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

8.3.3 Procedure for Bleedup of Collider Ring Warm Beam Vacuum Sections

Text Pages 2 through 5

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

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

M. Mapes

8.3.3 Procedure for Bleedup of Collider Ring Warm Beam Vacuum Sections

1. Purpose and Scope

This procedure is for the bleedup of the individual RHIC warm beam vacuum sections (warm sections hereafter). This procedure defines the layout, major processes, equipment and safety precautions associated with the bleedup of these warm sections.

The procedure is to be used after the completion of assembly and pump down of the warm sections.

Note:
This procedure shall not be used for the bleedup of the warm sections at IP2, IP6, IP8, and IP10. Bleedup of these sections are defined by other location specific procedures. In addition, there will be a separate procedure for handling of beryllium beam tube assemblies. Contact the cognizant detector supervisor or the operations coordinator prior to work at the IR.

2. Responsibility

The Vacuum Section personnel and other trained staff under the supervision of Vacuum Section technical supervisor are responsible to conduct the procedure.

3. Prerequisites

3.1 All personnel who implement this procedure shall be familiar with the layout of the warm sections described in C-A-OPM-ATT 8.3.3.a.

3.2 The personnel shall have received the following trainings prior to carrying out this procedure.

Knowledgeable Employee as defined by SBMS requirements for electrical safety.
Lockout/Tagout (LO/TO) Requirement.
C-A Access Training for tunnel access.
Cryogen Safety (HP-OSH-025).

4. Precautions

4.1 The affected warm sections shall not be bled up prior to the completion of 4.2 and 4.3. Failure to carry out these steps may cause considerable damage to this warm section, the adjacent warm and/or cold sections and the associated equipment.

4.2 All the gate valves shall be closed and the electrical connectors at the gate valves in the tunnel unplugged and tagged.

4.3 High voltage at the sputter ion pump controllers shall be turned off and the connectors at the rear of the controllers unplugged and tagged.

5. Procedure

Caution:
The personnel shall be familiar with the layout of the warm sections given in C-A-OPM-ATT 8.3.3.a and the operation of the RHIC Vacuum Pet pages given in C-A-OPM-ATT 8.3.3.b and C-A-OPM-ATT 8.3.3.c prior to carrying out this procedure. Bleedup of incorrect warm section might cause damages to that warm section and the adjacent cold sections.

5.1 Verify and Secure the Vacuum Devices at Service Building

Prior to the bleedup, the status of the affected warm section shall be verified through both the vacuum Pet pages (see C-A-OPM-ATT 8.3.3.b and C-A-OPM-ATT 8.3.3.c) and the vacuum instruments located at the specific service building corresponding to the affected warm section.

5.1.1 Start up the Vacuum Pet page, if not already started, using the X-terminal at the service building control room (see C-A-OPM-ATT 8.3.3.b).

5.1.2 Scroll down the Pet tree to **SectorValves** then to **Sectors_X+Y,** here **X+Y** represents the two sectors bracketing each interaction point. Check the status of the gate valves under '**Valve Is**' column.

5.1.3 Close the valve, if not already closed, by selecting '**Close**' at the box under the '**Command**' column.

5.1.4 Repeat for the other gate valve in the affected section.

Caution:
Do not proceed if the gate valves will not close and remain closed, so as not to bleed up the adjacent sections. Contact vacuum technical supervisor (x4627 or pager 4164) or vacuum instrument specialists at x4612.

5.1.5 Scroll down the Pet tree to **RingIonPumps** then to **Sectors_X+Y.** Check the status of the ion pumps under '**Status**' column.

5.1.6 Turn off HV, if HV is not already off, by selecting '**HV off**' under '**Set HV'** column.

5.1.7 Repeat for other ion pumps in the affected section.

5.1.8 Scroll down the Pet tree to **Yellow(or Blue)Gauges** then to **Sectors_X+Y.** Check the status of the cold cathode gauges.

5.1.9 Turn off HV, if HV is not already off, by selecting '**HV off**' under '**Set HV**' column.

5.1.10 Repeat for other cold cathode gauges in the affected section.

5.1.11 Verify that HV of all the pumps and gauges is off by checking the display of the affected gauge and pump controllers on the vacuum instrument racks in the same service building.

Caution:
Do not proceed if HV will not turn off and remain off. Bleedup vacuum sections with HV on may damage the cold cathode gauges and ion pumps. Contact vacuum technical supervisor (x4627 or pager 4164) or vacuum instrument specialists at x4612.

5.1.12 Unplug and tag the pump HV connectors located at the rear of the pump controllers.

5.1.13 Unplug and tag the gauge HV connectors located at the rear of the gauge controllers.

5.1.14 Verify the status of gate valves, pumps and gauges again using the X-terminal.

5.2 Prepare for BleedUp of the Warm Section in RHIC Tunnel

The following equipment is needed for bleeding up.

RHIC liquid nitrogen -gas nitrogen dewar.

HPS Pirani thermocouple gauge controller and gauge cable.
Bleedup cross with 2-3/4" flange and Circle Seal CSC S59B-2M-90 or equivalent relief valve.

Note:
The relief valve shall be calibrated before use and set at 1 psig.

5.3 Bleed Up of the Warm Section

5.3.1 Verify that the gate valves bracketing the warm section are indeed closed by inspecting mechanical position indicator located at the top of the actuator of each gate valve.

5.3.2 Remove the valve connectors from the gate valves to ensure that the valves will remain closed.

5.3.3 Connect the bleedup cross to the 2-3/4" flange of the 1-1/2" all-metal valve on the pump tee.

5.3.4 Connect the Pirani gauge cable and the HPS controller to the Pirani gauge tube on the pump tee. The HPS controller shall read less than 760 Torr.

5.3.5 Flush the bleedup cross with nitrogen gas from the dewar for at least one (1) minute.

5.3.6 Crank open the 1-1/2" valve slowly using a 1/2" valve handle while monitoring the reading of the HPS controller.

5.3.7 Stop the nitrogen flow from the dewar when the HPS controller is reading above 750 Torr or when the relief valve is releasing gas.

6. Documentation

None

7. References

7.1 "Instruction Manual for Varian MultiVac Controller," No. 87-900-061-1 August, 1994, Varian Vacuum Products

7.2 "Instruction Manual for Sensa Vac Series 937 High Vacuum Gauge Controller," 1994, HPS Division, MKS Instruments, Ins.

8. Attachments

8.1 C-A-OPM-ATT 8.3.3.a "Layout and List of RHIC Warm Beam Vacuum Sections".

8.2 C-A-OPM-ATT 8.3.3.b "Operation Procedure of RHIC Vacuum Pet Pages".

8.3 C-A-OPM-ATT 8.3.3.c "Typical RHIC Vacuum Pet Pages and ADOs".