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

15.5.48 Oval Installation, AGS

(Vacuum Group Procedure VA-008.18.1.48)

Note: This document was formerly a C-A Group Procedure. The content of the group procedure was reviewed by the Technical Supervisor. All approvals and/or issue dates of the original group procedure are maintained for present use.

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

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

S. Gill

Vacuum Group Procedure VA-008.18.1.48
Original Issue Date: 01/01/00
Revision 01

*****IMPORTANT*****

PRIOR TO THE PERFORMANCE OF ANY WORK WITHIN THE SCOPE OF THIS PROCEDURE, IT IS THE RESPONSIBILITY OF THE SUPERVISOR TO ENSURE THAT ***WORK PLANNING*** HAS BEEN REVIEWED FOR THE PROTECTION OF WORKERS, EQUIPMENT, AND THE ENVIRONMENT.

1. PURPOSE:

1.1 To provide an effective procedure for AGS Vacuum Technicians to install an oval seal in an AGS ring chamber.

2. RESPONSIBILITIES:

2.1 The AGS Vacuum Supervisor shall be responsible for the implementation of this procedure.

3. DISCUSSION:

3.1 This procedure is written so that trained AGS Vacuum Technicians will be able to successfully & efficiently install an oval seal on a closed style AGS Main Magnet.

4. PRECAUTIONS:

4.1 The Technician shall be aware of radiation levels in the area and, when required, obtain a radiation work permit.

4.2 The Technician shall be aware of what constitutes a vacuum sector, for example, "A" Starts at A-4 Main Magnet and ends at A-13 Main Magnet. "AB" Starts at A-14 Main Magnet and ends at B-3 Main Magnet.

4.3 The Technician shall not remove any materials from the ring enclosure until first checked by Health Physics Personnel.

4.4 The Technician shall check the color code on the Kirk Key and verify that it matches that of the ion pump H.V. cable in the locked out sector prior to touching the cable.

4.5 The Technician shall be aware that upon removal of an ion pump H.V. cable within the locked out section, the cable and connector must be properly discharged using an OSHA approved resistive type grounding stick.

5. PREREQUISITES:

5.1 The Technician shall have been trained in this procedure.
5.2 Lockout/Tagout 15.17.00.02
5.3 Electrical Safety 15.17.00.04
5.4 AGS Ring Access Training
5.5 Activation Worker Training (BNL OH&S Guide 3.5.0)
5.6 Safety glasses must be worn during this procedure
5.7 OSHA approved resistive type grounding stick
5.8 Fluke meter or equal, capable of reading OHMS
5.9 Technician has been trained to at least a level of knowledgeable l IN LOTO of AGS I. P. Power Supplies (8.18.1.27) 5.10 Affected Persons Training 15.12.00.01

6. OPERATIONAL PROCEDURE:

6.1 Ensure that a radiation survey has been done by the HP Group of the area to be worked in.

6.2 Close sector valves and disconnect power to those valves U/S and D/S of sector to be vented

6.3 Perform LO/TO procedures for ION Pump HV supplies

6.4 Perform LO/TO procedures for sector CCG

6.5 Perform and or verify LO/TO as per AGS OPM 4.1.5.1.1 Which states "If the ring is expected to be open for one hour or more, or if persons entering the ring may be on the inside catwalk, or if they need to touch a ring vacuum chamber, then all the items on the ring sweep/Access equipment lockout/tagout checklist "must be locked , tagged and the keys and tag stubs placed in the MCR electrical safety keylocker'".

6.6 Oval Seal Replacement Procedure

NOTE:
This procedure begins once the oval flange is readily accessible. This may require the removal of a Five Foot Straight Section or the magnet/chamber from ~he girder.

****This is a UHV procedure requiring the use of lintless gloves and wipes throughout its execution.****

Unbolt the Vee-type oval flange from the chamber, taking care hot to scratch either the 9 1/2" or the oval sealing surface. Wrap the flange in aluminum foil and set aside to be taken back to the vacuum laboratory for refurbishment (old style Vee-type oval flanges dispose of properly).

Carefully clean flange attached to the bellows with a Scotchbrite® alcohol and/or acetone, taking care not to allow the cleanser nor Scothchbrite® to become trapped in the convolutions of the bellows. Check for any scratches or nicks on the outside of the bolt circle (oval). Make note of the discontinuities in the ring/sector notebook. Also, clean the bolt holes. Any old lubricants or dirt built-up in these holes may be displaced into the chamber when the bolts are replaced.

Using a 5/8 inch thick Vee-type/oval flange which has been properly Scotchbrited® and cleaned, place two (2) flange bolts* through the upper, centermost holes in the face of the Vee-type flange. Align the associated holes in the diamond oval seal (P/N: D05-M-2211-3A) with bolt ends protruding from the back of the flange. Gently place the seal against the back of the flange.

Keeping the seal, bolts and flange in proper alignment, place the bolt ends into the corresponding upper, centermost holes in the oval chamber flange. Start the bolts into threaded holes until the flange is secure, and can not fall, but the seal can still move freely. Allowing the seal to maintain a loose fit, install the remaining bolts.

Set the torque wrench to 150 inch-pounds, then torque each bolt to this setting. Start with the upper bolt just left of center and continuing around the flange clockwise. Readjust the wrench to 200 inch-pounds and repeat the torque wrench process. Again readjust the wrench to 250 inch-pounds and repeat the torque wrench process. Wait for 30 minutes allowing the seal to take a set then once again repeat the torque wrench process at 250 inch-pounds.

The chamber\magnet may now be replaced on the girder or the Five Foot Straight Section may now be installed.
* - The silver - plated oval flange bolts shall not be reused. Once spend these bolts should be disposed of in a radiation waste container.

7. ACCEPTANCE CRITERIA:

7.1 The main magnet has been returned to the girder and the new oval seal is leak tight

8. FINAL CONDITIONS:

8.1 Work area has been cleaned and all equipment and/or tools have been removed from the ring after being checked by HP personnel.

8.2 Dosimeter readings have been logged in the dosimeter log book located in the Vacuum Lab