have performed the procedure and pressure is returning, notify the U1 CRO.

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT

EOI PROGRAM MANUAL

EMERGENCY ABNORMAL PROCEDURE

EA-32-2

ESTABLISHING CONTROL AND SERVICE AIR

Revision 2

QUALITY RELATED

PREPARED/PROOFREAD BY: CECIL DYER DATE: 9/17/97

RESPONSIBLE ORGANIZATION: OPERATIONS

APPROVED BY: ORIGINAL SIGNED BY O. D. HAYES DATE: 9/18/97

EFFECTIVE DATE: 9/30/97

VERIFICATION DATE: 9/17/97

VALIDATION DATE: N/A

REVISION DESCRIPTION: Section 4.2 step 7 deleted C compressor from position-1, also step 16 deleted in accordance with DCN M12611A.

1.0 PURPOSE

To establish control and service air following restoration of AC power to 480 V Shutdown Boards 1A2-A and 1B1-B, which supply Control and Service Air Compressors A and B.

2.0 SYMPTOMS AND ENTRY CONDITIONS

2.1 Entry Conditions

A. ECA-0.0, Loss of All AC Power.

3.0 PRECAUTIONS AND LIMITATIONS

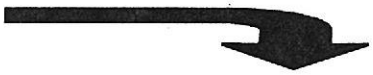
3.1 Precautions

A. If the accountability siren sounds, the operator should continue performing this procedure. The SM will remain aware of procedure progress and location of performing personnel.

4.0 OPERATOR ACTIONS

4.1 Section Applicability

1. **IF** starting and placing in service with system partially or fully depressurized,
   THEN
   GO TO Section 4.2. ☐



2. **IF** aligning control and service air to supply auxiliary air,
   THEN
   GO TO Section 4.3. ☐

3. **IF** loading air compressor(s) on hand control,
   THEN
   GO TO Section 4.4. ☐

4. **RETURN TO** procedure and step in effect. ☐

4.2 Startup With System Partially or Fully Depressurized

1. **CHECK** the following equipment power supplies AVAILABLE:

CONTROL AND SERVICE AIR COMPRESSOR	SUPPLIED BY 480 V SHUTDOWN BOARD	COMPARTMENT	AVAILABLE √
A	1A2-A	3D	☐
B	1B1-B	3D	☐

2. **CHECK** pressure in Control Air Receivers 1 and 2. ☐

3. **ENSURE** service air receiver isolation valve **[0-PCV-33-4]** CLOSED. ☐

4. **ENSURE** compressor trip signals RESET, as follows:

   a. **DEPRESS [0-HS-32-25B]** to reset air compressor trip signals. ☐

   b. **CHECK** Air Compressor A trip lights DARK:

   - Low OIL PRESSURE ☐
   - High OIL TEMPERATURE ☐
   - High DISCHARGE AIR PRESSURE. ☐

   c. **CHECK** Air Compressor B trip lights DARK:

   - Low OIL PRESSURE ☐
   - High OIL TEMPERATURE ☐
   - High DISCHARGE AIR PRESSURE. ☐

4.2 Startup With System Partially or Fully Depressurized (Continued)

5. **PLACE** Air Compressor A AUTO/HAND switch **[0-HS-32-25D]** in HAND. ☐

6. **PLACE** Air Compressor B AUTO/HAND switch **[0-HS-32-26A]** in HAND. ☐

7. **PLACE [HS-32-25A]** in Position 1 (AB). ☐

8. **ENSURE [0-HS-32-25F]** for Air Compressor A in PULL TO START. ☐

9. **DEPRESS [0-HS-32-25E]** to start Air Compressor A. ☐

10. **PLACE [0-HS-32-43A]** and **[0-HS-32-43B]** in ON to fully load Air Compressor A. ☐

11. **ENSURE [0-HS-32-26D]** for Air Compressor B in PULL TO START. ☐

12. **DEPRESS [0-HS-32-26B]** to start Air Compressor B. ☐

13. **PLACE [0-HS-32-38A]** and **[0-HS-32-38B]** in ON to fully load Air Compressor B. ☐

4.2 Startup With System Partially or Fully Depressurized (Continued)

14. **CHECK** operation of Air Compressors A and B:

    a. Air Compressor A oil pressure between 15 and 40 psig on **[0-PI-32-40]** ☐

    b. Air Compressor A cooling water flow INDICATED on **[0-FG-32-44B]** ☐

    c. Air Compressor B oil pressure between 15 and 40 psig on **[0-PI-32-35]** ☐

    d. Air Compressor B cooling water flow INDICATED on **[0-FG-32-24B]**. ☐

15. **MAINTAIN** air pressure in receiver tanks between 80 psig and 100 psig. ☐

16. **GO TO** Section 4.1, step in effect. ☐

END OF SECTION

4.3 Aligning Control and Service Air to Supply Auxiliary Air

NOTE [FCV-32-82] and [FCV-32-85] isolate auxiliary air from control air between 66.5 psig and 71.5 psig.

