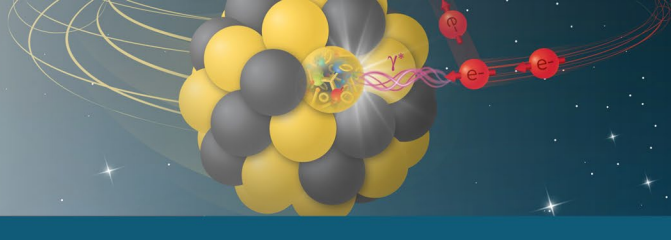

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Date: 09/10/2024

To: T. Raubenheimer, Chair, and Members of the EIC Machine Advisory Committee
Cc: S. Nagaitsev
L. Lari

From: J. Yeck, EIC Project Director

Subject: Charge questions to the EIC MAC, Sep 16-18, 2024

Following the MAC meeting in Apr 2024, the project made steady progress in many areas including defining the engineering requirements, specifications, and interfaces, the engineering designs, and the preparation of long-lead procurements. In addition, important decisions were taken regarding the electron SRF linac and the updated RCS concept, the low-energy electron cooler concept, and project phasing to achieve EIC early science.

Specifically, for this MAC meeting we would like to focus on the following areas:

1. The electron SRF linac concept and the updated RCS design;
2. Comparison of EIC performance with and without SHC.
3. The low-energy cooler;
4. The 591-MHz RF Systems;
5. IR Magnets;
6. Project phasing to achieve early EIC science; and,
7. Beam dynamics, polarization and beam optics.

Advice from the MAC will help us further develop the technical baseline for the machine and to determine an appropriate strategy for developing the Project Performance Baseline, currently planned for the end of 2025. We plan to present a preview of the Project Performance Baseline at the next DOE Independent Project Review (IPR) in January 2025.

We would like for the committee to address the following charge topics and questions:

- Provide feedback on the project effort to define Project phases and the initial EIC ‘first science’ plan.
- Provide feedback on the project effort to address the electron injector risks and to update the injector and the RCS design concepts. Will this area be ready to be baselined by the end of 2025?
- Is the project plan to add a low-energy cooler sound?

- Provide feedback on the IR magnets (risks, status and plans).
- Provide feedback on the 591-MHz ESR cryomodule status and plans.
- Does the MAC identify any significant gaps in our progress with beam dynamics, beam polarization, beam-beam effects, beam cooling and beam intensity effects?
- Provide feedback on the EIC Hadron Injector requirements and expectations.

A draft agenda for the meeting is attached to this letter.

We expect the committee's comments and recommendations to be compiled in a written report that we would like to receive by Oct 14, 2024, which is two weeks prior to the EIC Director's review on Oct 22-24.