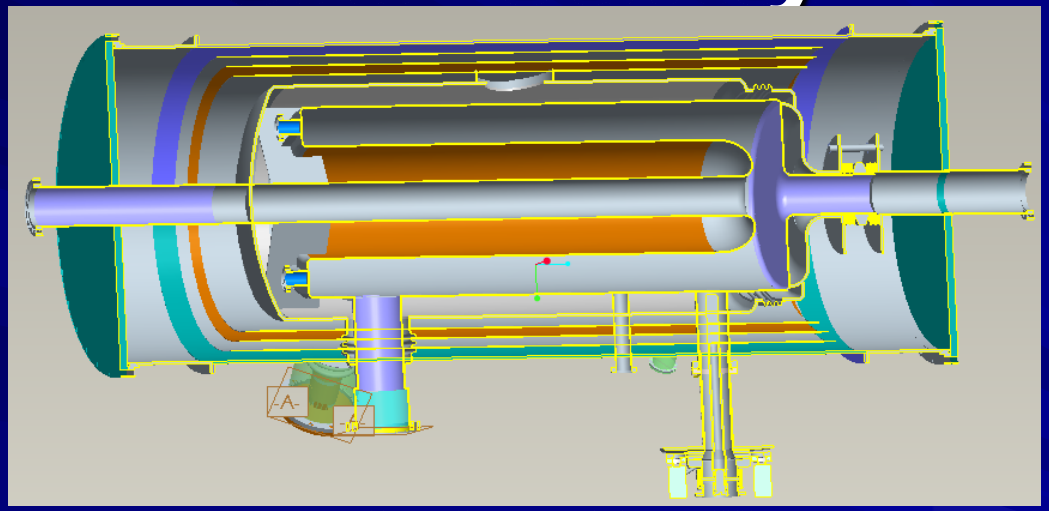
Chemical Processing and RF Testing of the 56 MHz SRF Cavity



