

MEMORANDUM FOR: ERIC FENG
PROGRAM MANAGER
OFFICE OF HIGH ENERGY PHYSICS

FROM: MICHAEL PROCARIO
DIRECTOR OF FACILITIES DIVISION
OFFICE OF HIGH ENERGY PHYSICS

SUBJECT: REVIEW OF U.S. OPERATIONS OF DUNE

I request that you chair the inaugural review of U.S. operations of the Deep Underground Neutrino Experiment (DUNE), termed DUNE-US. The evaluation is scheduled for February 25-27, 2025 at Fermi National Accelerator Laboratory. I appreciate each reviewer's contribution to this important appraisal.

The Long Baseline Neutrino Facility (LBNF) will enable DUNE to make the world's most precise measurements of neutrinos' oscillation parameters, determine their mass hierarchy, and probe CP violation. LBNF is under construction, with CD-4 approval targeted for one of the Far Detectors in 2029 and the Near Detector in 2032. The DUNE-US Operations program was launched in 2023 and is ramping up quickly. Overall the program is projected to cost around \$500M cumulatively over the next 15 years.

This review will evaluate the current operations planning and cost estimates. Please identify any resource, technical, or management issues that should be addressed. The Fermilab accelerator and LBNF neutrino beamline are not covered here.

For the following areas of work:

1. Science Operations

- a) Computing, including core software development
- b) Far and Near detectors
- c) Central operations

2. Mission Support

- a) Far site activities, including South Dakota Services
- b) General services including power, IT, ES&H, hoisting, and liability insurance
- c) DUNE Coordination Office and general administrative services

please address the following issues:

1. **Requirements and scope:** Are the requirements and scope of work appropriately defined? Are the interfaces with the LBNF/DUNE project clearly articulated? Are the financial resources, labor, and materials adequate to achieve the goals?
2. **Budget:** Are the cost estimates accurate and appropriate for this stage of the program? Are future expenses planned for? Does the budget fit within guidance from the Office of HEP?
3. **Schedule & risks:** Are key milestones defined for installation, integration, commissioning, operation, maintenance, and upgrades? Are the main technical risks mitigated?
4. **Workforce:** Is the present labor sufficient? Are scientific personnel at labs and universities properly supported? Is the personpower for future work identified? Is the workplace diverse, equitable, and inclusive (DEI)?
5. **Management:** Has the host lab assigned a competent management team with clear lines of authority and responsibility? Does the leadership plan strategically and allocate resources effectively?
6. **Safety:** Are the environment, safety, and health (ES&H) aspects of all work properly managed?

The DUNE-US presenters will upload their slides online at least one week prior to the review.

After the review, each reviewer should privately send you observations they could not include in the committee's public evaluation. The Office of HEP will keep these letters confidential.

I expect to receive your report within 60 days of the review. Thank you for taking on this important task.

cc: Regina Rameika, DOE-HEP
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