1. **ALIGN** control and service air to supply Train A auxiliary air as follows: [Aux Bldg, elev 734, Panel 0-L-321]

   a. **NOTIFY** Unit SRO Auxiliary Control Air Compressor A-A being placed in standby. ☐

   b. **ENSURE** Train A control air supply [0-FCV-32-82] OPEN. ☐

   c. **PLACE** AUTO/OFF/HAND handswitch [0-HS-32-60B] in AUTO. ☐

   d. **ENSURE** safe stop pushbutton [0-HS-32-60E] PULLED OUT. ☐

2. **ALIGN** control and service air to supply Train B auxiliary air as follows: [Aux Bldg, elev 734, Panel 0-L-322]

   a. **NOTIFY** Unit SRO Auxiliary Control Air Compressor B-B being placed in standby. ☐

   b. **ENSURE** Train B control air supply [0-FCV-32-85] OPEN. ☐

   c. **PLACE** AUTO/OFF/HAND handswitch [0-HS-32-86B] in AUTO. ☐

   d. **ENSURE** safe stop pushbutton [0-HS-32-86E] PULLED OUT. ☐

3. **GO TO** Section 4.1, step in effect. ☐

END OF SECTION

4.4 Loading Air Compressors on Hand Control

1. **LOAD** desired control and service air compressor(s) on hand control as follows:

   a. **PLACE** hand loading panel switch **[HS-32-125]** in OFF. (disables auto sequence relay) ☐

   b. **PLACE** half load handswitch in ON:

COMPRESSOR	HALF LOAD HANDSWITCH	ON √
A	HS-32-43A	☐
B	HS-32-38A	☐

   c. **PLACE** full load handswitch in ON:

COMPRESSOR	FULL LOAD HANDSWITCH	ON √
A	HS-32-43B	☐
B	HS-32-38B	☐

   d. **CONTROL** loading to maintain desired air pressure between 80 and 100 psig. ☐

2. **GO TO** Section 4.1, step in effect. ☐

END OF TEXT

5.0 REFERENCES

5.1 Drawings

A. 45N749-2, 480 V Shutdown Board 1A2-A Single Line.

B. 45N779-6, 480 V Shutdown Board Auxiliary Power Schematic.

SEQUOYAH NUCLEAR PLANT
JOB PERFORMANCE MEASURE

B.1.k JPM 66

Control S/G PORVs from the Aux. Control Room

Original Signatures on File

PREPARED/ REVISED BY: _____ Date/ _____

VALIDATED BY: * _____ Date/ _____

APPROVED BY: _____ Date/ _____
(Operations Training Manager)

CONCURRED: ** _____ Date/ _____
(Operations Representative)

* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.
** Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

NUCLEAR TRAINING

REVISION/USAGE LOG

Revision Number	Description Of Revision	V	Date	Pages Affected	Prepared/ Revised By:
5	Transfer from WP. Minor enhancements due to AOI-27 Rev change	N	8/26/94	All	HJ Birch
6	Incorp previous pen/ink which modified init cues to ensure all 4 S/G PORVs are opened as JPM steps imply..Chg from AOI-27 to AOP-C.04. Added Trip Hazard caution	N	3/12/96	4,5,6	HJ Birch
pen/ink	Revision to AOP-C.04 had no impact. Revised K/A ratings. Reformatted critical steps	N	9/22/98	All	JP Kearney
pen/ink	Incorporate performance comment. Change Initial conditions to reference Thot rather than Tavg.	N	10/25/99	4	SR Taylor
7	Made changes per revision 3 of AOP-C.04 to allow manual control of S/G atmospheric relief valves to obtain steady cooldown rate.	Y	12/20/00	All	W. R. Ramsey
8	Made changes per recent revisions to AOP-C.04; Changes did not impact flow of the JPM	N	8/16/02	4, 7	J P Kearney
9	Incorporated JPM comments and procedure changes	N	9/15/2003	All	G S Poteet
10	Updated to current revision.	N	9/15/04	All	MG Croteau
11	Updated to current revision.	N	10/30/05	All	MG Croteau
12	Updated to current revision. Minor format changes. Made JPM step 7 non- critical and step 8 critical.	N	2/6/07	All	RH Evans

V - Specify if the JPM change will require another validation (Y or N).
See cover sheet for criteria.

