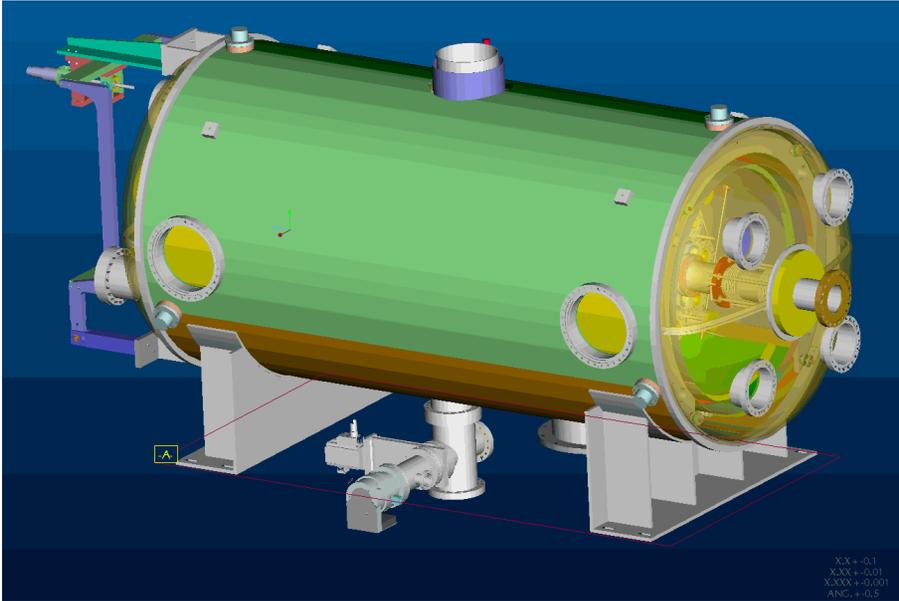


56 Mhz Vacuum

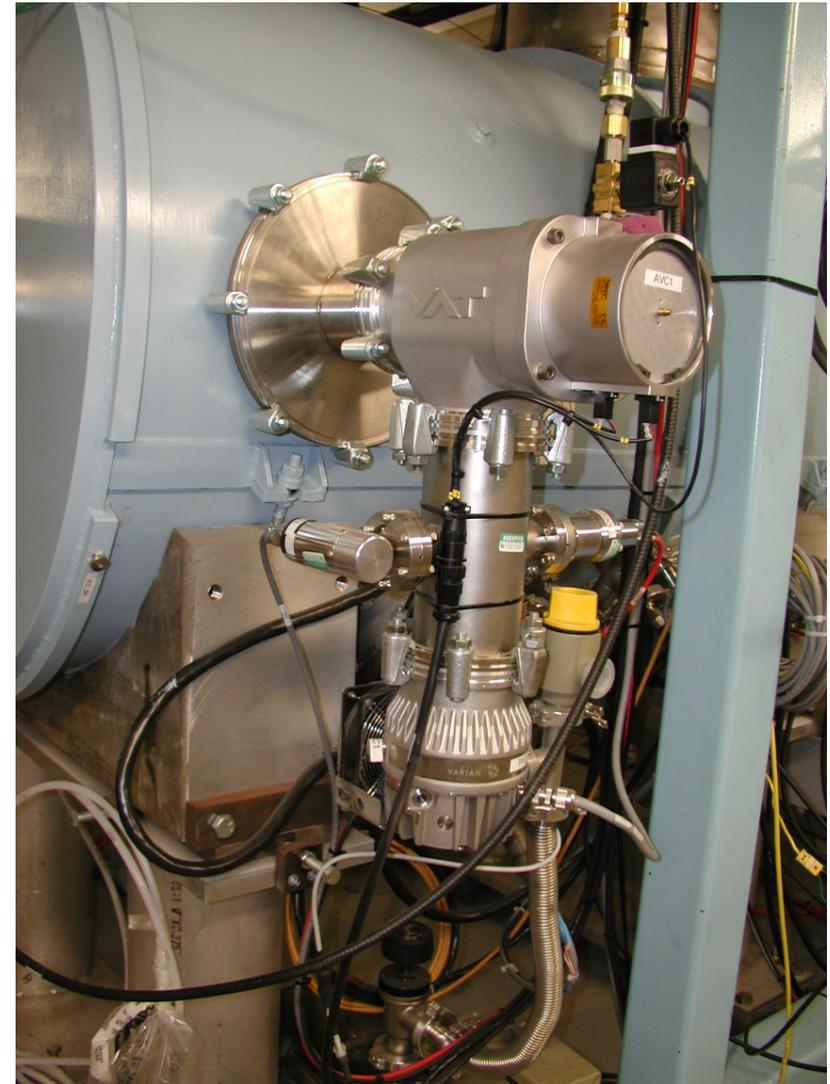
Mike Mapes

