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C-A OPERATIONS PROCEDURES MANUAL

7.1.35 Reactivation of Regeneration System

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Hand Processed Changes

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

A. Nicoletti

7.1.35 Reactivation of Regeneration System

1. Purpose

- 1.1 To provide instruction on reactivation of the Regeneration (Regen) system.
- 1.2 The Regen System consists of the skid, including dryer towers, and the distribution manifold.

2. Responsibilities

- 2.1 The shift supervisor or an operator designated by the shift supervisor is responsible for conducting the procedure and providing documentation in the cryogenic control room log.
- 2.2 Should a problem arise in the process of installing or removing an expander braking system, the shift supervisor shall report to the technical supervisor for instructions before continuing.
- 2.3 The technical supervisor shall report all problems to the appropriate engineer.

3. Prerequisites

- 3.1 Pure helium system available.
- 3.2 Nitrogen gas available.
- 3.3 If Regen skid or distribution manifold is to be evacuated and back filled, the Regen System must be shut down.
- 3.4 If a dryer tower is to be reactivated, that tower must be off line.

4. Precautions

If there is liquid in the refrigerator pots, all personnel entering the refrigerator wing of Bldg. 1005R must be ODH Class 1 qualified, have a Personal Oxygen Monitor (POM) and carry an emergency escape pack.

5. Procedure

5.1 General

- 5.1.1 Ensure closed 110 VAC circuit breakers 25 ____ 27 ____ and 29 ____ in panel RP-2 (located next to CB3 and CB5 calorimeter local control panels).

5.1.2 Ensure closed 480 VAC circuit breakers 1 ____ and 2 ____ on subsection F (panel located on east wall of lower level).

5.2 Reactivation of Dryer Tower "A"

Note:
Ensure that there is nitrogen gas for purging.

____ 5.2.1 Date _____.

____ 5.2.2 Ensure the following valves are closed:

H6105M ____	H6202M ____
H6102M ____	H6140M ____
H6103M ____	N645M ____
H6104M ____	Helium Pump Out Valve ____
H6207M ____	Nitrogen Pump Out Valve ____

____ 5.2.3 Depressurize tower "A" by opening valves N646m ____ and H6106M ____.

____ 5.2.4 Align N₂ purge by opening valves H6104 ____ and N6200M ____.

____ 5.2.5 Start purge by throttling valve H6202M for a flow of 100%, as read on N₂ flow meter FI6201N.

____ 5.2.6 Depress "System control Reset" button on Regen skid control panel.

____ 5.2.7 Set left temperature switch to 400°F.

____ 5.2.8 Place flow switch selector to "Flow Switch 1 On" (N₂).

____ 5.2.9 Place tower reactivation selector switch to "LT Reactivation."

____ 5.2.10 Place control circuit selector switch to "On."

____ 5.2.11 After approximately six hours, record T1 temperature (should be 300 to 375°F). Stop the heating cycle by placing the control circuit selector switch to "Off."

____ 5.2.12 Start cooldown of the bed by leaving nitrogen purge on until T1 is below 100°F.

____ 5.2.13 Stop N₂ purge by closing valves N6200M ____ and H6106M ____.

_____ 5.2.14 To start helium purge, open valve H6106M_____, N651M_____,
H6104M_____, and throttle valve H6102M_____. FI6101N should read
50%.

_____ 5.2.15 After purging for approximately 20 minutes, close valve H6106M_____
and pressurize tower “A” to approximately 100 psig.

_____ 5.2.16 Close the following valves:

H6102M_____	N646M_____
H6104M_____	N651M_____
H647M_____	

_____ 5.2.17 Open valve N618M.

5.3 Reactivation of Dryer Tower “B”

Note:
Ensure that there is nitrogen gas for purging.

_____ 5.3.1 Date_____.

_____ 5.3.2 Ensure the following valves are closed:

H6205M_____	H6142M_____
H6202M_____	H6104M_____
H6139M_____	N645M_____
H6106M_____	Helium Pump Out Valve_____
H6102M_____	Nitrogen Pump Out Valve_____

_____ 5.3.3 Depressurize tower “B” by opening valves N646M_____ and
H6207M_____.

_____ 5.3.4 Align N₂ purge by opening valves H6140M_____ and N6200M_____.

_____ 5.3.5 Start purge by throttling valve H6202M for a flow of approximately 100,
as read on N₂ flow meter FI6201N.

_____ 5.3.6 Depress “System Control Reset” on Regen skid control panel.

_____ 5.3.7 Set right temperature switch to 400°F.

_____ 5.3.8 Place flow switch selector to “Flow Switch 1 On” (N₂).

- _____ 5.3.9 Place tower reactivation selector switch to “RT Reactivation.”
- _____ 5.3.10 Place control circuit selector switch to “On.”
- _____ 5.3.11 After approximately six hours, record T2 temperature (should be 300 to 375°F). Stop the heating cycle by placing the control circuit selector switch to “Off.”
- _____ 5.3.12 Start cooldown of the bed by leaving the nitrogen purge on until T2 is below 100°F.
- _____ 5.3.13 To start helium purge, open valve H6207M_____, N651M_____, H6140M_____, and throttle valve H6102M_____. FI6101N should read 50%.
- _____ 5.3.14 After purging for approximately 20 minutes, close valve H6207M_____ and pressurize tower “B” to approximately 100 psig.
- _____ 5.3.15 Close the following valves:

H6102M_____	N646M_____
H6140M_____	N651M_____
H647M_____	
- _____ 5.3.16 Open valve N618M.

6. Documentation

- 6.1 The check-off lines on the procedure are for place keeping only. The procedure is not to be initialed or signed, it is not a record.
- 6.2 The Shift Supervisor shall document the completion of the procedure in the Cryogenics Control Room Log.

7. References

- 7.1 Drwg. 3A995060, Regeneration System
- 7.2 Drwg. 3A995009, 25 kW Helium Refrigerator P&ID

8. Attachments

None