

## **8-Pack/ SLED II Demonstration Project**

The committee agrees with the decision to refocus the efforts on demonstration of the SLED-II scheme in 2003, 2004. It was driven by the realization that demonstration of a DLDS system could not take place in a 2-year time scale. It is the opinion of the committee that the refocused, rebaselined 8-pack project is achievable given the appropriate level of support and priority at SLAC.

Phase 1 addresses the first “R1 Technology Demonstration Milestone” and remains virtually unchanged. It aims at demonstrating the feasibility of a SLED II rf system at design power level starting in March 03.

Phase 2 will use SLED for full power demonstration on an rf feed to 5.4m of high-gradient structures provided by Fermilab on the NLCTA beam line.

Infrastructure for Phase I is virtually complete and the design of the critical components has been cold-tested.

The committee has some concern about the tightness of the schedule and recommends that backup options and opportunities for providing schedule float be explored as soon as possible.

We would like to recommend further efforts in the following three areas concerning project scoping and execution:

1. Clear, well-documented definitions of the goals for 2003 and 2004.
2. Clear, well-documented definitions of (sub-)milestones, check-points, action plans and participant responsibilities.
3. Clear, well-documented definitions of how the decision making processes, reports and internal reviews are to be managed and shared within the collaboration. This is particularly important since KEK is being introduced as one of the full partners in this project in addition to FNAL and SLAC.

## High-Gradient R&D

Breakdown mechanism is still not fully understood from the physics point of view but recent progress has been impressive and the latest structures have performed at a level consistent with NLC requirements, as far as trip rate and phase shift are concerned. This has been mainly due to new designs for the input couplers. The committee would like to congratulate the structures R&D team on the significant advances made since our first meeting.

Damping and detuning still need to be addressed, and the transverse wakefields are still too large. New structures with larger apertures will be needed.

The team has put in place an incremental plan to demonstrate the validity of the NLC approach to a linear collider. This effort constitutes the second of the "R1 Technology Demonstration Milestones"

This plan includes backup options and parallel paths: further exploration of standing wave structures and traveling wave structures with larger group velocity.

Given the importance of this activity it is receiving a significant (and appropriate) level of support.

The top priority should be placed (as it is) on demonstration of high-power stability of accelerator structures with "reasonably realistic" arrangement of HOM slots and manifolds. Demonstration of ideal HOM damping or detuning should be of secondary priority at least within 2003 (could be an important agenda in 2004). This point needs to be clearly communicated to the interested community members, so as to avoid confusions of results to be obtained within 2003.

## Structure Fabrication at Fermilab

Fermilab has made significant contribution to the program and we hope that this will continue, in spite of the demands made by other Fermilab priorities.

Great progress has been made toward a production facility (furnaces, clean room, tooling and fixturing, rf equipment, etc)

Have produced structures for NLCTA and 8-pack.

Have developed a structure fabrication traveler system and vendor selection has continued, although at a slower pace.

The large vacuum furnace continues to be a source of frustration and is having a negative impact of Fermilab's production capability. Nevertheless Fermilab intends to fulfill its production commitments.

Resolution of the furnace issue in a timely manner is important. It could alleviate a manufacturing choke point and the use of an argon atmosphere could be a significant development in the manufacturing process.

It is noted that the manpower provided by Fermilab has been reduced by about a third and that the anticipated budget will not allow production of "NLC-like" structures in FY03 and will bring the industrialization effort to a stop. The committee looks forward to a continuing, active, and significant involvement of Fermilab in NLC activities. For example we would like to encourage stronger FNAL participation in fabrication studies of HDDS-type cells

It will be a while before the NLC/JLC completely settle on the final version of the structure length (60cm or 90cm or 120cm or else). The fab/assembly engineering and development of structure support need to be able to accommodate certain flexibilities.