EDMS: 2187965

HL-LHC Magnet Circuits Review

Mandate and objectives:

The Panel invited:

1. To review the final layout of the magnet circuits including the aspects related to powering and quench protection strategies, making sure that the right choices have been made both in terms of circuit optimization and protection reliability;

2. To review the adequacy of the protection of the circuits for the different configurations that are adopted in order to assure safe commissioning and operation with beam. This aspect includes protection in case of quenches, failures of various components or of systems, effects of protection equipment to beam, protection of power converters, etc.;

3. To review the integration of equipment respecting installation and maintainability requirements;

4. To review the proposed instrumentation for protection and the ancillary equipment (feeders, feedthroughs, etc.) and its test in operational condition in the IT String;

5. To assess on the Electrical Quality Assurance strategy of cold/warm equipment and circuits, making sure that insulation coordination is properly established.

While this is mainly a technically oriented review, (management is reviewed by special Cost & Schedule Reviews) the Panel may comment on the level of integration and collaboration between various Work packages and teams participating to the circuits design and realization.

Members of the Review Panel:

Akira Yamamoto (KEK-CERN-Chair)
Hans-Jörg Eckoldt (DESY)
Jim Strait (FNAL)
Neil Mitchell (ITER)
Paolo Fessia (CERN)
Steve Gourlay (LBNL)

Link person: Felix Rodriguez Mateos
Scientific Secretary: Samer Yammine

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Dates and Place:

9 September and 10 September at CERN, room 30/7-018

Program (draft):

The program is on 2 days, organized as follows:

Day 1:

- Closed Session
- HiLumi Status and Charge to Review
- Introduction to the HL-LHC circuits and report from previous review
- Warm powering and adequacy with respect to requirements (incl. warm cabling)
- Cold powering
- Superconducting bus bars inside cryostats
- Requirements and solutions for quench protection– including coils, bus bars, link: from simulations to protection layouts, failure scenarios
- Quench detection, related hardware and required instrumentation
- Quench protection hardware
- Implementation of protection instrumentation and related equipment (feeders, feedthroughs, etc.)
- Contribution of power converters to the protection of the circuits
- Potential effects of protection equipment to beam
- Overview on integration of HL-LHC circuit systems (UR, UL, USC55, tunnel, etc.)
- Document Plan, management of change
- Closed Session

Day 2:

- Recommended voltage test levels: evolution of criteria
- 11T MBH: Test results with emphasis on electrical integrity tests and quench protection, evolution of quench heater insulation
- MQXF: Test results with emphasis on electrical integrity tests and quench protection, evolution of quench heater insulation
- NbTi magnets: Test results with emphasis on electrical integrity tests and quench protection
- The systems validation in a full scale Inner Triplet
- Closed session including working lunch for Panel
- Close out of the Review