Department of Energy
Office of Science
Washington, DC 20585

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MEMORANDUM FOR: BRUCE STRAUSS
MAP PROGRAM MANAGER
FACILITIES DIVISION
OFFICE OF HIGH ENERGY PHYSICS

FROM: JAMES SIEGRIST
ASSOCIATE DIRECTOR
OFFICE OF HIGH ENERGY PHYSICS

SUBJECT: U.S. Muon Accelerator Program (MAP) Management and Technical Review

This memorandum is to request that you organize and conduct a special Management and Technical review of the U.S. Muon Accelerator Program (MAP). This review is in response to the U.S. Particle Physics Project Prioritization Panel (P5) Report which recommended to:

> *Reassess the Muon Accelerator Program (MAP). Incorporate into the GARD program the MAP activities that are of general importance to accelerator R&D, and consult with international partners on the early termination of MICE.*

In particular, the panel recommends to "*realign activities in accelerator R&D with the P5 strategic plan. Redirect muon collider R&D and consult with international partners on the early termination of the MICE muon cooling R&D facility.*"

Therefore we are planning for an orderly ramp-down of MICE activities, with an annual funding Profile of $9M, $6M and $3M over the next three years, subject to availability of funds; and identifying and preserving the most critical generic accelerator R&D activities via redirection to the General Accelerator R&D (GARD) program.

This review should be completed before the end of August 2014.

MAP is charged with developing and demonstrating the concepts and critical technologies to provide beams of muons for Muon Colliders and Neutrino Factories. Thus the MAP effort encompasses research and development activities in accelerator and beam systems, in particular systems for achieving emittance reduction in muon beams, beam instrumentation, and technology development such as: very high field magnets, RF cavities capable of operating in high magnetic fields, superconducting RF for muon acceleration, and high power targetry. MAP has international commitments to the Muon Ionization Cooling Experiment (MICE) at the Rutherford Appleton Laboratory. Given the recent P5 recommendations, it is important for OHEP to understand how to leverage the substantial investment made so far and to determine what elements of the program are worth continuing.

It is requested that your review determine:

- Can Stage IV or Stage V of the MICE experiment be achieved with the quoted profile?
- Is the resource-loaded plan for achieving all deliverables to MICE at the Rutherford-Appleton Laboratory (RAL) well documented and complete?
- Are the skilled personnel needed accomplish these goals available and committed to the effort?
- Are the milestones provided by MAP and MICE partners for hardware assembly, testing, and delivery suitable for tracking progress in this plan?
- Are technical, cost, and schedule risks understood?

Are any of the non-MICE activities listed below suitable to be transferred to the General Accelerator R&D program due to their potential use either broadly in a variety of accelerators or some specific area with high priority in the P5 strategic plan?

- Design studies and simulations of the accelerator systems required for intense sources of neutrinos and cold muons;
- Design studies and simulations for muon collider capabilities
- The study of the operation of RF cavities in strong magnetic fields as part of the experimental program in the MuCool Test Area (MTA) experimental facility at Fermilab;
- Technology R&D and demonstration efforts for high power proton targets, pion capture systems, muon cooling, high field magnets, rapid cycling magnets, and superconducting RF.

I should appreciate receiving the review reports, suitable for transmission to the laboratories, within 30 days after the review.

Sincerely,

James Siegrist

James Siegrist
Associate Director of Science
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cc: Michael Procario, DOE
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