3-8-2011

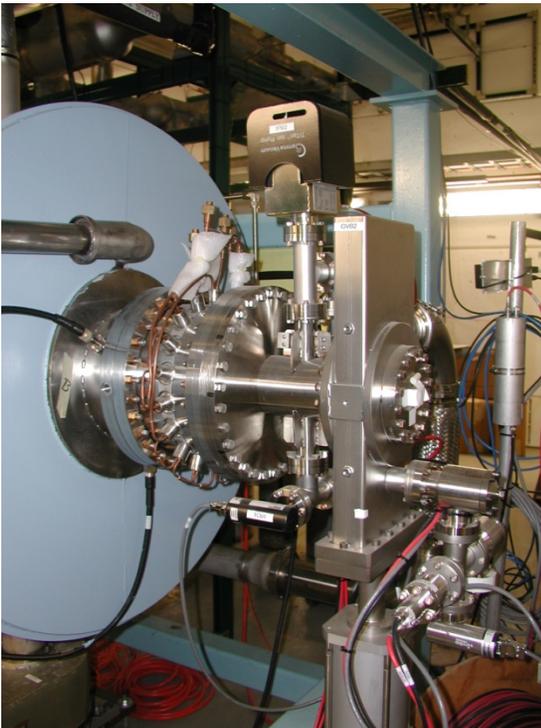
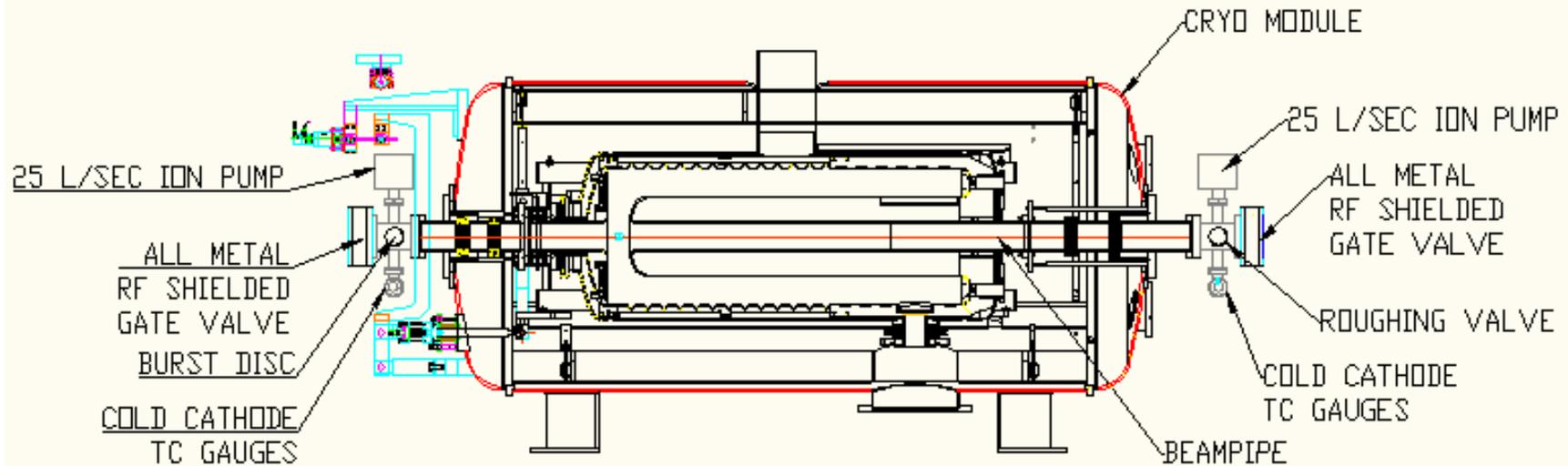
56 Mhz Insulating Vacuum



