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 available by contacting the ESSHQ Procedures Coordinator, Bldg. 911A

C-A OPERATIONS PROCEDURES MANUAL

7.1.62 Oil Injected Screw Compressors - General Maintenance for Periods of Inactivity

Text Pages 2 through 4

Hand Processed Changes

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Collider-Accelerator Department Chairman Date

V. Badea

7.1.62 Oil Injected Screw Compressors – General Maintenance for Periods of Inactivity

1. Purpose

General procedures for storing and maintaining oil injected screw compressors in the RHIC Cryogenics Group.

5.1 Short Term Compressor Storage (< 6 months)
5.2 Long Term Compressor Storage (> 6 months)
5.3 Inactive Compressors

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 execution of the procedure, the Shift Supervisor shall report to the Technical Supervisor for instructions before continuing.

3. Prerequisites

3.1 The Operator shall be familiar with the specific compressor and the specific compressor Maintenance Manual.

3.2 The Operator shall be familiar with the specific compressor and able to identify the various flanged ports and plugged ports used in the required procedures.

3.3 The, Operator, shall have been instructed by his Supervisor, or other qualified member of the RHIC Cryogenics group, in the performance of each of the required procedures.

4. Precautions

4.1 Operator should be trained in LOTO procedures for locking out operational compressors in preparation for hand rotation of compressor drive shafts.

4.2 Approved eye protection and safety shoes shall be worn at all times.

5. Procedures

5.1 **SHORT TERM COMPRESSOR STORAGE (Less than 6 months)**
Applies to compressors received from off site sources, and compressors removed from operational service, and put into SHORT-TERM storage.

5.1.1 For storage purposes the Howden 321mm screw compressors used for RHIC, should ideally be mounted to their original base or shipping box bottom. If removing, one of these compressors from its shipping box, save the box lid for future use. If removing one from operations, install the inlet and outlet flanges and plug all additional oil ports, then mount it on its original shipping box bottom, if available. Most of our other compressors are integrated into their own compressor skids.

5.1.2 ROTATE THE COMPRESSOR DRIVE SHAFT, BY HAND, USING A STRAP WRENCH. ROTATE APPROXIMATELY 1.5 TURNS IN THE DIRECTION THAT IT ROTATES WHEN OPERATING. FINAL SHAFT ORIENTATION, AFTER ROTATION, SHOULD BE APPROXIMATELY 180 DEGREES FROM ITS INITIAL ORIENTATION.

5.1.3 If pressurized with dry nitrogen, depressurize the compressor through the Schrader (air valve).

5.1.4 Remove and Reinstall the Schrader valve with a tee and a pressure gauge with a range of 0 to 30 psig.

5.1.5 Recharge the compressor with 15 psig of dry nitrogen using the pressure gauge.

5.1.6 Place the compressor in its proper storage location. Record in inventory records.

5.1.7 ON A MONTHLY BASIS: Rotate the compressor drive shaft as described in 5.1.2 above. Also, check and record the DATE and the READING on the pressure gauge to insure that the pressurized nitrogen is not leaking.

5.1.8 Nitrogen pressure, inside the compressor must always be maintained.

5.2 **LONG TERM COMPRESSOR STORAGE (More than 6 months)**

Applies to compressors received from off site sources, and compressors removed from operational service, and put into LONG-TERM storage.

5.2.1 For storage purposes the Howden 321mm screw compressors used for RHIC, should ideally be mounted to their original base or shipping box bottom. If removing, one of these compressor from its shipping box, save the box lid for future use. If removing one from operations, install the inlet and outlet flanges and plug all additional oil ports, then mount it on its original shipping box bottom, if available. Most of our other compressors are integrated into their own compressor skids. If the compressor was in storage and filled with oil drain the oil thoroughly and wipe the oil residues from inside as well as possible. If the compressor already was in storage for one year and filled with nitrogen, the following steps to be taken:

- Release the dry nitrogen pressure through the provided Schrader Valve
- The blank flanges on suction and discharge should be removed and the inside of the compressor examined for any corrosion

- If there is no corrosion then inhibiting oil should be sprayed on to all accessible surfaces and the compressor rotated about 10 times with the same inhibiting oil being sprayed into the area around the inlet end of the rotors.
- The following oils are recommended:

  -Mobil ARMA 524
  -Esso IL 1175
  -Shell Engine Oil 30
  -Caltex Preservative Oil 10W
  -Castrol Storage Oil 20

5.2.2 The suction and discharge blanking flanges should then be put back in position., and the compressor to be packed with dry nitrogen and pressurized to 15 psig (1bar g)

5.2.3 The compressor drive shaft and any machined unpainted surfaces on the outside of the unit should be painted with one of the following recommended products:

  -Castrol Rustilo 150
  -Shell Ensis Fluid G

5.2.4 Place the compressor in its proper storage location..

5.2.5 ON A MONTHLY BASIS: Rotate the compressor drive shaft as described in 5.1.2 above.

5.3 **INACTIVE COMPRESSORS**

Applies to compressors that are in operational service, but are not being used continuously.

5.3.1 RUN THE SKID OIL PUMP FOR 10 MINUTES PER WEEK.

5.3.2 RUN COMPRESSOR SKID FOR at least 1.5 HOURS EVERY MONTH AND, MAINTAIN A LOG OF HOURS AND DENOMINATION OF COMPRESSORS SWITCHED TO OPERATION MODE. THIS IS TO ENSURE THAT EVERY COMPRESSOR WILL BE RUNNING AS REQUESTED BY PRESENT OPM.

6. Documentation

6.1 Compressor Service Manuals

7. References

7.1 Howden Compressor Bulletin CSA/GCB/EH/12.2.7, June 1993

8. Attachments

None