**Department of Energy**
Washington, DC 20585

**May 21, 2018**

MEMORANDUM FOR LK LEN

FROM: GLEN CRAWFORD, DIRECTOR
RESEARCH AND TECHNOLOGY DIVISION
OFFICE OF HIGH ENERGY PHYSICS

SUBJECT: Charge for HEP General Accelerator R&D Lab Review

The mission of the Department of Energy High Energy Physics (HEP) program is to seek an understanding of how our universe works at its most fundamental level. The General Accelerator R&D (GARD) subprogram supports that mission by fostering fundamental research and development in the science and technology of particle accelerators. This subprogram nurtures the technologies needed to design and build the future accelerator facilities that will be used to carry out the HEP research program thereby advancing our strategic goals for science.

This letter is to request that you conduct an onsite review of HEP-supported laboratory research efforts in the area of the GARD subprogram on July 30-August 4, 2018. The purpose of this review is to assess the quality and impact of the recent scientific achievements by these research groups; the feasibility, relevance and impact of the proposed research on achieving the scientific goals and milestones of the HEP mission; and the national deployment and balance of accelerator test facilities Your panel will also review the operation of user/test facilities at each laboratory, including reliability, facility up-keep and improvement, cost containment, and how well the users are being served.

*For each laboratory's GARD research group*, we request a specific evaluation of:

1) The quality and impact of the research by the group since the last review in 2013;
2) The scientific significance, merit, and feasibility of the proposed research;
3) The competence and future promise of the group for carrying out the proposed research;
4) The adequacy of resources for carrying out the proposed research, and cost-effectiveness of the research investment;
5) The quality of the support and infrastructure provided by the laboratory;
6) Where an experimental facility exists,
   - The reliability and cost containment of operation;
   - What is the condition of the facility? What is the deferred maintenance backlog and its associated risk and cost?
   - How impactful is each experiment to achieving the goals of the P5 and GARD subpanel reports, the relevant GARD research roadmaps, and on accelerator science in general?
   - How well the users are being served?

- Is the facility well suited to conduct these experiments?
- Could this work be done at other test facilities?

7) How the group benefits the laboratory's experimental program (as applicable), and how well the group's activities relate to the overall HEP mission; and
8) The overall soundness of the GARD program, potential areas where consolidation or redirection will be beneficial and feasible.

The research efforts should be presented in terms of the laboratory group's contributions (as applicable) along the following programmatic thrust lines:

- Accelerator and Beam Physics (including modeling, simulation as well as beam instrumentation and controls)
- Particle Sources and Targetry
- Advanced Accelerator Concepts
- RF Acceleration Technology (including SRF, NCRF and RF Sources)
- Superconducting Magnets and Materials
- Test Facility Operations

The laboratories should provide information in this format on both their accomplished and proposed research in advance of the review, including the level of effort for each thrust line (FTEs and funding), using the provided Excel template worksheet.

The final report should outline the laboratory-based accelerator R&D program in each of these thrusts and discuss the unique and important elements that the laboratory programs bring to bear in addressing these research topics**. In this context, we request a comparative assessment of each lab's overall performance in these areas relative to its peers, as well as an assessment versus comparable university groups.** The overall evaluation of the lab's research will be an important input to the process of optimizing resource allocations within the various research thrusts.

The HEP GARD program supports a wide range of research thrust areas that are important to HEP needs, both in the mid and long term time scales. As part of this review, we are also requesting the reviewers to provide additional general findings and comments about the current status and future promise of the programmatic thrust areas listed above, for example:

- What are the expected deliverables of this research thrust in the next 5-10 years?
- Are adequate resources in place to plausibly achieve these goals?
- Do the labs have sufficient technical and management infrastructure to reliably deliver the goals for this programmatic area and respond to new developments?
- What is the benefit of additional investments in this particular thrust? What are the likely impacts of reduced investments?

I encourage you to interact with the laboratory groups at the review and provide them with whatever immediate feedback you find appropriate. Upon the completion of the review, reviewers should send a letter summarizing their findings and evaluations, which

includes their overall findings on the GARD thrusts, an assessment of lab contributions to these thrusts, and the individual lab evaluations. The letters will be confidential within OHEP.

Individual lab evaluations, along with the findings on the each research thrust, and assessment of laboratory contributions therein, will be incorporated into a summary report. I would like to receive the draft individual laboratory evaluations and the summary report no later than October 1, 2018. Thank you for taking on this important task.

Glen Crawford
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