

# Project Progress Summary

24 July 1990

## Injector

- Cryounit A' was cooled down after repair of the beamline vacuum accident. Both cavities reached 5 MV/m gradient, although at reduced  $Q_0$  ( $\sim 5 \times 10^8$ ), permitting full-energy injector tests to resume.
- Preparations for fully computer-controlled operation of the capture accelerator RF system are nearly complete, and everything appears satisfactory.
- Changes and improvements to the RF control modules, followed by the failure of the CTF pump motor, prevented full-energy injector operation during the past week. Full-energy testing was expected to resume yesterday (23 July) with return of the CTF to full operational status.
- The beam loss monitor system now includes fast protection at the location of the recent burnthrough accident.
- On Friday 20 July, 400- $\mu$ A, 500-kV beam was re-established at the entrance to the cryounit, ready for further testing.

## Front End Test

- Installation of small portable dehumidifiers in the tunnel and a sump pump in the west arc has led to an improvement in the tunnel humidity situation in the injector area.
- An initial set of song sheets for the FET has been produced and will be available for signoff at the systems meeting this week.
- Cable-pulling activities are fully booked and a number of groups are in the queue.
- An initial plan has been developed for incorporating alignment activities in the installation with minimal impact on other activities.

## WBS 1

Facilities (C. Reece): A new stamping layout now allows 14 halves (instead of 10) for niobium pair parts. This reduces trim time by using smaller blanks. The circuit design for the VCO loop amplifier is done. This includes the PC board artwork.

Cavities (J. Mammosser): CEBAF 1&2 reprocessed and the preliminary test results look good. IA 9&10 went on the Interatom test stand last Monday. CEBAF 3&6 had the waveguide extensions put on. IA 4&6 has leaking gate valve.

Cryomodules (W. Schneider):

- The old C' cryounit has been cycled 5 to 6 times. Leaks during warming and cooling, but not warm. The C' replacement cryounit has been moved to the cryomodule assembly bench. There are some warm window problems, including a permeation leak. With virgin teflon, there is a 2-minute permeation; with mechanical teflon, a 15-minute permeation. DuPont says no difference should be seen.
- Two cryounits of the cryomodule are aligned to 10 mils; the third is high by 100 mils on one end (B'D'E') and will be adjusted.
- Lost beam vacuum in the injector. Suspected the bellows on the upstream Lesker valve. The vacuum was believed to have improved on both sides when Apiezon was applied to the stem bellows. Closed the inner Lesker valve and replaced the outer one. Found a

hole—approximately 0.5 mm—burned by the beam in the beamline bellows. The max pressure was approximately 1 Torr. Cooling down and will retest this week.

Acceleration System Interlocks (W. Schneider): The question of ion pumps holding atmosphere without conducting must be answered.

HOM Loads (I. Campisi): Cycled 16 more HOM loads last week. Approximately 16 loads can be completed each week. Looking at behavior of loads at less than 2.1 GHz with a taper. Loads perform favorably compared to long loads. Absorption can't be better for this frequency band. Tested CEBAF 1&2 with the following results:

#### CEBAF 1

1970 MHz:  $2.8 \times 10^4$ , P<sub>1</sub>     $9.8 \times 10^4$ , P<sub>2</sub>  
2110-215: 100 minimum     $3.4 \times 10^4$  maximum

#### CEBAF 2

1976 MHz:  $8.4 \times 10^4$ , P<sub>1</sub>     $8.9 \times 10^3$ , P<sub>2</sub>  
~2100:  $5.3 \times 10^4$  max at 2102 MHz;  $10^3$  range typical

Results of the fundamental HOM filter test measured with the network analyzer show it meets and exceeds specifications. The TE<sub>20</sub>-TE<sub>30</sub> modes had greater than 7 dB attenuation.

RF Windows (L. Phillips): During brazing of a batch of sputter metallized eyelets, the Argon-ion gun and Molybdenum gun shorted. Three of the five eyelets leaked. The others are MoMn. Repairing two PTR welded windows; another two from last meeting have been RF tested and delivered. The last batch of eyelet/window assemblies was dropped, which contributed to the weld problems.

### WBS 2

- The common arc dipole coil contract was allowed to continue with United Magnet Technologies by a judgment of DOE Headquarters, despite the Elma Engineering protest.
- The mounting and aligning of the first FET magnets on their girders continued.
- The design of the arc stands continued and the schedule for their completion was extensively revamped to coincide with the parts of the detailed design.
- FET magnet production continues on schedule.
- Improvement of song sheet drawing package continued with the first two sheets (tunnel and elements) and the eighth sheet (vacuum) of the first two drawings in the review-before-signoff stage.
- The differences in the survey of the north linac baseline resolved the finding that the eastern surface monument moved north by about an inch. Thus from now on the PK nail monuments in the north linac floor, put down before the movement, will be the accelerator baseline.
- As per schedule, the water system drawing for the injector service building went out for a bid due 3 August. The requirements drawing for the injector and linac tunnel system was started.
- The order for vacuum pumps is still awaiting DOE approval.

