PSEG NUCLEAR L.L.C

Salem Unit 1

SALEM OPERATIONS

S1.OP-SO.CVC-0012(Q) - Rev. 31

CVCS DEMINERALIZER - NORMAL OPERATION

ADHERENCE LEVEL: LEVEL 2 - REFERENCE USE

Biennial Review Performed: Yes ☐ No ☒

Configuration Change Packages and Affected Document Numbers incorporated into this revision:

- None

OTSCs incorporated into this revision:

- 30A

Operational Experience (OPEX) incorporated into this revision:

- None

Revision Summary	
Location	**Description of Change**
Entire Procedure	• Converted to updated Word Template.
3.1.8 & 3.2.1	• Added the requirement of a timing device. [70204837, OTSC 30A]
4.7.17, 4.8.7, 4.9.7, 4.10.4.4, 4.10.5.7, 4.10.5.14, 4.11.8.	• Revised to give throttling direction [70204837, OTSC 30A]
4.3.3	• Revised to remove deborating bed demin from service only when necessary [70183909]
Attachment 7, Section S	• Revised to allow OPEN or CLOSE IV, dependent on status of Letdown alignment to deborating bed. [70140517]
4.13.16	• Added step to remove deborating demin if no longer needed for reactivity control. [70203096]
4.14.7.12	• Added step to give operator action if sample results not obtained [70204976]
4.14.7.7, 4.14.7.8, 4.14.7.11, Attachment 7 Table 16	• Sections 4.13 and 4.14 update to include a flowpath IV IAW Attachment 7 before placing 1CV27 to FLOW TO DB BED position. Updated Attachment 7, sections N and O by removing 1CV205 IV and added Independent Verification for closing 1CV205 into the main body for each evolution. [CRCA 70174717-0030 (From Unit 2)]
All	• Changed steps in the procedure to refelect the preferred method for operating the CV18 when closing orifice valves are in Auto during normal operations for sections: 4.1.6.c-f, 4.1.19.3-6, 4.2.4.1.c-f, 4.2.15.3-6, 4.7.4.1.c-f, 4.7.16.3-6, 4.10.5.1.c-f, 4.10.5.13.c-f, 4.13.4.3-6, 4.13.13.5-8, 4.14.7.1.c-f, 4.14.7.17.d-g, 4.15.8.7.c-f, 4.15.8.15.c-f, 4.16.6.1.c-f, 4.16.6.10.c-f, Attachment 6 3.c.2.c-f, Attachment 6 14.c-f, Attachment 8 1.c-f, and Attachment 8 9.c-f. [70213017]

IMPLEMENTATION REQUIREMENTS: **Effective Date:**

None

All	• Added Sign Offs with IV underneath for steps requiring Independent Verifications.
2.1.21	• Added precaution associated with the preferred method for operating the CV18 when closing orifice valves is in Audo during normal operations. [70213017]

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1.0 PURPOSE AND SCOPE

1.1 Purpose

1.1.1. To provide instructions necessary to:

1. Borate a Mixed Bed Resin or Cation Bed Resin Demineralizer.
2. Place CVCS Demineralizers in service.
3. Remove CVCS Demineralizers from service.
4. Place a borated Mixed Bed Resin or Cation Bed Resin Demineralizer in service for RCS Chemistry control
5. Coordinate crud burst cleanup during shutdown.

1.2 Scope

1.2.1. CVCS Demineralizer Operations

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

_____2.1.1. When placing a CVCS Demin in service for RCS lithium control the applicable sections of SC.CH-AP.RC-0106(Z), Implementation of Salem Lithium Control Program should be completed as directed by Chemistry.

_____2.1.2. Trending R41D radiation monitor, VCT level, and PZR level should be considered to ensure that any RCS leakage is detected in a timely manner. When leakage is suspected, an RCS Water Inventory Balance should be performed IAW S1.OP-ST.RC-0008(Q), REACTOR COOLANT SYSTEM WATER INVENTORY BALANCE.

_____2.1.3. Changes in RCS pH should be anticipated when placing a Demin with Mixed Bed Resin or Cation Bed Resin in service.

_____2.1.4. To preclude the possibility of a demineralizer bed causing an inadvertent dilution or boration, CVCS blender concentration should be matched to RCS boron concentration.

_____2.1.5. When a Deborating Bed Demin is in service careful consideration should be given when placing another Demin Bed in service which has cooled since it was last in service. The Deborating Bed Demin will absorb more boron due to the cooling effects from placing a colder Demin Bed in service which can produce unexpected reactivity results. **[80062317]**

_____2.1.6. To prevent an inadvertent reactivity event, a Demin with Cation Bed Resin should NOT be placed in service when there is a greater than 25 ppm difference between RCS boron concentration from the last time it was in service without flushing a line volume through demineralizer to ensure water trapped in piping is equalized with RCS for boron. **[C0417]**

_____2.1.7. To prevent an inadvertent reactivity event, with the exceptions discussed in Sections 4.15 and 4.18, a Demin with Mixed Bed Resin is NOT to be placed in service to the VCT until Chemistry has determined that the demin inlet and outlet boron concentrations are within 25 ppm. **[C0417]**

_____2.1.8. Section 4.18 provides guidance on operating Mixed Bed Demins during unit shutdown for RCS cleanup. The guidance contained in Section 4.18 only applies when the plant is in Modes 3, 4, 5, 6 or Defueled.

_____2.1.9. When placing a Cation Bed Demin in service which contains a mixed resin then place in service IAW Sections 4.7, 4.8 or 4.9, as applicable.

_____2.1.10. When borating a Demin, letdown flow should be less than makeup capacity to VCT.

_____2.1.11. During normal operation in Mode 1-4, the maximum Letdown flowrate is that flow which is obtained with a 75 gpm and 45 gpm orifice operating in parallel [nominally 120 (110-130) gpm]. However, Letdown flow should **NOT** be allowed to exceed 130 gpm. When operating with a 75 gpm orifice and 45 gpm orifice in parallel Letdown pressures and temperatures should be closely monitored to ensure flashing in the Letdown line does **NOT** occur.

_____2.1.12. When charging flow is reduced for minimum Letdown, the Letdown Line should be monitored closely for indications of flashing.

_____2.1.13. When re-establishing letdown flow to an out of service Demin Bed, Chemistry should be contacted to evaluate if flushing the Demin Bed to the Waste Holdup Tank is required to minimize CRUD particulate build up on the Reactor Coolant Filter. **[70028170]**

_____2.1.14. When borating a Demin it may become necessary to place Excess Letdown in service IAW S1.OP-SO.CVC-0003(Q), Excess Letdown Flow, to maintain Pressurizer level due to minimum Charging flow requirements. Excess Letdown needs be in service when RCS is at Normal Operating Pressure (NOP) and Normal Operating Temperature (NOT) **AND** minimum letdown is in service, otherwise charging flow will be too low to cool letdown and flashing will occur.

_____2.1.15. When the micron size is changed on newly installed filters, excessive differential pressure may result as a result of particulate buildup. The monitoring of newly installed filters with smaller micron sizes should be increased during initial demineralizer flushes. **[80077626]**

_____2.1.16. The Reactor Coolant Filter should remain in service any time a CVCS Demin is in service. This will minimize the potential for resin introduction into the RCS.

_____2.1.17. When removing CVCS Demin Header from service IAW Section 4.6, the Reactor Coolant Filter should be removed from service, provided RCS chemistry will support it's removal, IAW S1.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection. This will minimize loading and radiation levels on the Reactor Coolant Filter.

_____2.1.18. Demineralizers, when **NOT** in service, are to be administratively controlled by ensuring applicable inlet and outlet valves are closed. Therefore, the CRS/SM should evaluate the need to fill and vent the demineralizer prior to placing the demineralizer in service. The following points should be considered:

_____ • The potential for water hammer.

_____ • The potential to introduce oxygen into the Reactor Coolant System.

_____ • Tagging evolutions or the transition from S1.OP-SO.CVC-0007(Q), Fill and Vent of CVCS.

_____ • The potential for airborne radioactivity. The CVCS Demineralizer vents are hard piped to the in service WHUT which is open to vent through Auxiliary Building floor drains.

_____ • In progress RCS Water Inventory Balance IAW S1.OP-ST.RC-0008(Q), REACTOR COOLANT SYSTEM WATER INVENTORY BALANCE.

_____2.1.19. During the initial fill and vent of a demineralizer following resin replacement, additional fill and vent time (i.e., in excess of the specified minimum fill and vent time) should be considered to ensure the demineralizer is completely filled and vented. Ensuring a demineralizer is completely filled and vented minimizes the possibility of an unexpected drop in VCT level when placing the demineralizer in service.

_____2.1.20. **IF** in Mode 6,
THEN, ensure compliance with S1.OP-ST.ZZ-0007(Q), Refueling Operations/Unborated Water Source Isolation Valves.

_____2.1.21. The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the Letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

2.2 Limitations

2.2.1. Resin damage will occur when CVCS demineralizer inlet temperature exceeds 140°F. 1CV21, LETDOWN DEMIN BYPASS VALVE, when in AUTO will divert to VCT when temperature reaches 136°F as indicated on 1TI 130A.

2.2.2. Design pressure of CVCS Demins is 200 psig.

2.2.3. Maximum design flowrate of a Cation Bed Demin is 75 gpm.

2.2.4. The maximum Letdown flowrate is 180 gpm during RHR Letdown Booster Pump operation.

3.0 PREREQUISITES

3.1 Prerequisities

_____3.1.1. **IDENTIFY** sections of this procedure that are **NOT** to be performed with "N/A".

_____3.1.2. **REVIEW** components "Off Normal and Off Normal Tagged" List(s) for system and support system(s) associated with the evolution to be performed in this procedure.

_____3.1.3. **IF** performing Section 4.18,
THEN ENSURE the plant is in Mode 3, 4, 5, 6 or Defueled.

_____3.1.4. **IF** placing a CVCS Demineralizer in service,
THEN:

_____ 1. **ENSURE** CVC System is available IAW S1.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection.

_____ 2. **ENSURE** Boric Acid Blender is available IAW S1.OP-SO.CVC-0006(Q), Boron Concentration Control.

_____ 3. **ENSURE** CVC Holdup Tanks are available IAW S1.OP-SO.CVC-0004(Q), CVCS Holdup Tank System Operations.

_____ 4. **ENSURE** the Reactor Coolant Filter is in service.

_____ 5. **ENSURE** Chemistry concurrence to place a demineralizer in service is obtained.

_____ 6. **IF** placing any CVCS Demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition,
THEN ENSURE Radiation Protection is available to support the removal of Resin Fill V pit cover (Aux. 122′).

_____3.1.5. **IF** placing a Mixed Bed Demin in service,
THEN:

_____ 1. **NOTIFY** Chemistry to evaluate if flushing the Demin Bed to WHUT is required to minimize CRUD particulate build up on the Reactor Coolant Filter. **[70028170]**

_____ 2. **IF** Chemistry determines flushing of CVCS Demin Bed to WHUT is required,
THEN PERFORM Attachment 6, Flushing CVCS Demin To WHUT.

_____3.1.6. **IF** placing a Cation Bed or Deborating Bed Demin in service,
AND the type of resin in the Demin is unknown or unsure,
THEN CONTACT Chemistry, as required, to determine the type of resin in the Demin.

_____3.1.7. A Pre-Job Brief is conducted IAW HU-AA-1211, Briefings - Pre-Job, Heightened Level of Awareness, Infrequent Plant Activity and Post-Job Briefings.

3.1 (continued)

_____3.1.8. A stopwatch or other accurate timing device will be used in the control room to determine demineralizer usage duration.

3.2 Equipment/Materials Required

_____3.2.1. A Stop Watch or equivalent.

4.0 INSTRUCTIONS

4.1 Borating a Mixed Bed Demin With No Other Mixed Bed Demin In Service

_____4.1.1. **OBTAIN** current RCS boron concentration from Chemistry, **AND RECORD** on Attachment 3.

_____4.1.2. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition, **THEN COMPLETE** Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

_____4.1.3. **ENSURE** Deborating Bed Demineralizers are removed from service IAW Section 4.17.

_____4.1.4. **ENSURE** 1CV21, LETDOWN DEMIN BYPASS, selected to MIXED BED DIVERSION TO VCT.

_____4.1.5. **ENSURE** 1CV27, DEBORATING DEMIN 3-WAY INLET V, in FLOW TO VCT position.

_____4.1.6. **ADJUST** Letdown to 45 gpm by performing the following:

_____ 1. **IF** Normal Letdown is in service, **THEN**:

_____ a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

_____ b. Simultaneously **PERFORM** the following:

_____ (1) **OPEN** 1CV3, LETDOWN ORIFICE ISOLATION, 45 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ c. **IF** controlling Letdown pressure in AUTO,

_____ (1) **PLACE** 1CV18 in AUTO

4.1.6.c (continued)

_____ (2) **CLOSE** 1CV4 **OR** 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (1) **CLOSE** 1CV4 **OR** 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 2. **IF** Letdown is from RHR,
THEN:

_____ a. **THROTTLE** 1CV8, LETDOWN PRESSURE CONTROL VALVE, to reduce letdown flow to 45 GPM.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ 4.1.7. **ENSURE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE is CLOSED.

_____ 4.1.8. **ENSURE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE is CLOSED.

NOTE

_____ When borating a mixed bed demin, letdown flow should be less than makeup capacity to VCT.

CAUTION

_____ Mixed Bed Demineralizer valve manipulations are to be conducted slowly to minimize the potential to move resin out of the demineralizer during the fill and vent.

_____ 4.1.9. **IF** 11 MIXED BED Demin is to be borated,
THEN:

_____ 1. **IF** fill and vent is required (Refer to Step 2.1.18),
THEN:

_____ a. Slowly **THROTTLE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE 3 turns OPEN.

4.1.9.1 (continued)

_____ b. Slowly **OPEN** 11CV234, MB DM VENT for at least 15 minutes, **THEN CLOSE** valve.

_____ 2. Slowly **OPEN** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE

_____ 3. Slowly **OPEN** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____4.1.10. **IF** 12 MIXED BED Demin is to be borated, **THEN**:

_____ 1. **IF** fill and vent is required (Refer to Step 2.1.18), **THEN**:

_____ a. Slowly **THROTTLE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE 3 turns OPEN.

_____ b. Slowly **OPEN** 12CV234, MB DM VENT for at least 15 minutes, **THEN CLOSE** valve.

_____ 2. Slowly **OPEN** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ 3. Slowly **OPEN** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

_____4.1.11. **PLACE** 1CV35, VCT 3 WAY INLET V, in MANUAL/FLOW TO HUT.

_____4.1.12. **PLACE** 1CV21, LETDOWN DEMIN BYPASS VALVE in FLOW TO MIXED BED position **AND PLACE** in AUTO .

_____4.1.13. **IF** Mixed Bed Demin to be borated contains new resin, **THEN**:

_____ 1. **RECORD** Time on Attachment 3, CVCS Demin Borating Record.

_____ 2. **DETERMINE** approximate amount of time required to saturate Mixed Bed Demin with boron IAW Attachment 1, Time Required To Saturate A Mixed Bed Demin.

_____ 3. **WHEN** required amount of time has elapsed, **CONTINUE** with this procedure.

_____4.1.14. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling.

_____4.1.15. **RECORD** results of sample on Attachment 3, CVCS Demin Borating Record.

4.1 (continued)

_____4.1.16. **IF** difference in boron concentration is greater than 25 ppm, **THEN**:

_____ 1. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling (at intervals of 30 minutes or less).

_____ 2. **RECORD** results of samples on Attachment 3, CVCS Demin Borating Record.

_____ 3. **WHEN** difference in boron concentration is less than or equal to 25 ppm, **CONTINUE** with this procedure.

_____4.1.17. **PLACE** 1CV35, VCT 3 WAY INLET V, in FLOW TO VCT position **AND PLACE** in AUTO.

_____4.1.18. **NOTIFY** Chemistry that 11 (12) Mixed Bed Demineralizer is in service.

_____4.1.19. **IF** Normal Letdown is in service, **THEN**:

_____ 1. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

_____ 2. Simultaneously **PERFORM** the following:

_____ a. **OPEN** 1CV4, LETDOWN ORIFICE ISOLATION VALVE, **OR** 1CV5, LETDOWN ORIFICE ISOLATION VLV, 75 GPM Orifice Isolation Valve.

_____ b. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

_____ The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ 3. **IF** controlling Letdown pressure in AUTO,

a. **PLACE** 1CV18 in AUTO

_____ b. **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

4.1.19 (continued)

_____ 4. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ a. **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ b. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ 5. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ 6. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____4.1.20. **IF** Letdown is from RHR,
THEN:

_____ 1. **ADJUST** 1CV8, LETDOWN ISOL FOR RHR, to obtain desired letdown flow.

_____ 2. **ADJUST** Charging flow as necessary to match Letdown flow.

___ ___4.1.21. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification, Section A.
IV

_____4.1.22. **UPDATE** the following Control Room Console Station Aids, as required.

_____ 1. S1-OPA-99-0007, 11 MIXED BED Demineralizer

_____ 2. S1-OPA-99-0008, 12 MIXED BED Demineralizer

4.2 Borating Standby Mixed Bed Demin With A Mixed Bed Demin In Service

_____ 4.2.1. **OBTAIN** current RCS boron concentration from Chemistry, **AND RECORD** on Attachment 3, CVCS Demin Borating Record.