Andrew Burrill

AIP Review

January 8, 2009

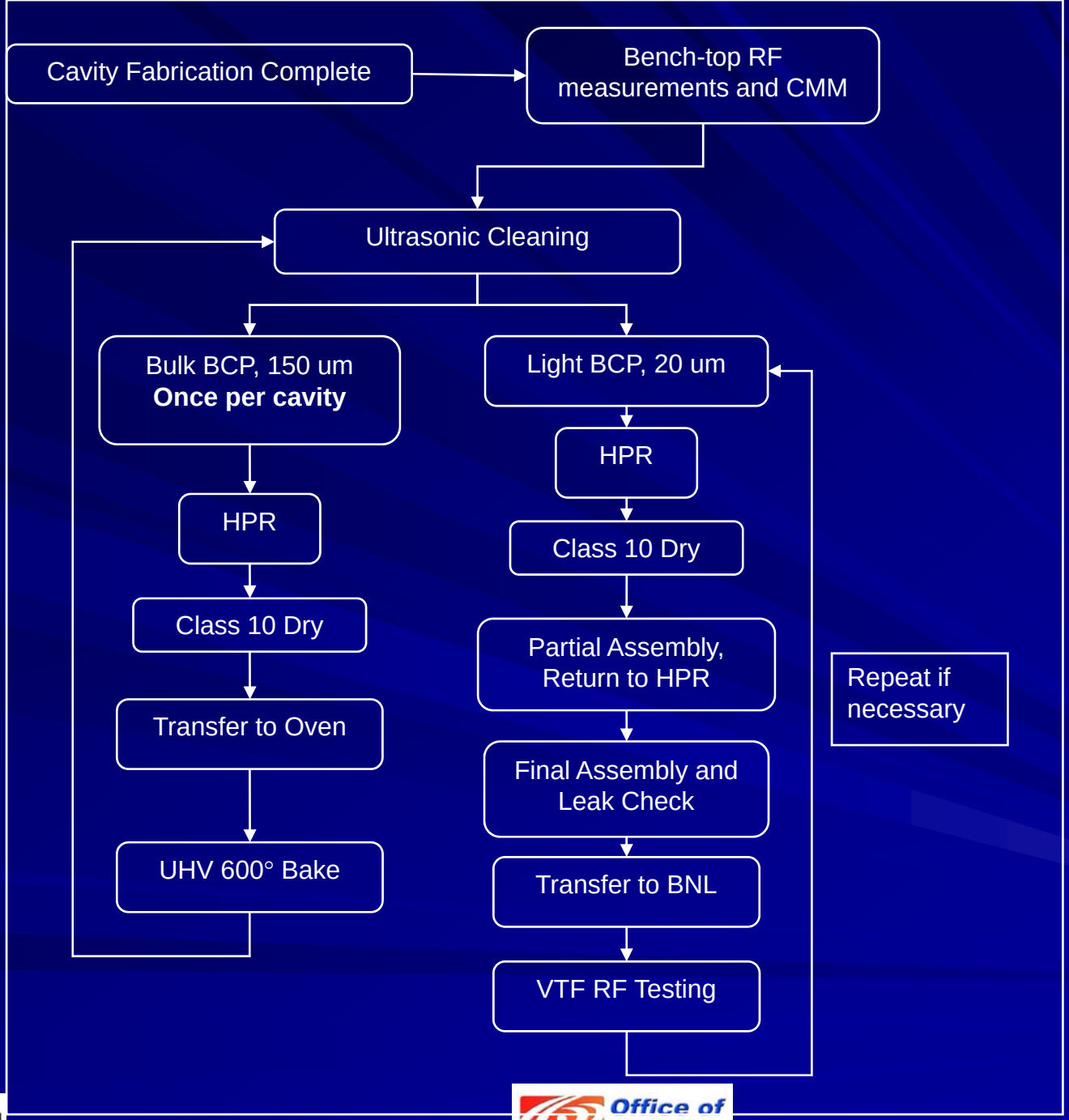
BROOKHAVEN NATIONAL LABORATORY

Office of Science U.S. DEPARTMENT OF ENERGY

Advanced Energy Systems, Inc.

Outline

- Processing Sequence
- Infrastructure & Background
- Status of Facilities
- BCP & HPR plan
- UHV Oven Treatment
- VTF Testing


Cavity Fabrication Complete
Bench-top RF measurements and CMM
Ultrasonic Cleaning
Bulk BCP, 150 um
Once per cavity
HPR
Class 10 Dry
Transfer to Oven
UHV 600° Bake
Light BCP, 20 um
HPR
Class 10 Dry
Partial Assembly, Return to HPR
Final Assembly and Leak Check
Transfer to BNL
VTF RF Testing
Repeat if necessary

