28 April 2018

LBNC Meeting: May 22-24, 2018
CHARGE

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.

A major focus of the May meeting will be on the DUNE Technical Proposal. Since the TP will only be available a few days before the meeting, we do not anticipate the committee will have had time to fully read the document. The May meeting will provide an overview of, and introduction to, the TP. We anticipate the committee will read the document(s) in depth after the meeting in preparation for a more thorough review in August, and that this process will provide feedback and guidance for the TDR.

Since the TP is primarily seen as a critical first step towards a full Technical Design Proposal, useful advice on the TP could include any of the following:

1. Are the technical requirements for system clearly stated?
2. Do the technical requirements connect well to the physics requirements of DUNE?
3. Is the system accurately and clearly described, keeping in mind the criteria that a science agency specialist should understand the introductory section and a professional member of the HEP community should be able to follow the body of the text?
4. Has the system been demonstrated to meet its technical requirements, and if not, what are the deficiencies?
5. Is the level of detail appropriate? Are any key elements missing? Are any components described in too much detail for this phase of the experiment?
6. Are project related activities—management structure, facilities, interfaces, safety, quality assurance, integration/installation, and high level schedule—described well enough in the TP to show that the complete delineation of these activities needed for the TDR is on-track?
7. Is there a clear decision pathway laid out to address options and unknowns between now and the TDR? Are decision criteria understood and can the required information or process realistically be executed on the proposed timeline?
8. Are risks to the subsystem project identified and are mitigation strategies plausible?
9. Are there aspects of the subsystem design that will not be informed by previous experience or prototypes and therefore present risks to the project design and/or execution?

Other important topics at the meeting include progress on LBNF and issues related to the interfaces between LBNF and DUNE, and protoDUNE progress and future plans.

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 provide a good introduction to the DUNE Technical Proposal, we ask the plenary speakers covering the TP to:

- Give an executive summary of the content of the relevant part(s) of the TP, including a high-level overview of the main physics drivers for the system design and the corresponding critical design parameters;
- Identify the main unresolved design or construction issues and uncertainties, risks to the design or project execution and gaps in planning as they exist now at the time of the TP;
- Identify the decision pathway, decision criteria and timeline to resolve these issues by the time of the TDR;
- Identify the state of interface (internal or external) definitions and plans for defining these by the time of the TDR;
- Describe the additional tasks that need to be executed by the time of the TDR, and the associated plans for taking these steps;
- Provide an overview of the project execution plan and main organizational partners in the plan.

Referee Groups:

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

- Assess recent progress against key milestones and schedules. Identify any new areas that need special attention, and draft the associated recommendations, if needed.
- Assess the status of the actions recommended in past LBNC meetings. Identify any areas where progress may be insufficient.
- 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?
- 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
   - Status and schedule of the 3 ASIC front-end design.
   - Describe the plans for the protoDUNE Testbeam measurements and plans beyond the testbeam.
2. DUNE-DP
   - Update on identifying HV issues with the 1x1x3
   - Update on design and testing for protoDUNE-DP CRPs
   - Update on schedule and planning 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, the resulting list of requirements, and how the physics-driven requirements are transmitted to, and used by, the consortia.
   - Describe the physics studies guiding the Near Detector design decisions and the ND technology decision process.
4. DUNE Computing
   - Outline of the factors that will impact the computing model;
   - Outline the lessons learned from the experience of other LAr TPC experiments wrt software and computing;
   - Outline the state of readiness for ProtoDUNE data collection? What are the plans to use ProtoDUNE data to influence the computing model?
5. LBNF/DUNE Cryogenics
   - Detailed commissioning plan for protoDUNE cyostats and cryogenic systems
   - Update on equivalence approach in lieu of cryostat pressure testing
6. LBNF Management, Schedule & Planning
   - Provide an overview of LBNF progress and planning, with particular attention to aspects of the project that could impact the DUNE project and schedule
   - Provide an update on risks, with particular attention to those risks that could impact the DUNE project and schedule
7. LBNF/DUNE Interfaces
   - Discuss protoDUNE lessons-learned implications for definition and control of interfaces for DUNE interfaces and project office management
   - Discuss status of internal and LBNF-DUNE interfaces at the time of the TP and plans for maturing these definitions and plans by the time of the TDR
8. DUNE Management, Schedule & Planning
   - Update on implementation of new management structure, including new Executive Board;
   - Review plans for, and scope of, the international project office;
   - Review document covering construction and installation lessons from protoDUNE and earlier prototypes;
   - Report on progress and status of the ND conceptual design development;

- Update on collaboration membership and development plans for funding matrix
- Discuss lessons learned from the assembly and commissioning of protoDUNE-SP for planning of the FD design and development effort

9. Beamline design and optimization
   - Discuss revised plans for restarting beamline design work on a timescale commensurate with the fall 2019 CD 2/3b review
   - Discuss risks and buildability issues raised by the beamline optimized solution proposed by DUNE

10. DUNE Near Detector
    - see #3