SEQUOYAH NUCLEAR PLANT
RO/SRO
JOB PERFORMANCE MEASURE

Task:

Control S/G PORVs from the Aux. Control Room

JA/TA TASK #: 0390080101 **(RO)**

K/A Ratings:

068AA1.01 (4.3/4.5)
068AA2.08 (3.2/3.4)
068AK3.06 (3.9/4.3)

Task Standard:

S/G Power Operated Relief Valves have been opened and acceptable RCS cooldown rate established.

Evaluation Method: Simulator _____ In-Plant ___X___

==========

Performer: _____
NAME

Start Time _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____ Finish Time _____

Evaluator: _____/_____
SIGNATURE DATE

==========

COMMENTS

SPECIAL INSTRUCTIONS TO EVALUATOR:

1. Sequenced steps identified by an "s"
2. **SM approval will be required to enter the "Trip Hazard Zone" in the Vital Battery Rm and Vital Inverter area.**
3. Any UNSAT requires comments
4. This JPM may be simulated in the plant or preferably from the simulator backup control room. This will allow the operator to actually manipulate the ATM Relief valve controllers. Cues for instrument feedback, S/G pressure and RCS cooldown rate will still be required.

Validation Time: CR. _____ **Local** 15 minutes

Tools/Equipment/Procedures Needed:
AOP-C.04, section 2.2

References:

	Reference	Title	Rev No.
A.	AOP-C.04	Control Room Inaccessibility	13

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READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be simulated for this JPM. **WHEN ENTERING A UNIT TRIP HAZARD ZONE, ENSURE YOU DO NOT TOUCH ANY SWITCHES WITHIN THAT ZONE.** I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

1. There has been a fire in the spreader room, Unit 1 has been tripped, the main control room has been abandoned per AOP-C.04, "Control Room Inaccessibility".
2. Unit 1 is currently being maintained in HOT STANDBY from the Aux. Control Room.
3. All controls have been placed in auxiliary mode.
4. S/G pressures are at 1005 psig and Thot is ≈ 547°F and stable.
5. The source range monitor in the Aux. C.R. is in service.
6. The RCS has been borated to the COLD SHUTDOWN, Xenon-free condition.
7. RCPs are off.

INITIATING CUES:

1. It has been determined to cool the plant down to Cold Shutdown due to extensive damage in the spreader room.
2. You are the Unit 1 OATC and the US directs you to initiate cooldown at ≈50°F/Hr in accordance with AOP-C.04, Section 2.2, step 9.
3. Notify US when cooldown established.

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
Evaluator Note: SGs 1 & 2 are feed with 1A-A MDAFWPp; 3 & 4 with 1B-B MDAFWPp. The operator may chose to use these combinations making level control simpler due to the level controller locations.	
STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a copy of AOP-C.04, Section 2.2 and refers to step 9. COMMENTS:	___ SAT ___ UNSAT Start Time____
STEP 2: **[9]** **INITIATE** RCS cooldown to approximately 450°F. STANDARD: N/A, this will be satisfied in JPM step 7 after PORVs adjusted. COMMENTS: **NOTE: JPM Steps 3 through 6 give specifics for each S/Gs PORV, the steps do not have to be performed in any particular sequence.** **NOTE: Operator may elect to control S/G PORVs in manual to establish a steady cooldown rate.**	
EVALUATOR NOTE Steps 3 through 6 are part of procedure step 9.a.	
STEP 3: a. **ADJUST** S/G atmospheric relief valve controllers [L-10] to begin dumping steam. Lower pressure setpoint on PIC-1-6C or PLACE PIC-1-6C in manual and slowly increase demand to open valve slightly (less than 20% demand). (SG-1 Atm Relief) ***Cue:*** ***If operator Rotates thumbwheel up, state that setpoint is increasing, output decreasing*** ***Cue:*** ***IF operator Rotates thumbwheel down State:*** ***1. Controller output has increased.*** ***2. Indicated S/G Pressure currently 940 psig.*** ***Cue:*** ***IF operator goes to manual and increases demand:*** ***1. Controller output has increased.*** ***2. Indicated S/G Pressure currently 940 psig.*** STANDARD: Operator controls 1-PIC-1-6C until setpoint is below actual pressure and output increases or PORV is manually opened a slight amount. **This step is critical to open the atmospheric relief valve.** COMMENTS:	___ SAT ___ UNSAT **Critical Step**