Infrastructure

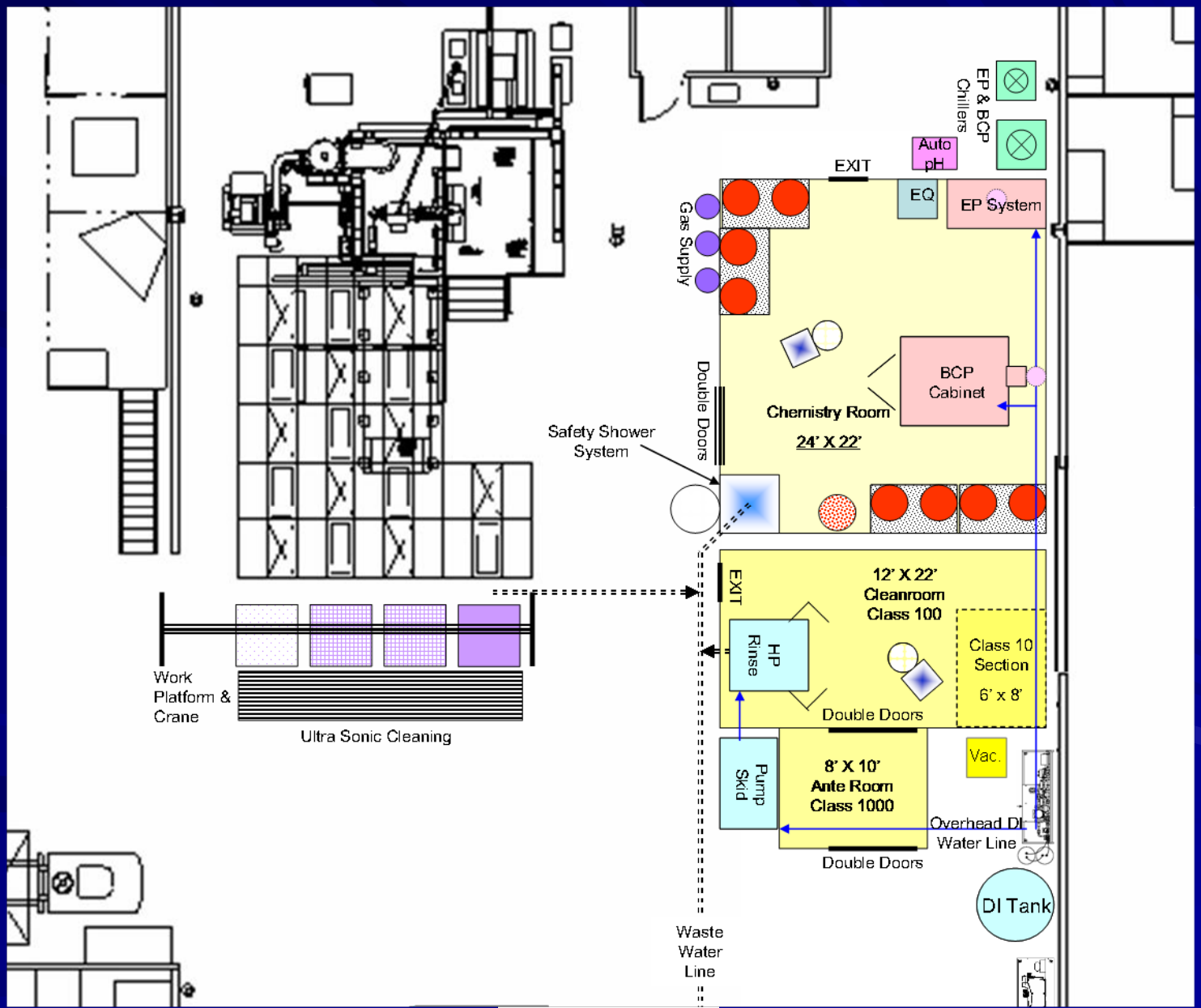
AES

- Ultrasonic rinsing
- BCP
- HPR
- Clean room
  - Class 100 and 10
- Ultra-pure DI water
  - 1500 gallon storage

BNL

- UHV Oven
- Vertical Test Dewars
- RF system
- Clean room

BNL Chemistry Facility at AES

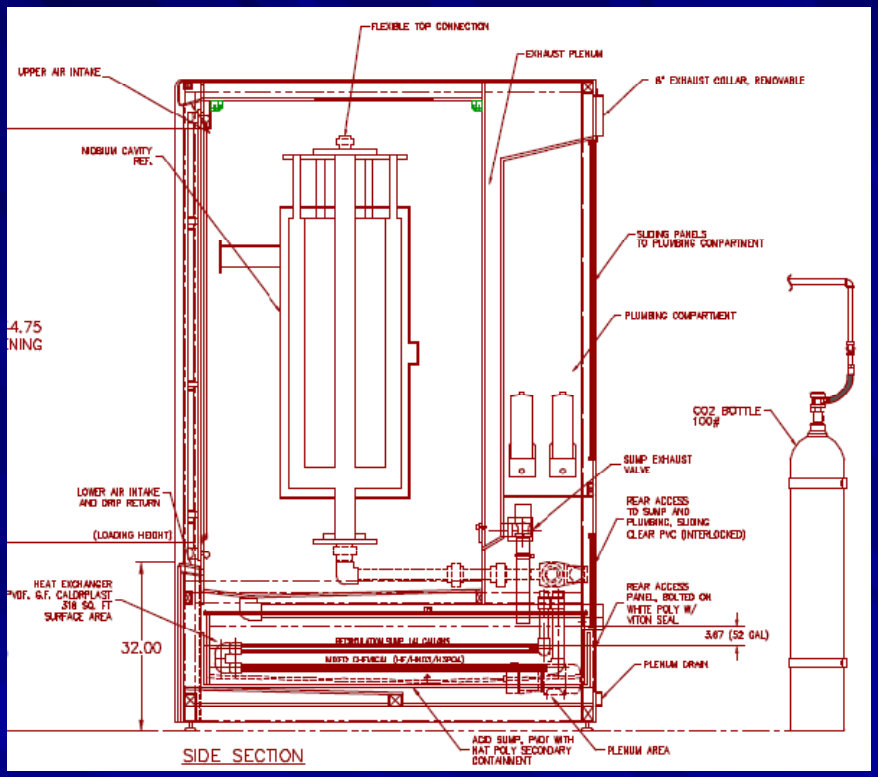


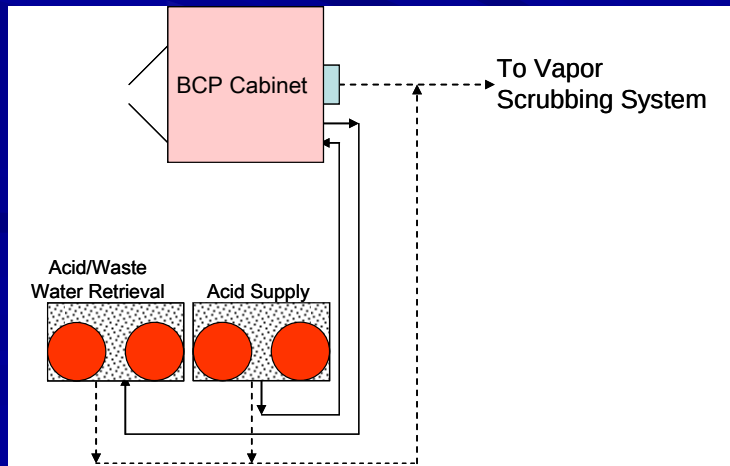
BROOKHAVEN NATIONAL LABORATORY

Advanced Energy Systems, Inc.

