

Accelerator Systems Division Highlights for the Week Ending November 30, 2001

ASD/LBNL: Front End Systems

ASD/LANL: Warm Linac

Marconi tests on the first 402.5-MHz klystron have revealed multipacting in the RF input cavity. Further conditioning did not improve the situation. Tests are being performed to see whether the source of the multipacting is due to vacuum contamination or from a design flaw. Marconi will repeat the input cavity tests on tubes numbers 2 and 3. (WBS 1.4.1.1)

LANL and ASD personnel conducted a review at CPI on the test plan for the 550-kW SRF klystron. Results were satisfactory. (WBS 1.4.1.1)

The first SRF circulator is at LANL and ready for installation and site acceptance tests. Installation will occur immediately after the JLab traveling wave tests on their fundamental power couplers. (WBS 1.4.1.1)

JLab colleagues have returned to LANL for their fifth session to test prototype SRF fundamental power couplers. During this two-week visit, they will require 1 MW traveling wave RF and 2 MW standing wave RF. (WBS 1.4.1.1)

We completed tests on the modulator and LANSCE klystron which will be loaned to JLab for their RF test stand. They are drained, packaged, and are expected to arrive at JLab next week. (WBS 1.4.1.1)

Mitsubishi IGBTs have been installed in one phase of the prototype high-voltage converter modulator (HVCM) and operation has commenced. Results, to date, appear satisfactory. (WBS 1.4.1.2)

Bids have been received for the build-to-print, production HVCM converter modulators. They are under review. (WBS 1.4.1.2)

The empty drift tubes are nearly finished. Stems were plated this week and are now at Coronado for cleaning and inspection. The PMQ drift tubes (Fig. 1) were sent to the plating shop. We now have two vacuum tight BPM diagnostics, which will allow us to complete the BPM drift tubes for Tank 3. These drift tubes should ship sometime mid December. (WBS 1.4.2.2)

Two copper-plated DTL-3 tank sections were received by LANL. The third tank is in Albuquerque and should ship next week. The end walls for DTL Tank 3 are nearly complete. The support stand and struts for Tank 3 (Figs. 2-3) were received by LANL. (WBS 1.4.2)

Manufacturing of DTL Tank 1 sections is progressing (Fig. 4). We are still on schedule to complete by mid-January. (WBS 1.4.2.2)



Fig. 1 PMQ Drift Tubes for DTL-3



Fig. 4 DTL-1 Tank Section



Fig. 3 DTL-3 Support Struts



Fig. 2 DTL-3 Support Stand

Bids were received for water skids. They are under review. (WBS 1.4.2.4 and 1.4.4.4)

The MEBT chopper meander lines were assembled and potted. Impedance and high-voltage tests were satisfactory. (WBS 1.4.5.1)

Our physics team did work to support ASD beam scraping simulations. PARMILA was modified to include DTL apertures. Also, the heat load from the RF power loads on the drift tubes were computed and sent to ASD. (WBS 1.4.5.2)

Two PCRs were approved by LANL this week. PCR LI 02 006 is to accept new scope requested by ORNL to deliver MEBT wire scanner electronics. PCR LI 02 007 is to accept to new scope requested by ORNL and BNL to provide a PCI motherboards that can be used for both current monitor and BPM systems. We also reviewed the details associated with the ETC implementation PCR SN 02 003 and concur. (WBS 1.4.6.1)

ASD/JLAB: Cold Linac

Two-thirds of the warm compressors have been delivered to the RATS building.

Concerns arising from the change in CHL BOD and an apparent change in the amount of cooling water to be supplied to the warm compressors have been found to be the result of inadequate communication and resolved.

A JLab technician visited ORNL for several days and successfully assisted with the installation of diodes in the RATS assembly line and in the training SNS personnel in the task.

Cavity #2 was successfully sealed using indium gaskets and successfully cryo-tested. It just achieved the performance specification. Cavity #4 has been heat-treated at 600°C, and assembly of the helium vessel on the cavity has begun. Cavity #3 has been cleaned in preparation for vacuum assembly (using indium seals) and cryogenic testing next week.

Investigation of the problems with the aluminum-magnesium gaskets continues. Softening of the NbTi flange materials during the bake has been eliminated as a possible contributing factor, with measured changes in hardness of only a few percent.