- TURBO PUMP WITH GATE VALVE AND GAUGE SET MOUNTED ON TANK
- SIMILAR TO RHIC CRYOSTAT & VALVE BOX, AGS COLD SNAKE AND ERL 5-CELL INSULATING VACUUM
- ALLOWS FOR ROUGHING & LEAK CHECKING
- PROVIDES PUMPING TO OVERCOME SMALL LEAKS
- BURST DISC FOR PRESSURE RELIEF

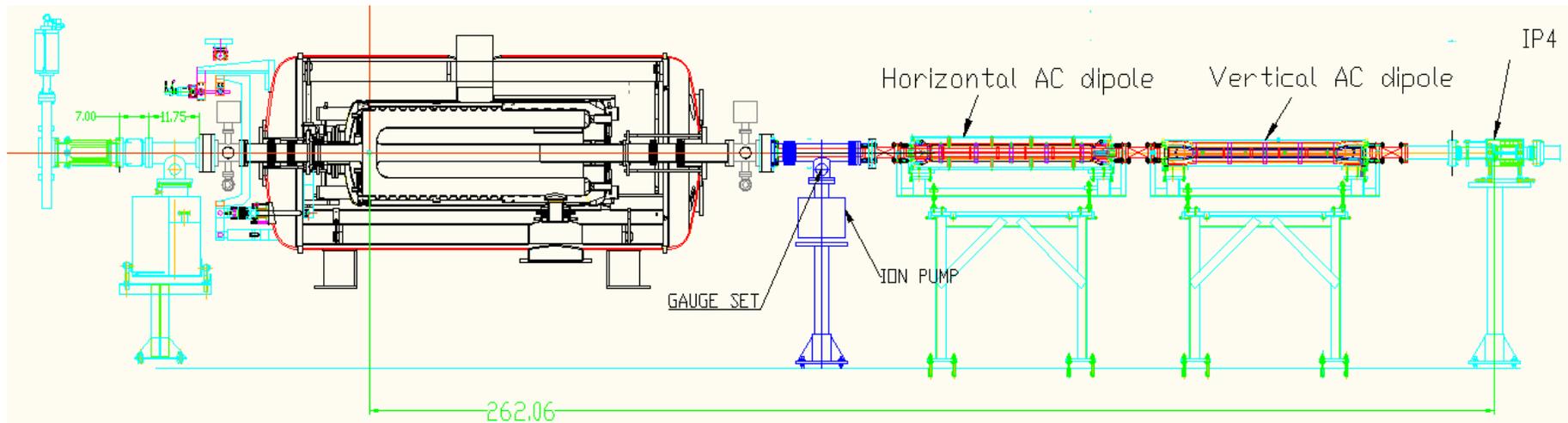


56 Mhz Beam Vacuum System



- BEAM PIPE IN MODULE IS CRYOPUMPED
- 2- 25 L/SEC USED TO MAINTAIN VACUUM WHEN WARM
- SELF CONTAINED WITH 2 ISOLATION VALVES
- BAKED ENDS – VALVES, PUMPS, GAUGES AND TEES
- 10^{-11} TORR PRESSURE **PARTICULATE FREE PROCESSED**
- SILICON OR CLEAN ROOM HEATING JACKETS
- BURST DISC FOR PRESSURE RELIEF FOR BEAM VACUUM