_____ 4.2.2. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition,
THEN COMPLETE Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

_____ 4.2.3. **ENSURE** Deborating Bed Demineralizers are removed from service IAW Section 4.17.

_____ 4.2.4. **ADJUST** Letdown to 45 gpm by performing the following:

_____ 1. **IF** Normal Letdown is in service,
THEN:

_____ a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

_____ b. Simultaneously **PERFORM** the following:

_____ (1) **OPEN** 1CV3, LETDOWN ORIFICE ISOLATION VALVE, 45 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

_____ The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ c. **IF** controlling Letdown pressure in AUTO,

_____ (1) **PLACE** 1CV18 in AUTO

_____ (2) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (1) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

4.2.4.d (continued)

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 2. **IF** Letdown is from RHR,
THEN:

_____ a. **THROTTLE** 1CV8, LETDOWN ISOL FOR RHR, to reduce letdown flow to 45 GPM.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

NOTE

_____ When borating a mixed bed demin, letdown flow should be less than makeup capacity to VCT.

_____4.2.5. **PLACE** 1CV35, VCT 3 WAY INLET V, in MANUAL/FLOW TO HUT.

_____4.2.6. **IF** 11 MIXED BED Demin is to be borated,
THEN:

_____ 1. Slowly **OPEN** 11CV24, 11 MIXED BED Demin Inlet Valve.

_____ 2. **IF** fill and vent is required (Refer to Step 2.1.18),
THEN slowly **OPEN** 11CV234, MB DM VENT for at least 2 minutes, then **CLOSE** valve.

_____ 3. **OPEN** 11CV25, MB DM OUTLET VALVE.

_____ 4. **CLOSE** 12CV25, MB DM OUTLET VALVE.

_____ 5. **CLOSE** 12CV24, MB DM INLET VALVE.

_____4.2.7. **IF** 12 MIXED BED Demin is to be borated,
THEN:

_____ 1. Slowly **OPEN** 12CV24, 12 MIXED BED Demin Inlet Valve.

_____ 2. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 12CV234, MB DM VENT for at least 2 minutes, then **CLOSE** valve.

_____ 3. **OPEN** 12CV25, MB DM OUTLET VALVE.

4.2.7 (continued)

_____ 4. **CLOSE** 11CV25, MB DM OUTLET VALVE.

_____ 5. **CLOSE** 11CV24, MB DM INLET VALVE.

_____4.2.8. **ENSURE** 1CV21, LETDOWN DEMIN BYPASS VALVE, in FLOW TO MIXED BED position **AND PLACE** in AUTO.

_____4.2.9. **IF** Mixed Bed Demin to be borated contains new resin,
THEN:

_____ 1. **RECORD** Time on Attachment 3, CVCS Demin Borating Record.

_____ 2. **DETERMINE** approximate amount of time required to saturate Mixed Bed Demin with boron IAW Attachment 1, Time Required To Saturate A Mixed Bed DeminAttachment 2, Time Required To Saturate Cation Demin (IF Mixed Resin USED).

_____ 3. **WHEN** required amount of time has elapsed, **CONTINUE** with this procedure.

_____4.2.10. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling.

_____4.2.11. **RECORD** results of sample on Attachment 3, CVCS Demin Borating Record.

_____4.2.12. **IF** difference in boron concentration is greater than 25 ppm,
THEN:

_____ 1. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling (at intervals of 30 minutes or less).

_____ 2. **RECORD** results of samples on Attachment 3, CVCS Demin Borating Record.

_____ 3. **WHEN** difference in boron concentration is less than or equal to 25 ppm, **CONTINUE** with this procedure.

_____4.2.13. **PLACE** 1CV35, VCT 3 WAY INLET V, in FLOW TO VCT position **AND PLACE** in AUTO.

_____4.2.14. **NOTIFY** Chemistry that 11 (12) Mixed Bed Demineralizer is in service.

_____4.2.15. **IF** Normal Letdown is in service,
THEN:

_____ 1. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

4.2.15 (continued)

_____ 2. Simultaneously **PERFORM** the following:

_____ a. **OPEN** 1CV4, LETDOWN ORIFICE ISOLATION VALVE, **OR** 1CV5, LETDOWN ORIFICE ISOLATION VLV.

_____ b. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

_____ The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ 3. **IF** controlling Letdown pressure in AUTO,

_____ a. **PLACE** 1CV18 in AUTO

_____ b. **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ 4. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ a. **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ b. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ 5. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ 6. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____4.2.16. **IF** Letdown is from RHR,
THEN:

_____ 1. **ADJUST** 1CV8, LETDOWN ISOL FOR RHR, to obtain desired letdown flow.

_____ 2. **ADJUST** Charging flow as necessary to match Letdown flow.

4.2 (continued)

_____4.2.17. **IF** a Mixed Bed Demin was placed in service for RCS chemistry control in Section 4.5,
THEN:

_____ 1. **DETERMINE** amount of time Mixed Bed Demin is to remain in service using gallons recorded in Step 4.5.3 and Letdown flow AND RECORD below:

_____ *gallons* ÷ _____ $\frac{gallons}{minute}$ = _____ *minutes*

_____ 2. **WHEN** the Standby Mixed Bed Demin has been in service for the time recorded in Step 4.2.17.1, **REMOVE** it from service as follows:

_____ a. **IF** removing 11 MIXED BED Demin from service,
THEN:

_____ (1) Slowly **OPEN** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

_____ (2) Slowly **OPEN** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ (3) **CLOSE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ (4) **CLOSE** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____ b. **IF** removing 12 MIXED BED Demin from service,
THEN:

_____ (1) Slowly **OPEN** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____ (2) Slowly **OPEN** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ (3) **CLOSE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ (4) **CLOSE** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

___ ___4.2.18. **IF** 11 MIXED BED Demin is in service,
IV **THEN DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification, Section B.

___ ___4.2.19. **IF** 12 MIXED BED Demin is in service,
IV **THEN DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification, Section C.

4.2 (continued)

_____4.2.20. **UPDATE** the following Control Room Console Station Aids, as required:

_____ 1. S1-OPA-99-0007, 11 MIXED BED Demineralizer

_____ 2. S1-OPA-99-0008, 12 MIXED BED Demineralizer

4.3 Placing a Borated Mixed Bed Demin In Service With No Other Mixed Bed Demin In Service

_____4.3.1. **OBTAIN** current RCS boron concentration from Chemistry**, AND RECORD** on Attachment 3, CVCS Demin Borating Record.

_____4.3.2. **IF** Mixed Bed Demin contains new resin, **OR** CRS/SM or Chemistry determines present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Mixed Bed Demin was last in service,
THEN TERMINATE performance of this section, **AND PLACE** Mixed Bed Demin in service IAW Section 4.1 **OR** 4.2. **[C0417]**

_____4.3.3. **IF** Deborating Bed Demin fill and vent is required,
OR
IF the SM/CRS or Chemistry determines present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service,
THEN ENSURE Deborating Bed Demineralizers are removed from service IAW Section 4.17.

_____4.3.4. **ENSURE** 1CV21, LETDOWN DEMIN BYPASS, selected to MIXED BED DIVERSION TO VCT.

_____4.3.5. **ENSURE** 1CV27, DEBORATING DEMIN 3-WAY INLET V, in FLOW TO VCT position.

_____4.3.6. **ENSURE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE is CLOSED.

_____4.3.7. **ENSURE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE is CLOSED.

CAUTION

_____ Mixed Bed Demineralizer valve manipulations are to be conducted slowly to minimize the potential to move resin out of the demineralizer during the fill and vent.

_____4.3.8. **IF** placing 11 MIXED BED Demin in service,
THEN:

_____ 1. **ENSURE** 12CV24, MB DM INLET VALVE, is closed.

_____ 2. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN:

_____ a. Slowly **THROTTLE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE 3 turns OPEN.

_____ b. Slowly **OPEN** 11CV234, MB DM VENT for at least 15 minutes, **THEN CLOSE** valve.

_____ 3. Slowly **OPEN** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE

4.3.8 (continued)

_____ 4. Slowly **OPEN** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____ 5. **PLACE** 1CV35, VCT 3 WAY INLET V, in MANUAL/FLOW TO HUT.

_____ 6. **PLACE** 1CV21, LETDOWN DEMIN BYPASS VALVE in FLOW TO MIXED BED position **AND PLACE** in AUTO.

_____ 7. **WHEN** 500-1000 gallons has been flushed through the demineralizer, **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO VCT position **AND PLACE** in AUTO . **[CAPR 70062042]**

CAUTION

_____ Maximum Letdown flow rate is 130 gpm. Flow may be restricted by throttling the Mixed Bed Demineralizer outlet valve(s) to maintain letdown flow rate less than or equal to 130 gpm when RCS cleanup is required.
_____ When throttling CV25 to control letdown flow all valve manipulations must be performed slowly and coordinated with adjustments of the 1CV18.
_____ When throttling CV25 monitor 1PI136 to ensure pressure does **NOT** exceed 165 psig.

_____ 8. **IF** Letdown flow is greater than 130 gpm, **THEN COORDINATE** the following:

_____ a. **MONITOR** 1PI136 to ensure pressure does **NOT** exceed 165 psig.

_____ b. Slowly **THROTTLE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE, to limit Letdown flow to less than or equal to 130 gpm.

NOTE

_____ 1CV18 should be adjusted to maintain backpressure greater than saturation pressure for Letdown Heat Exchanger Inlet Temperature (T0127A, on Plant Computer).

_____ c. **PERFORM** the following:

_____ (1) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as required to maintain letdown pressure approximately 300 psig OR as required for present plant conditions as directed by the CRS/SM. **[C0417]**

_____ (2) **IF** present plant conditions permit, **THEN PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in AUTO.

4.3.8 (continued)

_____ (3) **IF** 1CV18, LETDOWN PRESSURE CONTROL VALVE is **NOT** placed in AUTO,
THEN UPDATE WCM to reflect position of 1CV18, LETDOWN PRESSURE CONTROL VALVE.

_____ d. **UPDATE** WCM to reflect position of 11CV25, MB DM OUTLET VALVE.

_____ e. **INITIATE** a NOTF to investigate high Letdown flow rate.

_____4.3.9. **IF** placing 12 MIXED BED Demin in service,
THEN:

_____ 1. **ENSURE** 11CV24, 11 MB DM INLET VALVE, is closed.

_____ 2. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN:

_____ a. Slowly **THROTTLE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE 3 turns OPEN.

_____ b. Slowly **OPEN** 12CV234, MB DM VENT for at least 15 minutes, **THEN CLOSE** valve.

_____ 3. Slowly **OPEN** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ 4. Slowly **OPEN** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

_____ 5. **PLACE** 1CV35, VCT 3 WAY INLET V, in MANUAL/FLOW TO HUT.

_____ 6. **PLACE** 1CV21, LETDOWN DEMIN BYPASS VALVE in FLOW TO MIXED BED position **AND PLACE** in AUTO.

_____ 7. **WHEN** 500-1000 gallons has been flushed through the demineralizer, **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO VCT position **AND PLACE** in AUTO. **[CAPR 70062042]**

4.3.9 (continued)

CAUTION

Maximum Letdown flow rate is 130 gpm. Flow may be restricted by throttling the Mixed Bed Demineralizer outlet valve(s) to maintain letdown flow rate less than or equal to 130 gpm when RCS cleanup is required.

When throttling CV25 to control letdown flow all valve manipulations must be performed slowly and coordinated with adjustments of the 1CV18.

When throttling CV25 monitor 1PI136 to ensure pressure does NOT exceed 165 psig.

8. **IF** Letdown flow is greater than 130 gpm,
THEN COORDINATE the following:

a. **MONITOR** 1PI136 to ensure pressure does not exceed 165 psig.

b. Slowly **THROTTLE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE, to limit Letdown flow to less than or equal to 130 gpm.

NOTE

1CV18 should be adjusted to maintain backpressure greater than saturation pressure for Letdown Heat Exchanger Inlet Temperature (T0127A, on Plant Computer).

c. **PERFORM** the following:

(1) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as required to maintain letdown pressure approximately 300 psig **OR** as required for present plant conditions as directed by the CRS/SM. **[C0417]**

(2) **IF** present plant conditions permit,
THEN PLACE 1CV18, LETDOWN PRESSURE CONTROL VALVE, in AUTO.

(3) **IF** 1CV18, LETDOWN PRESSURE CONTROL VALVE, is **NOT** placed in AUTO,
THEN UPDATE WCM to reflect position of 1CV18, LETDOWN PRESSURE CONTROL VALVE.

d. **UPDATE** WCM to reflect position of 12CV25, MB DM OUTLET VALVE.

e. **INITIATE** a NOTF to investigate high Letdown flow rate.

4.3.10. **NOTIFY** Chemistry that 11 (12) Mixed Bed Demin is in service.

4.3 (continued)

___ ___ IV 4.3.11. **IF** 11 MIXED BED Demin is placed in service,
THEN DIRECT a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section D.

___ ___ IV 4.3.12. **IF** 12 MIXED BED Demin is placed in service,
THEN DIRECT a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section E.

_____ 4.3.13. **UPDATE** the following Control Room Console Station Aids, as required.

_____ 1. S1-OPA-99-0007, 11 MIXED BED Demineralizer

_____ 2. S1-OPA-99-0008, 12 MIXED BED Demineralizer

4.4 Placing a Borated Mixed Bed Demin In Service With A Mixed Bed Demin In Service (i.e., Swapping Inservice Mixed Bed Demins)

NOTE

Section 4.5 of this procedure is to be used for placing a Standby Mixed Bed Demin in service for RCS chemistry control.

_____ 4.4.1. **OBTAIN** from Chemistry RCS boron concentration when Mixed Bed Demin was last in service.

_____ 4.4.2. **IF** Mixed Bed Demin contains new resin,
OR CRS/SM or Chemistry determines present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Mixed Bed Demin was last in service,
THEN TERMINATE performance of this section,
AND PLACE Mixed Bed Demin in service IAW Section 4.1 **OR** 4.2. **[C0417]**

_____ 4.4.3. **ENSURE** 1CV21, LETDOWN DEMIN BYPASS VALVE in FLOW TO MIXED BED position **AND PLACE** in AUTO.

_____ 4.4.4. **IF** placing 11 MIXED BED Demin in service,
THEN:

_____ 1. Slowly **OPEN** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____ 2. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 11CV234, MB DM VENT for at least 2 minutes,
THEN CLOSE valve.

_____ 3. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO HUT position. **[CAPR 70062042]**

_____ 4. Slowly **OPEN** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ 5. **CLOSE** 12CV25, MB DM OUTLET VALVE.

_____ 6. **CLOSE** 12CV24, MB DM INLET VALVE.

_____ 7. **WHEN** 500-1000 gallons has been flushed through the demineralizer,
PLACE 1CV35, VCT THREE WAY INLET VALVE in FLOW TO VCT position
AND PLACE in AUTO . **[CAPR 70062042]**

4.4.4 (continued)

CAUTION

Maximum Letdown flow rate is 130 gpm. Flow may be restricted by throttling the Mixed Bed Demineralizer outlet valve(s) to maintain letdown flow rate less than or equal to 130 gpm when RCS cleanup is required.

When throttling CV25 to control letdown flow all valve manipulations must be performed slowly and coordinated with adjustments of the 1CV18.

When throttling CV25 monitor 1PI136 to ensure pressure does NOT exceed 165 psig.

8. **IF** Letdown flow is greater than 130 gpm,
THEN COORDINATE the following:

a. **MONITOR** 1PI136 to ensure pressure does NOT exceed 165 psig.

b. Slowly **THROTTLE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE, to limit Letdown flow to less than or equal to 130 gpm.

NOTE

1CV18 should be adjusted to maintain backpressure greater than saturation pressure for Letdown Heat Exchanger Inlet Temperature (T0127A, on Plant Computer).

c. **PERFORM** the following:

(1) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as required to maintain letdown pressure approximately 300 psig **OR** as required for present plant conditions as directed by the CRS/SM. **[C0417]**

(2) **IF** present plant conditions permit,
THEN PLACE 1CV18, LETDOWN PRESSURE CONTROL VALVE, in AUTO.

(3) **IF** 1CV18, LETDOWN PRESSURE CONTROL VALVE, is **NOT** placed in AUTO,
THEN UPDATE WCM to reflect position of 1CV18, LETDOWN PRESSURE CONTROL VALVE.

d. **UPDATE** WCM to reflect position of 11CV25, MB DM OUTLET VALVE.

e. **INITIATE** a NOTF to investigate high Letdown flow rate.

4.4 (continued)

_____4.4.5. **IF** placing 12 MIXED BED Demin in service,
THEN:

_____ 1. Slowly **OPEN** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

_____ 2. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 12CV234, MB DM VENT for at least 2 minutes, **THEN CLOSE** valve.

_____ 3. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO HUT position.

_____ 4. Slowly **OPEN** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ 5. **CLOSE** 11CV25, MB DM OUTLET VALVE.

_____ 6. **CLOSE** 11CV24, 11 MB DM INLET VALVE.

_____ 7. **WHEN** 500-1000 gallons has been flushed through the demineralizer, **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO VCT position **AND PLACE** in AUTO.

CAUTION

_____ Maximum Letdown flow rate is 130 gpm. Flow may be restricted by throttling the Mixed Bed Demineralizer outlet valve(s) to maintain letdown flow rate less than or equal to 130 gpm when RCS cleanup is required.

_____ When throttling CV25 to control letdown flow all valve manipulations must be performed slowly and coordinated with adjustments of the 1CV18.

_____ When throttling CV25 monitor 1PI136 to ensure pressure does **NOT** exceed 165 psig.

_____ 8. **IF** Letdown flow is greater than 130 gpm,
THEN COORDINATE the following:

_____ a. **MONITOR** 1PI136 to ensure pressure does not exceed 165 psig.

_____ b. Slowly **THROTTLE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE, to limit Letdown flow to less than or equal to 130 gpm.

4.4.5 (continued)

NOTE

1CV18 should be adjusted to maintain backpressure greater than saturation pressure for Letdown Heat Exchanger Inlet Temperature (T0127A, on Plant Computer).

c. **PERFORM** the following:

(1) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as required to maintain letdown pressure approximately 300 psig **OR** as required for present plant conditions as directed by the CRS/SM. **[C0417]**

(2) **IF** present plant conditions permit,
THEN PLACE 1CV18, LETDOWN PRESSURE CONTROL VALVE, in AUTO.

