

memorandum

DATE: May 28, 2008
REPLY TO
ATTN OF: Office of Basic Energy Sciences, SC-22
SUBJECT: DOE REVIEW OF THE LINAC COHERENT LIGHT SOURCE (LCLS) ULTRAFAST
SCIENCE INSTRUMENTS (LUSI) PROJECT
TO: Daniel R. Lehman, Director, SC-28

This memorandum modifies the review dates and the scope of the previous charge memorandum dated February 25, 2008. I request that your office organize and conduct an Office of Science (SC) Independent Project Review (IPR) of the LUSI Major Item of Equipment (MIE) project at the Stanford Linear Accelerator Center (SLAC) in Menlo Park, California, during August 19-21, 2008.

The purpose of the LUSI project is to expand upon and utilize the unique scientific capability of the LCLS by building instruments that use the LCLS x-ray beam for research. To this end, the technical objective of the LUSI project is to design, build, and install at LCLS three instruments that will complement the initial atomic, molecular, and optical physics instrument that is included in the LCLS project scope. The LUSI instruments are X-ray Pump Probe Diffraction (XPP), Coherent X-Ray Imaging (CXI), and X-Ray Photon Correlation Spectroscopy (XPS). The capabilities, technical performance parameters, and fuller descriptions of each of these instruments are described in project documents to be available prior to the review.

This project achieved its Critical Decision-1 (CD-1) milestone, Approval of Alternative Selection and Cost Range, on September 27, 2007. The preliminary schedule in the Acquisition Strategy and preliminary Project Execution Plan (PEP) shows the LUSI instruments to be designed and built in a phased approach, with completion of some capability for early science in Fiscal Year (FY) 2010, and all instruments completed by FY 2012. The project has a Total Project Cost range of \$50-60 million projected through FY 2012.

The purpose of this IPR is to evaluate the project's readiness to achieve the milestone of CD-2, Approve Performance Baseline, for all elements of the Work Breakdown Structure (WBS), which at level 2 are overall project management and support (WBS element 1.1), the XPP instrument (WBS element 1.2), the CXI instrument (WBS element 1.3), the XPS instrument (WBS element 1.4), Diagnostics and Common Optics (WBS element 1.5), and Control and Data Acquisition Systems (WBS element 1.6). This review should examine the performance baseline for all these WBS elements, in fulfillment of the CD-2 IPR requirement that is specified in DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*.

To carry out this charge, the review committee should evaluate the project's readiness in all aspects (technical, cost, schedule, management, and environment, safety and health (ES&H)) that relate to establishing a performance baseline, and should respond to the following questions:

1. Technical Scope: Is the preliminary design technically sound and adequate to establish a reasonable performance baseline? Has an appropriate design review been performed? Is the design likely to meet performance expectations? Do the Key Performance Parameters in the PEP adequately capture the technical scope of the project?
2. Project Management: Is the management team organized and staffed to successfully execute the project? Have project risks and uncertainties been identified and appropriately addressed? Are procurements appropriately planned, including any early (e.g., long-lead) requests?
3. Cost and Schedule: Are cost and schedule estimates complete and reasonable to accomplish the planned scope? Do these estimates include adequate contingency that is based on a risk analysis?
4. ES&H: Are ES&H aspects being properly addressed?
5. Overall readiness for CD-2: Is LUSI ready for CD-2? Have all the prerequisite activities and documents been completed adequately? Is the project baseline plan, including major assumptions and interfaces, sufficiently well developed to engender successful outcomes? Are any changes recommended?

Thomas E. Kiess, the LUSI Program Manager, will serve as the Basic Energy Sciences point of contact for this review. I would appreciate receiving your committee's report within 60 days of the review's conclusion.



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