OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE U.S. DEPARTMENT OF ENERGY

Norbert Holtkamp
Accelerator Systems Division
Division Director

PHONE: (865) 241-6945
FAX: (865) 241-6739
Cell Phone: (865) 919 1070
E-MAIL: holtkamp@sns.gov

1/15/2004

Overview:
All 210 drift tubes that are necessary to assemble the SNS linac were at ORNL. From the 210 delivered 2 were found to have a leak and are both shipped back to LANL. While DT 6/17 (nr 17 from DTL 6) is not time critical, DT 2/02 is critical since the next commissioning period is coming up soon and tank 2 has to be in place for that. A mitigation plan is put in place that will allow us to meet the ARR (Accelerator Readiness Review) date if repairs work as planned. The plan is described in more detail later in this report.

LANL:

DT 2-02 passed final vacuum leak test at LANL and first test at ORNL. Leak rate in ORNL test, while satisfactory, was somewhat higher than usual when compared with background, so ORNL baked hotter and longer, and then tested again. It was in this second test that the DT leak rate exceeded the acceptance criterion.

Travelers for 2-02 were pulled and it was found that it passed final leak checks at LANL following the approved baking/He pressurization procedures. However, earlier on, during the final cosmetic e-beam welding at ESCO, we recorded that this DT experienced leaks and eruptions; six e-beam passes were needed before it became leak tight. Eruptions were likely due to contamination either on the surface or from inside. Had it been from the inside, one can speculate that a longer-than-normal baking time would be needed to completely evaporate contaminant through a low-conductance path from the water channel weld joint.

Meanwhile all tank-2 travellers were pulled and the ESCO e-beam weld reports were reviewed to look for multiple pass e-beam welds. None were found to be as problematic as with DT 2-02. We will, however, report to ORNL which DTs received extra rework; some of these might also require the more stringent bake/leak retest procedure.

We started repair of DT 6-17. We are implementing a machine prep followed by electroforming and final machining. (this should take ~ 2 weeks). After machining a slot around the leak region, the leak rate increased (to 1E-4). Consultation with experts indicate that electroforming will work, as long as we are careful that the plating solution doesn't significantly penetrate leaking regions. DT will be electroformed this weekend. We should have it back, machined, and tested before Tank-2 bead pulls are complete. If leaks are still detected, we believe we will need to do a cosmetic e-beam weld pass or perhaps a ring weld repair on this unit before repeating electroforming. This will add ~ one month since we need to cut stems, ship tooling back to ESCO, and prepare rings.

While 6-17 is being repaired, all tank-2 DTs are being installed, aligned, and tank will be tuned. This will take ~ two weeks. DT 2-02 will then be removed and repaired during the same two-week period when tank-2 post couplers and slug tuners are getting their final welds/cuts.

Norbert Holtkamp
Accelerator Systems Division
Division Director

PHONE: (865) 241-6945
FAX: (865) 241-6739
Cell Phone: (865) 919 1070
E-MAIL: holtkamp@sns.gov

Bottom line: at this time we should be able to meet the 3/29/04 ARR date provided we don't have to implement the e-beam weld repair of DT 2-02. If e-beam weld is necessary, we would envision DT 2-02 delivery in March, which would probably cause a delay. To minimize delay, if weld repair is needed, we will consider TIG as a substitute for e-beam. Daily communications and interactions between LANL, ASD, & suppliers are excellent will continue. Tank-2 is the top priority for now.

ORNL:

All tank 2 drift tubes are installed in the tank. Tuning of Tank 2 will start in about 2 weeks after alignment has been done. Tank for is tuned and manufacturing of post coupler and tuners is ongoing under LANL supervision by Peter Smith who is at ORNL for most of the time on a change of station from LANL. Tank 5 is set up and leak tested. Tank 6 segments are prepared and assembly of the tank sections and leak checking is upcoming.