US HL-LHC Accelerator Upgrade Project

MQXFA08b Structure & Shims Review

TABLE OF CONTENTS

1. Goal & scope

The HL-LHC AUP project is starting the assembly of MQXFA08b magnet. This is the first re-assembly of an MQXFA magnet that did not meet requirements during vertical test. If MQXFA08b meets MQXFA requirements [1] it will be used in a Q1/Q3 cryo-assembly to be installed in the HL-LHC.

During vertical test MQXFA08 reached and hold acceptance current (16.53 kA) but showed detraining to ~15.7 kA afterwards. All detraining and limiting quenches were in coil 213 [2]. The other three coils of MQXFA08 did not show any issue and will be re-used in MQXFA08b. Coil 218 has been selected to replace coil 213.

MQXFA08 coils were reviewed during the MQXFA08 Coils Acceptance Review [3]. Coil 218 was reviewed during the Coils Acceptance Review for MQXFA07b and MQXFA11 [4]. MQXFA08b coil ordering and voltages were reviewed during a Working Group meeting [5]. MQXFA08 structure was reviewed during the MQXFA08 Structure & Shims Review [6].

MQXFA Series magnet specifications are presented in [7]. Discrepancy or Non-Conformity Reports are generated whenever a component does not meet specifications [8].

The goal of this review is to evaluate MQXFA08b structure assembly and shim plans. Reviewers should also assess that discrepancies and non-conformities from MQXFA08 disassembly and inspection have been adequately processed, and that the shims will allow MQXFA08b to meet MQXFA requirements [1].

2. Charges

The committee is requested to answer the following questions:

1. Have discrepancies and non-conformities been adequately documented and processed?
2. If there are critical non-conformities, have they been adequately documented and processed?
3. Are the proposed shims adequate for allowing MQXFA08b to meet MQXFA requirements [1]?
4. Have all recommendations from previous reviews [9] been adequately addressed?
5. Do you have any other comment or recommendation to assure MQXFA08b is going to meet requirements?

3. Technical information

Committee
Peter Wanderer, chairperson (BNL)
Susana Izquierdo Bermudez (CERN)
Rodger Bossert (FNAL)

Date and Time
June 14, 2022. Start time is 7/9/10/16 (LBNL/FNAL/BNL/CERN)

Location/Connection
Video-link by Zoom, info by email.

Link to agenda with talks and other documents
https://indico.fnal.gov/event/54942/

4. References

1) *MQXFA Functional Requirements Specification,* US-HiLumi-doc-36.
2) *MQXFA08 Test Results*, https://indico.fnal.gov/event/53196/
3) *MQXFA08 Coils Acceptance Review*, US-HiLumi-doc-4057.
4) *Coils Acceptance Review for MQXFA07b and MQXFA11*, US-HiLumi-doc-4224.
5) *Coil WG meeting on May 26, 2022*, https://indico.fnal.gov/event/54756/
6) *MQXFA08 Structure & Shims Review*, US-HiLumi-doc-4058.
7) *MQXFA Series Magnet Production Specification*, US-HiLumi-doc-4009.
8) *Handling of Discrepancies and Nonconformances*, US-HiLumi-doc-2484.
9) *MQXFA11 Structure & Shims Review*, US-HiLumi-doc-4309.