RFQ Installation Status 10/27/2015

October 27, 2015

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Pictures – RFQ in place

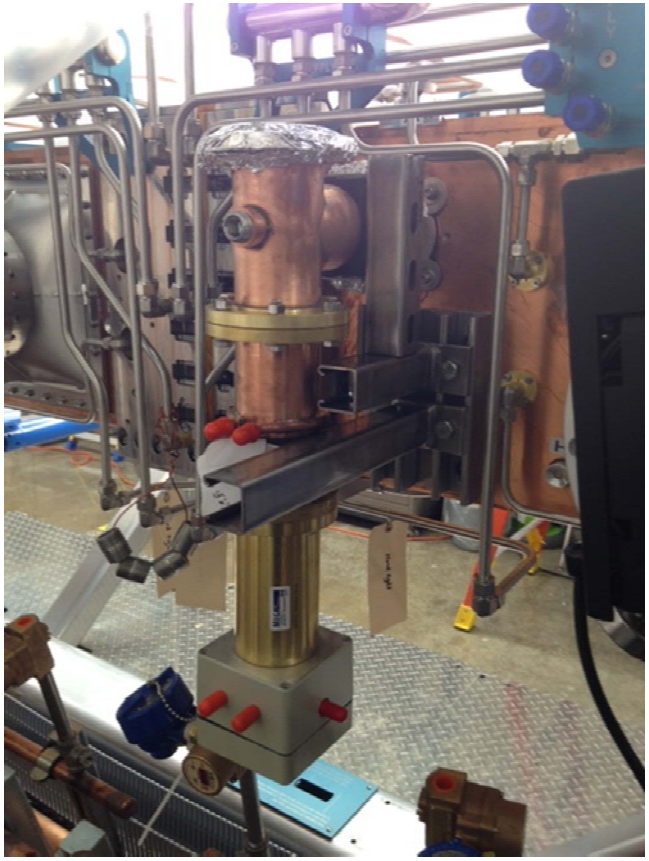
- Alignment crew surveyed RFQ into place and RFQ is now connected to LEBT.
- RFQ has been pumped down to specified vacuum pressure.

RFQ within about 1” of final location downstream of MEBT.

RFQ Water Cooling System

- All RFQ wall mount water cooling hardware installed.
- Copper manifold and instrumentation in place with hoses to follow shortly.

RFQ Input Coupler



- RFQ supports for input couplers complete.
- Left input coupler non-vacuum hardware in place, so water hoses for RFQ can be installed without interfering.

Other Milestones

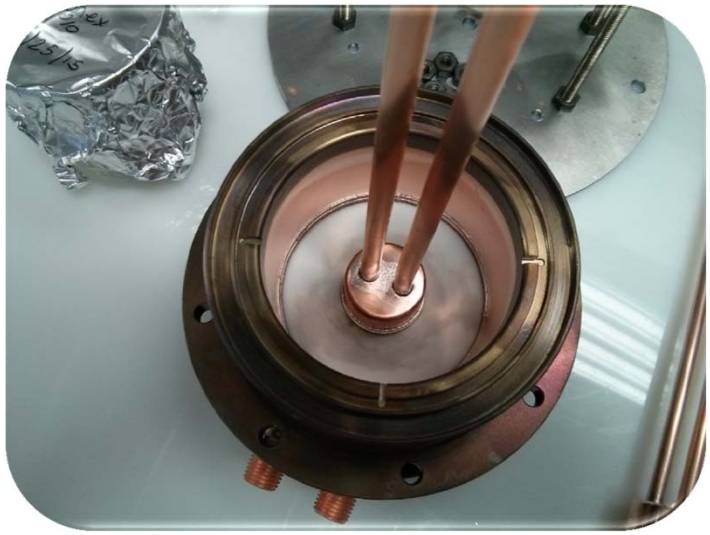
- Hardware design of resonant control system complete.
  - All hardware is on hand and most is already installed.
  - Work continues on software control algorithm and interfaces.
- RF fanback design complete and all hardware components are on hand.
- Still need to order final two pieces of 6” coaxial transmission line.

Installation Order

- Install non-vacuum components of left coupler (done).
- Install hoses for RFQ cooling (copper manifold to module manifold).
  - Install power distribution for RFQ water skids pumps and valves.
  - Flush out vane and wall systems through water filter with module bypass hoses.
- Install RF pickup loop fanback switches and cables.
- Install working platform and cable tray.
- Pull instrumentation wiring.
- Install RF power distribution, 6” coaxial transmission lines.

RFQ Couplers (162.5 MHz)

- Status: All components minus vacuum end assemblies shipped. First end assy is brazed and leak tight. Some contamination on alumina window resulted from last braze cycle. Cleaning solutions ineffective.
- Sandblasting with SiO_2 with dry nitrogen should work, but trying on other alumina samples first. Should complete cleaning by Nov. 4.
- TiN coating completed by Nov. 12.
- Final forming and Vacuum tests by Nov. 17th.

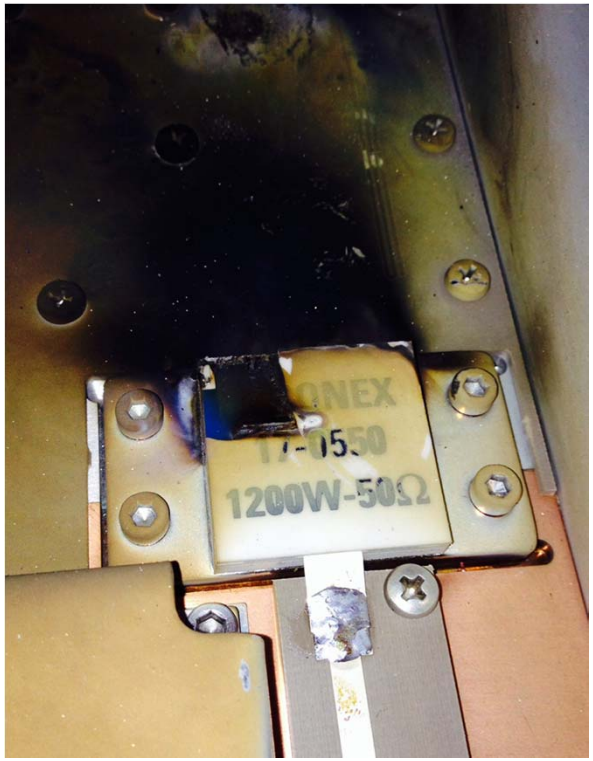


RFQ Couplers

- Second vacuum end assy is being assembled for brazing. Should complete brazing by Nov. 11.
- TiN coating completed Nov. 18.
- Final forming and vacuum tests by. Nov. 22.
- Last two vacuum assemblies to be completed by Dec. 15th.

RFQ Coupler Follow-up

- We have requested that they focus on trying to get a clean braze on the second coupler instead of trying to clean the first coupler.
- If braze is successful, third coupler will follow quickly.
  - Process for cleaning first coupler can be developed after two couplers are delivered.
- Mega will test extra ceramic window in braze oven with outer conductor and braze material to insure no contamination to final antenna.
- Mega will also hi-pot antenna between 6-10kV.

RFQ Power Amplifier

- Catastrophic failure of an amplifier slice during CW operation. Believed to be due to high, internal reflected power.
- Slice sent to vendor (under warranty) for investigation and repairs.
- Only left amplifier is operational, and we have no more working spares.
- Left amplifier was tested over the weekend at 50kW output, 20 Hz, 10% duty cycle without failure.
- May not be able to condition RFQ in CW mode until problem is resolved.