



Charge for the USCMS HL-LHC ESH and QA Conceptual Design Review

The CMS experiment at CERN's Large Hadron Collider is embarking on a program to ready the detector to collect data during the High Luminosity LHC phase, which will begin in 2026 and last for approximately 10 years, delivering an integrated luminosity of 3-4 ab^{-1} to the CMS detector. Due to the high irradiation and particle collision rates, the detector and its related electronics, trigger and DAQ must be upgraded. The US has significant responsibilities and deliverables within the international CMS upgrade program. The upgrade is funded by both DOE and NSF. The project received DOE CD-0 in March of 2016.

This review of the ESH and QA aspects of the Project is to assess the Project's readiness for DOE CD-1. It also responds to recommendations of a previous DOE review held in June of 2018.

The review team is asked to address the following questions:

1. Are the ES&H and QA aspects of the Project being properly addressed and is ESH and QA planning sufficient for this stage of the Project?
2. Are there ES&H and QA resources assigned to the Project organization with defined roles and responsibilities?
3. Has the Project established the flow-down of ES&H and QA requirements to collaborating Institutions?
4. Is the documentation required by DOE O413.b for CD-1 approval complete and in good order?
5. Does the preliminary Hazard Analysis Report (pHAR) address the known Project hazards and present mitigation strategies?
6. Has the Project satisfactorily responded to ESH & QA recommendations from previous reviews?

Finally, the Committee should present findings, comments, recommendations and answers to the above questions at a closeout meeting with the USCMS-HL-LHC Project Management team, and Fermilab management. A final written report should be provided approximately 2 weeks following the review.