

## Director's Corner

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### ILC Americas Regional Team progress report

*Today's issue features a Director's Corner from Mike Harrison, GDE Americas Regional Director.*

The first of October marks the start of the US fiscal year. As the process of allocating resources to the various Americas region ILC activities begins, it is natural to reflect on the past 12 months as we look forward to the upcoming year. The recently published ILC reference design provides a strong technical basis for the increasingly global ILC R&D programme, and the Americas regional programme reflects this state of affairs.

One of the principal goals of the Americas R&D programme reflects the dominant role of superconducting radiofrequency (SRF) technology in the ILC design (and cost). During FY07 (Fiscal Year 2007), Fermilab constructed a significant amount of SRF infrastructure with the help of several other research institutions that include DESY, Jefferson Laboratory, Cornell University and Argonne National Laboratory.

Fermilab brought a vertical test stand online over the summer, with a successful test of a single cell cavity. High power testing of multi-cell structures is now underway. A horizontal test stand for superconducting cavity development is in its commissioning phase, and a multi-cryomodule test facility is under construction. When completed, this facility will run electron beams through the cryomodules, enabling tests of additional hardware elements. Low-volume fabrication facilities are also part of the Fermilab programme, and a clean room fabrication area is presently in use to construct the first US cryomodule in collaboration with DESY.

In addition to Fermilab, JLab and Cornell continued cavity testing throughout FY07, as part of the global cavity development programme. Cavity processing facilities are under construction at Argonne, and are in use at JLab and Cornell. In addition to the US national laboratory programme, the first cavity production in US industry took place in FY07, as well as some pre-production SRF items from other potential industrial vendors. Industrial SRF production also formed the basis of an FY07 Memorandum of Understanding between Fermilab and TRIUMF for collaborative cryomodule development.

Additional aspects of RF system engineering are underway at SLAC. This fiscal year saw the first proof-of-principle demonstration of a solid-state modulator, known as the Marx modulator, that promises both cost reductions and enhanced reliability. Coupler, klystron, and high-level RF distribution system development were also all part of the SLAC FY07 R&D portfolio.

In addition to the main linac technology, Americas Regional Team members were heavily involved in the recently completed reference design study.

While FY07 was a busy year, we project an increase in regional efforts during FY08, with overall budget growth of 30 percent. SRF technology development will continue to be the dominant activity with further



Superconducting cavity R&D played a large role during this past fiscal year in the Americas region. (Photo Fermilab)

cavity production and testing, as we seek to increase the accelerating gradient and cavity yield. The horizontal test stand at Fermilab will be commissioned and will be used to test cavities for the first US-produced cryomodule. We will place high priority on technology industrialisation with continued vendor development in several areas. We hope to be able to certify the first US cavity vendor at some point during the year.

In addition to cavities, other hardware components for the latest cryomodule design, called type IV, will be fabricated and assembly will begin. Along with the main linac components, the major project cost driver is the conventional construction and associated facilities. FY08 will also see the start of a value engineering effort that will examine all aspects of the baseline layout. The goal for these efforts will be to identify alternative design features that may lead to cost reductions. We will also start to investigate the possibilities associated with using the Fermilab site as a location for the ILC.

One of the larger accelerator-related programme elements for FY08 includes polarised electron source development at SLAC and JLab. In addition, a multi-group GDE collaboration will pursue an electron cloud and beam dynamics experimental studies programme at Cornell's CESR facility, jointly supported by DOE and NSF. The regional Beam Delivery System programme will also continue ongoing efforts in hardware R&D, and this group will be involved with the GDE R&D programme based at the KEK ATF2 facility. RF system engineering will continue at SLAC, with additional effort involving high reliability controls and power supplies. High brightness beam dynamics studies are ubiquitous across the whole GDE programme, and the Americas region participation in these items will continue in FY08.

The ILC engineering design phase over the next several years will require a truly global approach to achieve our goals. The upcoming year in the Americas region will enable further progress towards this end. Support and encouragement from the various funding agencies has been especially helpful in determining the evolution of the programme.

-- *Mike Harrison*