BCP system

- BCP cabinet designed to handle cavity 48” diameter and 73” long
- sump capacity 141 gallons
- Heat exchanger sized for 56 MHz cavity, 13.2 kW capacity maintain sump at 15°C
- Cabinet designed to handle 1118 lb load
- Acid supply and waste collection in chemistry room





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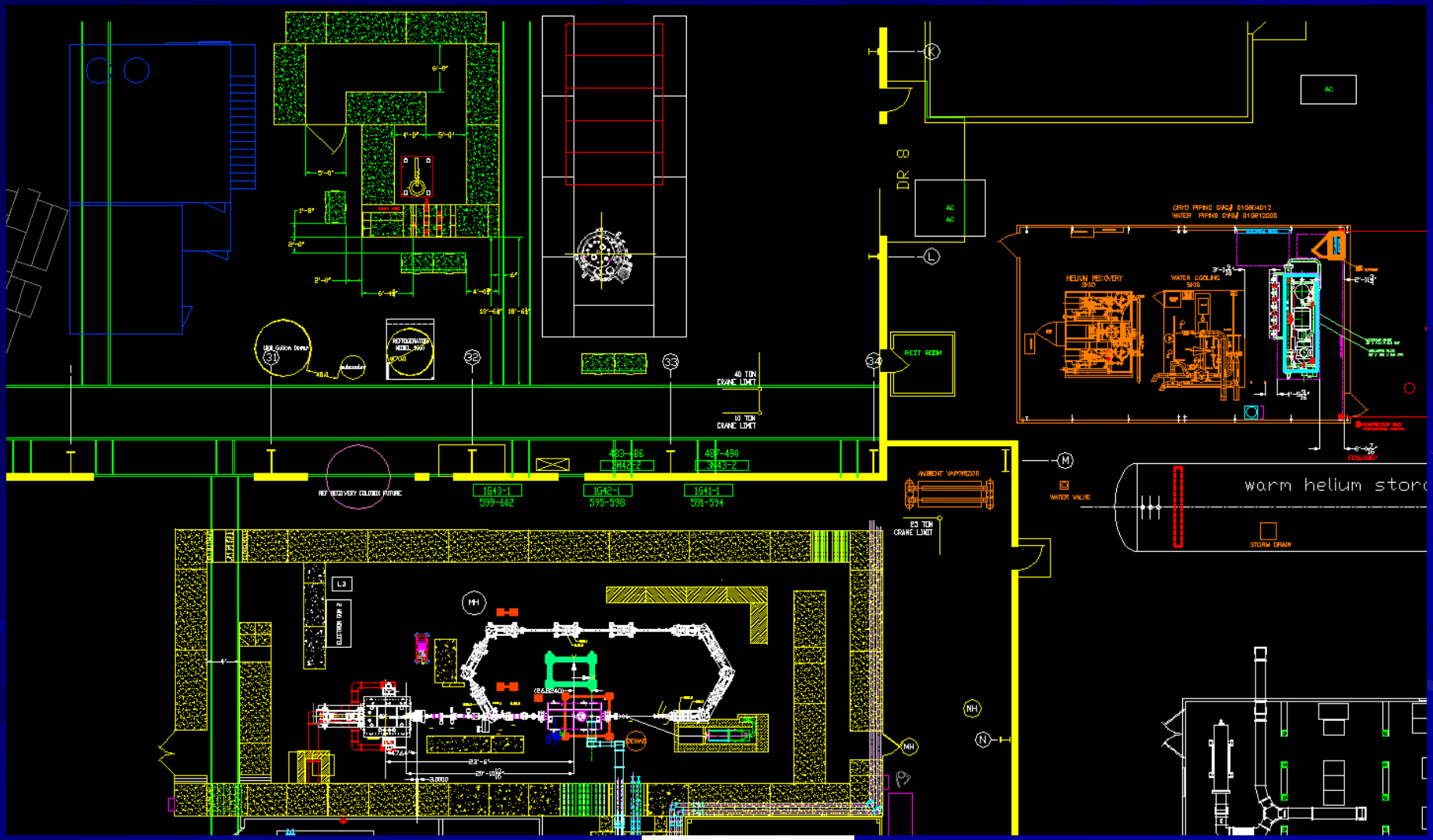
HPR System

