Design Review:

DUNE Single Phase Cathode Plane Assembly, Field Cage and High Voltage

9–10 November 2016

DRAFT Charge

The Committee is requested to review the DUNE cathode plane assembly (CPA), field cage (FC) and high voltage (HV) technical design and determine if it is at a state commensurate with that needed for producing the equipment planned for the NP04 ProtoDUNE prototype detector operation at the CERN Neutrino Platform in 2018.

In particular, the review team is asked to address the following questions:

1. Does the CPA/FC/HV design meet the requirements? Are the requirements/justifications sufficiently complete and clear?
2. Are CPA/FC/HV risks captured and is there a plan for managing and mitigating these risks?
3. Does the design lead to a reasonable production schedule, including QA, transport, installation and commissioning?
4. Does the documentation of the CPA/FC/HV technical design provide sufficiently comprehensive analysis and justification for the CPA/FC/HV design adopted?
5. Are all CPA/FC/HV interfaces to other detector components (APA, detector support system and beam plug) and cryostat documented, clearly identified and complete? Does the TPC integrated 3D model adequately represent the mechanical interfaces to the CPA/FC/HV and between adjacent CPA/FC?
6. Are the CPA/FC/HV 3D model, top level assembly drawings, detail/part drawings and the material and process specifications sufficiently complete to demonstrate that the design can be constructed and installed?
7. Is the grounding of the FC ground planes and to the APA and shielding/filtering of the HV understood and adequate?
8. Are the design radii, surface finish, cleanliness and QC standards adequate to support operation at the design HV?
9. Is the HV system design comprehensive and integrated? Are appropriate safety concerns incorporated into the design? Is the HV system monitoring properly integrated in the Detector Safety System? Is appropriate HV filtering in place to effectively reduce noise on cold electronics and photon system?
10. Is the HV feedthrough design comprehensive and integrated?
11. Are operation conditions (loads and temperature) listed, understood and comprehensive?
12. Are the CPA/FC/HV engineering analyses sufficiently comprehensive for safe handling, installation and operation at the CERN Neutrino Platform? Is the installation plan for the CPA/FC/HVs sufficiently well developed? Is the design for the installation tooling adequate for installation of the CPA/FC/HV?
13. Is the CPA/FC/HV quality assurance, quality control and test plan adequate? Have applicable lessons-learned from previous LArTPC devices been documented and implemented into the QA plan? Does the plan appropriately account for CPA/FC/HV production at multiple international sites with different standards (metric/imperial) for available stock materials?
14. Are the teams sufficiently resourced to deliver on time?

The committee should present its findings, comments, and recommendations in a closeout meeting with DUNE management at the end of the review, on November 10. The committee should provide a final written report by November 18.