



Special Technical Meeting on the 11T Dipole QH-Trace to Wire Jointing

Introduction


F. Savary
















CERN – Virtual room <https://indico.cern.ch/event/978144/> – 2020.11.27

Agenda of today's meeting

Special technical meeting on the 11T dipole QH trace to wire jointing procedure

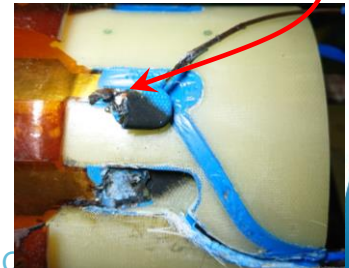
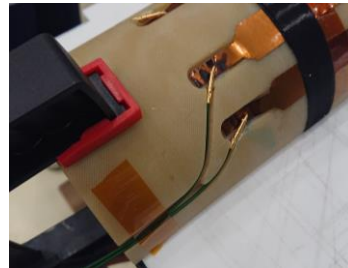
 Friday 27 Nov 2020, 14:00 → 16:30 Europe/Zurich

Videoconference Rooms  11T dipole QH trace to wire jointing procedure [Join](#) 

- 14:00 → 14:15 Introduction**  15m 
Speaker: Frederic Savary (CERN)
- 14:15 → 14:35 Description of the test campaign, samples, and jointing procedures**  20m 
Speakers: Frederic Savary (CERN), Michel Andreini, Rosario Principe (CERN), Thibault Genestier (General Electric)
- 14:35 → 15:05 Electrical tests**  30m 
Speaker: Ludovic Grand-Clement (CERN)
- 15:05 → 15:45 Non-destructive – destructive examination of samples**  40m 
Speakers: Mariusz Dawid Jedrychowski (CERN), Mickael Denis Crouvizier (CERN), Mickael Sebastien Meyer (CERN)
- 15:45 → 16:00 Proposal to move forward**  15m 
Speaker: Frederic Savary (CERN)
- 16:00 → 16:30 Discussion: Questions and answers** 
Convener: Frederic Savary (CERN)

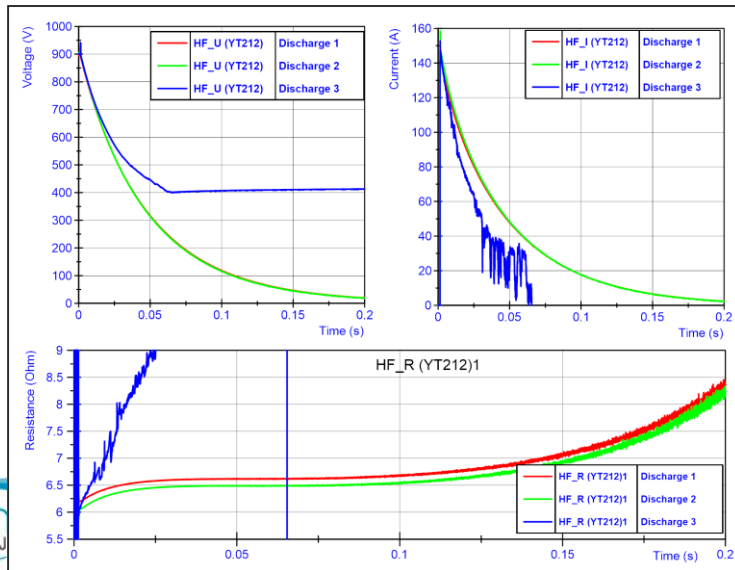
Why this meeting?

- There have been QH failures during the cold tests of two 11T dipole magnets:
 - One in the magnet S3 (LMBHA-002) tested in Jan./Feb. 2020
 - Another one in the magnet S4 (LMBHB-003) tested in Sept./Oct. 2020
- Till then, none of the 40 connections of the coils equipped with impregnated QHs (10 series coils) had shown any issue
- Whereas, 2 out of 32 connections of the coils equipped with external QHs (8 series coils) have failed in open loop
- As to S3, reflectometry, and later on visual inspection of the coil, have pointed to the QH-trace to wire jointing, as shown on the picture below
- S4 is not yet dismantled but reflectometry is pointing to the same location

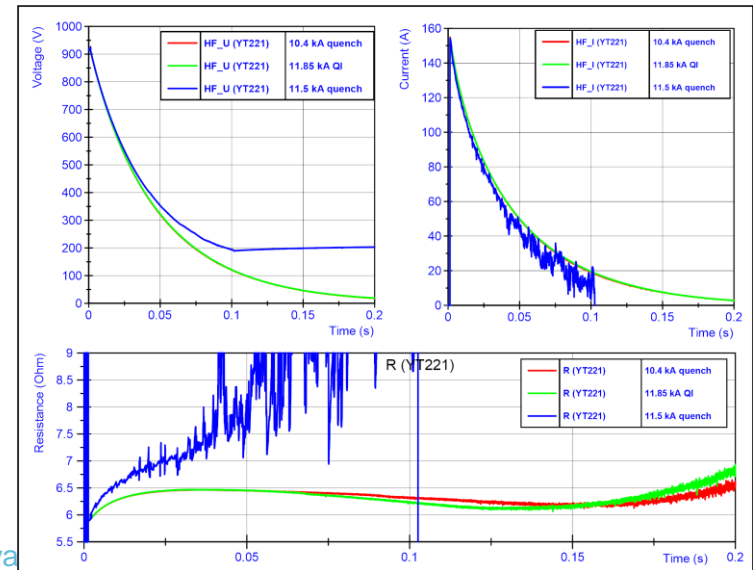


QH-trace to wire jointing issue – Facts

- Case of the magnet **S3**, coil **C14**, **D2-Lo**
 - At RT, in production, 4 discharge tests are made, 1 after collaring, 3 during CM construction (400 V, 80 A)
 - Failure at 3rd QH firing during reception tests at cold** prior to powering (900 V, 150 A)
 - Circuit YT-212
 - No sign of degradation during the first 2 discharges
 - NCR EDMS [2311125](#)



- Case of the magnet **S4**, coil **C17**, **D2-Up**
 - At RT, in production, 4 discharge tests are made, 1 after collaring, 3 during CM construction (400 V, 80 A)
 - Failure at 12th QH firing at cold**
 - Circuit YT-221
 - No sign of degradation during the previous discharges
 - NCR EDMS [2423242](#)



11T dipole magnets inventory

Magnet ID	Impregnated QHs	External QHs	QH Failure - NCR
LMBHB001 – P1 – Proto	X		None
LMBHP001 – H1 – Hybrid	X		None
LMBHB002 – S1	X		None
LMBHA001 – S2	X		None
LMBHA002 – S3		X	1 circuit in C14
LMBHB003 – S4		X	1 circuit in C17
LMBHA003 – S5		X	Not tested at cold
LMBHB004 – S6		X	Not yet fabricated
LMBHA004 – S7		X	Not yet fabricated

Why this meeting?

- To review the work that has been done
 1. To characterize the electrical integrity of the soldered joints (endurance, robustness) of the baseline concept, and of alternative concepts
 2. To assess the quality of the soldered joints
 3. To determine the root cause of the non-conformity
- To review, and hopefully endorse the proposed solution



Thank you for your attention!
Questions?