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
STEP 4:	Lower pressure setpoint on PIC-1-13C or PLACE PIC-1-13C in manual and slowly increase demand to open valve slightly (less than 20% demand). (SG-2 Atm Relief)	___ SAT ___ UNSAT **Critical Step**
Cue:	***If operator Rotates thumbwheel up, state that setpoint is increasing, output decreasing***	
Cue:	***IF operator Rotates thumbwheel down State:*** ***1. Controller output has increased.*** ***2. Indicated S/G Pressure currently 960 psig.***	
Cue:	***IF operator goes to manual and increases demand:*** ***1. Controller output has increased.*** ***2. Indicated S/G Pressure currently 960 psig.***	
STANDARD:	Operator controls 1-PIC-1-13C until setpoint is below actual pressure and output increases or PORV is manually opened a slight amount. **This step is critical to open the atmospheric relief valve.**	
COMMENTS:		
STEP 5:	Lower pressure setpoint on PIC-1-24C or PLACE PIC-1-24C in manual and slowly increase demand to open valve slightly (less than 20% demand). (SG-3 Atm Relief)	___ SAT ___ UNSAT **Critical Step**
Cue:	***If operator Rotates thumbwheel up, state that setpoint is increasing, output decreasing***	
Cue:	***IF operator Rotates thumbwheel down State:*** ***1. Controller output has increased.*** ***2. Indicated S/G Pressure currently 940 psig.***	
Cue:	***IF operator goes to manual and increases demand:*** ***1. Controller output has increased.*** ***2. Indicated S/G Pressure currently 940 psig.***	
STANDARD:	Operator controls 1-PIC-1-24C until setpoint is below actual pressure and output increases or PORV is manually opened a slight amount. **This step is critical to open the atmospheric relief valve.**	
COMMENTS:		

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
STEP 6:	Lower pressure setpoint on PIC-1-31C or PLACE PIC-1-31C in manual and slowly increase demand to open valve slightly (less than 20% demand). (SG-4 Atm Relief)	___ SAT ___ UNSAT **Critical Step**
Cue:	***If operator Rotates thumbwheel up, state that setpoint is increasing, output decreasing***	
Cue:	***IF operator Rotates thumbwheel down State:*** ***1. Controller output has increased.*** ***2. Indicated S/G Pressure currently 980 psig.***	
Cue:	***IF operator goes to manual and increases demand:*** ***1. Controller output has increased.*** ***2. Indicated S/G Pressure currently 980 psig.***	
STANDARD:	Operator controls 1-PIC-1-31C until setpoint is below actual pressure and output increases or PORV is manually opened a slight amount. **This step is critical to open the atmospheric relief valve.**	
COMMENTS:		
STEP 7:	b. **MONITOR** cooldown rate USING Appendix O.	___ SAT ___ UNSAT
Cue:	***Inform operator that Tsat has changed from 547°F to 536°F in the last 15 minutes.***	
Cue:	***If Thot indications are referred to for temperature determination, state the Thot has changed from 547°F to 545°F in the last 15 minutes.***	
STANDARD:	Operator refers to Appendix O and MONITORS RCS temperature Operator should use temperature gradients on the S/G pressure scales 1-PI-1-1C or 8C for Tsat)	
COMMENTS:		
EVALUATOR NOTE	Incorrect use of Thot indication will result in erroneous cooldown determination in the following step.	
STEP 8:	Inform the US a cooldown rate of ≈44°F/hr has been established.	___ SAT
STANDARD:	Operator informs the US a cooldown rate of ≈44°F/hr (± 10°F) has been established. **This step is critical to establish desired cooldown rate.**	___ UNSAT **Critical Step**
COMMENTS:		Stop Time____

END OF JPM

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

There has been a fire in the spreader room, Unit 1 has been tripped, the main control room has been abandoned per AOP-C.04, "Control Room Inaccessibility".

Unit 1 is currently being maintained in HOT STANDBY from the Aux. Control Room. All controls have been placed in auxiliary mode.

S/G pressures are at 1005 psig and Thot is ≈ 547°F and stable.

The source range monitor in the Aux. C.R. is in service.