### WBS 3

Klystrons and Power: Test data on initial HOM filter looks good. Need to revise test equipment setup to permit testing from 1.7 to 2.0 GHz (this is the easy part). WG

parts being acquired. Klystrons 24 to 26 have arrived. BAFO responses on couplers and transitions due 25 July. Crowbar will be tested using final power supply cap bank. Software for HPA operation being written. Progress looks good on both HPAs and power supplies. Still expect delivery as scheduled.

RF Control Module: Lots of overtime to get the PC boards artwork ready to award. Thanks especially to the CAD people, and also to others involved, for an excellent effort in getting the job done, including many long days. Analog board is signed off. CPU board was being checked over the weekend but was probably not going to be ready to send out by yesterday, 23 July. These extra efforts reduced an apparent three-week schedule stop to one week only.

Safety: Safety shoes were issued to a good number of the WBS 3 staff.

#### WBS 4

- Printed circuit boards for FET trim system: 70 on hand from RMS; 1 finished, with more in process; none tested; start debugging 23 July.
- Analog blocks for trim regulators: 59 on hand.
- Cabling: work is proceeding on collecting necessary information.
- A work order is in hand for HPA rack supports. Will install this week.
- Will add two installation techs.
- Additional 120-VAC outlets are being installed in injector area.
- Electricians are setting last transformer/panel board in north linac.

#### WBS 5

- RF: Held meeting on RF microprocessor tasks; next meeting 25 July.
- Beam Transport: Trained users and loaded computer for power supply test stand.
- Safety: Installation continues; entry cameras tested; PLC to HP software being developed.
- Cryogenics: Cryo group approved FSM software layout. Went through checklist of cryo software needs; 95% complete.
- Beam Diagnostics: Cable layouts for beam viewers, harps, current monitors 90% complete. Began running cable for beam position monitors.

#### WBS 6

Hall A dipole RFP delayed; to be issued this week.

#### WBS 7

- Surveyed 24-inch return sleeve; 12-inch supply sleeve to south linac in process.
- Ring pump motor repaired. Failure appears to be caused by improper power connection to motor by Kinney.
- Kinney pump for FET due Wednesday, 25 July. WBS 7 ready to install.

#### WBS 8

Tunnel: Three dehumidifiers are now operational in the north linac. The contractor improperly placed a wall near exit stair #2. It has been removed.

Special note: Please keep doors, hatches, and penetrations closed. If you must unseal an opening, close it when you finish.

End Stations, Package A: Approximately 250 linear feet of tunnels are in place (out of 700 linear feet). Heavy rain slowed end station excavation. Hall A excavation is nearing completion for stone and drain piping. The decision to reduce permanent water extraction from the hall areas has resulted in a revised design. DMJM is working on the details. The contractor has the information he needs to preclude a slowdown.

End Stations, Package B: The design has been received and is being distributed for final review.

Test Lab: The 250-ton chiller was scheduled to be on line yesterday, 23 July. The main chem room ceiling will be done in about two weeks.

EEL: Exterior metal is complete except for some trim. Interior partitions are in place, and painting starts this week. Installation of mechanical and electrical systems is progressing nicely.

### Linac Installation

-Systems Meeting today, 3:30, auditorium. An agenda has been distributed.

-A first conceptual sketch of the FET temporary shielding wall is in hand. Installation is to begin in August, with an access way left until the end of the process. Planning should begin now for relevant special tooling needs or equipment moves. See Tom Mann or Steve Suhring for additional details.

-Jim Pace is WBS 1 installation coordinator.

### Accelerator Division Support Services

-Machine Shop: HOM filter support bracket completed; beam dumps being fabricated.

-Stockroom: Kits for WBS 3 I/O, buffer, and CPU boards developed. The stockroom's database is now set up; to see kit contents, look in "Production Kits" in the database. Electronic time sheet training complete.

-External Fabrication: The run/safe box was awarded 16 July, with the first article due 6 August (WBS 5).

### Power Outage

The proposed 4 August power outage will probably be rescheduled.

### Training Opportunities

-Intro to On-Line Stockroom, 2:00-3:00, Computer Center, TODAY, Tuesday 24 July.

-CEBAF Accelerator Hardware (for student interns and other staff),  
3:30 this Friday, auditorium.

-ODH, 9:30-11:00, 53/55, 9 August.