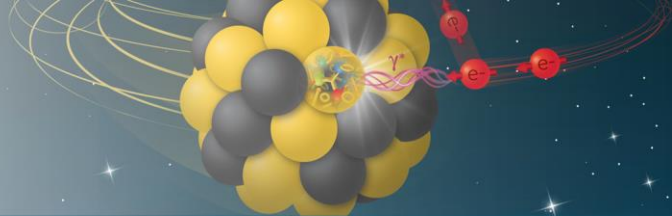


Electron-Ion Collider



Building 1005S
P.O. Box 5000
Upton, NY 11973-5000
Phone (631) 344-5865
ksmith@bnl.gov

October 8, 2025

To: K. Badgley (FNAL), M. Jaski (ANL), S. Miller (PRIB), H. Prin (CERN), S. Seberg (BNL)
From: Kevin Smith, EIC Deputy Technical Director *Kevin Smith*
Subject: Charge for the Electron-Ion Collider Helical Magnet Upgrades Preliminary Design Review
November 12 - 13, 2025

The Electron-Ion Collider (EIC) is a major new facility being designed and built at the U.S. Department of Energy's (DOE) Brookhaven National Laboratory (BNL) in partnership with the Thomas Jefferson National Accelerator Facility. The EIC's Hadron Storage Ring (HSR) requires repurposing existing superconducting RHIC helical dipole magnets to achieve polarized beam collisions. RHIC currently contains two types of helical magnets: Siberian Snakes (4 total) and Spin Rotators (8 total). For the EIC, six Siberian Snakes and two Spin Rotators are required.

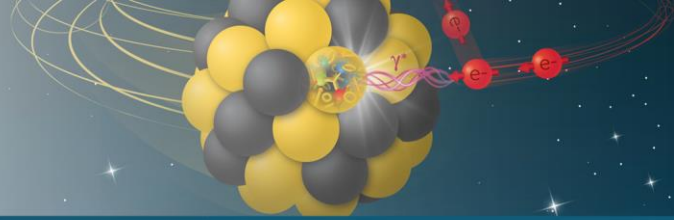
Each helical magnet for EIC will be upgraded with a new vacuum beampipe coated with copper and amorphous carbon to reduce beam-induced resistive losses and suppress secondary electron yield (SEY). In addition, a new beam position monitor (BPM) and cryogenic bypass line for the Actively Cooled Beam Screen (ACBS) system will be integrated into each magnet.

The purpose of this review is to evaluate whether the design and production plan for the upgraded helical magnets satisfy EIC requirements. The scope includes the design, analysis, and integration of the upgraded components, the disassembly techniques & tooling for incorporating upgrades, and the production plans to achieve the required helical magnet configurations for EIC.

We would appreciate your assistance in assessing our readiness and preliminary design maturity for the Helical Magnet Upgrades. The committee is asked to respond to the following charge questions:

1. Are the requirements for the Helical Magnet Upgrades sufficiently mature, understood and documented?
2. Does the preliminary design (new components, production plans, & tooling) fulfill the needs of the EIC project and meet the requirements, i.e. are they sufficiently consistent with applicable expectations outlined in the EIC Technical Review Plan (EIC-SEG-PDN-009) for a Preliminary Design?
3. Are the Helical Magnet Upgrades interfaces sufficiently defined, understood, and documented for this phase of the design?
4. Are design, simulations, analysis, design models, specifications and work-plans sufficiently mature for this phase of the design?
5. Are the quality and acceptance plans adequate for this phase of the design?

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6. Have risks, including technical and safety risks, been identified and are mitigation plans adequate for this phase of the design?
7. Is the overall design maturity sufficient to proceed with the final design phase?

We would appreciate receiving the committee's report within 14 days of the review's conclusion.

cc: B. Brenton, D. Holmes, L. Lari, S. Nagaitsev, V. Ptitsyn, T. Russo, A. Seryi, K. Wilson, J. Yeck,