The RCS has been borated to the COLD SHUTDOWN, Xenon-free condition.

RCPs are off.

INITIATING CUES:

It has been determined to cool the plant down to Cold Shutdown due to extensive damage in the spreader room.

You are the Unit 1 OATC and the US directs you to initiate cooldown at ≈ 50°F/Hr in accordance with AOP-C.04, Section 2.2, step 9.

Notify US when cooldown established.

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT

AOI PROGRAM MANUAL

ABNORMAL OPERATING PROCEDURES

AOP-C.04

SHUTDOWN FROM AUXILIARY CONTROL ROOM

Revision **13**

QUALITY RELATED

PREPARED/PROOFREAD BY: D. A. PORTER

RESPONSIBLE ORGANIZATION: OPERATIONS

APPROVED BY: W. T. Leary

EFFECTIVE DATE: 01/23/07

REVISION DESCRIPTION: Revised to add interim actions for PER 118222 (potential for CCP auto start prior to aligning suction valves). Added step to reset D/G lockout relay (PER 118278)

ANY INTENT CHANGE TO THIS PROCEDURE WHICH IS NOT DIRECTLY RELATED TO A DCN REQUIRES EVALUATION OF FIRE PROTECTION LICENSE CONDITION USING FPDP-3.

1.0 PURPOSE

This procedure provides actions necessary for Control Room abandonment, plant cooldown from the Auxiliary Control Room, and return to Main Control Room operation. This AOP may be used to transfer control to ACR on one unit or both units.

This procedure is relied upon for Appendix R Safe Shutdown for Control Building fires.

Appendix A and B contain staffing requirements for dual unit or single unit MCR abandonment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

2.0 OPERATOR ACTIONS

CAUTION **A major fire in spreading room could result in collapse of the MCR floor. If entering this AOP for a spreading room fire, both units should abandon the MCR.**

NOTE Transferring controls on only one unit will impact control of common systems (ERCW, D/G, and Train B CCS) for the opposite unit.

1. **DETERMINE** required actions:

IF...	GO TO SECTION	PAGE
Abandoning the Main Control Room	2.1	4
Performing Plant Cooldown from Auxiliary Control Room	2.2	25
Returning to Main Control Room operation	2.3	40

END OF SECTION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

2.2 Plant Cooldown from Auxiliary Control Room (cont'd)

CAUTION **The maximum cooldown rate for the RCS should not exceed 100°F in any one hour period. (TS 3.4.9.1)**

NOTE Plant cooldown should be performed using a continuous rate as much as possible rather than steps. S/G atmospheric relief valve controllers may be placed in manual to provide a more constant steam flow.

9. **INITIATE** RCS cooldown to approximately 450°F:

   a. **ADJUST** S/G atmospheric relief valve controllers [L-10] to begin dumping steam.

   a. **OPERATE** S/G #1 and 4 atmospheric relief valves locally:

      1) **DISPATCH** personnel to perform Appendix K, Local Control of S/G Atmospheric Reliefs.

      2) **PLACE** S/G #1 and 4 atmospheric relief valve controllers in MANUAL and
      ADJUST controller output to zero.

   b. **MONITOR** cooldown rate
   USING Appendix O.

APPENDIX O

RCS / PZR COOLDOWN RATE DETERMINATION

Page 1 of 3

Unit _____

TIME/DATE (Monitoring cooldown every 15 minutes is recommended)	RCS COOLDOWN RATE (Tech Spec Limit is 100°F/hr)		PRESSURIZER COOLDOWN RATE (Tech Spec Limit is 200F/hr)			RCS TEMP PRESS within limits of TI-28 Fig. A.11.1		RCS SUBCOOLING (>40F required)	
	RCS TEMP (°F) ◆	HOURLY ΔT(°F)	PZR PRESS (psig) ♣	Pzr T-sat	HOURLY ΔT(°F)	YES	NO	Highest T-hot (°F)	SUBCOOLING [Pzr T-sat – Highest T-hot]
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◆ To monitor RCS cooldown rate, any one of the following can be used (indicate choice):

Loop 1		Loop 2		Loop 3		Loop 4	
Tsat from PI-1-1C	Thot (if RCP 1 running)	Tsat from PI-1-8C	Thot (if RCP 2 running)	Tsat from PI-1-19C	Thot (if RCP 3 running)	Tsat from PI-1-26C	Thot (if RCP 4 running)

♣ Use PI-68-336C or PI-68-337C (indicate choice).