

Charge for the PIP-II Machine Advisory Committee (P2MAC)

March 25-27, 2019
Fermilab

The Proton Improvement Plan-II (PIP-II), an accelerator project at Fermilab with significant contributions from international partners, will enable the most intense neutrino beam for LBNF/DUNE and is a key element of the planned modernization of the Fermilab accelerator complex.

The project achieved CD-1 approval in July 2018, completed a successful Department of Energy (DOE) Independent Project Review (IPR) in December 2018 and is now proceeding through the Preliminary Design phase, with the goal to baseline in July 2019. Project technical activities during this phase are focused on developing a detailed design that meets agreed upon performance requirements and supports the development of credible cost and schedule estimates. The project is formalizing agreements with international partners for the significant anticipated in-kind contributions. The R&D program is proceeding to address the main areas of technical risk.

At the upcoming DOE CD-2/3a review planned for July 2019, the PIP-II project will seek approval for its proposed baseline scope, performance, budget, and schedule and will present a preliminary design of the Project as a whole. The design of every subsystem will not be complete, but the design of subsystems seeking CD-3a approval will be sufficiently mature (> 90% maturity) to start procurement and construction as per the planned schedule. The rest of the systems must satisfy design maturity in a range of 30% to 60%. Project-level requirements and interface controls between systems ensure that the procurements and construction will be appropriate, and that any incomplete designs carry minimal risk to the successful completion of the Project.

The P2MAC is asked to review and assess three major themes: a) the project's readiness to baseline, b) maturity of the Preliminary Design Report (PDR), and c) approach to management of international in-kind contributions. In particular, we would like specific advice, recommendations, and/or commentary on:

1. Readiness to seek CD-2/3a approval:
 - a. Is the project on track to be baselined in July 2019?
 - b. Is the project technical design and planned work sufficient to provide the technical basis for developing a credible project baseline cost and schedule by July 2019 (CD-2)?
 - c. Is the technical design presented in the PDR sound and likely to meet performance expectations and KPPs?
 - d. Is the design presented in the PDR feasible and practical to operate?
 - e. Are plans for the Fermilab accelerator complex upgrade to achieve 1.2 MW of beam power from the Main Injector sound, well-coordinated and consistent with the project's schedule?
 - f. Are the technical risks prioritized appropriately and will the completion of the R&D plan provide a basis for proceeding to the construction phase with confidence that performance goals can be met?

- g. Has the project satisfactorily responded to the recommendations from previous reviews?
2. Approach to managing international in-kind contributions:
- a. Does the PIP-II International Governance model enable effective management of the international collaboration, project interfaces, and risks?
 - b. Is the plan to manage the in-kind contributions sufficiently developed to ensure their expected technical performance and timely delivery?
 - c. Are documented scope of work, deliverables, and conditions of acceptance for in-kind contribution well aligned with the needs of PIP-II project?
 - d. Are the major risks posed by the international collaboration to the Project understood with appropriate mitigations applied?

The P2MAC is not limited by these specific charge areas and may delve into other related areas, and offer advice, comment, or recommendations, as it deems appropriate under the general guidance of this charge. In fact, we would appreciate if the committee specifically comment on the cost and schedule.

We request an oral closeout presentation by the P2MAC with Fermilab and PIP-II management, and DOE observer(s), at the end of the meeting. A written report is requested to be submitted to the PIP-II Project Director by May 1, 2019.