

Vacuum Group Procedure VA-008.18.1.5
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.

1.0 PURPOSE:

1.1 TO PROVIDE AN EFFECTIVE PROCEDURE FOR AGS VACUUM TECHNICIANS TO REMOVE AND/OR INSTALL AN "OPEN" DIPOLE MAGNET CHAMBER.

2.0 RESPONSIBILITIES:

2.1 THE AGS VACUUM SUPERVISOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THIS PROCEDURE.

3.0 DISCUSSION:

3.1 THIS PROCEDURE IS WRITTEN SO THAT TRAINED AGS VACUUM TECHNICIANS WILL BE ABLE TO SUCCESSFULLY AND EFFICIENTLY REMOVE AND/OR INSTALL AN "OPEN" DIPOLE MAGNET CHAMBER IN A SAFE AND PROPER MANNER.

4.0 PRECAUTIONS:

4.1 THE TECHNICIAN SHALL BE AWARE OF RADIATION LEVELS IN THE AREA AND, WHERE REQUIRED, SHALL OBTAIN A RADIATION WORK PERMIT.

4.2 THE TECHNICIAN WILL ENSURE THAT HE IS IN FACT USING A SAFE AND PROPERLY FUNCTIONING GAS REGULATOR AND BOTTLE CART. THOSE FOUND TO BE UNSAFE SHALL BE RETURNED FOR REPAIR.

4.3 THE TECHNICIAN SHOULD BE AWARE OF WHAT CONSTITUTES A VACUUM SECTOR. FOR EXAMPLPE, SECTOR "AB" STARTS AT A14 AND ENDS AT THE B3 MAIN MAGNET. SECTOR "B" STARTS AT B4 AND ENDS AT THE B13 MAIN MAGNET. A SCHEMATIC REPRESENTING THE ENTIRE AGS LAYOUT IS POSTED IN THE VACUUM LAB.

4.4 THE TECHNICIAN SHALL NOT REMOVE ANY MATERIALS OR EQUIPMENT FROM THE AGS RING UNLESS THEY ARE FIRST CHECKED BY HEALTH PHYSICS.

4.5 THE TECHNICIAN SHALL BE AWARE THAT UPON REMOVAL OF A HV CABLE FROM A S.I.P. WITHIN THE LOCKED OUT SECTOR, THE CABLE & CONNECTOR MUST BE PROPERLY DISCHARGED USING AN OSHA APPROVED RESISTIVE TYPE GROUNDING STICK.

4.6 CHECK COLOR CODE ON KIRK KEY & VERIFY THAT IT MATCHES THAT OF THE HV CABLES IN THE LOCKED OUT SECTOR.

5.0 PREREQUISITES:

5.1 THE TECHNICIAN WILL HAVE BEEN TRAINED IN THIS PROCEDURE.

5.2 LOCKOUTITAGOUT 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 ARE REQUIRED DURING THIS PROCEDURE.

5.7 WHITE LINT-FREE GLOVES ARE REQUIRED DURING THIS PROCEDURE.

5.8 OSHA APPROVED RESISTIVE TYPE GROUNDING STICK

- 5.9 FLUKE METER OR EQUAL, CAPABLE OF READING OHMS
- 5.10 TECHNICIAN HAS BEEN TRAINED TO AT LEAST A LEVEL OF KNOWLEDGEABLE IN LOITO AGSIHEBT VACUUM ION PUMP POWER DISCONNECT.
- 5.11 AFFECTED PERSONS TRAINING 15.12.00.01.

