

Incremental Design and Safety Review of the EIC Detector Calorimeters

Charge to the Committee

The scope of this review includes all aspects of particle detection using the electromagnetic (EMCal) and hadronic (HCAL) calorimeter systems in the central EIC detector, which includes the barrel, the forward endcap, and the backward endcap regions. This may include design and fabrication choices and their cost-effectiveness, granularity, optimization of energy and position resolution, construction schedule, early considerations for safety and quality assurance, levels of redundancy, front-end electronics and interface to the data acquisition system, commissioning and calibration procedures, considerations for materials and labor, operational reliability and longevity, and any other considerations that may influence the construction and operation of these calorimeters.

You are asked to address the following questions:

1. Are the technical performance requirements appropriately defined and complete for this stage of the project?
2. Are the plans for achieving detector performance and construction sufficiently developed and documented for the present phase of the project?
3. Are the current designs and plans for detector and electronics readout likely to achieve the performance requirements with a low risk of cost increases, schedule delays, and technical problems?
4. Are the calorimeter fabrication and assembly plans consistent with the overall project and detector schedule?
5. Are the plans for detector integration in the EIC detector appropriately developed for the present phase of the project?
6. Have ES&H and QA considerations been adequately incorporated into the designs at their present stage?

Please address these questions point-by-point.

You will be supplied with the detailed schedule and manpower assumptions, drawing packages, copies of presentations relevant to this subject material, and the project milestones extracted from the most current EIC resource loaded P6 schedule as part of the pre-brief material.

Note that several aspects of the EIC detector integration and installation, its electronics, and data acquisition systems have been reviewed previously. Along with your briefing materials, you will also be supplied with the reports from these earlier reviews.

Review Committee: four people, TBD

Timing: 2 days, period of December 1 to December 16. Assume each day from 8 am to 2 pm EST, or 2 pm to 8 pm CET.

Conveners: Elke Aschenauer and Rolf Ent

Agenda Day-one (note that each talk time assumes more than 1/3 of time for questions and discussion)

30 min Executive Session (Closed Session) – needs some time as context important

30 min Welcome and Introduction (introduce the general project status) – Elke/Rolf

30 min Electromagnetic Calorimetry Overview and Requirements – Sasha Bazilevsky (BNL)

30 min Hadronic Calorimetry Overview and Requirements – Alexander Kiselev (BNL)

30 min Overall Detector Integration Status and CAD Design – Roland Wimmer or Rahul Sharma (BNL)

20 min Break

40 min Backward Electromagnetic Calorimetry detector and integration – Carlos Munoz Camacho (IJCLab) and engineer

20 min Backward Hadron Calorimetry detector upgrade (material distribution and impact on magnet design, backward HCal requirements, simulations and feasibility – Leszek Kosarzewski (CTU Prague)

40 min SciGlass-Based Barrel Electromagnetic Calorimetry detector and integration – Tanja Horn (CUA) and Josh/Avishay

30 min Imaging-Calorimeter Barrel Electromagnetic Calorimetry alternate option – TBD (ANL)

60 min Executive Session – Discussion

Agenda Day-Two

30 min Barrel Hadronic Calorimetry detector and upgrades – John Lajoie (ISU)

40 min Forward Electromagnetic Calorimetry detector and integration – Oleg Tsai (UCLA) and engineer

40 min Forward Hadronic Calorimetry detector and integration – Friederike Bock (ORNL) and engineer

20 min Calorimetry Electronics Overview – Fernando Barbosa (JLab)

15 min Forward Electromagnetic Calorimetry electronics – Gerard Visser (Indiana)

15 min Forward Hadronic Calorimetry electronics – TBD (ORNL)

20 min Break

3 hr Executive Session and closeout