(3) **IF** 1CV18, LETDOWN PRESSURE CONTROL VALVE, is **NOT** placed in AUTO,
THEN UPDATE WCM to reflect position of 1CV18, LETDOWN PRESSURE CONTROL VALVE.

d. **UPDATE** WCM to reflect position of 12CV25, MB DM OUTLET VALVE.

e. **INITIATE** a NOTF to investigate high Letdown flow rate.

f. **NOTIFY** Chemistry that 11 (12) Mixed Bed Demin is in service.

___ ___ IV
g. **IF** 11 MIXED BED Demin is placed in service,
THEN DIRECT a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section D.

___ ___ IV
h. **IF** 12 MIXED BED Demin is placed in service,
THEN DIRECT a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section E.

i. **UPDATE** the following Control Room Console Station Aids, as required.

(1) S1-OPA-99-0007, 11 MIXED BED Demineralizer

(2) S1-OPA-99-0008, 12 MIXED BED Demineralizer

4.5 Placing a Borated Standby Mixed Bed Demin In Service for RCS Chemistry Control

_____4.5.1. **OBTAIN** from Chemistry RCS boron concentration when Standby Mixed Bed Demin was last in service.

_____4.5.2. **IF** Standby Mixed Bed Demin contains new resin
OR the CRS/SM or Chemistry determines present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Standby Mixed Bed Demin was last in service,
THEN TERMINATE performance of this section,
AND PLACE Standby Mixed Bed Demin in service IAW Section 4.2. **[C0417]**

_____4.5.3. **RECORD** the amount of gallons to be flushed through the Mixed Bed Demin (as determined by Chemistry):

_____ Gallons

_____4.5.4. **DETERMINE** amount of time Mixed Bed Demin is to remain in service using gallons recorded in Step 4.5.3 and Letdown flow **AND RECORD** below:

$$\_\_\_\_\_\ gallons \div \_\_\_\_\_\ \frac{gallons}{minute} = \_\_\_\_\_\ minutes$$

_____4.5.5. **ENSURE** 1CV21, LETDOWN DEMIN BYPASS VALVE in FLOW TO MIXED BED position **AND PLACE** in AUTO.

_____4.5.6. **ENSURE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO VCT position **AND PLACE** in AUTO.

_____4.5.7. **IF** placing 11 MIXED BED Demin in service,
THEN:

_____ 1. Slowly **OPEN** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____ 2. Slowly **OPEN** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ 3. **CLOSE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ 4. **CLOSE** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

_____4.5.8. **IF** placing 12 MIXED BED Demin in service,
THEN:

_____ 1. Slowly **OPEN** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

_____ 2. Slowly **OPEN** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ 3. **CLOSE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ 4. **CLOSE** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

4.5 (continued)

_____4.5.9. **WHEN** the Standby Mixed Bed Demin has been in service for the time recorded in Step 4.5.4,
THEN REMOVE Mixed Bed Demin from service as follows:

_____ 1. **IF** removing 11 MIXED BED Demin from service,
THEN:

_____ a. Slowly **OPEN** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

_____ b. Slowly **OPEN** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ c. **CLOSE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ d. **CLOSE** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____ 2. **IF** removing 12 MIXED BED Demin from service,
THEN:

_____ a. Slowly **OPEN** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____ b. Slowly **OPEN** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ c. **CLOSE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ d. **CLOSE** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

___ ___4.5.10. **DIRECT** a Second Operator to perform an Independent Verification IAW Attachment 7, Independent Verification, Section F.
IV

_____4.5.11. **UPDATE** the following Control Room Console Station Aids, as required.

_____ • S1-OPA-99-0007, 11 MIXED BED Demineralizer

_____ • S1-OPA-99-0008, 12 MIXED BED Demineralizer

4.6 Removing CVCS Demin Header from Service

_____4.6.1. **PLACE** 1CV21, LETDOWN DEMIN BYPASS VALVE in FLOW TO VCT position.

_____4.6.2. **IF** 11 MIXED BED Demin is to be removed from service,
THEN:

_____ 1. **CLOSE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ 2. **CLOSE** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____4.6.3. **IF** 12 MIXED BED Demin is to be removed from service,
THEN:

_____ 1. **CLOSE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ 2. **CLOSE** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

___ ___4.6.4. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section G.
IV

_____4.6.5. **NOTIFY** Chemistry that CVCS Demins are removed from service **AND** to **EVALUATE** whether RCS chemistry will support removing the Reactor Coolant Filter from service.

_____4.6.6. **IF** Chemistry determines that RCS chemistry can support removing Reactor Coolant Filter from service,
THEN REMOVE Reactor Coolant Filter from service IAW S1.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection.

_____4.6.7. **UPDATE** the following Control Room Console Station Aids, as required.

_____ 1. S1-OPA-99-0007, 11 MIXED BED Demineralizer

_____ 2. S1-OPA-99-0008, 12 MIXED BED Demineralizer

4.7 Placing a Non Borated Cation Bed Demin (with Mixed Resin) In Service

_____4.7.1. **OBTAIN** current RCS boron concentration from Chemistry, **AND RECORD** on Attachment 3, CVCS Demin Borating Record.

_____4.7.2. **ENSURE** a Mixed Bed Demin is in service.

_____4.7.3. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition, **THEN COMPLETE** Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

_____4.7.4. **ADJUST** Letdown to 45 gpm by performing the following:

_____ 1. **IF** Normal Letdown is in service, **THEN**:

_____ a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE in MANUAL.

_____ b. Simultaneously **PERFORM** the following:

_____ (1) **OPEN** 1CV3, LETDOWN ORIFICE ISOLATION VALVE, 45 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ c. **IF** controlling Letdown pressure in AUTO,

_____ (1) **PLACE** 1CV18 in AUTO

_____ (2) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

4.7.4 (continued)

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (1) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 2. **IF** Letdown is from RHR, **THEN**:

_____ a. **THROTTLE** 1CV8, LETDOWN ISOL FOR RHR, to reduce letdown flow to 45 GPM.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

NOTE

_____ When borating a cation bed demin, letdown flow should be less than makeup capacity to VCT.

_____4.7.5. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO HUT position.

_____4.7.6. Slowly **OPEN** 1CV224, 1 CATION BED DEMIN INLET VALVE.

_____4.7.7. **IF** fill and vent is required (Refer to Step 2.1.22), **THEN** slowly **OPEN** 1CV226, CATION DM VENT for at least 2 minutes, **THEN CLOSE** valve.

_____4.7.8. Slowly **OPEN** 1CV225, 1 CATION BED DEMIN OUTLET VALVE.

NOTE

_____ When closing 1CV26, flow will rise through the Cation Bed Demin. Maximum flow through Cation Bed Demin is 75 gpm.

_____4.7.9. Slowly **CLOSE** 1CV26, CATION BED BYPASS VALVE.

4.7 (continued)

_____4.7.10. **IF** Cation Bed Demin to be borated contains new Mixed Resin, **THEN**:

_____ 1. **RECORD** time on Attachment 3, CVCS Demin Borating Record.

_____ 2. **DETERMINE** approximate amount of time required to saturate Cation Bed Demin with boron IAW Attachment 2, Time Required To Saturate Cation Demin (IF Mixed Resin USED).

_____ 3. **WHEN** required amount of time has elapsed, **CONTINUE** with this procedure.

_____4.7.11. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling.

_____4.7.12. **RECORD** results of sample on Attachment 3, CVCS Demin Borating Record.

_____4.7.13. **IF** difference in boron concentration is greater than 25 ppm, **THEN**:

_____ 1. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling (at intervals of 30 minutes or less).

_____ 2. **RECORD** results of samples on Attachment 3, CVCS Demin Borating Record.

_____ 3. **WHEN** difference in boron concentration is less than or equal to 25 ppm, **CONTINUE** with this procedure.

_____4.7.14. **OPEN** 1CV26, CATION BED BYPASS VALVE.

_____4.7.15. **PLACE** 1CV35, VCT 3 WAY V, in FLOW TO VCT position **AND PLACE** in AUTO.

_____4.7.16. **IF** Normal Letdown is in service, **THEN**:

_____ 1. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

_____ 2. Simultaneously **PERFORM** the following:

_____ a. **OPEN** 1CV4, LETDOWN ORIFICE ISOLATION VALVE, **OR** 1CV5, LETDOWN ORIFICE ISOLATION VLV.

_____ b. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

4.7.16 (continued)

NOTE

The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ 3. **IF** controlling Letdown pressure in AUTO,

_____ a. **PLACE** 1CV18 in AUTO

_____ b. **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ 4. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ a. **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ b. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ 5. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ 6. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____4.7.17. **THROTTLE** CLOSE 1CV26, CATION BED BYPASS VALVE to obtain desired flow on FL-8864.

_____4.7.18. **IF** Letdown is from RHR,
THEN:

_____ 1. **ADJUST** 1CV8, LETDOWN ISOL FOR RHR, to obtain desired letdown flow.

_____ 2. **ADJUST** Charging flow as necessary to match Letdown flow.

_____4.7.19. **NOTIFY** Chemistry that the Cation Bed Demin is in service.

4.7 (continued)

_____4.7.20. **IF** the Cation Bed Demin was placed in service for RCS chemistry control from Section 4.9,
THEN:

_____ 1. **DETERMINE** amount of time Cation Bed Demin is to remain in service using gallons recorded in Step 4.9.3 and flow on FL-8864 **AND RECORD** below:

_____ *gallons* ÷ _____ $\frac{gallons}{minute}$ = _____ *minutes*

_____ 2. **WHEN** the Cation Bed Demin has been in service for the time recorded in Step 4.7.20A, **REMOVE** Cation Bed Demin from service as follows:

_____ a. **OPEN** 1CV26, CATION BED BYPASS VALVE.

_____ b. **CLOSE** 1CV225, 1 CATION BED OUTLET VALVE.

_____ c. **CLOSE** 1CV224, 1 CATION BED INLET VALVE.

_____ 3. **NOTIFY** Chemistry that the Cation Bed Demin is removed from service.

___ ___4.7.21. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section H.
IV

_____4.7.22. **UPDATE** Control Room Console Station Aid S1-OPA-99-0011, 1 Cation Bed Demineralizer.

4.8 Placing a Borated Cation Bed Demin (with Mixed Resin) In Service

NOTE

Section 4.9 of this procedure is to be used for placing a Cation Bed Demin in service for RCS chemistry control.

4.8.1. **OBTAIN** from Chemistry RCS boron concentration when Cation Bed Demin was last in service.

4.8.2. **IF** Cation Bed Demin contains new resin
OR CRS/SM or Chemistry determines present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Cation Bed Demin was last in service,
THEN TERMINATE performance of this section,
AND PLACE Cation Bed Demin in service IAW Section 4.7. **[C0417]**

4.8.3. **ENSURE** a Mixed Bed Demin is in service.

4.8.4. Slowly **OPEN** 1CV224, 1 CATION BED DEMIN INLET VALVE.

4.8.5. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 1CV226, CATION DM VENT for at least 2 minutes,
THEN CLOSE valve.

4.8.6. Slowly **OPEN** 1CV225, 1 CATION BED DEMIN OUTLET VALVE.

NOTE

Maximum flow through Cation Bed Demin is 75 gpm.

4.8.7. **THROTTLE** CLOSE 1CV26, CATION BED BYPASS VALVE to obtain desired flow on FL-8864.

___ ___ 4.8.8. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification, Section I.
IV

4.8.9. **NOTIFY** Chemistry that the Cation Bed Demin is in service.

4.8.10. **UPDATE** Control Room Console Station Aid S1-OPA-99-0011, 1 Cation Bed Demineralizer.

4.9 Placing a Borated Cation Bed Demin (with Mixed Resin) In Service for RCS Chemistry Control

_____4.9.1. **OBTAIN** from Chemistry RCS boron concentration when Cation Bed Demin was last in service.

_____4.9.2. **IF** Cation Bed Demin contains new resin
OR CRS/SM or Chemistry determines present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Cation Bed Demin was last in service,
THEN TERMINATE performance of this section,
AND PLACE Cation Bed Demin in service IAW Section 4.7. **[C0417]**

_____4.9.3. **RECORD** the amount of gallons to be flushed through the Cation Bed Demin (as determined by Chemistry):

_____ Gallons

_____4.9.4. **ENSURE** a Mixed Bed Demin is in service.

_____4.9.5. Slowly **OPEN** 1CV224, 1 CATION BED INLET VALVE.

_____4.9.6. Slowly **OPEN** 1CV225, 1 CATION BED OUTLET VALVE.

NOTE
Maximum flow through Cation Bed Demin is 75 gpm.

_____4.9.7. **THROTTLE** CLOSE 1CV26, CATION BED BYPASS VALVE to obtain desired flow on FL-8864.

_____4.9.8. **DETERMINE** amount of time Cation Bed Demin is to remain in service using gallons recorded in Step 4.9.3 and flow on FL-8864 **AND RECORD** below:

$$\_\_\_\_\_\ gallons \div \_\_\_\_\_\ \frac{gallons}{minute} = \_\_\_\_\_\ minutes$$

_____4.9.9. **WHEN** the Cation Bed Demin has been in service for the time recorded in Step 4.9.8, **REMOVE** Cation Bed Demin from service as follows:

_____ 1. **OPEN** 1CV26, CATION BED BYPASS VALVE.

_____ 2. **CLOSE** 1CV225, 1 CATION BED OUTLET VALVE.

_____ 3. **CLOSE** 1CV224, 1 CATION BED INLET VALVE.

4.9 (continued)

___ ___ IV 4.9.10. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section J.

_____ 4.9.11. **NOTIFY** Chemistry that the Cation Bed Demin is removed from service.

_____ 4.9.12. **UPDATE** Control Room Console Station Aid S1-OPA-99-0011, 1 Cation Bed Demineralizer.

4.10 Placing a Cation Bed Demin (with Cation Resin) In Service

NOTE

Section 4.7, 4.8 or 4.9, as applicable, of this procedure is to be used for placing a Cation Bed Demin with mixed bed resin in service.

4.10.1. **ENSURE** a Mixed Bed Demin is in service.

4.10.2. **OBTAIN** from Chemistry RCS boron concentration when Cation Bed Demin was last in service.

4.10.3. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition,
THEN COMPLETE Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

4.10.4. **IF** RCS boron concentration is less than or equal to 25 ppm different from RCS boron concentration when Cation Bed Demin was last in service,
THEN PERFORM the following:

1. Slowly **OPEN** 1CV224, 1 CATION BED DEMIN INLET VALVE.

2. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 1CV226, CATION DM VENT for at least 2 minutes,
THEN CLOSE valve.

3. Slowly **OPEN** 1CV225, 1 CATION BED DEMIN OUTLET VALVE.

NOTE

Maximum flow through Cation Bed Demin is 75 gpm.

4. **THROTTLE** CLOSE 1CV26, CATION BED BYPASS VALVE to obtain desired flow on FL-8864.

4.10 (continued)

NOTE

When the RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Cation Bed Demin was last in service then a line volume flush will be required to ensure water trapped inside Cation Bed Demin is equilibrated with RCS.

4.10.5. **IF** CRS/SM **OR** Chemistry determines present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Cation Bed Demin was last in service,
THEN PERFORM the following to flush the Cation Bed Demin: **[C0417]**

1. **IF** Normal Letdown is in service,
THEN:

a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

b. Simultaneously **PERFORM** the following:

(1) **OPEN** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

(2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

c. **IF** controlling Letdown pressure in AUTO,

(1) **PLACE** 1CV18 in AUTO

(2) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

4.10.5.1 (continued)

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (1) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 2. **IF** Letdown is from RHR,
THEN:

_____ a. **THROTTLE** 1CV8, LETDOWN ISOL FOR RHR, to reduce letdown flow to 45 GPM.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

NOTE

_____ When borating a cation bed demin, letdown flow should be less than makeup capacity to VCT.

_____ 3. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO HUT position.

_____ 4. Slowly **OPEN** 1CV224, 1 CATION BED DEMIN INLET VALVE.

_____ 5. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 1CV226, CATION DM VENT for at least 2 minutes,
THEN CLOSE valve.

_____ 6. Slowly **OPEN** 1CV225, 1 CATION BED DEMIN OUTLET VALVE.

NOTE

_____ When closing 1CV26, flow will rise through the Cation Bed Demin. Maximum flow through Cation Bed Demin is 75 gpm.

_____ 7. Slowly **THROTTLE** CLOSE 1CV26, CATION BED BYPASS VALVE.

_____ 8. **WHEN** 500 gallons have been flushed through the Cation Bed Demin, **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling.

4.5 (continued)

_____ 9. **RECORD** results of sample on Attachment 3, CVCS Demin Borating Record.

_____ 10. **IF** difference in boron concentration is greater than 25 ppm, **THEN**:

_____ a. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling (at intervals of 30 minutes or less).

_____ b. **RECORD** results of samples on Attachment 3, CVCS Demin Borating Record.

_____ c. **WHEN** difference in boron concentration is less than or equal to 25 ppm, **CONTINUE** with this procedure.

_____ 11. **OPEN** 1CV26, CATION BED BYPASS VALVE.

_____ 12. **PLACE** 1CV35, VCT 3 WAY INLET V, in FLOW TO VCT position **AND** **PLACE** in AUTO.

_____ 13. **IF** Normal Letdown is in service, **THEN**:

_____ a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

_____ b. Simultaneously **PERFORM** the following:

_____ (1) **OPEN** 1CV4 **OR** 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ c. **IF** controlling Letdown pressure in AUTO,

(1) **PLACE** 1CV18 in AUTO

_____ (2) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

4.5.13 (continued)

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously PERFORM the following:

(1) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

(2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 14. **THROTTLE** CLOSE 1CV26, CATION BED BYPASS VALVE to obtain desired flow on FL-8864.