Designed for Cavity 48” diameter x 73” length
Interchangeable nozzle head
Wand off-set option for cleaning outer section of cavity
Heated nitrogen drying
LEWA triplex diaphragm metering pumps to provide at least 5 gpm at 1200 psi

BNL Facility

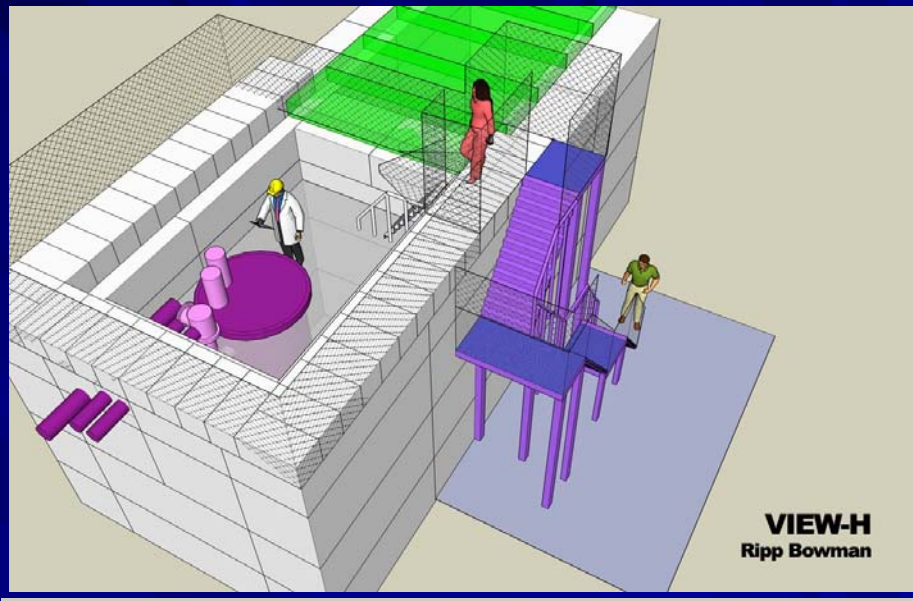


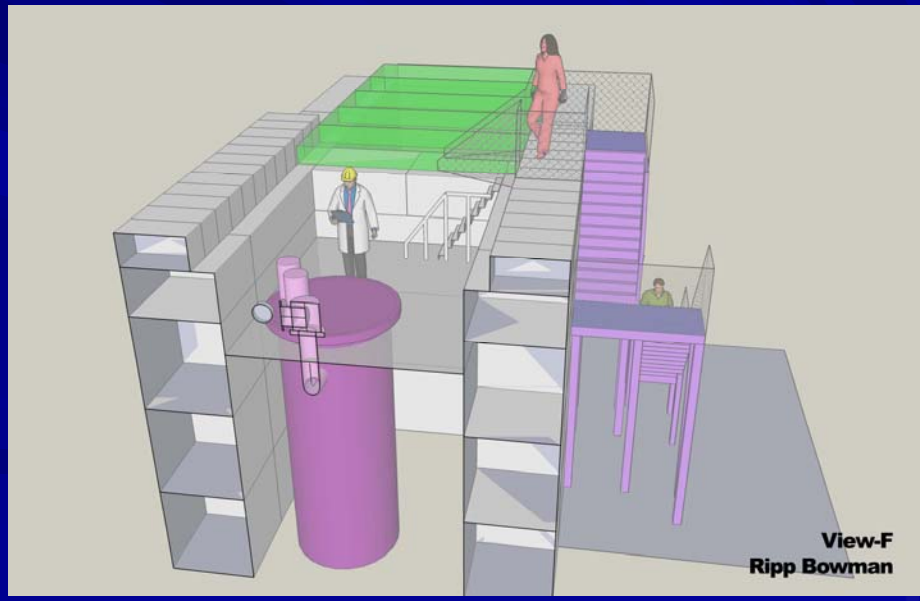
UHV Oven

- 600 C maximum temp
- 20” cryo-pump
- Vacuum to 10^{-8} torr
- Residual Gas Analyzer
- Located adjacent to the VTF
- PLC programmable

Vertical Test Facility

- Dewar 38” diameter 96” working depth
- LHe refrigerator with 360 W capacity
- 1000 gallon storage dewar
- Liquid ring pump for operation to 1.8K
- RF systems from 56 – 1300 MHz





Thank you!