# Accelerator Systems Division Highlights for the Week Ending September 7, 2001

**ASD/LBNL: Front End Systems**

**ASD/LANL: Warm Linac**

The first two 2.5-MW, 402.5-MHz klystrons are ready for acceptance tests at the vendor. These tests are pending full operation of the vendor test stand. They are now operating at 105 kV, and are limited by their test load. Recent communications indicate that the vendor's delivery schedule has slipped another week. (WBS 1.4.1.1)

Fig. 1: First two SNS 2.5-MW, 402.5-MHz klystrons

We continue to work on the LANL portion of the JLab high-power RF test stand. The modulator transformer deck (Fig. 2) refurbishment is nearing completion. (WBS 1.4.1.1)

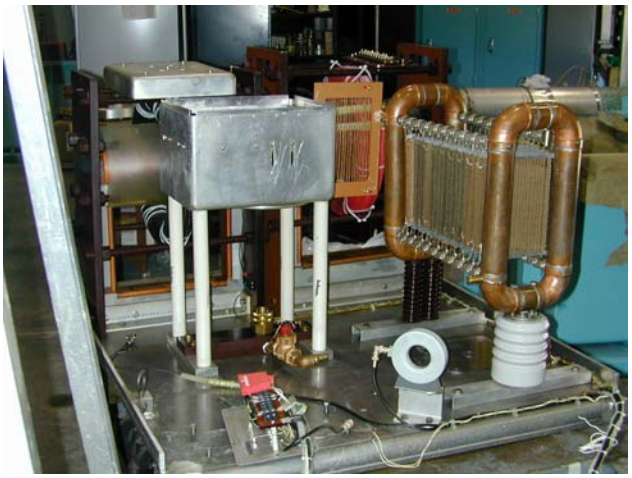


Fig. 2: Modulator deck for LANSCE klystron being prepared for the JLab test stand.

LANL is supporting ORNL in evaluating the condition of several 402.5-MHz circulators shipped from the vendor to the RATS facility. The shipping boxes showed damage but the impact on the contents is unknown. LANL offered to send an RF engineer to ORNL next week to help in the low power, network analyzer, acceptance tests on the suspect units. (WBS 1.4.1.1)

Building utility refurbishment and upgrades have started in support of the upcoming higher-power high-voltage converter modulator tests and installation of the SNS RF test stands. (WBS 1.4.1)

X-ray measurements were made on the DTL at $I^3$ Inc, in Denton. TLDs are being analyzed at LANL. (WBS 1.4.2)

Three spare DTL tank forgings were shipped from LANL the ORNL RATS facility. (WBS 1.4.2)

The physics team performed 100 PIC runs, with errors, with the LINAC code. Each run employed 3E5 particles, waterbag distribution through the CCL. We are now compiling results. Initial results indicate that we are within the 1 W/m beam loss budget. (WBS 1.4.5)

Serge Palanque and Paul Giovannoni of CEA, Saclay visited LANL for three days this week to discuss linac operations, conventional facilities, and linac construction costs with LANSCE and SNS personnel. While here, they also gave a colloquium on CONCERT and ESS.

**ASD/JLAB: Cold Linac**

The fourth field installation coordination meeting with SNS staff has been scheduled for September 13. Design of the field installation package continues.

Electro-Polishing bids for the cabinet have been received.

Visited the helium vessel manufacturer to discuss the first article vessels and to discuss modifications to the helium vessels for future deliveries.

Prototype stand PR's were awarded. Bids for the Production stands were received. Modified drawings were sent out for Best and Finals on the production contract.

Installation of infrastructure support for the RF test stand continues.

Many from the group have been in Japan participating in the SRF Workshop. Stephen Smee arrived from ORNL and is getting his set up for an extended stay at the lab.

**ASD/BNL: Ring**

**Controls:**

A dry run of the Controls Network Final Design Review was held.

A spreadsheet defining all cables in the site communications and controls backbone system was completed and sent to the design team.

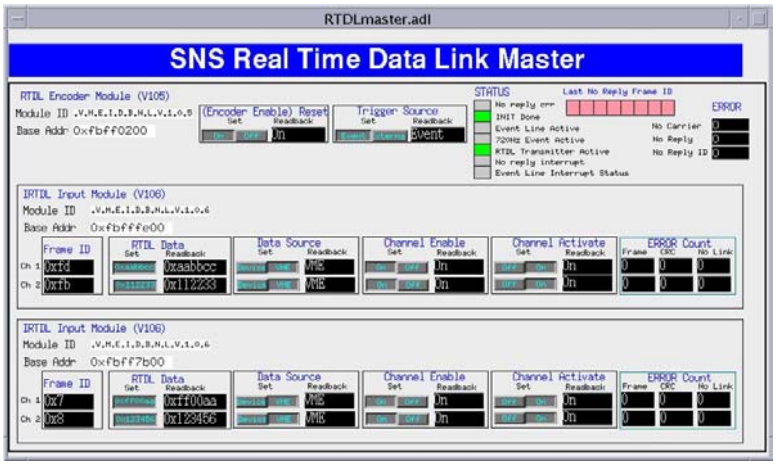
A design criteria document for generating Conventional Facilities Controls software was drafted.

The Oracle EPICS RDB tools from LANL have been implemented at ORNL.