_____ 15. **IF** Letdown is from RHR,
THEN:

_____ a. **ADJUST** 1CV8, LETDOWN ISOL FOR RHR, to obtain desired letdown flow.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

_____4.10.6. **NOTIFY** Chemistry that the Cation Bed Demin is in service.

_____4.10.7. **IF** the Cation Bed Demin was placed in service for RCS chemistry control from Section 4.11,
THEN:

_____ 1. **DETERMINE** amount of time Cation Bed Demin is to remain in service using gallons recorded in Step 4.11.1 and flow on FL-8864 **AND RECORD** below:

_____ *gallons* ÷ _____ $\frac{gallons}{minute}$ = _____ *minutes*

_____ 2. **WHEN** the Cation Bed Demin has been in service for the time recorded in Step 4.10.7.1, **REMOVE** Cation Bed Demin from service as follows:

_____ a. **OPEN** 1CV26, CATION BED BYPASS VALVE.

_____ b. **CLOSE** 1CV225, 1 CATION BED OUTLET VALVE.

_____ c. **CLOSE** 1CV224, 1 CATION BED INLET VALVE.

_____ 3. **NOTIFY** Chemistry that the Cation Bed Demin is removed from service.

4.10 (continued)

___ ___ IV 4.10.8. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section K.

_____ 4.10.9. **UPDATE** Control Room Console Station Aid S1-OPA-99-0011, 1 Cation Bed Demineralizer.

4.11 Placing a Cation Bed Demin (with Cation Resin) In Service for RCS Chemistry Control

NOTE

If placing Cation Bed Demin with mixed bed resin in service then place in service IAW Sections 4.7, 4.8 or 4.9, as applicable.

_____ 4.11.1. **RECORD** the amount of gallons to be flushed through the Cation Bed Demin (as determined by Chemistry):

_____ Gallons

_____ 4.11.2. **OBTAIN** from Chemistry RCS boron concentration when Cation Bed Demin was last in service.

NOTE

When RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Cation Bed Demin was last in service then a line volume flush will be required to ensure water trapped inside Cation Bed Demin is equilibrated with RCS.

_____ 4.11.3. **IF** CRS/SM **OR** Chemistry determines present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Cation Bed Demin was last in service,
THEN TERMINATE performance of this section, AND PLACE Cation Bed Demin in service IAW Section 4.10. **[C0417]**

_____ 4.11.4. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition,
THEN COMPLETE Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

_____ 4.11.5. **ENSURE** a Mixed Bed Demin is in service.

_____ 4.11.6. Slowly **OPEN** 1CV224, 1 CATION BED INLET VALVE.

_____ 4.11.7. Slowly **OPEN** 1CV225, 1 CATION BED OUTLET VALVE.

NOTE

Maximum flow through Cation Bed Demin is 75 gpm.

_____ 4.11.8. **THROTTLE** CLOSE 1CV26, CATION BED BYPASS VALVE to obtain desired flow on FL-8864.

4.11 (continued)

_____4.11.9. **DETERMINE** amount of time Cation Bed Demin is to remain in service using gallons recorded in Step 4.11.1 and flow on FL-8864 **AND RECORD** below:

$$\_\_\_\_\_\ gallons \div \_\_\_\_\_\ \frac{gallons}{minute} = \_\_\_\_\_\ minutes$$

_____4.11.10. **WHEN** the Cation Bed Demin has been in service for the time recorded in Step 4.11.9, **REMOVE** it from service as follows:

_____ 1. **OPEN** 1CV26, CATION BED BYPASS VALVE.

_____ 2. **CLOSE** 1CV225, 1 CATION BED OUTLET VALVE.

_____ 3. **CLOSE** 1CV224, 1 CATION BED INLET VALVE.

___ ___4.11.11. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section L.
IV

_____4.11.12. **NOTIFY** Chemistry that the Cation Bed Demin is removed from service.

_____4.11.13. **UPDATE** Control Room Console Station Aid S1-OPA-99-0011, 1 Cation Bed Demineralizer.

4.12 Removing the Cation Bed Demin from Service

_____4.12.1. **OPEN** 1CV26, CATION BED BYPASS VALVE.

_____4.12.2. **CLOSE** 1CV225, 1 CATION BED OUTLET VALVE.

_____4.12.3. **CLOSE** 1CV224, 1 CATION BED INLET VALVE.

___ ___4.12.4. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, IV Independent Verification Section M.

_____4.12.5. **NOTIFY** Chemistry that the Cation Bed Demin is removed from service.

_____4.12.6. **UPDATE** Control Room Console Station Aid S1-OPA-99-0011, 1 Cation Bed Demineralizer.

4.13 Placing a Deborating Bed Demin In Service (Mixed Bed Demin Available)

CAUTION

When Deborating Bed Demins are in service, letdown heat exchanger outlet temperature should be monitored and **NOT** allowed to exceed 115°F.

_____ 4.13.1. **ENSURE** a Mixed Bed Demin is in service.

_____ 4.13.2. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition, **THEN COMPLETE** Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

_____ 4.13.3. **OPEN** 1CV205, LETDOWN TO DEBORATING DEMIN VALVE.

NOTE

A Deborating Bed Demineralizer flush of 500-1000 gallons is required when placing the demineralizer in service for the first time following resin replacement. The flush will ensure RCS quality effluent when the demineralizer is aligned to the RCS. **[CAPR 70062042]**

_____ 4.13.4. **IF** a Deborating Bed Demineralizer flush of 500-1000 gallons is required, **THEN**:

_____ 1. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE in MANUAL.

_____ 2. Simultaneously **PERFORM** the following:

_____ a. **OPEN** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ b. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

4.13.4 (continued)

NOTE

The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ 3. **IF** controlling Letdown pressure in AUTO,

_____ a. **PLACE** 1CV18 in AUTO

_____ b. **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ 4. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ a. **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ b. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ 5. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ 6. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 7. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO HUT position.

_____4.13.5. **IF** 11 DEBORATING Demin is to be placed in service,
THEN:

_____ 1. **ENSURE** OPEN 11CV208, 11 DEBORATING DEMIN INLET VALVE.

_____ 2. **ENSURE** OPEN 11CV210, 11 DEBORATING DEMIN OUTLET VALVE.

_____ 3. Slowly **OPEN** 11CV206, 11 DEBORATING DEMIN INLET VALVE.

_____ 4. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 11CV215, DB DM VENT for at least 2 minutes, **THEN CLOSE** valve.

_____ 5. **OPEN** 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

4.13 (continued)

_____4.13.6. **IF** 12 DEBORATING Demin is to be placed in service,
THEN:

_____ 1. **ENSURE** OPEN 12CV208, 12 DEBORATING DEMIN INLET VALVE.

_____ 2. **ENSURE** OPEN 12CV210, 12 DEBORATING DEMIN OUTLET VALVE.

_____ 3. Slowly **OPEN** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

_____ 4. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 12CV215, DB DM VENT for at least 2 minutes, **THEN CLOSE** valve.

_____ 5. **OPEN** 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____4.13.7. **OPEN** 1CV212, DEBORATING DEMIN OUTLET VALVE.

___ ___4.13.8. **IF** 21 Deborating Demin is placed in service,
IV **THEN DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Section N.

___ ___4.13.9. **IF** 22 Deborating Demin is placed in service,
IV **THEN DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Section O.

_____4.13.10. **PLACE** 1CV27, DEBORATING DEMIN THREE WAY INLET VALVE in FLOW TO DB BED position.

_____4.13.11. **CLOSE** 1CV205, LETDOWN TO DEBORATING DEMIN VALVE.

___ ___4.13.12. **DIRECT** second operator to perform Independent Verification of 1CV205, Letdown
IV to Deborating Demin Valve, IAW Attachment 7, Section P. **[CRCA 70174717-0030]**

_____4.13.13. **IF** a Deborating Bed Demineralizer flush of 500-1000 gallons is in progress
AND 500-1000 gallons has been flushed through the demineralizer
THEN:

_____ 1. **PLACE** 1CV27, DEBORATING DEMIN THREE WAY INLET VALVE in FLOW TO VCT position.

_____ 2. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO VCT position **AND PLACE** in AUTO.

_____ 3. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE in MANUAL.

4.13.13 (continued)

_____ 4. Simultaneously **PERFORM** the following:

_____ a. **OPEN** 1CV4, ORIFICE ISOLATION VALVE, **OR** 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ b. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VAVLE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

_____ The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ 5. **IF** controlling Letdown pressure in AUTO,

_____ a. **PLACE** 1CV18 in AUTO

_____ b. **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ 6. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ a. **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ b. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ 7. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ 8. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 4.13.14. **INITIATE** Attachment 4, Deborating Bed Demineralizer Usage.

_____ 4.13.15. **CYCLE** 1CV27, DEBORATING DEMIN 3-WAY INLET V, as required for RCS reactivity control.

_____ 4.13.16. **IF** DEBORATING Demin is no longer needed for reactivity control, **THEN PERFORM** section 4.17

4.14 Placing a Deborating Bed Demin (with Cation Bed Resin) In Service for RCS Chemistry Control (Mixed Bed Demin Available)

NOTE

Excess Letdown needs be in service when RCS is at Normal Operating Pressure (NOP) and Normal Operating Temperature (NOT) AND minimum letdown is in service, otherwise charging flow will be too low to cool letdown and flashing will occur.

_____ 4.14.1. **RECORD** the amount of gallons to be flushed through the Deborating Bed Demin (as determined by Chemistry):

_____ Gallons

_____ 4.14.2. **ENSURE** a Mixed Bed Demin is in service.

_____ 4.14.3. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition,
THEN COMPLETE Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

_____ 4.14.4. **OPEN** 1CV205, LETDOWN TO DEBORATING DEMIN VALVE.

_____ 4.14.5. **OBTAIN** from Chemistry RCS boron concentration when Deborating Bed Demin was last in service.

_____ 4.14.6. **IF** RCS boron concentration is less than or equal to 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service,
THEN PERFORM the following:

_____ 1. **IF** 11 DEBORATING Demin is to be placed in service,
THEN:

_____ a. **ENSURE** OPEN 11CV208, 11 DEBORATING DEMIN INLET VALVE.

_____ b. **ENSURE** OPEN 11CV210, 11 DEBORATING DEMIN OUTLET VALVE.

_____ c. Slowly **OPEN** 11CV206, 11 DEBORATING DEMIN INLET VALVE.

_____ d. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 11CV215, DB DM VENT for at least 2 minutes,
THEN CLOSE valve.

_____ e. **OPEN** 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

4.14.6 (continued)

_____ 2. **IF** 12 DEBORATING Demin is to be placed in service,
THEN:

_____ a. **ENSURE** OPEN 12CV208, 12 DEBORATING DEMIN INLET VALVE.

_____ b. **ENSURE** OPEN 12CV210, 12 DEBORATING DEMIN OUTLET VALVE.

_____ c. Slowly **OPEN** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

_____ d. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 12CV215, DB DM VENT for at least 2 minutes,
THEN CLOSE valve.

_____ e. **OPEN** 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____ 3. **OPEN** 1CV212, DEBORATING DEMIN OUTLET VALVE.

_____ 4. **PLACE** 1CV27, DEBORATING DEMIN THREE WAY INLET VALVE in FLOW TO DB BED position.

_____ 5. **CLOSE** 1CV205, LTDWN TO DB VALVE.

NOTE

_____ When RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service then a line volume flush will be required to ensure water trapped inside Deborating Bed Demin is equilibrated with RCS.

_____4.14.7. **IF** the CRS/SM **OR** Chemistry determines present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service,
THEN PERFORM the following to flush the Deborating Bed Demin:

_____ 1. **IF** Normal Letdown is in service,
THEN:

_____ a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE in MANUAL.

_____ b. Simultaneously **PERFORM** the following:

_____ (1) **OPEN** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

4.14.7 (continued)

NOTE

The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ c. **IF** controlling Letdown pressure in AUTO,

_____ (1) **PLACE** 1CV18 in AUTO

_____ (2) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (1) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 2. **IF** Letdown is from RHR,
THEN:

_____ a. **THROTTLE** 1CV8, LETDOWN ISOL FOR RHR, to reduce letdown flow to 45 GPM.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

NOTE

_____ When borating a Deborating bed demin, letdown flow should be less than makeup capacity to VCT.

_____ 3. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO HUT position.

4.14.7 (continued)

_____ 4. **IF** 11 DEBORATING Demin is to be flushed,
THEN:

_____ a. **ENSURE** OPEN 11CV208, 11 DEBORATING DEMIN INLET VALVE.

_____ b. **ENSURE** OPEN 11CV210, 11 DEBORATING DEMIN OUTLET VALVE.

_____ c. Slowly **OPEN** 11CV206, 11 DEBORATING DEMIN INLET VALVE.

_____ d. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 11CV215, DB DM VENT for at least 2 minutes,
THEN CLOSE valve.

_____ e. **OPEN** 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

_____ 5. **IF** 12 DEBORATING Demin is to be flushed,
THEN:

_____ a. **ENSURE** OPEN 12CV208, 12 DEBORATING DEMIN INLET VALVE.

_____ b. **ENSURE** OPEN 12CV210, 12 DEBORATING DEMIN OUTLET VALVE.

_____ c. Slowly **OPEN** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

_____ d. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 12CV215, DB DM VENT for at least 2 minutes,
THEN CLOSE valve.

_____ e. **OPEN** 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____ 6. **OPEN** 1CV212, DEBORATING DEMIN OUTLET VALVE.

___ ___ 7. **IF** 11 Deborating Demin is placed in service,
IV **THEN DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Section N.

___ ___ 8. **IF** 12 Deborating Demin is placed in service,
IV **THEN DIRECT** a second Operator to perform Independent Verification IAW Attachmet 7, Section O.

_____ 9. **PLACE** 1CV27, DEBORATING DEMIN THREE WAY INLET VALVE in FLOW TO DB BED position.

_____ 10. **CLOSE** 1CV205, LTDWN TO DB DM VALVE.

___ ___ 11. DIRECT second operator to PERFORM Independent Verification of 1CV205,
IV Letdown to Deborating Demin Valve IAW Attachment 7, Section P. **[CRCA 70174717-0030]**

4.14.7 (continued)

_____ 12. **IF** at any time, satisfactory sample results cannot be obtained,
OR Terminsation of flush is sesired,
THEN,

_____ a. **PLACE** 1CV27 int the flow to VCT position.

_____ b. **GOTO** step 4.14.7.15

_____ 13. **WHEN** 500 gallons have been flushed through the Cation Bed Demin, **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling.

_____ 14. **RECORD** results of sample on Attachment 3, CVCS Demin Borating Record.

_____ 15. **IF** difference in boron concentration is greater than 25 ppm,
THEN:

_____ a. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling (at intervals of 30 minutes or less).

_____ b. **RECORD** results of samples on Attachment 3, CVCS Demin Borating Record.

_____ c. **WHEN** difference in boron concentration is less than or equal to 25 ppm, **CONTINUE** with this procedure.

_____ 16. **PLACE** 1CV35, VCT 3 WAY INLET V, in FLOW TO VCT position **AND** **PLACE** in AUTO.

_____ 17. **IF** Normal Letdown is in service,
THEN:

_____ a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

_____ b. Simultaneously **PERFORM** the following:

_____ (1) **OPEN** 1CV4LETDOWN ORIFICE ISOLATION VALVE, **OR** 1CV5, LETDOWN ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

4.14.7 (continued)

NOTE

The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ c. **IF** controlling Letdown pressure in AUTO,

_____ (1) **PLACE** 1CV18 in AUTO

_____ (2) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (1) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 18. **IF** Letdown is from RHR,
THEN:

_____ a. **ADJUST** 1CV8, LETDOWN ISOL FOR RHR, to obtain desired letdown flow.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ 4.14.8. **DETERMINE** amount of time Deborating Bed Demin is to remain in service using gallons recorded in Step 4.14.1 and Letdown flow AND RECORD below:

_____ *gallons* ÷ _____ $\frac{gallons}{minute}$ = _____ *minutes*

_____ 4.14.9. **WHEN** the Deborating Bed Demin has been in service for the time recorded in Step 4.14.8,
THEN PLACE 1CV27, DEBORATING DEMIN THREE WAY INLET VALVE, in FLOW TO VCT position.

4.14 (continued)

_____4.14.10. **UPDATE** Control Room Console Station Aid S1-OP-03-001, Deborating Bed Demineralizer.

_____4.14.11. **NOTIFY** Chemistry that 11 (12) Deborating Bed Demineralizer is removed from service.

NOTE

_____ When RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service then a line volume flush will be required to ensure water trapped inside Deborating Bed Demin is equilibrated with RCS.

_____ When the Deborating Bed Demin is to remain aligned with the exception of the 1CV27 valve then this procedure must remain open until the Deborating Bed Demin is removed from service IAW Section 4.17.

_____ SC.CH-AP.RC-0106(Z), Implementation of Salem Lithium Control Program, establishes programmatic details for successful implementation of the Salem Lithium Control Program during all aspects of plant operation.

_____ When performing Step 4.14.12 for RCS Lithium Control:

_____ • A review of Sections 2.0 **AND** 3.0 of this procedure must be performed prior to use to ensure compliance with the requirements of HU-AA-104-101, Procedure Use and Adherence.

_____ • To facilitate placekeeping IAW with the requirements of HU-AA-104-101, Procedure Use and Adherence, the open procedure page should be sleeved AND placekeeping performed utilizing a erasable marker

_____4.14.12. **IF** further RCS Lithium Control is requested by Chemistry, **THEN PERFORM** the following to place Deborating Bed Demin in service:

_____ 1. **DETERMINE** RCS boron concentration when Deborating Bed Demin was last in service (1CV27, DEBORATING DEMIN 3-WAY INLET V, aligned to FLOW TO DB BED position).

