



EDMS: 2060044

International Review on D1 and D2 superconducting magnets for HL-LHC

Objectives of the Review:

HL-LHC is in the final stage of design and prototyping: all technologies for the hardware upgrade must be fully proven by 2020. This review covers three important superconducting magnets for HL-LHC sharing the same basic technology, namely the use of Nb-Ti Rutherford cable. These magnets are designed and manufactured as in-kind contribution for HL-LHC by two different Institutes in collaboration with CERN that will complete integration in a cryo-assembly:

- MBXF (D1) single aperture dipole cold mass and vertical test at 1.9 K: KEK (Tsukuba, Japan); cryostat by CERN;
- MBRD (D2) double aperture dipole magnet: INFN (Genova, Italy): cold mass and cryostat by CERN;

CERN will carry out all cryogenic and power test in the final configuration.

The scope of this review is to examine:

- Magnet requirements and final design status including conductor choice, mechanical structure, field quality, quench protection, cold mass with its interfaces (cryostats, electrical, hydraulic, mechanical, vacuum), integration issues, safety aspects and planning requirements;
- Strategy for in-kind procurements;
- Results of model magnets and status of prototype magnets;
- Strategy for magnet construction and/or procurement and overall production/delivery schedule;
- Status of production tooling, finalization of design, status and maturity of production procedure definition and QA, tracking and production documentation and information exchange with CERN;
- Components procurement and preparation status and plans (including superconducting cable);
- QA/QC and status of documentation;
- Test plan and acceptance criteria.



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Mandate:

The review committee is invited to assess the soundness of the design and technical choices, the readiness of the various components and of the construction plan and the documentation, the QA/QC plan and its implementation, the test plan and the acceptance criteria, the status of the integration with special attention to interfaces (e.g. magnet to cold-mass, and cold-mass to cryostat). A detailed resources analysis is beyond the scope of the review, however comments on the credibility of the plan, also with respect to the available resources that will be mentioned in the review, are welcome.

As mentioned above, these magnets are in joint venture between CERN and various Institutes (KEK, INFN). The committee is invited to comment on the level of integration of the teams and on the collaboration interface and information and documentation exchange.

Following the close-out by the review chair, the committee is required to compile a short report with findings, comments and recommendations within one month. The report will be delivered to L. Rossi, HL-LHC Project Leader. The chair (or a member of the panel in case of unavailability of the chair) will report the result to the HL-TCC.

Members of the Review Panel:

Peter Wanderer (BNL, part time, chair)
Hélène Felice (CEA)
Massimo Sorbi (INFN)
Jim Strait (FNAL)
Akira Yamamoto (KEK-CERN)

Dates and Place:

11 March afternoon, 12 March and 13 March morning (2019) at CERN in room 30-7-018

Program:

The program is on 3 days, organized as follows

Day 1: Afternoon

- MBRD (D2)

Day 2: Morning

- MBXF (D1)

Day 2: Afternoon:

- Closed Session: discussion, further materials/talks as required, writing close out;



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Day 3: morning

- Closed session: writing report and close out;
- Close out

End by noon of 13 March.

Ezio Todesco will be the link-person to propose and finalize the detailed program

Andrea Musso will be the scientific secretary

Elodie Kurzen will be the review assistant