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C-A OPERATIONS PROCEDURES MANUAL

7.1.17 Regeneration of Heat Exchanger 1A/2A

Text Pages 2 through 5

Hand Processed Changes

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

D. Lederle

7.1.17 Regeneration of Heat Exchanger 1A/2A

1. Purpose

This procedure provides instructions for regenerating heat exchanger 1A/2A on the RHIC 25 kW Helium Refrigerator. This procedure shall be performed when heat exchanger 1A/2A is contaminated and has been taken offline. The steps necessary to take heat exchanger 1A/2A offline are not covered under this procedure, please reference [C-A OPM 7.1.16](#).

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 regenerating the heat exchanger, the Shift Supervisor shall report to the Technical Supervisor for instructions before continuing.

3. Prerequisites

- 3.1 Operator shall be familiar with the refrigerator P&ID drawing 3A995009, the physical location of components on the refrigerator, and the refrigerator control pages found on the CRISP control system.
- 3.2 The regeneration skid must be available for use.
- 3.3 Oxygen monitor and hygrometer in compressor room are set to read compressor discharge.

4. Precautions

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

5. **Procedure**

_____ 5.1 Date _____

_____ 5.2 Ensure the following valves are CLOSED:

Process Valves:

H314A_____ H316M_____ H324M_____
H315M_____ H317M_____ H313M_____

Valves to atmosphere, relief valve, vacuum or pure helium:

H319M_____ H455M_____ H9194M_____
H321M_____ H456M_____ H306M_____
H323M_____ H457M_____ H705M_____
H448M_____ H1109A_____

_____ 5.3 Ensure the following valves are OPEN:

Process Valves:

H422M_____

_____ 5.4 Start the regeneration (regen) skid per [C-A-OPM 7.1.36](#), "Regeneration System Normal Operation".

_____ 5.5 Open the following valves:

H9102M_____ H322M_____
H9103M_____ H9105M_____
H9104M_____ H447M_____
H318M_____ H9101M_____
H320M_____ H305M_____

_____ 5.6 Close regen bypass valve H9100M.

_____ 5.7 Turn on regen skid pre-heater.

_____ 5.8 Monitor sensors TI308, TI309, TI310, TI311, TI865, TI866 and TI867, TI151, TI152, TI153.

_____ 5.9 When the above sensors reach 310°K, continue to regenerate for at least 1 hour. Hygrometer reading must be -30°C to -40°C and improving less than 0.5°C/hr.

- _____ 5.10 Turn off regen skid preheater.
- _____ 5.11 Open valve H9100M.
- _____ 5.12 Close the following valves:
- | | |
|-------------|-------------|
| H305M_____ | H322M_____ |
| H447M_____ | H9102M_____ |
| H9105M_____ | H9103M_____ |
| H318M_____ | H9104M_____ |
| H320M_____ | |
- _____ 5.13 Secure the regeneration skid per [C-A-OPM 7.1.36](#).
- _____ 5.14 Introduce pure helium into heat exchanger 1A/2A by cracking open valve H306_____. Immediately crack open the following valves to purge heat exchanger 1A/2A:
- | | |
|------------|------------|
| H319M_____ | H455M_____ |
| H321M_____ | H456M_____ |
| H323M_____ | H457M_____ |
- _____ 5.15 Adjust valves in previous step as necessary until an audible purge is heard.
- _____ 5.16 Allow heat exchanger 1A/2A to purge for 30 minutes at an audible level.
- _____ 5.17 Close the following valves:
- | | |
|------------|------------|
| H319M_____ | H455M_____ |
| H321M_____ | H456M_____ |
| H323M_____ | H457M_____ |
- _____ 5.18 When PI444H reaches 250 PSIA, close valves H306M_____ and H9101M_____.
- _____ 5.19 Open valves H315M_____, H316M_____ and H317M_____ as a sign that heat exchanger 1A/2A has been regenerated and is ready for service.

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, or designee, shall document the completion of the procedure in the Cryogenics Control Room Log

7. References

- 7.1 Drawing 3A995009, 25KW Helium Refrigerator P&ID.
- 7.2 [C-A-OPM 7.1.16](#), "Heat Exchanger 1B/2B Online and Heat Exchanger 1A/2A Offline".
- 7.3 [C-A-OPM 7.1.36](#), "Regeneration System Normal Operation".

7. Attachments

None