If you are using a printed copy of this procedure, and not the on-screen version, then you MUST make sure the dates at the bottom of the printed copy and the on-screen version match.
The on-screen version of the Collider-Accelerator Department Procedure is the Official Version.
Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ Training Office, Bldg. 911A.

C-A OPERATIONS PROCEDURES MANUAL

8.18.5 C-A Deionizer Handling and Resin Exchange Procedure

Text Pages 1 through 5

Attachment

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: ***Signature on File*** _____
Collider-Accelerator Department Chairman Date

J. DeBoer

8.18.5 C-A Deionizer Handling and Resin Exchange Procedure

1. Purpose:

To provide instructions to Water Systems Group for resin handling, removal and fill of deionizer vessels.

2. Responsibilities:

2.1 Water systems technicians are responsible to operate and service deionizers.

2.2 Perform work effectively and safely

2.3 Minimize waste

2.4 Stop Work if unsafe conditions are encountered

3. Prerequisites:

3.1 Rad Worker Training - TLD (Whole Body Dosimetry).

3.2 Working knowledge of the processes described in this procedure.

3.3 Contamination Worker or Dipersibles Training.

3.4 Post Work Area - “Radioactive Materials Area, Dispersibles in Use”.

3.5 Personal Protective Equipment (PPE) to be determined by RCD and may include rubber gloves, boots and tyvek suit for use throughout the task. Use of a face shield is required whenever there is a chance of splashing, such as while draining, disassembling, cleaning, and venting of the components, before and after repairs.

4. Precautions:

4.1 The Radiological Control Division (RCD) Representative is responsible for performing radiological evaluations. The CAD Environmental Coordinator determines ultimate disposition of the cooling water and resin. Notification of RCD Representative should be made in advance of the work to coordinate necessary support.

4.2 A determination will be made by RCD if radiological triggers are exceeded, which in turn will require a job specific RWP, as outlined in C-A-OPM 9.5.4, "Radiation Work Permit".

4.3 A smear survey is required after a resin exchange occurs. Frequency to be determined by RCD.

5. Procedure

5.1 Deionizer Removal

5.1.1 Close isolation valves to DI being removed.

5.1.2 Open vent valve slowly and drain water to a container.

5.1.3 Once DI is vented and hoses drained, cap and/or plug openings on "out of service" unit, disconnect the DI hoses and move unit to resin exchange facility (Bldg 974). Restrain vessel in truck for transport.

5.2 Deionizer Installation.

5.2.1 Place and secure ready for service DI unit and connect hoses. Crack supply and return valves to fill DI and vent air with vent valve. When air has been vented open return and supply valves fully. Check for leaks and verify flow at indicator.

5.3 Resin Exchange Procedure

5.3.1 Check Equipment

a. Verify air supply to deionoizer inlet port in between 5-10 psi
b. Verify there is not water in the air supply lines
c. Check all hoses for leaks or deterioration
d. Verify that the 55-gallon drum used to collect resin is less than half full

5.3.2 Attach DI vessel to resin removal system (C-A-OPM-ATT 8.18.5.a).

a. Plug outlet port
b. Remove fill plug from fill port
c. Install Resin removal tube (make sure o-ring and sealing surfaces are clean)
d. Install air/water supply hose to the inlet port
e. Verify there is enough water in the deionizer tank so it has slurry consistency.

5.3.3 Removal of resin

a. Open air supply to inlet valve
b. Check level of 55 gal drum. Replace drum when full
c. After DI vessel is empty, close air supply valve to DI vessel inlet
d. Open waste water valve to rinse resin from the sides of the DI vessel
e. Turn on air supply to pump
f. Close waste water valve
g. Check level of 55 gal drum
h. Open air supply to DI vessel inlet valve
i. After DI vessel is empty, close air supply valve to DI vessel inlet port
j. Repeat steps 5.3e to 5.3i until resin is expelled from the deionizer vessel
k. Turn off air supply to pump

5.3.4 Detach DI vessel from resin removal system

a. Remove Resin removal tube
b. Remove air/water supply from the inlet port

5.3.5 Attach DI vessel to resin fill system and fill vessel (to within 5 inches from top)

CAUTION:
Do not overfill. Resin may expand

a. Verify that outlet port is plugged
b. Install Resin fill hose (make sure o-ring and sealing surfaces are clean)
c. Install vacuum hose to DI vessel inlet port
d. Turn on vacuum cleaner
e. Use resin fill hose to vacuum new resin into DI vessel
f. Tap sides of DI vessel with rubber mallet to compact the resin in DI vessel
g. Repeat steps 5.5e to 5.5f until DI vessel is full

5.3.6 Remove DI vessel from resin fill system

a. Remove vacuum hose from DI vessel inlet port
b. Remove Resin fill hose

5.3.7 Fill DI vessel with recycled water from the 55 gal. drum (C-A-OPM-ATT 8.18.5.b).

a. Attach DI vessel to resin removal system as stated in step 5.2
b. Open waste water valve
c. Turn on air supply to pump
d. Fill enough water in the deionizer vessel so it has slurry consistency
e. Remove Resin removal tube
f. Remove air/water supply from the inlet port
g. Install DI vessel fill cap (make sure o-ring and sealing surfaces are clean)

6. Documentation

6.1 C-A DI Log Sheet.

7. References

7.1 C-A-OPM-ATT 10.1.d “Operator Response to Water Spills”.
7.2 C-A-OPM-ATT 8.31.c "Deionizer Maintenance".
7.3 C-A-OPM 9.5.4, "Radiation Work Permit".

8. Attachments

8.1 C-A-OPM-ATT 8.18.5.a “Resin Removal System”.
8.2 C-A-OPM-ATT 8.18.5.b "Resin Fill System”.
8.3 C-A DI Log Sheet.
8.4 C-A DI Service Tag [future].

C-A DI Log Sheet

Attachment 8.3

Unit ID No.	In Service Date	Out of Service Date	Test Sample Date	Test Results Date	Green Tag Yes/No