Fundamental Power Coupler Testing of the third pair of FPCs is underway at LANL.

Work continues on infrastructure installation, in preparation for the arrival of the 1 MW RF test stand next week.

ASD/BNL: Ring

21CS30 and 21CO30 first article magnets have been received at BNL from New England Technicoil. Electrical testing and inspections are IP. Acceptance testing will follow.

Inspection of the pole tip contour was completed on the 26Q40 quadrupole. Stangenes has been given the green light to proceed with fabrication.

Bids are in for the Injection Bend #4 magnet. The bid evaluation team completed their review this week. We plan to award a contract in early December.

Vacuum chambers – Ring half-cell dipole chambers #3 and #4 have been received from SDMS and are being inspected at BNL/QA. Coating set-up for assemblies #1 and #2 are in progress.

3D computer field analysis is underway for the 36Q85 (rad. hard) quadrupoles located at the end of the RTBT line. Magnet layout and design has begun.

Bob Lambiase sent requests to the Project Office addressing the need for vendor spare parts, as follows: PSI/PSC Controllers, Low Field Power Supplies, and Medium Field Power Supplies.

Mike Hemmer (Survey Group) is working on lattice format and dipole survey convention with the ASD Physics Group, BNL Design Staff and ASD's Joe Error.

Alex Zaltsman is testing the 2nd harmonic on the 1st article Ring RF cavity and amplifier. Tom Owens is with Alex this week.

Our Electrical Engineer is at IE Power this week to witness final testing of the 1st article Injection Kicker PS.

A Handoff workshop was conducted at BNL on November 29 with PO visitors including Dan Stout, Paul Holik and Grahame Murdock. Significant progress was made with the approval and sign-off of all major Ring systems.

Controls:

The SNS controls team presented 15 papers at this week's International Conference on Accelerator and Large Experimental Physics Control Systems (ICALEPCS '01) held this year in San Jose, California. This included one invited and two contributed oral presentations, and a dozen posters. At the conference dinner, six prizes were awarded for outstanding posters, of which two - the only prizes to American Laboratories - went to the SNS team. Congratulations to Bill DeVan and Herb Strong! If it was not the case before, it surely is now that the international controls community is well aware of what the SNS is and what we are doing. SNS can be proud of its contribution to this important conference."

ASD/ORNL: Integration and Installation Support

SNS and BNL personnel met in Brookhaven to discuss acceptance criteria and the Accelerator Turnover Plan. Individual sections of the plan and associated criteria were reviewed and discussed in detail. At the conclusion of the meeting, the acceptance criteria were signed by BNL personnel.

Revision 4 of the Klystron Gallery Layout drawing (SNS drawing # 104000000-G8E-8200-A006) was issued by SNS. Drawing responsibility had been transferred from LANL to ORNL earlier this year.

Accelerator Physics

J. Galambos and P. Chu attended the ICALEPS meeting. In addition to presenting the high level physics applications programming approach, contacts were made with others taking similar approaches. Collaborations will be attempted with some of these.

Analysis of PSR data taken earlier this year shows reasonable agreement between our simulation model and experiment observation. In particular, the effect of a longitudinal notch, on suppressing space charge effects was investigated.

We completed the HEBT Dipole Magnet Measurement Requirements document spelling out the magnetic field measurement program for the first article and production HEBT dipoles.

Operations

Ion Source Group

An analysis of the 7x24 test run has been completed and the resulting report includes the important lessons learned.

We continue to make progress on a better solution for fastening the LEBT high voltage standoffs.

Another small delay and holidays shifted the delivery date of the Big Blue Box to the middle of December.

An invitation to the ESS ion source workshop had to be declined due to divisional travel restrictions. A presentation "Lifetime issues of the RF-driven Volume Source built for SNS at LBNL" was submitted after Rod Keller offered to present it and after the workshop organizers allotted additional time. The presentation can be seen at \\Snsnta\users\Stockli\presentations\ess01.ppt

RF Group

Mechanical Group

Magnet Measurement Group

Cryogenics Group

Electrical Systems Group

Survey and Alignment Group

Beam Diagnostics Group