_____ 2. **IF** present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service, **THEN PERFORM** Attachment 8, Flushing A Deborating Bed Demineralizer When Present RCS Cb Is Greater Than 25 ppm Different From Previous Cb to flush the Deborating Bed Demin until the difference in boron concentration is less than or equal to 25 ppm.

_____ 3. **CYCLE** 1CV27, DEBORATING DEMIN 3-WAY INLET V, as required to control RCS chemistry as directed by Chemistry.

4.14.12 (continued)

_____ 4. **UPDATE** Control Room Console Station Aid S1-OP-03-001, Deborating Bed Demineralizer.

_____ 5. **NOTIFY** Chemistry that 11 (12) Deborating Bed Demineralizer is removed from service.

_____4.14.13. **WHEN** Deborating Bed Demin operation is no longer required, **REMOVE** Deborating Bed Demin from service IAW Section 4.17.

4.15 Placing a Deborating Bed Demin (with Mixed Bed or Cation Bed Resin) In Service With No Mixed Bed Demin Available

CAUTION

Performing this section may cause increased dose rates in the Demin Alley area, dependent upon plant conditions. Radiation Protection should be contacted to evaluate and monitor as necessary.

_____ 4.15.1. **ENSURE** 1CV21, LETDOWN DEMIN BYPASS, is in MIXED BED DIVERSION TO VCT position.

_____ 4.15.2. **ENSURE** 1CV27, DEBORATING DEMIN THREE WAY INLET VALVE, in FLOW TO VCT position.

_____ 4.15.3. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition, **THEN COMPLETE** Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

4.15 (continued)

_____4.15.4. **OPEN** 1CV205, LETDOWN TO DEBORATING DEMIN VALVE.

NOTE

_____ Two Operators will be required to coordinate placing Deborating Bed in service.

_____ Letdown flow will be momentarily terminated until the 1CV212 is opened. Monitoring Letdown pressure will be required until 1CV212 is opened.

CAUTION

_____ If RCS pressure is greater than or equal to 165 psig a momentary interruption in Letdown flow may cause relief valve 1CV253 to lift at 200 psig.

_____ Placing an unborated Deborating Bed Demin (Mixed Bed Resin) in service, in Modes 5, 6 or Defueled will result in RCS boron concentration lowering 40 to 80 ppm. To ensure Shutdown Margin is maintained RCS boron concentration should be a minimum of 100 ppm greater than boron concentration requirements for Shutdown Margin whenever an unborated Deborating Bed Demin (Mixed Bed Resin) is placed in service. If two unborated Deborating Bed Demins (Mixed Bed Resin) are to be in parallel then RCS boron concentration should be a minimum of 200 ppm greater than boron concentration requirements for Shutdown Margin.

_____4.15.5. **IF** RCS pressure is less than 165 psig
AND either of the following conditions exist:

_____ • Unit is in Modes 1-4, **AND** RCS boron concentration is less than or equal to 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service.

_____ • Unit is in Modes 5, 6 or Defueled, **AND** RCS boron concentration is a minimum of 100 ppm greater than boron concentration required to maintain Shutdown Margin (for each unborated Mixed Bed Demin) as determined by SC.RE-ST.ZZ-0002(Q), Shutdown Margin Calculation.

THEN PERFORM the following:

_____ 1. **IF** 11 DEBORATING Demin is to be placed in service,
THEN:

_____ a. **ENSURE** OPEN 11CV208, 11 DEBORATING DEMIN INLET VALVE.

_____ b. **ENSURE** OPEN 11CV210, 11 DEBORATING DEMIN OUTLET VALVE.

4.15.5.1 (continued)

_____ c. **LOWER** Letdown flow to 10-15 gpm with 1CV8, LETDOWN ISOL FOR RHR, while balancing Charging flow.

_____ d. **OPEN** 11CV206, 11 DEBORATING DEMIN INLET VALVE.

_____ e. Slowly **OPEN** 11CV215, DB DM VENT, to approximately ½ open, **THEN** have Control Room place 1CV21 in MIXED BED DIVERSION TO MIXED BED position **AND PLACE** in AUTO .

_____ f. **OPEN** 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

_____ 2. **IF** 12 DEBORATING Demin is to be placed in service, **THEN**:

_____ a. **ENSURE** OPEN 12CV208, 12 DEBORATING DEMIN INLET VALVE.

_____ b. **ENSURE** OPEN 12CV210, 12 DEBORATING DEMIN OUTLET VALVE.

_____ c. **LOWER** Letdown flow to 10-15 gpm with 1CV8, LETDOWN ISOL FOR RHR, while balancing Charging flow.

_____ d. **OPEN** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

_____ e. Slowly **OPEN** 12CV215, DB DM VENT, to approximately ½ open,

_____ **THEN** have Control Room place 1CV21 in MIXED BED DIVERSION TO MIXED BED position **AND PLACE** in AUTO.

_____ f. **OPEN** 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____ 3. **WHEN** at least 10 minutes has elapsed, slowly **OPEN** 1CV212, DEBORATING DEMIN OUTLET VALVE, while **CLOSING** 11(12)CV215, DB DM VENT, as applicable.

_____ 4. **ADJUST** Letdown flow, as required, with the 1CV8, LETDOWN ISOL FOR RHR, while balancing Charging flow.

4.15.5 (continued)

CAUTION

If RCS pressure is greater than or equal to 165 psig a momentary interruption in Letdown flow may cause relief valve 1CV253 to lift at 200 psig.

Placing an unborated Deborating Bed Demin (Mixed Bed Resin) in service, in Modes 5, 6 or Defueled will result in RCS boron concentration lowering 40 to 80 ppm. To ensure Shutdown Margin is maintained RCS boron concentration should be a minimum of 100 ppm greater than boron concentration requirements for Shutdown Margin whenever an unborated Deborating Bed Demin (Mixed Bed Resin) is placed in service. If two unborated Deborating Bed Demins (Mixed Bed Resin) are to be in parallel then RCS boron concentration should be a minimum of 200 ppm greater than boron concentration requirements for Shutdown Margin

4.15.6. **IF** RCS pressure is greater than or equal to 165 psig, **AND** either of the following conditions exist:

- Unit is in Modes 1-4, **AND** RCS boron concentration is less than or equal to 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service.
- Unit is in Modes 5, 6 or Defueled, and RCS boron concentration is a minimum of 100 ppm greater than boron concentration required to maintain Shutdown Margin (for each unborated Mixed Bed Demin) as determined by SC.RE-ST.ZZ-0002(Q), Shutdown Margin Calculation.

THEN PERFORM the following:

1. **IF** 11 DEBORATING Demin is to be placed in service, **THEN**:
   a. **ENSURE** OPEN 11CV208, 11 DEBORATING DEMIN INLET VALVE.
   b. **ENSURE** OPEN 11CV210, 11 DEBORATING DEMIN OUTLET VALVE.
   c. Slowly **OPEN** 11CV206, 11 DEBORATING DEMIN INLET VALVE.
2. **IF** 12 DEBORATING Demin is to be placed in service, **THEN**:
   a. **ENSURE** OPEN 12CV208, 12 DEBORATING DEMIN INLET VALVE.
   b. **ENSURE** OPEN 12CV210, 12 DEBORATING DEMIN OUTLET VALVE.
   c. Slowly **OPEN** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

4.15.6 (continued)

_____ 3. **PERFORM** the following to fill, vent and pressurize Deborating Bed Demin piping:

_____ a. **ENSURE** CLOSED the following valves:

_____ (1) 1WR116, PW DM SYS STOP V

_____ (2) 1WR109, PW SPENT RESIN FLUSH VALVE

_____ (3) 1WR135, PW DM SYS HDR DRN

_____ (4) 1WR136, PW DM SYS HDR VENT

_____ (5) 1WR137, PW DM SYS HDR VENT

_____ (6) 11CV236, MB DM PRI WTR SUP VALVE

_____ (7) 12CV236, MB DM PRI WTR SUP VALVE

_____ b. **OPEN** 1CV225, CATION DM OUTLET VALVE.

_____ c. **OPEN** 1CV230, CATION DM BKFSH INLET VALVE.

_____ d. **OPEN** 1CV222, PRI WTR TO DB DM BKFSH VALVE.

_____ e. **IF** placing 11 DB Demin in service,
THEN:

_____ (1) **OPEN** 11CV219, DB DM BKFSH INLET VALVE.

_____ (2) Slowly **OPEN** 11CV215, DB DM VENT, for at least 2 minutes, **THEN CLOSE** valve.

_____ (3) **CLOSE** 11CV219, DB DM BKFSH INLET VALVE.

_____ f. **IF** placing 12 DB Demin in service,
THEN:

_____ (1) **OPEN** 12CV219, DB DM BKFSH INLET VALVE

_____ (2) Slowly **OPEN** 12CV215, DB DM VENT, for at least 2 minutes, **THEN CLOSE** valve.

_____ (3) **CLOSE** 12CV219, DB DM BKFSH INLET VALVE.

_____ g. **CLOSE** 1CV222, PRI WTR TO DB DM BKFSH VALVE.

_____ h. **CLOSE** 1CV230, CATION DM BKFSH INLET VALVE.

_____ i. **CLOSE** 1CV225, CATION DM OUTLET VALVE.

4.15.6 (continued)

_____ 4. **IF** placing 11 DB Demin in service,
THEN OPEN 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

_____ 5. **IF** placing 12 DB Demin in service,
THEN OPEN 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____ 6. **OPEN** 1CV212, DEBORATING DEMIN OUTLET VALVE.

_____ 7. **PLACE** 1CV21 in MIXED BED DIVERSION TO MIXED BED position **AND PLACE** in AUTO.

NOTE

_____ Two Operators will be required to coordinate placing Deborating Bed in service.

_____ Letdown flow will be momentarily terminated until the 1CV212 is opened. Monitoring Letdown pressure will be required until 1CV212 is opened.

CAUTION

If RCS pressure is greater than or equal to 165 psig a momentary interruption in Letdown flow may cause relief valve 1CV253 to lift at 200 psig.

Placing an unborated Deborating Bed Demin (Mixed Bed Resin) in service, in Modes 5, 6 or Defueled will result in RCS boron concentration lowering 40 to 80 ppm. To ensure Shutdown Margin is maintained RCS boron concentration should be a minimum of 100 ppm greater than boron concentration requirements for Shutdown Margin whenever an unborated Deborating Bed Demin (Mixed Bed Resin) is placed in service. If two unborated Deborating Bed Demins (Mixed Bed Resin) are to be in parallel then RCS boron concentration should be a minimum of 200 ppm greater than boron concentration requirements for Shutdown Margin.

4.15.7. **IF** RCS pressure is less than 165 psig,
AND either of the following conditions exist:

- Unit is in Modes 1-4, **AND** RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service.

OR

- Unit is in Modes 5, 6 or Defueled **AND** RCS boron concentration is **NOT** a minimum of 100 ppm greater than boron concentration required to maintain Shutdown Margin (for each unborated Mixed Bed Demin) as determined by SC.RE-ST.ZZ-0002(Q), Shutdown Margin Calculation.

THEN PERFORM the following:

1. **THROTTLE** 1CV8, LETDOWN ISOL FOR RHR, to reduce letdown flow to 45 GPM.

2. **ADJUST** Charging flow as necessary to match Letdown flow.

4.15.7 (continued)

NOTE

When borating a Deborating bed demin, letdown flow should be less than makeup capacity to VCT.

3. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO HUT position.

4. **IF** 11 DEBORATING Demin is to be placed in service, **THEN**:

   a. **ENSURE** OPEN 11CV208, 11 DEBORATING DEMIN INLET VALVE.

   b. **ENSURE** OPEN 11CV210, 11 DEBORATING DEMIN OUTLET VALVE.

   c. **LOWER** Letdown flow to 10-15 gpm with 1CV8 while balancing Charging flow.

   d. **OPEN** 11CV206, 11 DEBORATING DEMIN INLET VALVE.

   e. Slowly **OPEN** 11CV215, DB DM VENT, to approximately 1/2 open, **THEN** have Control Room place 1CV21 in MIXED BED DIVERSION TO MIXED BED position **AND PLACE** in AUTO .

   f. **OPEN** 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

5. **IF** 12 DEBORATING Demin is to be placed in service, **THEN**:

   a. **ENSURE** OPEN 12CV208, 12 DEBORATING DEMIN INLET VALVE.

   b. **ENSURE** OPEN 12CV210, 12 DEBORATING DEMIN OUTLET VALVE.

   c. **LOWER** Letdown flow to 10-15 gpm with 1CV8 while balancing Charging flow.

   d. **OPEN** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

   e. Slowly **OPEN** 12CV215, DB DM VENT, to approximately 1/2 open,

      THEN have Control Room place 1CV21 in MIXED BED DIVERSION TO MIXED BED position **AND PLACE** in AUTO.

   f. **OPEN** 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

6. **AFTER** a minimum of 10 minutes, slowly **OPEN** 1CV212, DEBORATING DEMIN OUTLET VALVE, while **CLOSING** 11(12)CV215, as applicable.

4.15.7 (continued)

_____ 7. **ADJUST** Letdown flow to 45 gpm with 1CV8 while balancing Charging flow.

_____ 8. **WHEN** 500 gallons have been flushed through the Cation Bed Demin, **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling.

_____ 9. **RECORD** results of sample on Attachment 3, CVCS Demin Borating Record.

_____ 10. **IF** difference in boron concentration is greater than 25 ppm, **THEN**:

_____ a. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling (at intervals of 30 minutes or less).

_____ b. **RECORD** results of samples on Attachment 3, CVCS Demin Borating Record.

_____ c. **WHEN** difference in boron concentration is less than or equal to 25 ppm **CONTINUE** with this procedure.

_____ 11. **PLACE** 1CV35, VCT 3 WAY INLET V, in FLOW TO VCT position AND PLACE in AUTO.

_____ 12. **ADJUST** 1CV8, LETDOWN ISOL FOR RHR, to obtain desired letdown flow.

_____ 13. **ADJUST** Charging flow as necessary to match Letdown flow.

4.15.7 (continued)

CAUTION

If RCS pressure is greater than or equal to 165 psig a momentary interruption in Letdown flow may cause relief valve 1CV253 to lift at 200 psig.

Placing an unborated Deborating Bed Demin (Mixed Bed Resin) in service, in Modes 5, 6 or Defueled will result in RCS boron concentration lowering 40 to 80 ppm. To ensure Shutdown Margin is maintained RCS boron concentration should be a minimum of 100 ppm greater than boron concentration requirements for Shutdown Margin whenever an unborated Deborating Bed Demin (Mixed Bed Resin) is placed in service. If two unborated Deborating Bed Demins (Mixed Bed Resin) are to be in parallel then RCS boron concentration should be a minimum of 200 ppm greater than boron concentration requirements for Shutdown Margin.

4.15.8. **IF** RCS pressure is greater than or equal to 165 psig, **AND** either of the following conditions exist:

- Unit is in Modes 1-4, **AND** RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service.
- Unit is in Modes 5, 6 or Defueled **AND** RCS boron concentration is **NOT** a minimum of 100 ppm greater than boron concentration required to maintain Shutdown Margin (for each unborated Mixed Bed Demin) as determined by SC.RE-ST.ZZ-0002(Q), Shutdown Margin Calculation.

THEN PERFORM the following:

1. **IF** 11 DEBORATING Demin is to be placed in service, **THEN:**
   a. **ENSURE** OPEN 11CV208, 11 DEBORATING DEMIN INLET VALVE.
   b. **ENSURE** OPEN 11CV210, 11 DEBORATING DEMIN OUTLET VALVE.
   c. Slowly **OPEN** 11CV206, 11 DEBORATING DEMIN INLET VALVE.
2. **IF** 12 DEBORATING Demin is to be placed in service, **THEN**:
   a. **ENSURE** OPEN 12CV208, 12 DEBORATING DEMIN INLET VALVE.
   b. **ENSURE** OPEN 12CV210, 12 DEBORATING DEMIN OUTLET VALVE.
   c. Slowly **OPEN** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

4.15.8 (continued)

_____ 3. **PERFORM** the following to fill, vent and pressurize Deborating Bed Demin piping:

_____ a. **ENSURE** CLOSED the following valves:

_____ (1) 1WR116, PW DM SYS STOP V

_____ (2) 1WR109, PW SPENT RESIN FLUSH VALVE

_____ (3) 1WR135, PW DM SYS HDR DRN

_____ (4) 1WR136, PW DM SYS HDR VENT

_____ (5) 1WR137, PW DM SYS HDR VENT

_____ (6) 11CV236, MB DM PRI WTR SUP VALVE

_____ (7) 12CV236, MB DM PRI WTR SUP VALVE

_____ b. **OPEN** 1CV225, CATION DM OUTLET VALVE.

_____ c. **OPEN** 1CV230, CATION DM BKFSH INLET VALVE.

_____ d. **OPEN** 1CV222, PRI WTR TO DB DM BKFSH VALVE.

_____ e. **IF** placing 11 DB Demin in service,
THEN:

_____ (1) **OPEN** 11CV219, DB DM BKFSH INLET VALVE.

_____ (2) Slowly **OPEN** 11CV215, DB DM VENT, for at least 2 minutes, **THEN CLOSE** valve.

_____ (3) **CLOSE** 11CV219, DB DM BKFSH INLET VALVE.

_____ f. **IF** placing 12 DB Demin in service,
THEN:

_____ (1) **OPEN** 12CV219, DB DM BKFSH INLET VALVE

_____ (2) Slowly **OPEN** 12CV215, DB DM VENT, for at least 2 minutes, **THEN CLOSE** valve.

_____ (3) **CLOSE** 12CV219, DB DM BKFSH INLET VALVE.

_____ g. **CLOSE** 1CV222, PRI WTR TO DB DM BKFSH VALVE.

_____ h. **CLOSE** 1CV230, CATION DM BKFSH INLET VALVE.

_____ i. **CLOSE** 1CV225, CATION DM OUTLET VALVE.

4.15.8 (continued)

_____ 4. **IF** placing 11 DB Demin in service,
THEN OPEN 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

_____ 5. **IF** placing 12 DB Demin in service,
THEN OPEN 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____ 6. **OPEN** 1CV212, DEBORATING DEMIN OUTLET VALVE.

