Department of Energy
Washington, DC 20585

OCT 30 2014

Dr. Sergei Nagaitsev
Chief Accelerator Officer
Fermi National Accelerator Laboratory
P.O. Box 500 306 (X GLRY)
Batavia, IL 60510

Dear Dr. Nagaitsev:

The Office of High Energy Physics of the Department of Energy (DOE) has scheduled a review of the Fermilab plans to provide a reliable 700 kW proton beam to the Nova target within the next two years. The Proton Improvement Plan (PIP) is a critical element of this goal because it will improve both the performance and reliability of both the Linac and Booster. In addition, to insure that the Accelerator Complex can meet the needs of the Nova experiment, the Recycler requires improvements in beam stability, beam losses and slipstacking. The review will occur on January 21-22, 2015, at Fermilab.

This review will address the following issues:

- Are the goals, deliverables, budget and schedule of the PIP properly defined, well understood, achievable and self-consistent?
- Are the plans to address the Linac vulnerabilities and reliability adequate?
- Are the plans for the Booster rf cavities sufficient to support the required beam intensity and extend their life at least until 2030?
- Are the plans to minimize Booster losses adequate and sufficiently understood to allow for the required higher beam power levels? Are beam losses in the Recycler understood sufficiently to minimize machine and tunnel activation and avoid any degradation of the magnetic elements?
- Are the Recyler plans to overcome beam instabilities and losses during slip-stacking adequate?
- Are the goals of achieving 460 kW (without the slow-extraction program) in 2015 and 700 kW by mid-2016 technically achievable? Are key risks to both goals identified and mitigation strategies defined?
- How well do the current plans for PIP integrate smoothly into future plans for achieving even higher beam power (PIP-II and beyond)?

Dr. John Kogut will chair the review and serve as our contact on all aspects of the review. He can be reached at (301) 903-1298 or John.Kogut@science.doe.gov. Please work with him to develop the agenda for the review in accordance with the guidance below. In addition, background materials for the review committee should be posted on a review

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website at least two weeks before the review. These materials should include PIP planning and execution documents as well as reports from all recent relevant reviews of PIP and the Accelerator Complex.

The first day of the review should consist of presentations by the laboratory and two executive sessions, one at the beginning and another at the end of the day. Breakout sessions in addition to the traditional plenary talks are encouraged. The morning of the second day will be used for a Q&A session followed by an executive session for preliminary report writing; a close-out session will take place in the early afternoon. Preliminary findings, comments, and recommendations will be presented at the close-out.

Each panel member will be asked to evaluate those parts of the PIP in which they have specialized expertise and write individual letters on their findings. The Chairman will collect these letters and prepare a DOE report based on the information contained therein.

I greatly appreciate your efforts in preparing for this important review. The success of the PIP and improvements to the recycler are essential for the laboratory's experimental program. I look forward to a very informative and stimulating review.

Sincerely,

Michael Weis for JS

James Siegrist
Associate Director of Science
for High Energy Physics

cc: Michael Procario, SC-25.2
Glen Crawford, SC-25.1
Michael Weis, FSO