56Mhz Ring Installation



Major Installation Tasks/Items

- Existing warm bore pipes and chambers need to be Particulate Free Processed
- Silicon or clean room heating jackets for existing warm bore chambers for bakeout
- Add ion pump and gauge set in dead space
- Extensive Vacuum I&C rework
 - Add valves with logic for interlocks to protect cold bores
 - Add gauges, cables and pumps

Particulate Free Clean Room Process

- All parts used will either come cleaned, or cleaned at BNL Central Shops Cleaning Facility for UHV service. Some components should be specified and delivered particulate free.
- Small parts, such as a fittings or flanges, can be blown clean with pressurized filtered nitrogen. Other larger or more complicated parts required wet processing such as alcohol and/or ultrasonic cleaning or in the case of long pipes and very large chambers high pressure rinse.
 - *Clean is defined as recording less than 5 counts of 0.3 micron particles over 10 second sample period.*
- Parts are assembled and prepared within class 100 soft wall on a laminar flow bench. Assemblies are double bagged and delivered to portable clean room for assembly onto cavity.

Gowning Room



Suit up in full gown to enter class 100 clean room

Incoming Storage



Incoming parts stored in class 10,000 area

Processing Room



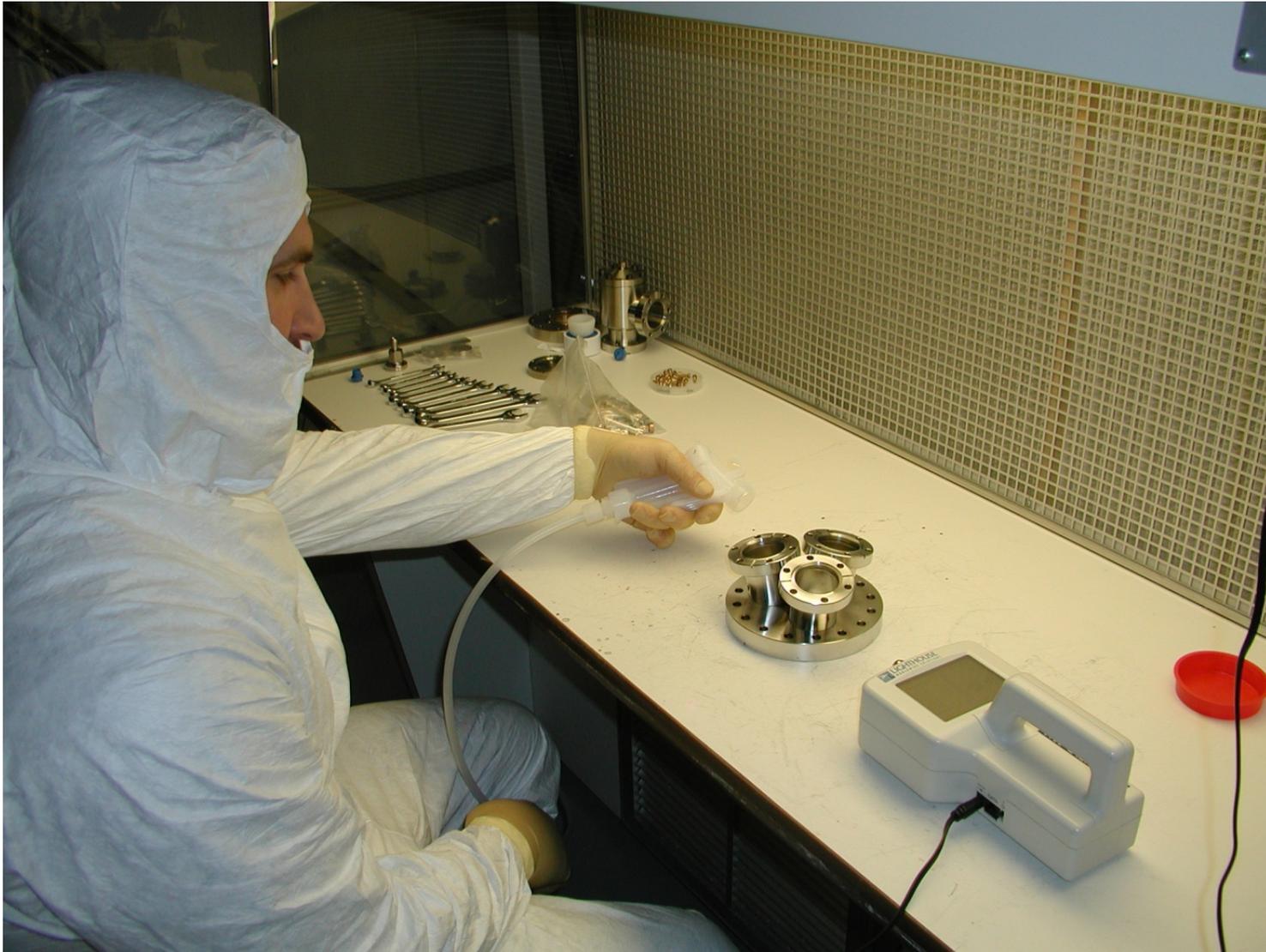
Technicians wet processing parts in Ultrasonic cleaner