_____ 7. **IF** Normal Letdown is in service,
THEN:

_____ a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE in MANUAL.

_____ b. Simultaneously **PERFORM** the following:

_____ (1) **OPEN** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

_____ The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ c. **IF** controlling Letdown pressure in AUTO,

_____ (1) **PLACE** 1CV18 in AUTO

_____ (2) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (1) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

4.15.8.7 (continued)

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 8. **IF** Letdown is from RHR,
THEN:

_____ a. **THROTTLE** 1CV8, LETDOWN ISOL FOR RHR, to reduce letdown flow to 45 GPM.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

NOTE

_____ When borating a Deborating bed demin, letdown flow should be less than makeup capacity to VCT.

_____ 9. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO HUT position.

_____ 10. **PLACE** 1CV21, LETDOWN DEMIN BYPASS, in MIXED BED DIVERSION TO MIXED BED position **AND PLACE** in AUTO.

_____ 11. **WHEN** 500 gallons have been flushed through the Cation Bed Demin, **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling.

_____ 12. **RECORD** results of sample on Attachment 3, CVCS Demin Borating Record.

_____ 13. **IF** difference in boron concentration is greater than 25 ppm,
THEN:

_____ a. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling (at intervals of 30 minutes or less).

_____ b. **RECORD** results of samples on Attachment 3, CVCS Demin Borating Record.

_____ c. **WHEN** difference in boron concentration is less than or equal to 25 ppm, **CONTINUE** with this procedure.

_____ 14. PLACE 1CV35, VCT 3 WAY INLET V, in FLOW TO VCT position **AND PLACE** in AUTO.

4.15.8 (continued)

_____ 15. **IF** Normal Letdown is in service,

THEN:

_____ a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

_____ b. Simultaneously **PERFORM** the following:

_____ (1) **OPEN** 1CV4, LETDOWN ORIFICE ISOLATION VALVE, **OR** 1CV5, LETDOWN ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

_____ The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ c. **IF** controlling Letdown pressure in AUTO,

_____ (1) **PLACE** 1CV18 in AUTO

_____ (2) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (1) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

4.15.8 (continued)

_____ 16. **IF** Letdown is from RHR,
THEN:

_____ a. **ADJUST** 1CV8, LETDOWN ISOL FOR RHR, to obtain desired letdown flow.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

___ ___ 4.15.9. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section Q.
IV

NOTE

_____ The Deborating Bed Demins may be temporarily removed from service only if it will be of a short enough duration that RCS Boron Concentration will not change by greater than 25 ppm and maintenance or operational activities are not allowed to occur which could drain the Deborating Bed Demins and their associated piping. If time is anticipated to be longer than this or maintenance/operational activities could occur which might drain the DB Bed Demins and their associated piping, they should be removed from service IAW Section 4.17 and returned to service IAW this section beginning at Step 4.15.1.

_____ 4.15.10. **IF** a temporary removal of Deborating Beds from service is required,
THEN:

_____ 1. **PLACE** 1CV21, LETDOWN DEMIN BYPASS, in MIXED BED DIVERSION TO VCT position.

_____ 2. **WHEN** it is required to place Deborating Bed Demin back in service,
THEN:

_____ a. **ENSURE** RCS boron concentration is less than or equal to 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service.

_____ b. **ENSURE** no maintenance or operational activities have occurred which might have drained the Deborating Bed Demins and their associated piping.

_____ c. **PLACE** 1CV21, LETDOWN DEMIN BYPASS, in MIXED BED DIVERSION TO MIXED BED position AND PLACE in AUTO.

4.16 Swapping Deborating Bed Demins (with Mixed Bed or Cation Bed Resin) With No Mixed Bed Demin Available

_____4.16.1. **ENSURE** a Deborating Bed Demin is in service IAW Section 4.15.

_____4.16.2. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition,
THEN COMPLETE Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

_____4.16.3. **IF** placing in service for Lithium control,
THEN RECORD the amount of gallons to be flushed through the Deborating Bed Demin (as determined by Chemistry):

_____ Gallons

_____4.16.4. **OBTAIN** from Chemistry RCS boron concentration when Deborating Bed Demin was last in service.

_____4.16.5. **IF** RCS boron concentration is less than or equal to 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service,
THEN PERFORM the following:

_____ 1. **IF** 11 DEBORATING Demin is to be placed in service,
THEN:

_____ a. **ENSURE** OPEN 11CV208, 11 DEBORATING DEMIN INLET VALVE.

_____ b. **ENSURE** OPEN 11CV210, 11 DEBORATING DEMIN OUTLET VALVE.

_____ c. Slowly **OPEN** 11CV206, 11 DEBORATING DEMIN INLET VALVE.

_____ d. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 11CV215, DB DM VENT for at least 2 minutes,
THEN CLOSE valve.

_____ e. **OPEN** 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

_____ f. **CLOSE** 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____ g. **CLOSE** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

_____ 2. **IF** 12 DEBORATING Demin is to be placed in service,
THEN:

_____ a. **ENSURE** OPEN 12CV208, 12 DEBORATING DEMIN INLET VALVE.

_____ b. **ENSURE** OPEN 12CV210, 12 DEBORATING DEMIN OUTLET VALVE.

_____ c. Slowly **OPEN** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

4.16.5 (continued)

_____ d. **IF** fill and vent is required (Refer to Step 2.1.22), **THEN** slowly **OPEN** 12CV215, DB DM VENT for at least 2 minutes, **THEN CLOSE** valve.

_____ e. **OPEN** 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____ f. **CLOSE** 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

_____ g. **CLOSE** 11CV206, 11 DEBORATING DEMIN INLET VALVE.

_____4.16.6. **IF** CRS/SM **OR** Chemistry determines present RCS boron concentration is greater than 25 ppm different from RCS boron concentration when Deborating Bed Demin was last in service,
THEN PERFORM the following: **[C0417]**

_____ 1. **IF** Normal Letdown is in service, **THEN**:

_____ a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE in MANUAL.

_____ b. Simultaneously **PERFORM** the following:

_____ (1) **OPEN** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

_____ The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ c. **IF** controlling Letdown pressure in AUTO,

_____ (1) **PLACE** 1CV18 in AUTO

_____ (2) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

4.16.6.1 (continued)

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (1) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 2. **IF** Letdown is from RHR,
THEN:

_____ a. **THROTTLE** 1CV8, LETDOWN ISOL FOR RHR, to reduce letdown flow to 45 GPM.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

NOTE

_____ When borating a Deborating bed demin, letdown flow should be less than makeup capacity to VCT.

_____ 3. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO HUT position.

_____ 4. **IF** 11 DEBORATING Demin is to be placed in service,
THEN:

_____ a. **ENSURE** OPEN 11CV208, 11 DEBORATING DEMIN INLET VALVE.

_____ b. **ENSURE** OPEN 11CV210, 11 DEBORATING DEMIN OUTLET VALVE.

_____ c. Slowly **OPEN** 11CV206, 11 DEBORATING DEMIN INLET VALVE.

_____ d. **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 11CV215, DB DM VENT for at least 2 minutes,
THEN CLOSE valve.

_____ e. **OPEN** 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

_____ f. **CLOSE** 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____ g. **CLOSE** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

4.16.6 (continued)

_____ 5. **IF** 12 DEBORATING Demin is to be placed in service, **THEN**:

_____ a. **ENSURE** OPEN 12CV208, 12 DEBORATING DEMIN INLET VALVE.

_____ b. **ENSURE** OPEN 12CV210, 12 DEBORATING DEMIN OUTLET VALVE.

_____ c. Slowly **OPEN** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

_____ d. **IF** fill and vent is required (Refer to Step 2.1.22), **THEN** slowly **OPEN** 12CV215, DB DM VENT for at least 2 minutes, **THEN CLOSE** valve.

_____ e. **OPEN** 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____ f. **CLOSE** 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

_____ g. **CLOSE** 11CV206, 11 DEBORATING DEMIN INLET VALVE.

_____ 6. **WHEN** 500 gallons have been flushed through the Cation Bed Demin, **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling.

_____ 7. **RECORD** results of sample on Attachment 3, CVCS Demin Borating Record.

_____ 8. **IF** difference in boron concentration is greater than 25 ppm, **THEN**:

_____ a. **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling (at intervals of 30 minutes or less).

_____ b. **RECORD** results of samples on Attachment 3, CVCS Demin Borating Record.

_____ c. **WHEN** difference in boron concentration is less than or equal to 25 ppm, **CONTINUE** with this procedure.

_____ 9. **PLACE** 1CV35, VCT 3 WAY INLET V, in FLOW TO VCT position **AND PLACE** in AUTO.

_____ 10. **IF** Normal Letdown is in service, **THEN**:

_____ a. **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

4.16.6 (continued)

_____ b. Simultaneously **PERFORM** the following:

_____ (1) **OPEN** 1CV4, LETDOWN ORIFICE ISOLATION VALVE, **OR** 1CV5, LETDOWN ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ c. **IF** controlling Letdown pressure in AUTO,

_____ (1) **PLACE** 1CV18 in AUTO

_____ (2) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ d. **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (1) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (2) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ e. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ f. **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ 11. **IF** Letdown is from RHR,
THEN:

_____ a. **ADJUST** 1CV8, LETDOWN ISOL FOR RHR, to obtain desired letdown flow.

_____ b. **ADJUST** Charging flow as necessary to match Letdown flow.

4.16 (continued)

_____4.16.7. **IF** DB Demin was placed in service for Lithium control (see Step 4.16.3) **THEN**:

_____ 1. **DETERMINE** amount of time Deborating Bed Demin is to remain in service using gallons recorded in Step 4.16.3 and Letdown flow **AND RECORD** below:

$$\_\_\_\_\_\ gallons \div \_\_\_\_\_\ \frac{gallons}{minute} = \_\_\_\_\_\ minutes$$

_____ 2. **WHEN** the Deborating Bed Demin has been in service for the time recorded in Step, 4.16.7.1 **REMOVE** Deborating Bed Demin from service as follows:

_____ a. **IF** 11 DB Bed Demin was placed in service, **THEN PERFORM** the following:

_____ (1) **OPEN** 12CV206, DB DM INLET VALVE.

_____ (2) **OPEN** 12CV209, DB DM OUTLET VALVE.

_____ (3) **CLOSE** 11CV209, DB DM OUTLET VALVE.

_____ (4) **CLOSE** 11CV206, DB DM INLET VALVE.

_____ b. **IF** 12 DB Bed Demin was placed in service, **THEN PERFORM** the following:

_____ (1) **OPEN** 11CV206, DB DM INLET VALVE.

_____ (2) **OPEN** 11CV209, DB DM OUTLET VALVE.

_____ (3) **CLOSE** 12CV209, DB DM OUTLET VALVE.

_____ (4) **CLOSE** 12CV206, DB DM INLET VALVE.

___ ___4.16.8. **IF** 11 DEBORATING Demin is in service, **THEN DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification, Section R.
IV

___ ___4.16.9. **IF** 12 DEBORATING Demin is in service, **THEN DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification, Section S.
IV

4.17 Removing a Deborating Bed Demin from Service

_____4.17.1. **IF** a Mixed Bed Demin is **NOT** in service,
THEN:

_____ 1. **PLACE** 1CV21 in MIXED BED DIVERSION TO VCT position.

_____ 2. **CLOSE** 1CV205, LETDOWN TO DEBORATING DEMIN VALVE.

_____4.17.2. **PLACE** 1CV27, DEBORATING DEMIN THREE WAY INLET VALVE, in FLOW TO VCT position.

_____4.17.3. **CLOSE** 1CV212, DEBORATING DEMIN OUTLET VALVE.

_____4.17.4. **IF** 11 DEBORATING Demin is to be removed from service,
THEN:

_____ 1. **CLOSE** 11CV206, 11 DEBORATING DEMIN INLET VALVE.

_____ 2. **CLOSE** 11CV209, 11 DEBORATING DEMIN OUTLET VALVE.

_____4.17.5. **IF** 12 DEBORATING Demin is to be removed from service,
THEN:

_____ 1. **CLOSE** 12CV206, 12 DEBORATING DEMIN INLET VALVE.

_____ 2. **CLOSE** 12CV209, 12 DEBORATING DEMIN OUTLET VALVE.

_____4.17.6. **NOTIFY** Chemistry that 11 (12) Deborating Demin is removed from service.

___ ___4.17.7. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification, Section T.
IV

_____4.17.8. **UPDATE** Control Room Console Station Aid S1-OP-03-001, Deborating Bed Demineralizer.

4.18 Mixed Bed Demin Operation During Shutdown Modes 3, 4, 5, 6 and Defueled

_____4.18.1. **ENSURE** letdown is in service.

_____4.18.2. **ENSURE** RCS temperature is less than or equal to 547°F.

_____4.18.3. **NOTIFY** Chemistry to coordinate placing Mixed Bed Demins in service as required for RCS chemistry control during RCS cleanup.

_____4.18.4. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition,
THEN COMPLETE Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

_____4.18.5. **WHEN** directed by Chemistry, **PLACE** a Mixed Bed Demin in service as follows:

_____ 1. **OBTAIN** from Chemistry RCS boron concentration when the Mixed Bed Demin to be placed in service was last in service.

_____ 2. **IF** placing MB Demineralizer(s) in service concurrent with borating the RCS to Cold Shutdown conditions during a EOC shutdown **AND** concurrence from Reactor Engineering is obtained,
THEN MARK Step 4.18.5.3 as N/A **[70116043 / 80100486].**

CAUTION

_____ Placing an unborated Mixed Bed Demin in service will result in RCS boron concentration lowering 40 to 80 ppm. To ensure Shutdown Margin is maintained RCS boron concentration should be a minimum of 100 ppm greater than boron concentration requirements for Shutdown Margin whenever an unborated Mixed Bed Demin is placed in service. If two unborated Mixed Bed Demins are to be in parallel then RCS boron concentration should be a minimum of 200 ppm greater than boron concentration requirements for Shutdown Margin.

_____ 3. **IF** the MB Demin to be placed in service is greater than 25 ppm different from RCS boron concentration when it was last in service, **OR** contains new resin,
THEN ENSURE RCS boron concentration is a minimum of 100 ppm greater than boron concentration required to maintain Shutdown Margin (for each unborated Mixed Bed Demin) as determined by SC.RE-ST.ZZ-0002(Q), Shutdown Margin Calculation.

_____ 4. **ENSURE** 1CV35, VCT THREE WAY INLET VALVE is in FLOW TO VCT position **AND PLACE** in AUTO.

4.18.5 (continued)

_____ 5. **IF** there are no Mixed Bed Demins in service, **THEN**:

_____ a. **ENSURE** 1CV21, LETDOWN DEMIN BYPASS, selected to MIXED BED DIVERSION TO VCT.

_____ b. **ENSURE** CLOSED 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ c. **ENSURE** CLOSED 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

CAUTION

_____ Mixed Bed Demineralizer valve manipulations are to be conducted slowly to minimize the potential to move resin out of the demineralizer during the fill and vent.

_____ d. **IF** 11 MIXED BED Demin is to be placed in service, **THEN**:

_____ (1) **IF** fill and vent is required (Refer to Step 2.1.22), **THEN**:

_____ (a) Slowly **THROTTLE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE 3 turns OPEN.

_____ (b) Slowly **OPEN** 11CV234, MB DM VENT for at least 15 minutes, **THEN CLOSE** valve.

_____ (2) Slowly **OPEN** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE

_____ (3) Slowly **OPEN** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____ (4) **ENSURE** 1CV21, LETDOWN DEMIN BYPASS VALVE is in the FLOW TO MIXED BED position **AND PLACE** in AUTO.

4.18.5 (continued)

_____ e. **IF** 12 MIXED BED Demin is to be placed in service, **THEN**:

_____ (1) **IF** fill and vent is required (Refer to Step 2.1.22), **THEN**:

_____ (a) Slowly **THROTTLE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE 3 turns OPEN.

_____ (b) Slowly **OPEN** 12CV234, MB DM VENT for at least 15 minutes, **THEN CLOSE** valve.

_____ (2) Slowly **OPEN** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ (3) Slowly **OPEN** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

_____ (4) **ENSURE** 1CV21, LETDOWN DEMIN BYPASS VALVE is in the FLOW TO MIXED BED position **AND PLACE** in AUTO.

_____ 6. **IF** a Mixed Bed Demin is in service, **THEN**:

_____ a. **ENSURE** 1CV21, LETDOWN DEMIN BYPASS VALVE is in FLOW TO MIXED BED position **AND PLACE** in AUTO.

_____ b. **IF** 11 MIXED BED Demin is to be placed in service, **THEN**:

_____ (1) Slowly **OPEN** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____ (2) **IF** fill and vent is required (Refer to Step 2.1.22), **THEN** slowly **OPEN** 11CV234, MB DM VENT for at least 2 minutes, **THEN CLOSE** valve.

_____ (3) Slowly **OPEN** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ (4) **IF** 12 MIXED BED Demin is no longer required to be in service, as determined by Chemistry, **THEN REMOVE** it from service as follows:

_____ (a) **CLOSE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ (b) **CLOSE** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

4.18.6 (continued)

_____ c. **IF** 12 MIXED BED Demin is to be placed in service, **THEN**:

_____ (1) Slowly **OPEN** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

_____ (2) **IF** fill and vent is required (Refer to Step 2.1.22), **THEN** slowly **OPEN** 12CV234, MB DM VENT for at least 2 minutes, **THEN CLOSE** valve.

