Department of Energy
Office of Science
Washington, DC 20585

MAY 30 2013

MEMORANDUM FOR DANIEL LEHMAN, DIRECTOR
OFFICE OF PROJECT ASSESSMENT

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

SUBJECT: REQUEST TO CONDUCT CD-1 REVIEW OF THE LHC-CMS DETECTOR UPGRADE PROJECT

I request that you conduct an Independent Project Review of the "LHC-CMS Detector Upgrade" MIE Project on August, 26-27, 2013 at Fermilab, in order to assess conceptual designs, proposed alternatives, and cost range in preparation for Critical Decision CD-1. The purpose of this review is to determine if the LHC CMS Detector Upgrade Project has fulfilled the requirements for CD-1, "*Approve Alternative Selection and Cost Range*" and if it is ready to request CD-1 approval.

The objective of the LHC CMS Detector Upgrade Project is to enable CMS to fully exploit the physics opportunities offered by the LHC for exploration of new physics and to make precision measurements of properties of known phenomena. The "LHC CMS Detector Upgrade Project" received CD-0, "*Approve Mission Need*" on September 18, 2012, with a preliminary Total Project Cost in the range $22 million to $34 million and estimated completion date of December 2018. By the end of 2012, the LHC delivered about 25 fb^{-1} of data, to the CMS experiment. Planned upgrades to the LHC to be installed in 2018 will produce 2-3 times the instantaneous luminosity currently delivered by the machine. Upgrades are needed to the Pixelated Inner Tracking (Pixel) Detector, the Hadron Calorimeter (HCAL) Detector and Trigger to take advantage of the increased luminosity.

In your review, please evaluate whether the Project is prepared to begin preliminary design. In addition to a general assessment of progress, current status and the identification of potential issues, the committee should address the following specific items:

1. Conceptual Design: is the conceptual design sound and likely to meet the MIE project's technical performance requirements most efficiently and effectively? Do the conceptual design report and supporting documentation adequately justify the stated cost range and project duration?
2. Project Scope: Are the project's scope and specifications sufficiently defined to support preliminary cost and schedule estimates?
3. Cost and Schedule: are the cost and schedule estimates credible and realistic for this stage of the project? Do they include adequate scope, cost and schedule contingency?

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4. Management and ES&H: Is the project being appropriately managed at this stage? Does the proposed project team have adequate management experience, design skills, and Laboratory support to produce a credible technical, cost and schedule baseline? Are ES&H aspects being properly addressed and are future plans sufficient given the projects current stage of development?
5. Documentation: Is the prerequisite documentation required for approval of CD-1 complete?

Dr. Simona Rolli is the program manager for the LHC-CMS Detector Upgrade Project in this office and will serve as the OHEP contact person for the review.

We appreciate your assistance in this matter. As you know, these reviews play an important role in our program. I look forward to receiving your Committee's report, within 60 days of the review's conclusion.

Sincerely,

Michael Procario, Director
Facilities Division
for High Energy Physics

cc: Patricia Dehmer, SC-2
James Siegrist, SC-25
Simona Rolli, SC-25
Steven Webster, FNAL Site Office
Pier Oddone, FNAL Director