Wet Processing and Cleaning



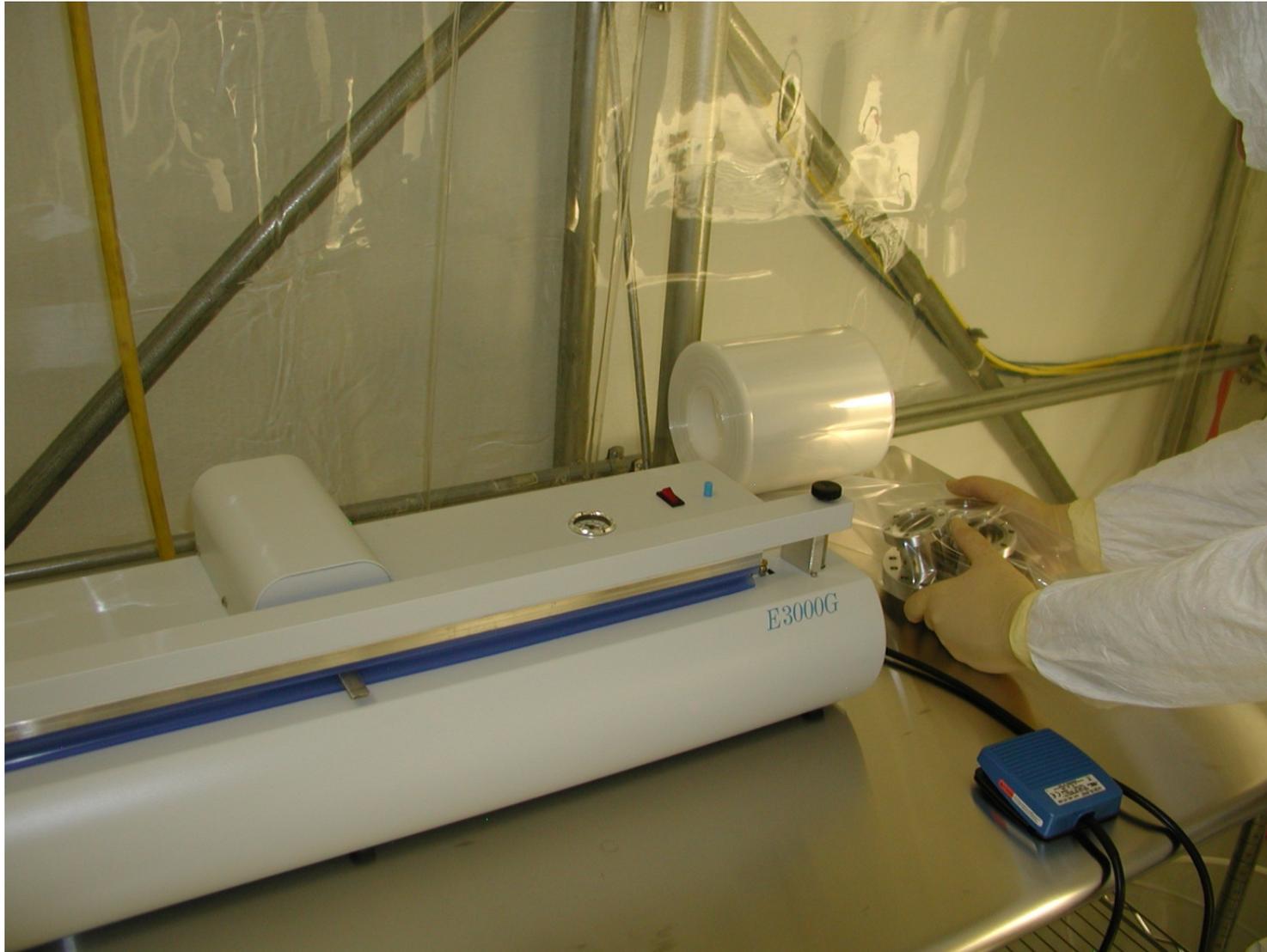
Technician drying part with HP Nitrogen after ultrasonic cleaning