_____ (3) Slowly **OPEN** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE.

_____ (4) **IF** 11 MIXED BED Demin is no longer required to be in service, as determined by Chemistry, **THEN REMOVE** it from service as follows:

_____ (a) **CLOSE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE.

_____ (b) **CLOSE** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____4.18.6. **IF** the RCS is depressurized **AND** Letdown Flow is to be maximized, **THEN INITIATE** S1.OP-SO.CVC-0001(Q), Charging, Letdown and Seal Injection, for Maximizing Letdown Flow During Shutdown.

___ ___4.18.7. **DIRECT** a Second Operator to perform an Independent Verification IAW Attachment 7, Independent Verification Section U.
IV

4.19 Cation Demin Operation During Shutdown Modes 3, 4, 5, 6 and Defueled

NOTE

Steps 4.19.1 - 4.19.7 can be performed in any mode.

_____4.19.1. **ENSURE** Letdown is in service.

_____4.19.2. **ENSURE** Mixed Bed Demin is in service.

_____4.19.3. **IF** placing a demineralizer in service following resin addition IAW SC.CH-AD.CVC-0412(Q), Primary Demineralizer Resin Addition,
THEN COMPLETE Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification. **[CRCA 70108974]**

_____4.19.4. Slowly **OPEN** 1CV224, CATION BED DEMIN INLET VALVE.

_____4.19.5. Slowly **OPEN** 1CV226, CATION DM VENT.

NOTE

_____ Vent Cation DM Bed for at least two minutes.

_____4.19.6. **WHEN** venting is complete, **CLOSE** 1CV226, CATION DM VENT.

_____4.19.7. **CLOSE** 1CV224, CATION BED DEMIN INLET VALVE.

_____4.19.8. **WHEN** directed by Chemistry, **PLACE** CAT Bed Demin in service as follows:

_____ 1. **OBTAIN** from Chemistry RCS boron concentration when the Cat Bed Demin to be placed in service was last in service.

CAUTION

_____ To ensure Shutdown Margin is maintained, RCS boron concentration should be a minimum of 25 ppm greater than boron concentration requirements for Shutdown Margin whenever an unborated Cat Bed Demin is place in service.

_____4.19.9. **IF** the Cat Bed Demin to be placed in service is >25 ppm different from the RCS boron concentration OR contains new resin,
THEN ENSURE RCS boron concentration is a minimum of 25 ppm greater than boron concentration required to maintain Shutdown Margin as determined by SC.RE-ST.ZZ-0002(Q), Shutdown Margin Calculation.

_____ 1. **IF** the minimum shutdown margin requirements are not met,
THEN PLACE the Cat Bed Demin in service IAW sections 4.10 or 4.11.

4.19 (continued)

_____4.19.10. **PLACE** 1CV35, VCT THREE WAY INLET VALVE, in FLOW TO HUT position.

_____4.19.11. Slowly **OPEN** 1CV224, CATION BED DEMIN INLET VALVE.

_____4.19.12. Slowly **OPEN** 1CV225, CATION BED DEMIN OUTLET VALVE.

NOTE

_____ Maximum flow through Cation Bed Demin is 75 gpm.

_____4.19.13. **THROTTLE** CLOSE 1CV26, CATION BED BYPASS VALVE, to obtain flow less than 75 gpm on FL-8864.

_____4.19.14. **WHEN** 500 gallons have been flushed through the Cation Bed Demin, **PLACE** 1CV35, VCT THREE WAY INLET VALVE, in FLOW TO VCT position **AND PLACE** in AUTO.

_____4.19.15. **WHEN** requested by Chemistry, **REMOVE** the Cat Bed from service by performing the following:

_____ 1. **OPEN** 1CV26, CATION BED BYPASS VALVE.

_____ 2. **CLOSE** 1CV225, CATION BED DEMIN OUTLET VALVE.

_____ 3. **CLOSE** 1CV224, CATION BED DEMIN INLET VALVE.

___ ___4.19.16. **DIRECT** a second Operator to perform Independent Verification IAW Attachment 7, Independent Verification Section V.
IV

4.20 Completion and Review

_____4.20.1. **COMPLETE** Attachment 10, Completion Sign-Off Sheet, Sections A and B, **AND FORWARD** this procedure to CRS/SM for review and approval.

_____4.20.2. CRS/SM **PERFORM** following:

_____ 1. **REVIEW** this procedure with Attachments 3-10 for completeness and accuracy.

_____ 2. **COMPLETE** Attachment 10, Completion Sign-Off Sheet, Section 3.0.

_____ 3. **FORWARD** completed procedure to Operations Staff.

END of Instructions

5.0 REFERENCES AND COMMITMENTS

5.1 Commitments

5.1.1. C0417 - INPO SER 08-91

5.2 Performance References

5.2.1. Updated Final Safety Analysis Report:

1. Section 9.3.4, Chemical and Volume Control System

5.2.2. Drawings:

1. 205228, No. 1 Unit Chemical and Volume Control System Operation - P&ID

5.2.3. PSBPs:

1. 304209, Salem Units 1 and 2 Precautions, Limitations, and Setpoints

5.2.4. Others:

1. DE-CB.CVC-0037(Q), Chemical and Volume Control Systems
2. DES-90-01505, CVCS Demineralizer Operating Procedures.
3. 80062317 - OE 16305, Cation Demineralizer - Unexpected Reactivity Results
4. 80077626-160 - OE 20002, Turkey Point - Bypass of Letdown Demineralizers and Filters due to Filter High Differential Pressure

5.2.5. Cross-References:

1. Procedures:
   a. RM-AA-101, Records Management Program
   b. S1.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection
   c. S1.OP-SO.CVC-0004(Q), CVCS Holdup Tank System Operation
   d. S1.OP-SO.CVC-0006(Q), Boron Concentration Control
   e. S1.OP-SO.CVC-0007(Q), Fill and Vent of CVCS

5.3 Developmental References

5.3.1. None

6.0 RECORDS

6.1 Records Retention

6.1.1. Retain the following IAW-RM-AA-102, Control of Documents

- Attachments 3-10

Attachment 1, Time Required To Saturate A Mixed Bed Demin

NOTE

Times listed in this Attachment are based on a Letdown flow of 45 gpm.

RCS BORON CONCENTRATION (ppm)	TIME (minutes)	RCS BORON CONCENTRATION (ppm)	TIME (minutes)
2000	96	1000	191
1950	98	950	201
1900	101	900	212
1850	103	850	225
1800	106	800	239
1750	109	750	255
1700	112	700	273
1650	116	650	294
1600	119	600	319
1550	123	550	347
1500	127	500	382
1450	132	450	425
1400	137	400	478
1350	142	350	546
1300	147	300	637
1250	153	250	764
1200	159	200	956
1150	166	150	1274
1100	174	100	1912
1050	182		

Attachment 2, Time Required To Saturate Cation Demin (IF Mixed Resin USED)

NOTE

Times listed in this Attachment are based on a Letdown flow of 45 gpm.

RCS BORON CONCENTRATION (ppm)	TIME (minutes)	RCS BORON CONCENTRATION (ppm)	TIME (minutes)
2000	64	1000	128
1950	66	950	134
1900	68	900	142
1850	69	850	150
1800	71	800	160
1750	73	750	170
1700	75	700	182
1650	78	650	196
1600	80	600	213
1550	82	550	232
1500	85	500	255
1450	88	450	284
1400	92	400	319
1350	95	350	364
1300	98	300	425
1250	102	250	510
1200	106	200	638
1150	111	150	850
1100	116	100	1275
1050	122		

Attachment 3, CVCS Demin Borating Record

TIME	ELAPSED TIME (in minutes)	BORON CONCENTRATION (ppm)	
		CURRENT RCS	DEMIN OUTLET

Attachment 4, Deborating Bed Demineralizer Usage

Demineralizer	Date	Time		In Service Time		Cumulative In Service Time (1)
		IN	OUT	Hours	Minutes	

(1) REQUEST Chemistry to sample the Deborating Bed Demineralizer outlet at least once per eight hours of Cumulative In Service Time.

Attachment 5, Alternate Letdown Sampling

A. Backpressure Method:

CAUTION

_____ To prevent an inadvertent reactivity event, a mixed bed or cation bed demin is not to be placed in service to the VCT until Chemistry has determined that the demin inlet and outlet boron concentrations are within 25 ppm. **[C0417].**

_____ The Reactor Coolant Filter shall remain in service any time a CVCS demineralizer is in service. This will minimize the potential for resin introduction into the RCS.

_____1. **ENSURE** the following valve positions:

_____ a. 1CV29, RC FILTER INLET PRESS TAP, OPEN.

_____ b. 1CV34, RC FILTER BYP VALVE, CLOSED.

_____ c. 1CV33, RC FILTER OUTLET VALVE, OPEN.

CAUTION

_____ When throttling 1CV28, continuous attendance is required due to the dynamic control of 1CV18 controller to ensure a pressure of 50 psig as read on local 1PI137 is not exceeded.

_____2. **ESTABLISH** communication with the Control Room.

_____3. Slowly **THROTTLE** CLOSED 1CV28, RC FILTER INLET VALVE, until indicated pressure, as read on 1PI137, is between 25-45 psig.

Attachment 5, Alternate Letdown Sampling (continued)

_____4. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROLV VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ a. **ADJUST** Charging flow as necessary to match Letdown flow.

_____ b. **IF** Letdown pressure is at 300 psig,
THEN PLACE 1CV18, LETDOWN PRESSURE CONTROL VALVE, in AUTO.

NOTE

_____ Continuous purging of sample is acceptable to reduce evolution time and liquid waste.

_____5. **NOTIFY** Chemistry to sample the demin outlet.

CAUTION

_____ When opening 1CV28, continuous attendance is required due to the dynamic control of 1CV18 controller to ensure a pressure of 50 psig as read on local 1PI137 is not exceeded.

_____6. **WHEN** the Letdown Sample is obtained, slowly **OPEN** 1CV28, RC FILTER INLET VALVE.

___ ___7. **DIRECT** a second Operator to perform Independent Verification of 1CV28 in the OPEN position.
IV

Attachment 6, Flushing CVCS Demin To WHUT

_____1. **DIRECT** Chemistry to determine either of the following, as applicable:

_____ **a.** **DETERMINE** amout of time water is to be flushed through the applicable Mixed Bed Demineralizer **AND RECORD** time: _____ TIME (min)

OR

_____ b. **DETERMINE** volume of water is to be flushed through the applicable Mixed Bed Demineralizer **AND RECORD** volume: _____VOL (gal)

_____2. **IF** a Mixed Bed Demineralizer is already in service,
(i.e., flushing an out-of-service MB Demin with the other MB Demin in-service)
THEN PERFORM flushing as follows:

_____ a. **IF** flushing 11 Mixed Bed Demin,
THEN:

_____ (1) **ENSURE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE is CLOSED.

_____ (2) Slowly **OPEN** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

_____ (3) **COORDINATE** with the Control Room **AND THROTTLE** OPEN 11CV233, MB DM DRAIN.

_____ (4) **WHEN** the required flush time or volume (as applicable) recorded in Step 1.1 has been met, **CLOSE** 11CV233, MB DM DRAIN.

_____ (5) **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 11CV234, MB DM VENT for at least 2 minutes,
THEN CLOSE valve.

_____ (6) **CLOSE** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

Attachment 6, Flushing CVCS Demin To WHUT (continued)

_____ b. **IF** flushing 12 Mixed Bed Demin,
THEN:

_____ (1) **ENSURE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE is CLOSED.

_____ (2) Slowly **OPEN** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

_____ (3) **COORDINATE** with the Control Room **AND THROTTLE** OPEN 12CV233, MB DM DRAIN.

_____ (4) **WHEN** the required flush time or volume (as applicable) recorded in Step 1.1 has been met, **CLOSE** 12CV233, MB DM DRAIN.

_____ (5) **IF** fill and vent is required (Refer to Step 2.1.22),
THEN slowly **OPEN** 12CV234, MB DM VENT for at least 2 minutes,
THEN CLOSE valve.

_____ (6) **CLOSE** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

Attachment 6, Flushing CVCS Demin To WHUT (continued)

_____3. **IF** a Mixed Bed Demineralizer is **NOT** already in service,
THEN PERFORM flushing as follows:

_____ a. **ENSURE** 1CV21, LETDOWN DEMIN BYPASS, in FLOW TO VCT position.

_____ b. **ESTABLISH** communications between the Control Room and an Operator at 1PI-136.

_____ c. **ADJUST** Letdown to 45 gpm by performing the following:

_____ (1) **IF** Letdown is out of service,
THEN PLACE a 45 gpm orifice in service IAW S1.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection.

_____ (2) **IF** Normal Letdown is in service,
THEN:

_____ (a) **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

_____ (b) Simultaneously **PERFORM** the following:

_____ 1. **OPEN** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ 2. **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

_____ The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ (c) **IF** controlling Letdown pressure in AUTO

_____ ▪ **PLACE** 1CV18 in AUTO.

_____ ▪ **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

Attachment 6, Flushing CVCS Demin To WHUT (continued)

_____ (d) **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ • **CLOSE** 1CV4 or 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ • **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ (e) **ADJUST** Charging flow as necessary to match Letdown flow.

_____ (f) **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

_____ (3) **IF** Letdown is from RHR,
THEN:

_____ (a) **THROTTLE** 1CV8, LETDOWN ISOL FOR RHR, to reduce letdown flow to 45 GPM.

_____ (b) **ADJUST** Charging flow as necessary to match Letdown flow.

d. **IF** flushing 11 MIXED BED Demin,

_____ **THEN**:

_____ (1) **ENSURE** 11CV25, 11 MIXED BED DEMIN OUTLET VALVE is CLOSED.

_____ (2) **THROTTLE** 11CV24, 11 MIXED BED DEMIN INLET VALVE 3 turns OPEN.

_____ (3) **OPEN** 11CV233, MB DM DRAIN.

_____ e. **IF** flushing 12 MIXED BED Demin,
THEN:

_____ (1) **ENSURE** 12CV25, 12 MIXED BED DEMIN OUTLET VALVE is CLOSED.

_____ (2) **THROTTLE** 12CV24, 12 MIXED BED DEMIN INLET VALVE 3 turns OPEN.

_____ (3) **OPEN** 12CV233, MB DM DRAIN.

Attachment 6, Flushing CVCS Demin To WHUT (continued)

CAUTION

While flushing Mixed Bed Demin, Demin Inlet Pressure at 1PI-136 should be monitored and 1CV21 is to be aligned to FLOW TO VCT if pressure exceeds 150 psig.

_____ f. **PLACE** 1CV21, LETDOWN DEMIN BYPASS, in FLOW TO MIXED BED position **AND PLACE** in AUTO .

_____ g. **IF** pressure at 1PI-136 exceeds 150 psig,
THEN PLACE 1CV21, LETDOWN DEMIN BYPASS, in FLOW TO VCT position, **AND EVALUATE** continued use of this procedure.

_____ h. **IF** flushing 12 MIXED BED Demin,
THEN slowly **OPEN** 12CV24, 12 MIXED BED DEMIN INLET VALVE.

CAUTION

_____ Mixed Bed Demineralizer valve manipulations are to be conducted slowly to minimize the potential to move resin out of the demineralizer during the flush.

_____ i. **IF** flushing 11 MIXED BED Demin,
THEN slowly **OPEN** 11CV24, 11 MIXED BED DEMIN INLET VALVE.

j. **WHEN** time recorded in Step 1.a **OR** volume recorded in Step 1.b has been met,

_____ **PLACE** 1CV21, LETDOWN DEMIN BYPASS, in FLOW TO VCT position.

_____ k. **IF** flushing 11 MIXED BED Demin,
THEN CLOSE the following valves:

_____ (1) 11CV233, MB DM DRAIN

_____ (2) 11CV24, 11 MIXED BED DEMIN INLET VALVE

_____ l. **IF** flushing 12 MIXED BED Demin,
THEN CLOSE the following valves:

_____ (1) 12CV233, MB DM DRAIN

_____ (2) 12CV24, 12 MIXED BED DEMIN INLET VALVE

_____ m. **IF** Normal Letdown is in service, AND plant conditions do NOT require Letdown to remain in service,
THEN SECURE Letdown IAW S1.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection.

Attachment 6, Flushing CVCS Demin To WHUT (continued)

_____ a. **IF** Normal Letdown is in service, AND plant conditions require a 75 gpm orifice in service,
THEN:

_____ (1) **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

_____ (2) Simultaneously **PERFORM** the following:

_____ (a) **OPEN** 1CV4, ORIFICE ISOLATION VALVE, **OR** 1CV5, 75 GPM Orifice Isolation Valve.

_____ (b) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

_____ The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ (3) **IF** controlling Letdown pressure in AUTO,

(a) **PLACE** 1CV18 in AUTO

_____ (b) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (4) **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (a) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (b) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ (5) **ADJUST** Charging flow as necessary to match Letdown flow.

_____ (6) **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

Attachment 6, Flushing CVCS Demin To WHUT (continued)

_____ b. **IF** Letdown is from RHR,
THEN:

_____ (1) **ADJUST** 1CV8, LETDOWN ISOL FOR RHR, to obtain desired letdown flow.

_____ (2) **ADJUST** Charging flow as necessary to match Letdown flow.

_____2. **IF** required, **PLACE** a Mixed Bed Demineralizer in service IAW Sections 4.1 through 4.5, **OR** Section 4.18, as applicable.

Attachment 7, Independent Verification

A. Borating a Mixed Bed Demin With No Other Mixed Bed Demin In Service

Valve	Description	Required Position	IV	Date
11CV24	11 MIXED BED DEMIN INLET VALVE	(1)		
11CV25	11 MIXED BED DEMIN OUTLET VALVE VALVE	(1)		
11CV234	MB DM VENT	CLOSED		
12CV24	12 MIXED BED DEMIN INLET VALVE	(1)		
12CV25	12 MIXED BED DEMIN OUTLET VALVE	(1)		
12CV234	MB DM VENT	CLOSED		

(1) OPEN when Demin is in service, CLOSED when Demin is out of service.

