

Charge Letter: LBNC October 2024 Review, October 2-4, 2024

The LBNC is charged by the Fermilab Director to provide external scientific peer review and to monitor the technical progress of the International DUNE collaboration, and those aspects of the facility construction that have direct impact on the DUNE experiment.

For the October 2024 meeting, the LBNC will meet to review status and progress of LBNF and DUNE. As with other meetings, the LBNC should construct a report in which it acknowledges, comments on, and where appropriate, makes recommendations following the meeting's presentations and discussions.

There is one major topic for this LBNC meeting: Beam monitoring using both the LBNF beamline instrumentation and the DUNE near detector. Secondary focus areas will be DUNE Computing, the DUNE near detector in its broader role, and the production of components for the VD and HD far detectors. In addition, the LBNC should receive updates on the DUNE collaboration, far detector progress beyond component production, activities on ProtoDUNE-II, and DUNE Phase II.

In considering the presentations and material provided for the meeting, attention should be given to prior LBNC recommendations and actions that have been undertaken to address these recommendations. We would like to continue our work toward uniform and regular reporting and tracking of major DUNE technical milestones. The Director requests that every effort be made by the speakers to have their talks uploaded at least six days before the October meeting and that responses to existing recommendations be addressed in the [recommendation tracker](#) also at least six days before the October meeting.

For the LBNF beam monitoring topic the committee is asked to address the following questions

1. Are the requirements for beam monitoring by the LBNF beamline instrumentation appropriate and clearly specified and is the TDR design expected to meet those requirements?
2. Are the requirements for beam monitoring by the DUNE near detector appropriate and clearly specified and is the currently understood design expected to meet those requirements?
3. Are there redundancies or gaps in the beam monitoring capabilities of the combined system of LBNF beamline monitoring and DUNE near detector? Please comment on the significance of any gaps and the desirability of any redundancies.
4. Does the committee have any concerns about the monitoring of the beam?

For the purposes of this charge the scope of beam monitoring includes that needed to understand the neutrino beam and does not include that needed on very short timescales to feed into the beam permit to ensure safe operating of the beam.

It is expected that the LBNC document review of the LBNF beamline TDR will have concluded well before the October LBNC meeting.

Regarding DUNE Computing, the committee is asked to track progress on the advancement of the overall organizational structure, and the formation and execution of the plan for development of the core software framework.

Regarding the Near Detector, the committee is asked to examine the ND-LAr 2x2 data taking and analysis, to comment on the path toward a final design for ND-LAr+TMS and SAND, and to offer initial opinions on the Near Detector Preliminary Design Report (PDR) chapters that are available at the time.

Regarding the Far Detector component production, the committee is asked to comment on APA and CRP production and protoDUNE testing with a focus on QA/QC and the resolution of issues.

The LBNC should present a Closeout Report to deliver at the end of the meeting. Subsequently this should be refined into a LBNC Meeting report.