Weekly Report – week of November 14th, 2011
Fabrication and Assembly of ERL hardware
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Controls: Software that will link digitized temperature readings to a Machine Protection System input has been created and is ready for testing. Discussions between Power Supply and Controls experts have outlined a plan for providing controls for the superconducting gun solenoid power supplies using existing VME PSC hardware with limited software modifications for testing the steering of the laser beam at the photocathode. The primary plan for supporting the quench detection on the same solenoid magnets incorporates the same National Instruments Curio platform (and possibly a portion of the software) as has been developed by the Superconducting Magnet Division for quench detection. The secondary option would be to use existing VME hardware and custom software for the same task, but this is less attractive due to cost and limited future prospects. We have outlined at least a portion of the MPS modes that will be needed for the G5 test in a special meeting and have received feedback on this list at the ERL Controls meeting. D. Kayran is now compiling the tables of required inputs for each mode that will be implemented in the MPS software.

Cryogenics:
CryoControls: PLC and SCADA programming continues.
Electric feeds: Electrical 480VAC tie-ins for cryoplant expander brakes are next on Facilities group's electric connection list for ERL.
Update on cryo controls logic document and process control with a chart being worked on.
Cryo System: Operating procedures OPM's being worked on. Some control valves actuators to be calibrated still.
Cryogenic transfer lines to ERL cryomodules: Vendor still working on the valve boxes. The vendor has indictated that completion of the valve boxes is estimated to be mid December, and installation would occur after the holidays in January.
Installation: Draft Phase hazard Analysis/Detail installation plan in review with CAD safety group.
Material for piping supports will be on order soon.
SRF Gun Cryomodule interfaces:
SRF Gun Cryomodule cryo instrumentation:
Large Grain Gun Test:
LESHC-PSSC Review Nov 29. Afternoon.
LESHC-PSSC and ASSRC committee walkthrough for vertical test facility Dec 1. Afternoon.

Gun Cryomodule/5-cell cavity: Gun cryomodule assembly continues with the welding of the 5K circuits and fill line. Line runs have required modifications to fit actual configuration. Fit up of inner magnetic shield indicated needed modifications. Test fit of HTSS completed to prepare for HTSS cable attachment.

Instrumentation: One Low Energy Profile Monitor and one High Energy Profile Monitor arrived from Radiabeam today. The remaining two of the five profile monitors are expected next week. We plan to proceed with our actuation and optics testing of the units in our video lab while the vacuum group continues cleanroom work on the halo scrapers. As particle counts increased beyond acceptable levels after bakeout of one of the scrapers, all four scrapers will be recleaned and rechecked for particulate content. Meanwhile, coordination is underway with the survey group to prepare and install a survey 4 foot FARO Arm on a table in the cleanroom in order to provide survey data on the in-vacuum parts of various ERL beam instrumentation components. Plans are also underway to buy and set-up a low power visible laser to illuminate the Pepper Pot slit mask during its installation in the beamline to properly align the slit to be parallel with the path of the electron beam. A mechanical designer is scheduled to recommence the effort Monday for the plunging profile monitors to be installed in two of the Zig-Zag bends. Progress continues with the design of the Integrating Current Transformer heartbeat circuitry, some prototyping parts were purchased.

Laser: Testing timing module control software. Nonlinear crystals for 266 nm production specified and ordered, expected in 2 weeks. Continuing simulation studies of FHG. Alignment tools for laser repair have been received from vendor.

Large Grain Gun: Work continues on preparing a statement of work for the fabrication of a test cathode. Configuration and testing of the temperature sensors for the experiment has commenced. The cleanroom has become available and processing of hardware has been completed. Planning is underway to resume assembly of the vacuum system.

Mezzanine/Cleanroom: The clean room construction is moving along with the majority of the walls up. The holes in the deck have been cut to accept the HVAC duct work. The electricians have begun to run wires for the lighting, HEPA filters, switches and outlets. Work on the VTF cleanroom continues toward the scheduled completion date. The purchase orders for interior equipment and consumables will be written this week.

Photocathode: [Deposition System] The ion pump is finished being processed by the Vacuum Group and delivered to Bldg 966. The silver plated hardware has been received. We are awaiting recommendations for the reassembly of the chamber and technical staffs help. At the Photocathode meeting requests were made to review the resource loading efforts regarding the deposition chamber. This includes the anticipation of dismantling and reassembling the chamber when it is to be moved into Bldg. 912. At the Instrumentation Department there is continued efforts with the metal cathode cleaning chamber.

Vacuum:

1. The leaks in the FPC braze were spray sealed. The vacuum was monitored using an RGA during the spray and no HC peaks were observed. The

larger leak required the sealant to be thickened prior to application. The remaining tube to flange braze joints were wire brushed and acetone cleaned and then spray sealed as a preventative measure. The FPC have remained leak tight for several days and the gun is being readied for venting to allow cryostating work to continue.

2. Received quote for custom HOM ceramics of 24K Euro with a 5 month delivery for two pieces. The long lead item is the ceramics, an option to purchase the uncoated ceramics with the custom junction will still take time and BNL would take on risk in how the interface between the thin coating and junction would perform.
3. A HOM test ceramic is being installed in the coating system and a test coating of 321 SS will be performed.
4. Design of an alternate e-gun HOM Damper impedance bridge between the ceramic and metal cuffs continues in parallel with a vendor supplied solution requiring new ceramic breaks. Central Shops has a detail drawing for fabrication and has placed the job in the queue under an open RFQ. Central Shops estimates approximately 3 weeks for delivery.
5. Detail design of the ERL zig-zag dipole chambers is complete. Dipole chamber drawings remain in final checking. Procurement documents are complete and released, including the PO with spec and SOW attached. Awaiting signed-off drawings to issue RFQ.
6. Detail design of SST/inconel chambers has resumed. BPM block chambers are nearly ready for engineering checking. However the designer has been temporarily reassigned. Estimated designer down time of 1 to 2 weeks.
7. Planning underway with Beam Components and Survey Groups for additional clean room work and installation work expected for the pepper pots. Efforts revolve around the precision and accuracy requirements of system measurements. Planning for a survey inspection station to be used by Survey Group in the 905 clean room is underway. Beam components foresees similar requirements for other equipment increasing the value of such a station.
8. 200C bake out of one of the four Halo scrapers is complete. The unit is leak tight and RGA scan is clean. The 2 halo scrapers that failed clean room QA remain staged for disassembly and precision cleaning.
9. All laser transport components remain staged and awaiting anchor drilling which will be followed by transport line installation.
10. Received & delivered to Photo Cathode Deposition System gauges and IP power supply:
11. In Process of reviewing transport cart and deposition system wiring and controls.
12. Assembly of deposition chamber started

ERL Injection Line: The window frame dipole steel has been machined. Winding of coils will be started once we purchase material.