B. Borating Standby Mixed Bed Demin (11 MB DEMIN)

Valve	Description	Required Position	IV	Date
11CV24	11 MIXED BED DEMIN INLET VALVE	OPEN		
11CV25	11 MIXED BED DEMIN OUTLET VALVE	OPEN		
11CV234	MB DM VENT	CLOSED		
12CV24	12 MIXED BED DEMIN INLET VALVE	CLOSED		
12CV25	12 MIXED BED DEMIN OUTLET VALVE	CLOSED		

Attachment 7, Independent Verification (continued)

C. Borating Standby Mixed Bed Demin (12 MB DEMIN)

Valve	Description	Required Position	IV	Date
12CV24	12 MIXED BED DEMIN INLET VALVE	OPEN		
12CV25	12 MIXED BED DEMIN OUTLET VALVE	OPEN		
12CV234	MB DM VENT	CLOSED		
11CV24	11 MIXED BED DEMIN INLET VALVE	CLOSED		
11CV25	11 MIXED BED DEMIN OUTLET VALVE	CLOSED		

D. Placing a Borated Mixed Bed Demin In Service (11 MB DEMIN)

Valve	Description	Required Position	IV	Date
11CV24	11 MIXED BED DEMIN INLET VALVE	OPEN		
11CV25	11 MIXED BED DEMIN OUTLET VALVE	OPEN (1)		
11CV234	MB DM VENT	CLOSED		
12CV24	12 MIXED BED DEMIN INLET VALVE	CLOSED		
12CV25	12 MIXED BED DEMIN OUTLET VALVE	CLOSED		

(1) May be throttled to control Letdown flow

Attachment 7, Independent Verification (continued)

E. Placing a Borated Mixed Bed Demin In Service (12 MB DEMIN)

Valve	Description	Required Position	IV	Date
12CV24	12 MIXED BED DEMIN INLET VALVE	OPEN		
12CV25	12 MIXED BED DEMIN OUTLET VALVE	OPEN (1)		
12CV234	MB DM VENT	CLOSED		
11CV24	11 MIXED BED DEMIN INLET VALVE	CLOSED		
11CV25	11 MIXED BED DEMIN OUTLET VALVE	CLOSED		

(1) May be throttled to control Letdown flow.

F. Placing a Borated Standby Mixed Bed Demin In Service for RCS Chemistry Control

Valve	Description	Required Position	IV	Date
11CV24	11 MIXED BED DEMIN INLET VALVE	(1)		
11CV25	11 MIXED BED DEMIN OUTLET VALVE	(1)		
12CV24	12 MIXED BED DEMIN INLET VALVE	(1)		
12CV25	12 MIXED BED DEMIN OUTLET VALVE	(1)		

(1) OPEN when Demin is in service, CLOSED when Demin is out of service.

Attachment 7, Independent Verification (continued)

G. Removing CVCS Demin Header from Service

Valve	Description	Required Position	IV	Date
11CV24	11 MIXED BED DEMIN INLET VALVE	CLOSED		
11CV25	11 MIXED BED DEMIN OUTLET VALVE	CLOSED		
12CV24	12 MIXED BED DEMIN INLET VALVE	CLOSED		
12CV25	12 MIXED BED DEMIN OUTLET VALVE	CLOSED		

H. Placing a Non-Borated Cation Bed Demin (with Mixed Resin) In Service

Valve	Description	Required Position	IV	Date
1CV224	1 CATION BED INLET VALVE	(1)		
1CV225	1 CATION BED OUTLET VALVE	(1)		
1CV26	CATION BED BYPASS VALVE	(2)		
1CV226	CATION DM VENT	CLOSED		

(1) OPEN when Demin is in service, CLOSED when Demin is out of service.

(2) THROTTLED for desired flow on FL-8864 when Demin is in service, OPEN when Demin is out of service.

Attachment 7, Independent Verification (continued)

I. Placing a Borated Cation Bed Demin (with Mixed Resin) In Service

Valve	Description	Required Position	IV	Date
1CV224	1 CATION BED INLET VALVE	OPEN		
1CV225	1 CATION BED OUTLET VALVE	OPEN		
1CV26	CATION BED BYPASS VALVE	(1)		
1CV226	CATION DM VENT	CLOSED		

(1) THROTTLED to obtain desired flow on FL-8864

J. Placing a Borated Cation Bed Demin (with Mixed Resin) In Service for RCS Chemistry Control

Valve	Description	Required Position	IV	Date
1CV224	1 CATION BED INLET VALVE	CLOSED		
1CV225	1 CATION BED OUTLET VALVE	CLOSED		
1CV26	CATION BED BYPASS VALVE	OPEN		

Attachment 7, Independent Verification (continued)

K. Placing a Cation Bed Demin (with Cation Resin) In Service

Valve	Description	Required Position	IV	Date
1CV224	1 CATION BED INLET VALVE	(1)		
1CV225	1 CATION BED OUTLET VALVE	(1)		
1CV26	CATION BED BYPASS VALVE	(2)		
1CV226	CATION DM VENT	CLOSED		

(1) OPEN when Demin is in service, CLOSED when Demin is out of service.

(2) THROTTLED to obtain desired flow on FL-8864 when Demin is in service, OPEN when Demin is out of service.

L. Placing a Cation Bed Demin (with Cation Resin) In Service for RCS Chemistry Control

Valve	Description	Required Position	IV	Date
1CV224	1 CATION BED INLET VALVE	CLOSED		
1CV225	1 CATION BED OUTLET VALVE	CLOSED		
1CV26	CATION BED BYPASS VALVE	OPEN		

M. Removing the Cation Bed Demin from Service

Valve	Description	Required Position	IV	Date
1CV224	1 CATION BED INLET VALVE	CLOSED		
1CV225	1 CATION BED OUTLET VALVE	CLOSED		
1CV26	CATION BED BYPASS VALVE	OPEN		

Attachment 7, Independent Verification (continued)

N. Placing 11 DEBORATING Bed Demin In Service (Mixed Bed Demin Available)

Valve	Description	Required Position	IV	Date
1CV212	DEBORATING DEMIN OUTLET VALVE	OPEN		
11CV215	DB DM VENT	CLOSED		
11CV206	11 DEBORATING DEMIN INLET VALVE	OPEN		
11CV208	11 DEBORATING DEMIN INLET VALVE	OPEN		
11CV210	11 DEBORATING DEMIN OUTLET VALVE	OPEN		
11CV209	11 DEBORATING DEMIN OUTLET VALVE	OPEN		

O. Placing 12 DEBORATING Bed Demin In Service (Mixed Bed Demin Available)

Valve	Description	Required Position	IV	Date
1CV212	DEBORATING DEMIN OUTLET VALVE	OPEN		
12CV215	DB DM VENT	CLOSED		
12CV206	12 DEBORATING DEMIN INLET VALVE	OPEN		
12CV208	12 DEBORATING DEMIN INLET VALVE	OPEN		
12CV210	12 DEBORATING DEMIN OUTLET VALVE	OPEN		
12CV209	12 DEBORATING DEMIN OUTLET VALVE	OPEN		

P. Placing a Deborating Bed Demin In Service (Mixed Bed Demin Available)

Valve	Description	Required Position	IV	Date
1CV205	Letdown To Deborating Demin Valve	CLOSED		

Attachment 7, Independent Verification (continued)

Q. Placing a Deborating Bed Demin (with Mixed Bed or Cation Bed Resin) In Service With No Mixed Bed Demin Available

Valve	Description	Required Position	IV	Date
1CV205	LETDOWN TO DEBORATING DEMIN VALVE	OPEN		
1CV212	DEBORATING DEMIN OUTLET VALVE	OPEN		
1CV225	CATION DM OUTLET VALVE	CLOSED		
1CV230	CATION DM BKFSH INLET VALVE	CLOSED		
1CV222	PRI WTR TO DB DM BKFSH VALVE	CLOSED		
11CV219	DB DM BKFSH INLET VALVE	CLOSED		
11CV215	DB DM VENT	CLOSED		
11CV206	11 DEBORATING DEMIN INLET VALVE	(1)		
11CV209	11 DEBORATING DEMIN OUTLET VALVE	(1)		
12CV219	DB DM BKFSH INLET VALVE	CLOSED		
11CV215	DB DM VENT	CLOSED		
12CV206	12 DEBORATING DEMIN INLET VALVE	(1)		
12CV209	12 DEBORATING DEMIN OUTLET VALVE	(1)		

(1) OPEN when Demin is in service, CLOSED when Demin is out of service.

Attachment 7, Independent Verification (continued)

R. Swapping Deborating Bed Demins (Mixed Bed or Cation Bed Resin) With No Mixed Bed Demin Available (11 DB Demin In Service)

Valve	Description	Required Position	IV	Date
11CV215	DB DM VENT	CLOSED		
11CV206	11 DEBORATING DEMIN INLET VALVE	OPEN		
11CV209	11 DEBORATING DEMIN OUTLET VALVE	OPEN		
12CV206	12 DEBORATING DEMIN INLET VALVE	CLOSED		
12CV209	12 DEBORATING DEMIN OUTLET VALVE	CLOSED		

S. Swapping Deborating Bed Demins (Mixed Bed or Cation Bed Resin) With No Mixed Bed Demin Available (12 DB Demin In Service)

Valve	Description	Required Position	IV	Date
12CV215	DB DM VENT	CLOSED		
12CV206	12 DEBORATING DEMIN INLET VALVE	OPEN		
12CV209	12 DEBORATING DEMIN OUTLET VALVE	OPEN		
11CV206	11 DEBORATING DEMIN INLET VALVE	CLOSED		
11CV209	11 DEBORATING DEMIN OUTLET VALVE	CLOSED		

Attachment 7, Independent Verification (continued)

T. Removing a Deborating Bed Demin from Service

Valve	Description	Required Position	IV	Date
1CV205	LETDOWN TO DEBORATING DEMIN VALVE	CLOSED (2)		
1CV212	DEBORATING DEMIN OUTLET VALVE	CLOSED		
11CV206	11 DEBORATING DEMIN INLET VALVE	(1)		
11CV209	11 DEBORATING DEMIN OUTLET VALVE	(1)		
12CV206	12 DEBORATING DEMIN INLET VALVE	(1)		
12CV209	12 DEBORATING DEMIN OUTLET VALVE	(1)		

(1) OPEN when Demin is in service, CLOSED when Demin is out of service.

(2) 1CV205 may remain open if Letdown is aligned to Deborating Beds.

Attachment 7, Independent Verification (continued)

U. Mixed Bed Demin Operation During Shutdown Modes 3, 4, 5, 6 and Defueled

Valve	Description	Required Position	IV	Date
1CV21	LETDOWN DEMIN BYP V	FLOW TO MIXED BED		
1CV35	VCT 3 WAY INLET V	FLOW TO VCT		
11CV24	11 MB DEMIN INLET V	(1)		
11CV25	11 MB DEMIN OUTLET V	(1)		
11CV234	MB DM VENT	CLOSED		
12CV24	12 MB DEMIN INLET V	(1)		
12CV25	12 MB DEMIN OUTLET V	(1)		
12CV234	MB DM VENT	CLOSED		

(1) OPEN when MB Demin is in service, CLOSED when MB Demin is out of service.

V. Removing the Cation Bed Demin from Service

Valve	Description	Required Position	IV	Date
1CV224	1 CATION BED INLET VALVE	CLOSED		
1CV225	1 CATION BED OUTLET VALVE	CLOSED		
1CV226	CATION DM VENT	CLOSED		
1CV26	CATION BED BYPASS VALVE	OPEN		

Attachment 8, Flushing A Deborating Bed Demineralizer When Present RCS Cb Is Greater Than 25 ppm Different From Previous Cb

_____1. **WHEN** directed by Procedure Step 4.14.12.2, **PERFORM** the following to flush the Deborating Bed Demin:

_____ a. **IF** Normal Letdown is in service,
THEN:

_____ (1) **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE in MANUAL.

_____ (2) Simultaneously **PERFORM** the following:

_____ (a) OPEN 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (b) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

_____ The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ (3) **IF** controlling Letdown pressure in AUTO,

_____ (a) **PLACE** 1CV18 in AUTO

_____ (b) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ (4) **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (a) **CLOSE** 1CV4 OR 1CV5, 75 GPM ORIFICE ISOLATION VALVE.

_____ (b) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ (5) **ADJUST** Charging flow as necessary to match Letdown flow.

_____ (6) **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

Attachment 8, Flushing A Deborating Bed Demineralizer When Present RCS Cb Is Greater Than 25 ppm Different From Previous Cb

_____ a. **IF** Letdown is from RHR,
THEN:

_____ (1) **THROTTLE** 1CV8, LETDOWN ISOL FOR RHR, to reduce letdown flow to 45 GPM.

_____ (2) **ADJUST** Charging flow as necessary to match Letdown flow.

Attachment 8, Flushing A Deborating Bed Demineralizer When Present RCS Cb Is Greater Than 25 ppm Different From Previous Cb (continued)

NOTE

When borating a Deborating bed demin, letdown flow should be less than makeup capacity to VCT.

_____ b. **PLACE** 1CV35, VCT THREE WAY INLET VALVE in FLOW TO HUT position.

_____ c. **PLACE** 1CV27, DEBORATING DEMIN THREE WAY INLET VALVE in FLOW TO DB BED position.

_____ d. **WHEN** 500 gallons have been flushed through the Cation Bed Demin, **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling.

_____ e. **RECORD** results of sample on Attachment 3, CVCS Demin Borating Record.

_____ f. **IF** difference in boron concentration is greater than 25 ppm, **THEN**:

_____ (1) **ESTABLISH** Alternate Letdown Sampling Backpressure Method IAW Attachment 5, Alternate Letdown Sampling (at intervals of 30 minutes or less).

_____ (2) **RECORD** results of samples on Attachment 3, CVCS Demin Borating record.

_____ (3) **WHEN** difference in boron concentration is less than or equal to 25 ppm, **CONTINUE** with this procedure.

_____ g. **PLACE** 1CV35, VCT 3 WAY INLET V, in FLOW TO VCT position **AND PLACE** in AUTO .

Attachment 8, Flushing A Deborating Bed Demineralizer When Present RCS Cb Is Greater Than 25 ppm Different From Previous Cb (continued)

_____ h. **IF** Normal Letdown is in service,
THEN:

_____ (1) **PLACE** 1CV18, LETDOWN PRESSURE CONTROL VALVE, in MANUAL.

_____ (2) Simultaneously **PERFORM** the following:

_____ (a) **OPEN** 1CV4, LETDOWN ORIFICE ISOLATION VALVE, **OR** 1CV5, LETDOWN ORIFICE ISOLATION VALVE.

_____ (b) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL VALVE, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

NOTE

The preferred method for operating the CV18 when closing orifice valves is in AUTO during normal operations. The primary concern when closing orifice valves is flashing in the letdown line. Letdown pressure will initially lower (~100 psig) until the CV18 can adjust. Saturation temperature at 100 psig is approximately 338 degrees Fahrenheit. Regen heat exchanger outlet temperatures should be monitored to ensure temperatures are not expected to reach saturation temperature.

_____ (3) **IF** controlling Letdown pressure in AUTO,

_____ (a) **PLACE** 1CV18 in AUTO

_____ (b) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (4) **IF** controlling Letdown pressure in Manual, simultaneously **PERFORM** the following:

_____ (a) **CLOSE** 1CV3, 45 GPM ORIFICE ISOLATION VALVE.

_____ (b) **ADJUST** 1CV18, LETDOWN PRESSURE CONTROL, as necessary to maintain Letdown pressure for current plant conditions (approximately 300 psig @ NOP).

_____ (5) **ADJUST** Charging flow as necessary to match Letdown flow.

_____ (6) **WHEN** Letdown pressure is at approximately 300 psig, **ENSURE** 1CV18 in AUTO.

Attachment 8, Flushing A Deborating Bed Demineralizer When Present RCS Cb Is Greater Than 25 ppm Different From Previous Cb

_____ a. **IF** Letdown is from RHR,
THEN:

_____ (1) **ADJUST** 1CV8, LETDOWN ISOL FOR RHR, to obtain desired letdown flow.

_____ (2) **ADJUST** Charging flow as necessary to match Letdown flow.

_____ b. **RETURN** TO Procedure Step 4.14.12.3.

Attachment 9, CVCS Demineralizers - Resin Fill Valve Position Verification

Valve	Description	Position	Notes	Initials
11CV231	MB DM RESIN FILL V	X - CAPPED	(1) (2) (3)	
12CV231				
1CV227	CATION DM RESIN FILL V	X - CAPPED	(1) (3)	
11CV213	DB DM RESIN FILL V	X - CAPPED	(1) (3)	
12CV213				

(1) Radiation Protection support is required when removing any Resin Fill V pit cover (Aux. 122′). Verify valve position for the demineralizer(s) being placed in service. Mark others as N/A.

(2) 11CV231 and 12CV231 are located under the same Resin Fill V pit cover.

(3) The Resin Fill V pit cover is to be replaced following valve position verification.

Attachment 10, Completion Sign-Off Sheet

A. COMMENTS:

(Include test deficiencies and corrective actions.)

Attachment 10, Completion Sign-Off Sheet (continued)

B. SIGNATURES:

Print	Initials	Signature	Date

INDEPENDENT VERIFICATION:

Print	Initials	Signature	Date

C. CRS/SM FINAL REVIEW AND APPROVAL:

This procedure with Attachments 3-10 is reviewed for completeness and accuracy. All deficiencies, including corrective actions, are clearly recorded in COMMENTS Section.

Signature: _____ Date: _____
CRS/SM