Weekly Report – week of August 29, 2011
Fabrication and Assembly of ERL hardware
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Beam line: Design, machining, and installation of downstream vacuum vessel restraint brackets continues.

Controls: Work continued towards establishing serial communications with the Danfysik power supply chassis: local control via the front panel interface has now been successfully tested with the first chassis, and the focus is now on setting up the remote serial RS485 connection. Lens controller software development has reached the stage of initial testing using a lens module on the workbench

Cryogenics: CryoControls: Wiring of last few instrumentation on cryoplant side to continue when technician returns from RHIC rack move.
Cryoplant system: Sullair Compressor skid oil lines replacement done.
Cryolines plant: Leak checking of last field joints was completed on last Friday. Vacuum jacket to be welded next.
Cryogenic transfer lines to ERL cryomodules: Fabrication continues on valveboxes for cryomodules.
Cryo System: FMEA (Failure Mode Effect Analysis) is continuing.
Large grain gun test: Rotatable blind flange bored and ready for weldup to last interconnect piece.
LN2 11,000 Gal storage Dewar: Official pressure retest / leak check was completed successfully past Friday, to recommission the dewar for use.
SRF Gun Cryomodule interfaces: 5K intercept return mass flow meters manifold is being welded up.
SRF Gun Cryomodule interfaces: Relief header system. Materials to be ordered next week.
SRF Gun Cryomodule cryo instrumentation prep: FPC heaters, cernox temperature sensors reviewed and ready for installation.

Gun Cryomodule/5-cell cavity: Expanded FPC gaskets and spacer received. Gun cryomodule assembly review with Q&A was held in preparation for gun assembly. Work continued on cathode transporter including survey of cathode insertion arm.

Mezzanine: The contract has been awarded for the under mezzanine VTF cleanroom.

Instrumentation: Fabrication of the Faraday cup amplifiers and control chassis continues in-house. Acquisition of the gun motion feedthroughs, connectors, and internal cryostat cabling is underway. A comprehensive comparison drawing outlining the instrumentation layout of the four phases of the ERL project (G0, G5-Straight, G5-ZigZag, ERL) has been published to the instrumentation Wiki pages. The optics box of the first article profile monitor is in the possession of the Controls Group in order to develop a suitable interface to the 3-axis lens within. This profile

monitor's vacuum vessel will be handed over for installation in G0/ERL by the end of the week. The dipole vacuum chamber accommodating the plunging profile monitors in the zig-zag have been redesigned, and the actuator design is awaiting its turn in the queue. The beam position monitor electronics, and associated accessories, to support G5 has been shipped from the vendor.

Laser: A modification of the laser transport design is being studied, in order to improve stability and reduce the number of optical surfaces. The present design requires multiple optical platforms and separated vacuum segments. A proposed new design would reduce the vacuum segments from 3 to 1, eliminating 8 optical surfaces. A critical focusing element would also be moved to a more stable platform; one platform would be eliminated and two would be combined into a single, more stable configuration.

Large Grain Gun: Preparations continue for assembly of the large grain cavity experiment. A rolling table is being procured along with several vacuum components to begin assembly of vacuum system on the dewar top plate. In addition, a local HEPA filtering system is being devised to aid the assembly using parts that have already been procured and that are available for use. Discussion has also begun with Advanced Energy Systems for fabrication of a new copper vertical test cathode.

Photocathode: Investigations into main cavity heating mantles regarding electrical operation and layout completed. Current thermal couples will be removed and new thermal couples will be installed under mantle elements to track each heating zone. Current control system does not provide enough feedback for all zones. Further bake out cycles will be done with a vacuum group bake out cart to replace current control system. Potassium arm components removed including manual valve, elbow, and six way cross to be baked out in high temperature furnace. Considerations are being made to do the same to the cesium arm as well. Parts ordered to build laser box to be attached to deposition system to process copper with excimer laser. Existing laser box for this task may be sufficient. Glass widow was removed and replaced with a sapphire window for the laser process.

Project Controls: Most but not all remaining estimates have been received and are being added to the schedule. Some estimates only address the G5 test and not the complete ERL, so we need to contact people to add those tasks to their spreadsheets.

Vacuum:
1. Detail design of the ERL Zig-Zag chamber fabrication drawings continues. Magnets at entrance of 5-cell along circulating beam line are repositioned to eliminate an interference and improve the chamber design.
2. Processing of laser/ion-pump cross complete. Assembly with vacuum gauging and ion pump underway. Laser mirror processing to begin since stability test will not be performed.

3. Purchase order for additional components to complete the interim “G-0” e-gun commissioning beam line has been dispatched.
4. Preparing test of various clean room compatible heater jackets.
5. Investigation of integration of cathode cart controls into the ERL controls continues.
6. Laser windows were liquid helium leak checked after two cool down cycles to 4K.
7. The deposition chamber parts are being cleaned.
8. A full redesign of the bakeout system is necessary for the deposition chamber.
9. Work continues on the gun string and FPC cart

ERL injection line: The upstream solenoid chamber has been modified and the g-0 drawings have been completed.