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## **LARP Collaboration Meeting Summary**

S. Peggs

The most recent LARP Collaboration Meeting was held April 26-28 at LBNL.

### **Some technical highlights**

Subscale Quadrupole SQ02 achieved 97% of its short sample limit after extensive testing at LBNL in October 05, and at FNAL in March 06. Technical Quadrupole TQS01 has just begun testing, and has reached 87% of its short sample limit. This is a great success for the world's first large bore (90 mm) Nb<sub>3</sub>Sn magnet. Nonetheless, the 13% shortfall is under investigation.

Simultaneous tune and coupling feedback was demonstrated in RHIC - a world first - thanks to work by physicists and engineers from BNL, CERN and FNAL. This paves the way towards the ultimate goal of chromaticity feedback during snap-back at the beginning of the LHC energy ramp. (See article in the May 2006 CERN Courier.)

### **IR and Hardware Commissioning**

Six people from FNAL and 2 from LBNL have been identified to take part in IR Commissioning (of U.S. built deliverables) and Hardware Commissioning (generic support of LHC installation and commissioning). Peak staffing of 7 people is foreseen in 2007. The start date for a major presence is September 1, 2006. One person, Peter Limon, is already in long term residence at CERN.

### **Accelerator Systems deliverables**

Four items have been identified by LARP and CERN as "hard deliverables", in the sense that they are crucial to LHC performance and that "plan B" is weak or non-existent. These tasks would need special protection in the face of an unforeseen LARP budget shortfall. They are:

- 1) Luminosity Monitors. A review held on April 24 noted good progress toward on-time completion.
- 2) Tune Feedback. Excellent recent progress at RHIC. A "Final Design Review" will be held this summer or early fall.
- 3) Beam and Instrumentation Commissioning. Several tentative names are already available, and more are being solicited. A vetting procedure needs to be established to ensure excellence in commissioning.
- 4) Rotatable Collimators. We are confident that this longer time scale item is on track, despite a slow start on the first engineering prototype.

### **Magnet Strategy**

The sole goal of the magnet program is to demonstrate long strong quadrupoles using Nb<sub>3</sub>Sn technology by 2009. While a single minded focus is currently necessary to maximize the probability of success,

nonetheless a modest diversification of the magnet program may begin to be appropriate in 2008. Supporting LHC IR Upgrades will always remain the broad goal.

Gourlay and Peggs contributed as non-European authors to the document “A Strategy for European Accelerator Magnet R&D Aimed at LHC Luminosity Upgrade”, which was submitted to the CERN Council. LARP would like to develop closer ties with CARE, building upon today’s excellent status of good will and intellectual co-operation.

Better communication with CERN on magnet topics can be fostered in four ways:

- 1) Broader participation by CERN Magnet Physicists and Engineers at LARP collaboration meetings (none were present at LBNL).
- 2) Re-tuning the CERN-U.S. Committee meetings that occur at least once per year at CERN.
- 3) Inviting all members of the CERN-U.S. Committee to be present as observers at the DOE reviews (including the June 12-14 review).
- 4) Holding regular phone and/or video conferences.

### **Safety**

The safety of U.S. personnel at LHC is an issue of great sensitivity on both sides of the Atlantic. Peter Limon has been named LARP Safety Officer, at CERN’s suggestion. Safety presentations and discussions will occur at all collaboration meetings. The ability to complete standard CERN training before an individual leaves the U.S. would help to make (shorter) visits to CERN more efficient.

### **University involvement**

The involvement of U.S. universities could significantly enhance Accelerator Science at the LHC. We are groping towards ways in which the DOE funded labs in LARP can work effectively with the (mostly) NSF funded universities that have appropriate talent and resources. Loose connections are being formed in four potential areas:

- 1) University of Texas at Austin (Kopp). AC Dipole topics.
- 2) MIT (Barletta, Milner). Demonstration of Optical Stochastic Cooling at the MIT-Bates ring.
- 3) National High Field Magnet Laboratory (Larbalestier). Material testing and R&D.
- 4) Texas A&M (McIntyre). Exotic magnets.

### **Documentation**

Ratti is leading an effort to systematize the documents co-written by CERN and LARP that describe the roles and responsibilities, etc, for Accelerator Systems hardware that will be installed and commissioned.

### **FY07 budget planning**

The “Blue Sky” Task Sheets now in preparation for FY07 (and FY08) will exceed the \$11M budget guidance given by the Department of Energy, and will need editing to establish the financial plan that will be implemented on October 1. In particular, major new initiatives seeking LARP funding will face critical evaluation and prioritization by LARP and CERN committees. Although LARP explicitly maintains an “open door” policy for new tasks, most are rejected or deferred, often in spite of great technical merit, in order to defend existing priorities.