6.0 OPERATIONAL PROCEDURE FOR REMOVAL:

- 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 LOITO PROCEDURES FOR ION PUMP HV SUPPLIES
- 6.4 PERFORM LOITO PROCEDURES FOR SECTOR CCG.
- 6.5 VENT SECTOR TO ATMOSPHERE AS PER PROCEDURE #8.18.1.1
- 6.6 REMOVE FLANGE R-C NETWORKS AND/OR SHORTING BARS
- 6.7 REMOVE CLAMPS, RETAINERS AND SEALS.
- 6.8 SCRAP SEALS IN "YELLOW RADIATION WASTE BARRELS IN RING.
- 6.9 WHERE NECESSARY, REMOVE P.U.E. ELECTRICAL CABLE. (ED GILL)
- 6.10 VERIFY WITH A FLUKE METER THAT THE GREEN GROUND CABLE WHICH IS BOLTED TO THE S.I.P. MAGNET BODY HAS CONTINUITY TO RING GROUND.
- 6.11 AFFIX OSHA APPROVED GROUND STICK TO THE GREEN GROUND CABLE WHICH IS BOLTED TO THE S.I.P. MAGNET BODY.
- 6.12 USING THE GROUND STICK, GROUND THE CENTER CONDUCTOR OF THE HV CABLE.
- 6.13 USING THE GROUND STICK, GROUND THE HV FEED-THRU OF THE S.I.P.
- 6.14 REMOVE ION PUMP HV CABLE AND GROUND CABLE.
- 6.15 REMOVE GREEN COVER FROM MAIN MAGNET & PLACE COVER NUTS ON STUDS.
- 6.16 REMOVE BOLTS OR CLAMP FROM ION PUMP & STORE SAFELY.
- 6.17 SCRAP ION PUMP SEAL IN "YELLOW RADIATION WASTE BARREL BUT SAVE THE RETAINER & STORE SAFELY.
- 6.18 REMOVE MAGNET CHAMBER R-C NETWORK & PLACE ON TOP OF MAIN MAGNET.
- 6.19 REMOVE CHAMBER SUPPORT BRACKETS & PLACE BRACKETS ON TOP OF MAIN MAGNET & PUT BOLTS BACK IN MAGNET FINGER TIGHT.
- 6.20 REMOVE CHAMBER BY CAREFULLY SLIDING OUT FROM FRONT (OR BACK) OF MAIN MAGNET.
- 6.21 TAKE RADIATION "SMEAR" OF CHAMBER AND TAG APPROPRIATELY (H-P).
- 6.22 TRANSPORT CHAMBER (IF NECESSARY) TO BLDG.975 FOR RE-WORK (RIGGERS)
- 6.23 IF GOING TO BLDG.975, LOG OUT IN RING BOOK & INTO BLDG.975 BOOK.

7.0 OPERATIONAL PROCEDURE FOR INSTALLATION:

- 7.1 CAREFULLY SLIDE CHAMBER INTO MAIN MAGNET.
- 7.2 INSTALL CHAMBER SUPPORT BRACKETS (USE CHAMBER LOCATING FIXTURE).
- 7.3 INSTALL MAGNET CHAMBER R-C NETWORK & CHECK FOR SHORTS.
- 7.4 ATTACH ION PUMP TO CHAMBER WITH NEW SEAL & CLAMP (OR BOLTS) AND CHECK FOR SHORTS.
- 7.5 CHECK P.U.E. FOR CAPACITANCE & SHORTS (ED GILL).
- 7.6 RE-CONNECT ION PUMP HV CABLE & GROUND CABLE.
- 7.7 NSTALL NEW CLAMPS & SEALS AS PER PROCEDURE #8.18.1.6
- 7.8 CHECK CHAMBER FOR SHORTS (EL GROUP).
- 7.9 START ROUGHING AND LEAK CHECK PROCEDURE #8.18.1.20
- 7.10 CHECK P.U.E. FOR CAPACITANCE & SHORTS & INSTALL CABLE (ED GILL)
- 7.11 INSTALL FLANGE R-C NETWORKS & SHORTING BARS.
- 7.12 REMOVE RED TAGS FROM ION PUMP P.S. AND CCG.
- 7.13 PROCEDE WITH SECTOR START-UP PROCEDURE #8.18.1.53

8.0 ACCEPTANCE CRITERIA:

- 8.1 CHAMBER HAS BEEN REMOVED AND/OR INSTALLED AND SECTOR HAS ACHIEVED VACUUM INTEGRITY.

9.0 FINAL CONDITIONS:

- 9.1 WORK AREA HAS BEEN CLEANED AND ALL EQUIPMENT AND/OR TOOLS HAVE BEEN REMOVED FROM THE RING AFTER BEING CHECKED BY H-P PERSONNEL.
- 9.2 DOSIMETER READINGS HAVE BEEN LOGGED IN THE DOSIMETER LOG BOOK LOCATED IN THE VACUUM LAB.