

16 March 2017

LBNC Meeting: March 23-25, 2017  
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 relevant recommendations (completed, not adopted for reasons, in progress and projected completion).

**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?

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

1. protoDUNE-SP CE & TPC:
  - i) Variable high frequency noise problem.
  - ii) Steel vs Al field cage profile decision.

- iii) Viability of CE solution and expected performance for protoDUNE-SP.
  - iv) Progress on requirements and development of long-term CE strategy.
  - v) Schedule update and status of system test stands.
  - vi) Viability of CE solution for SBND and interplay with protoDUNE-SP plans (Schmitz)
2. protoDUNE-SP DAQ:
    - i) Electronics to DAQ interfaces (WIB & SSP)
    - ii) Timing system
    - iii) Upcoming computing installation/infrastructure.
  3. protoDUNE-SP schedule & planning:
    - i) APA construction schedule & schedule margin wrt APA#3,6 delivery.
    - ii) Effort: detector support structure engineering, loss of ASIC designers, & mounting additional APA assembly team.
    - iii) Overall plan for PD, issues associated with SiPMs, delivery of electronics, & expected system performance versus requirements
    - iv) Overlap with SBND APA construction and experience
  4. DUNE physics & reconstruction:
    - i) LArSoft long-term sustainability (shared with DUNE computing)
    - ii) LArSoft: expansion of user base
    - iii) VALOR systematic uncertainties
    - iv) Performance and prospects for automated reconstruction versus CDR assumptions
    - v) Status of reconstruction of low energy (below 50 MeV) events
    - vi) Status and conclusions from the FD and ND Task Force efforts
  5. DUNE computing:
    - i) Evolution of FNAL SCD efforts on DUNE computing
    - ii) Joint computing planning for protoDUNE DP and SP
    - iii) LArSoft (shared with DUNE physics & reconstruction)
  6. LBNF/DUNE planning for cryogenics:
    - i) Fermilab engagement with CERN in first 1kT scale LAr purification system
    - ii) Status of reconciliation of engineering codes
    - iii) Overlap with and implications for the SBND cryostat
    - iv) Discuss a realistic plan for identifying sufficient build-up of engineering manpower in the light of uncertainties in funding/institutional construction responsibilities
    - v) Discussion on DUNE and LBNF requirements flow down
    - vi) WA105 commissioning experience
  7. LBNF schedule & planning:

- i) Potential hoist control systems upgrade
  - ii) Beamline design: mechanical design & FEA analysis
  - iii) Simulation vs observation in air activation
  - iv) Status of CM/GC and final design contract
  - v) Viability of contingency planning based on funding profile options and long-term impacts on the project
  - vi) Status of critical hires including FS management structure
  - vii) Update on risk registry, retirement of risks and EH&S management
  - viii) FRA-SDSTA interfaces and impact on LBNF, including ability for LBNF to conduct work in leased/non-leased spaces
  - ix) Roles and responsibilities for reliability infrastructure improvement projects
  - x) Interactions with other DOE facilities
8. LBNF/DUNE interfaces:
- i) Is the cryostat roof penetration planning and coordination between LBNF/DUNE progressing satisfactorily?
  - ii) What is the interaction between the planning for the DUNE installation process and Conventional Facilities and cryogenic systems design and construction sequencing planning? Are the interfaces and requirements communicated, understood, and agreed upon by all?
  - iii) Is the DUNE engineering as it relates to the two above items sufficient and able to meet the schedule?
  - iv) Is the flow down of technical requirements between DUNE and LBNF well defined? If so, how is it defined and controlled?
9. protoDUNE-DP technical, schedule & planning:
- i) Update and status of the 1x1x3m prototype and any lessons learned
  - ii) Revisit planning and any revisions based on experience to date for the 6x6x6m protoDUNE-DP (review original milestones)
  - iii) Current risk assessment and mitigation strategies
10. Beamline optimization and design
- i) Status and conclusions from BM optimization Task Force effort
  - ii) Status of engineering concept development in relation of simulated design and any alternatives still under consideration and projected decision points
11. DUNE management, schedule & planning
- i) Update on EOI process and formation of consortium groups
  - ii) Update on DUNE management structure and plans stemming from EOI process
  - iii) Update on progress against CD-2 plan
  - iv) Plans for engaging international partners and completing the funding matrix

- v) Discuss the strategy for follow-up on the NDTF in order to define the ND implementation plan
- vi) Discuss the responses to the SPSC questions

#### 12. Planning for joint SBN analysis

- i) Plans and progress to date in adopting common tools and analysis strategies
- ii) Viability of organizational structure to deliver of common physics output