



MQXFA13b Structure & Shims Review

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US HL-LHC Accelerator Upgrade Project

MQXFA13b Structure & Shims Review



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1. Goal & scope

The HL-LHC AUP project is starting the assembly of MQXFA13b quadrupole magnet. This is the re-assembly of MQXFA13 that showed some issues during vertical testing (slow training and quenches after down-ramp at 100 A/s) even if it was able to reach and hold acceptance current. If MQXFA13b meets MQXFA requirements [1] it will be used in a Q1/Q3 cryo-assembly to be installed in the HL-LHC.

All issues during MQXFA13 test occurred in a single coil (227). This coil has been removed and is being replaced by coil 241 that was reviewed on November 8, 2023 [2]. In order to avoid reoccurrence of the MQXFA13 issue, analysis of CMM data in coil ends [3] and assessment of minimum loading-key shim size were added to the assembly plan.

MQXFA Series magnet specifications are presented in [4]. Discrepancy or Non-Conformity Reports are generated whenever a component does not meet specifications [5].

The goal of this review is to evaluate MQXFA13b structure and shim plan. Reviewers should also assess that discrepancies and non-conformities of the magnet structure have been adequately processed, and that the shims will allow MQXFA13b to meet MQXFA requirements [1].

2. Charges

The committee is requested to answer the following questions:

1. Have all recommendations from previous reviews [6] been adequately addressed?
2. Have discrepancies and non-conformities been adequately documented and processed?
3. If there are major/critical non-conformities [5], have they been adequately documented and processed?
4. Are the proposed shims adequate for allowing MQXFA13b to meet MQXFA requirements [1]?
5. Do you have any other comment or recommendation to assure MQXFA13b is going to meet requirements?



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3. Technical information

Committee

Rodger Bossert, chairperson (FNAL)
Mike Anerella (BNL)
Susana Izquierdo Bermudez (CERN)

Date and Time

January 10, 2024.
Start time is 7:00/9:00/10:00/16:00 (LBNL/FNAL/BNL/CERN)

Location/Connection

Video-link by Zoom, info by email.

Link to agenda with talks and other documents

[MQXFA13b Structure & Shims Review \(January 10, 2024\) · INDICO-FNAL \(Indico\)](#)

4. References

- 1) *MQXFA Functional Requirements Specification*, US-HiLumi-doc-36.
- 2) *MQXFA13b Coils Acceptance Review*, US-HiLumi-doc-4956.
- 3) *MQXFA Series Coil Production Specification*, US-HiLumi-doc-2986.
- 4) *MQXFA Series Magnet Production Specification*, US-HiLumi-doc-4009.
- 5) *Handling of Discrepancies and Nonconformances*, US-HiLumi-doc-2484.
- 6) *MQXFA17 Structure and Shims Review*, US-HiLumi-doc-4939.