A Beam Loss Monitor demonstration is operating in the Diagnostics lab, with help from the Controls Group.

Patches to VXWorks for better EPICS compatibility with the 2100, developed at APS, have been implemented and installed on the SNS CVS repository.

A test driver for the SNS real time data link (RTDL) is operating at BNL. A sample test screen in shown below.




**ASD/ORNL: Integration**

A Component Delivery Schedule has been initiated to support the RATS Assembly Schedule and the ASD Detailed Installation Schedule. After a final review in the Installation Meeting today (9/07/01) it will be put into use next week.

**Installation Support**

**Accelerator Physics**

**Operations**

**Ion Source Group**

Paul Gibson visited LBNL to document all details of the improved wiring of the big blue box. His visit coincided with the visit by two DCS representatives who were contracted to build a duplicate box for our hot spare stand. Paul Gibson also worked on transferring additional technology and information needed for the hot spare stand.

Martin Stockli visited LBNL to coordinate the ORNL development efforts with LBNL, to coordinate ASAC presentations, and to witness pre-testing of an antenna in preparation for lifetime testing.

Martin Stockli and Robert Welton attended the International Ion Source Conference in Oakland, CA, organized by our LBNL colleagues and chaired by Ka-Ngo Leung. The conference was a big success, very informative and stimulating. Robert and Martin presented three posters and co-presented another four presentations. Robert's simulations and our antenna work was received with high interest.

A brief, successful meeting at the Ion Source conference revealed wide-spread, substantial interest for an workshop on H- sometimes next spring or summer. A list of 40 potential attendees has been gathered, which will be asked to vote on five or more pre-proposals for location and time.

**RF Group**

William Roybal from LANL will be here on the 11th to test the 402.5 circulators which had their crates damaged during shipment. We are preparing the units for network analyzer testing.

Problems with the HVCM, SCR rectifier section have been solved, wiring errors fixed and additional protection added to active devices.

We are preparing for partial waveguide assembly in rats and will be assembling chase structures in about a month. Chase waveguide water-cooling will be affixed to the waveguide.

Hengjie spent last week at LANL looking at how he can participate in the LLRF development, he and Amy established a workable plan.

**Cryo Transfer Line Group**

**Mechanical Group**

**Magnet Measurement Group**

Yesterday the 6-meter coil was connected to slides and was moved by computer control in 1 cm increments. The HEBT 8D533 dipole is now expected mid-November. We will continue to add components/software to the measurement system and should be ready for measurement much sooner than magnet arrival.

**Power Supply Group**

**Survey and Alignment Group**

Installation of Phase II of monument installation is proceeding despite a lack of cooperation from the weather and a failure on the part of the contractor's drilling rig. We expect completion by the end of next week.

Our lattice site integration compilation is ever evolving. We are now is the process of tying together the physic's lattice with the designer's cryo and warm section structures.

The S & A section of the RATS Bldg is now operational and is already performing work for different groups. This area comprises precision granite as well as metal tables, tooling bars and laser tracker measuring stations. We are also in the process of re-calibrating our equipment.

**Beam Diagnostics Group**

LBNL beam diagnostics progress report:

All major components for the emittance scanner are now on order. Alex Ratti is reviewing the original cost estimates for wire scanners and link interface development. Testing of the link interface hardware continues.

LANL beam diagnostics progress report:

D-plate: Final design work continues. Work to monitor temperature of beam stop continues.

BPMs: Fabrication continues on the DTL BPM pickups. There has been a problem with welding the Kaman feed-through to the stainless steel collar, probably due to copper contamination from the brazing process. Only 7 of 12 welds were successful. New collars are now being fabricated, with smaller holes that will be drilled to size after the brazing process, thus providing clean stainless steel surfaces to weld the feed-throughs to. This will cause about a one-week delay in the DTL tank 3 pickups. Work continues on rev. 3 of the DFE PC board. It has been stuffed with the exception of the FPGAs. Testing will now commence. The PCI motherboard is still on track for delivery to BNL by 1/Oct. The DLL software is at an advanced stage, and work continues on the Labview VIs. Data has successfully been transferred from an FPGA on the DFE through the PCI motherboard into PC memory. We are aiming for 19/Sep/01 for a mini FDR for the DTL pickups.

WSs: Work continues on the revs to the PC board. The prototype actuator from Huntington should be shipped next week.

The diagnostics layout for the CCL has been updated. There are significant changes to the BPM and LM positions and counts. The latest ideogram may be found on the LANL SNS web site:
( http://sns.atdiv.lanl.gov/SNS Records/Approved/SNS00_TCM_0287,R.02.pdf ).

BNL diagnostics report:

A draft ICD for the loss monitor/controls interface has been written and will be circulated soon. The BCM analog front end has been tested and is ready for integration with the PCI motherboard. By the end of the month, Matt Stettler will travel to BNL and assist with this activity. The schedule for delivery of the MEBT wire scanner actuators has been confirmed.

ORNL-SNS beam diagnostics progress report:

Dave Purcell has an IOC installed in his office with lots of help from the controls group The first version of Loss Monitor display screen is running, using PVs from the IOC. Craig is refining the Faraday cup model by adding Vacuum layer between the modeled beam and pickup to study the bandwidth of the system. Saeed is working on the 2-D space charge routine for the Matlab accelerator model. Tom is getting ready for the ASAC review.