Technical Meeting on Quench Protection Heaters and Electrical Tests of the 11 T Dipole

Panel:

- Jan Borburgh, TE-ABT
- Laurent Ducimetière, TE-ABT
- Arnaud Foussat (Scientific Secretary), TE-MSC
- Felix Rodriguez Mateos (Chair), TE-MPE
- David Tommasini, TE-MSC
- Akira Yamamoto, ATS-DO

CERN, January 11, 2019

Questions to Panel (1)

1. Assess on the **quench protection heater design, manufacture and QC**

- Assessment of the current design of QH protection scheme
- Is there any potential modification of the existing design which could lead to a more robust solution or have an impact on identified insulation weakness ?
- Assessment of QA/QC developed on QHs series production.
- Assessment on the analysis of the non-conformities showing the tests results, failures or non-conformities observed

Questions to Panel (2)

2. Assess on the **electrical tests** of the 11 T magnet (manufacture and baseline)

- Assessment of the current electrical test program implemented on quench heaters, coil, magnets during manufacture and further in operation. Adequacy with respect to the baseline proposed by the Project.
- Assessment of the long term reliability of quench heaters
- Identification of any recommended, supplementary tests on heaters during scenario of repair or maintenance actions (if the latter are recommended)
- To propose any complementary test campaign -if necessary- on models, prototypes or series magnets.
- To assess current QA/QC hi-pot electrical test and any additional characterization proposed plan on the QH insulation system.

Questions to Panel (3)

3. Assess on **risks of electrical failure** in present configuration in comparison with an external, non-impregnated, quench heater option

- to check the design margin in the two different scenarios of quench heater integration
- to assess on any trial test which could support a decision to be taken
- considering magnet operating conditions, circuit configuration, maintenance scenario on quench heaters during accelerator operation, to consider what would be the risks in either of the proposed quench heaters layouts.

4. Assess on the proposed **scenarios for 11 T production**

- considering the given boundary conditions of the LS2 milestones to be met, to assess what shall be the best technical strategy and/or mitigation actions which minimize risks on magnet performance.

Agenda (1)

08:30→ 08:35 **Introduction and objectives,** Speaker: Felix Rodriguez Mateos (CERN)

08:35→ 09:05 **Boundary conditions, coils insulation system design and issues identification,** Speaker: Frederic Savary (CERN)

09:05→ 09:35 **Quench protection studies on 11T dipole and comparison with test results,** Speaker: Susana Izquierdo Bermudez (CERN)

09:35 → 10:15 **Heater design, manufacture and QC,** Speaker: Christian Scheuerlein (CERN)

10:15 → 10:30 **Coffee break**

10:30 → 11:10 **Heater implementation in coils (baseline),** Speaker: Frederic Savary (CERN)

Agenda (2)

11:10→ 11:35 **Electrical test baseline,** Speaker: Tiago Daniel Catalao Rolhas Da Rosa

11:35 → 12:10 **Electrical tests and root-cause analysis of faults,** Speaker: Jan Petrik
12:10 → 12:20 **SP109 endurance test results, investigation of HV test station limits,** Speaker: Gerard Willering
12:20 → 12:35 Discussion**,** 15m

Lunch break (closed session, Panel lunch)

13:30 → 14:10 **Possible scenarios for 11 T production,** Speaker: Frederic Savary (CERN)

14:10 → 14:40 **Open discussion**

14:40 → 17:30 **Closed session**

~~17:30 → 18:00 **Close out** ~~**(postponed)**