

19 January 2018

LBNC Meeting: February 19-21, 2018  
DRAFT CHARGE for the Referee Groups

The LBNC is asked provide candid assessments of the scientific, technical, and managerial preparations and decisions for the Fermilab Long Baseline Neutrino Facility (LBNF), the long baseline Deep Underground Neutrino Experiment (DUNE), and some specific aspects of the Short Baseline Neutrino program. The LBNC referee groups are asked to focus on specific areas of these activities.

**Speakers:**

We ask the speakers to provide some general items for most talks/reports (where relevant):

- An update on previously agreed milestones in a standard format (comparing planned with actual or projected for example).
- An assessment of risks, mitigating strategies, and status of these strategies.
- An update on manpower planning and status of key scientific, engineering, or QA/ESH personnel.
- Status of relevant recommendations (completed, not adopted for reasons, in progress and projected completion).

To allow for questions during the talks, speakers are asked to present using no more than one slide per 2 mins of presentation.

One of the main goals for the review is to understand preparations and planning for the DUNE Technical Proposal. To this end, the LBNC would like to hear from either consortia leadership and/or collaboration leadership on the following:

- Describe the consortium strategy from now until the TDR, identifying technical decisions to be taken, R&D required to support decisions, the process and criteria (if known, or development plan if not known) for decisions, any internal reviews required, preliminary assessment of resources (including engineering effort) required to achieve this timeline, key milestones, etc.;
- Describe the status of interfaces to other consortia, plans and process to converge on agreed interface definitions, demonstrate completeness, rigor and ongoing sustainability of the interface process;
- Describe the status of defining system requirements and ensuring flow down from physics requirements;
- Describe any current opportunities for value engineering and the process for making assessments and decisions;
- Describe the biggest worries at this point, and the process for identifying and evaluating risks and risk mitigation strategies by the time of the TDR;

- Describe the process for defining and evaluating appropriateness and effectiveness of system architecture;
- Describe and justify the preliminary WBS structure for each system; and
- Discuss the intended approach to developing a schedule and cost estimate for each system.

### **Referee Groups:**

We ask the referee groups, for their focus areas, to:

- (i) Assess recent progress against key milestones and schedules. Identify any new areas that need special attention, and draft the associated recommendations, if needed.
- (ii) Assess the status of the actions recommended in past LBNC meetings. Identify any areas where progress may be insufficient.
- (iii) Consider issues and recommendations from recent U.S. and International funding agency reviews (for example, the recent DOE status review). Are there sound plans to address these issues and recommendations?
- (iv) Consider synergies with the SBN program (where applicable).

In addition, for each referee group there are some specific areas we would like the group to focus on for this meeting:

#### 1. DUNE-SP

- APA assembly experience.
- Results from the 35 ton test.
- Results from the APA tests in the cold box at CERN.
- The report from Dave Christian on cold electronics for DUNE (this was requested by the end of Nov 2017).
- The decision plan for 5 vs 6 APAs in the cryostat, and protoDUNE schedule.
- Overview of the installation procedures and protocols used for APA, CPA and Field Cage installation as a prelude to what will be needed for DUNE.

#### 2. DUNE-DP

- Update on the status of studies of HV issues with the 1x1x3;
- Update on design changes to protoDUNE-DP as a result of experience with the 1x1x3;
- Update and schedule and procurement status for protoDUNE-DP

#### 3. DUNE Physics, Simulation & Reconstruction

- Describe the status of the physics studies needed to define the system requirements adopted by each of the consortia; and
- Provide an update on the status of DUNE-DP simulation and reconstruction.

#### 4. DUNE Computing

- Status of follow-up on previous recommendations, especially those concerning interactions with Physics and Reconstruction;
- Based on lessons-learned from MicroBooNE, discuss implications for development of compression algorithms to reduce data and computing load at DUNE; and
- Discuss plans for the understanding the integrated needs for computing and simulation resources in order to support development of the TP and TDR.

#### 5. LBNF/DUNE Cryogenics

- Provide an update on development of plans for pressure testing the far site cryostats; and
- Provide a plan for testing of cryogenics during the commissioning of protoDUNE as previously recommended.

#### 6. LBNF Management, Schedule & Planning

- Provide an update on contracting and outlook for future issues
- Provide an update on development of a business model for SURF and implications for LBNF planning

#### 7. LBNF/DUNE Interfaces

- Provide an update on the status of interface management planning for Far Site. Are the plans for identifying, recording, disseminating, and controlling all the interfaces needed for LBNF and DUNE, with a complete set of managed ICD's and associated documentation in place? Status of ongoing mezzanine, cryo, and detector interface design work including updates on schedule and milestone development.
- Provide an update on the status of the LBNF/DUNE Configuration Management Plan, and implementation timeline and planning for initiating configuration control in preparation for CD-2.
- Describe progress on CFD analysis and interaction/optimization with the detector design, with focus on the ullage space, understanding of cable outgassing and associated cryogenic issues. Status of development of written requirements and specifications for this.
- Provide an update on the status of development of the Sharepoint database for transporting loads underground.

#### 8. DUNE Management, Schedule & Planning

- Provide an analysis of delays and lessons learned stemming from interface issues exposed by assembly and commissioning of protoDUNE-SP and future organizational approaches that will mitigate these issues for the DUNE project;
- Describe plans for developing the international project office, including a breakdown of the level and type of manpower required, and anticipated scope of engagement in quality assurance, risk assessment, and oversight of schedule, cost and technical capability;
- Describe the status of responses to previous recommendations.