Component Cleaning



Technician blowing down part with HP nitrogen and measuring particle count

Component Bagging



Clean parts are sealed in bags for storage and transport to assembly area

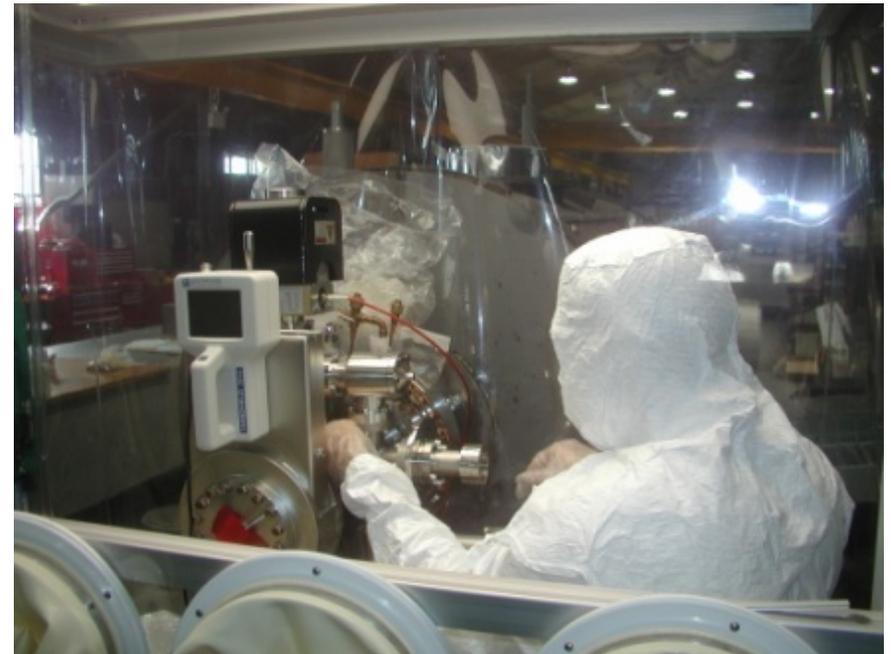
Bagged Components and Assemblies



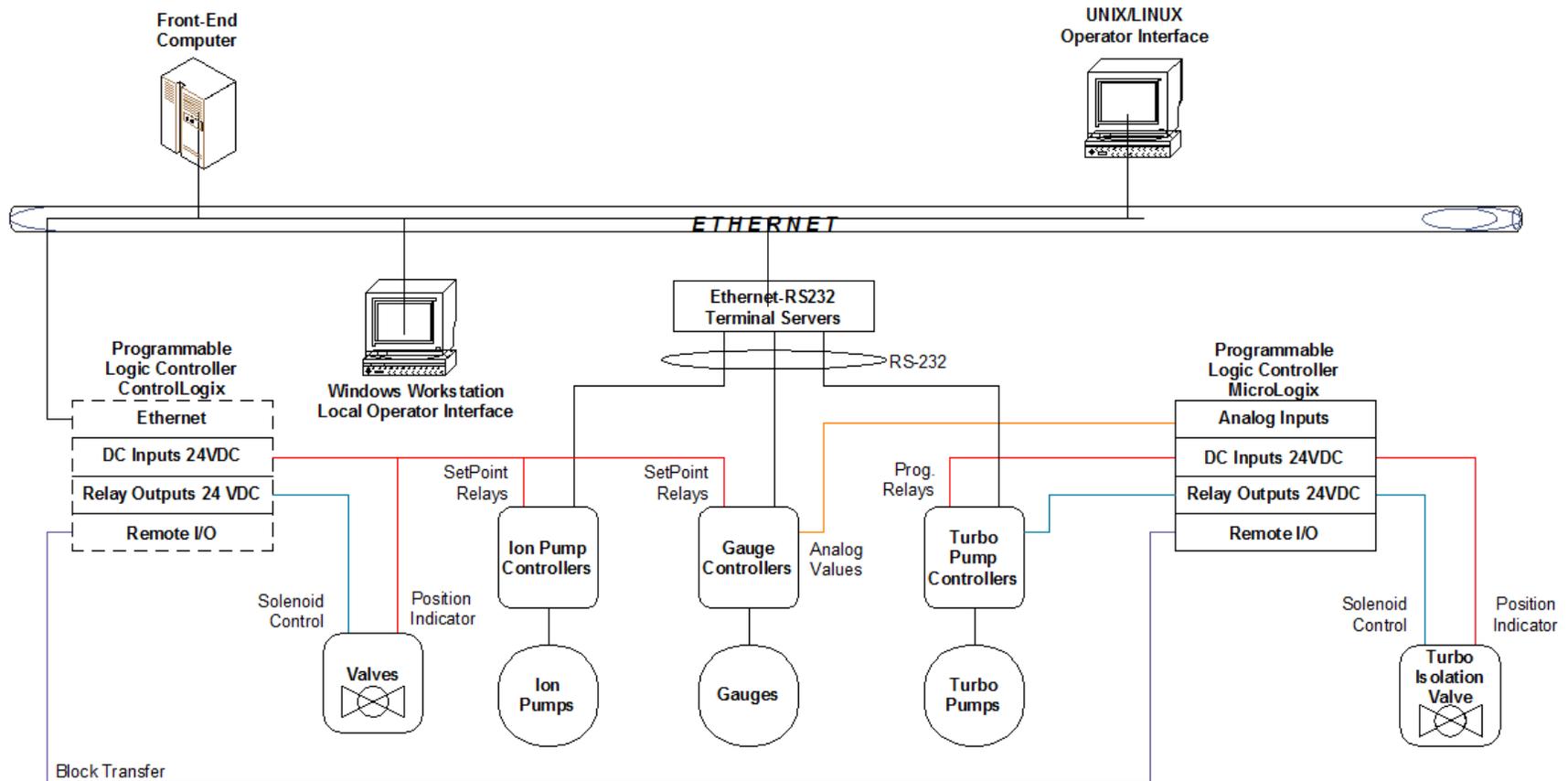
Parts cleaned and bagged ready for installation

In-situ Installation of Beam Line Components

- A portable class 100 clean room is installed over the component to be worked on. The space is thoroughly cleaned, blown down and allowed to clean up for several days.
- Once the particle count reaches acceptable levels the system is ready for installation
- Clean assemblies are delivered and installed inside portable clean room.



Vacuum I&C



New Vacuum Equipment to be Interfaced

- Turbo pump
- 3 ion pumps
- 3 valves
- 4 gauges sets

RHIC 56 MHz Cryomodule

- Vacuum System Schedule

Specific Components 05/13/11

Procure Vacuum Components & Testing Complete 08/31/11

Low Particulate Processing of Vacuum Components 02/28/12

Install Components in String Assembly 03/05/12