



**MQXFA12b
Coils Acceptance Review**

US-HiLumi-doc-4972
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US HL-LHC Accelerator Upgrade Project

MQXFA12b Coils Acceptance Review



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1. Goal & scope

The HL-LHC AUP project is planning to start assembly of MQXFA12b. MQXFA12 had an electrical issue caused by misplaced connector elements that triggered a coil-pole breakdown during an hipot test [1]. Two coils were not able to meet hipot specs after this issue and were put on hold. The other two coils of MQXFA12 (224 and 225) still meet all electrical specs and will be re-used in MQXFA12b.

In MQXFA12b AUP is planning to use these new QXFA coils: 158, 159, and 150 as spare.

Coil 150 was presented at the MQXFA17 Coil Acceptance Review [2]. At that time, it was recommended not using it because of small arc length in the ends. Updated analysis of this issue was presented during the MQXFA13b Coils Acceptance Review, and coil 150 was accepted as spare for MQXFA13b [3]. Therefore, it is assumed accepted as spare for MQXFA12b.

If MQXFA12b meets MQXFA requirements [4] it will be used in a Q1/Q3 cryo-assembly to be installed in the HL-LHC.

Conductor and series coil specifications are presented in [5-9]. Discrepancy or Non-conformity Reports are generated whenever a component does not meet specifications.

The reviewers are requested to review discrepancies and non-conformities in these coils and their strands and cables: 158 (cable P43OL1257) and 159 (cable P43OL1192).

2. Charge questions

The committee is requested to answer the following questions:

1. Have all recommendations from previous reviews [3] been adequately addressed?
2. Have Discrepancies and Non-conformities been adequately documented and processed (all DR/NCR for coils 158 and 159), and new DR/NCR for the other coils)?
3. If there are critical Discrepancies/Non-conformities, have they been adequately documented and processed?
4. Is there any coil that you recommend not to use in MQXFA12b?
5. Do you have any other comment or recommendation regarding these coils and their conductor for allowing MQXFA12b to meet MQXFA requirements [1]?



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3. Technical information

Committee

Arup Ghosh (chairperson), BNL retired

Susana Izquierdo Bermudez, CERN

GianLuca Sabbi, LBNL

Date and Time

January 23, 2024. Start time is 7/9/10/16 (LBNL/FNAL/BNL-FSU/CEA-CERN)

Location/Connection

Video-link by Zoom, info by email.

Link to agenda with talks and other documents

<https://indico.fnal.gov/event/62950/>

4. References

- 1) [MQXFA12 electrical issue and plans \(November 16, 2022\) - INDICO-FNAL \(Indico\)](#)
- 2) *MQXFA17 Coils Acceptance Review*, US-HiLumi-doc-4937
- 3) *MQXFA13b Coils Acceptance Review*, US-HiLumi-doc-4956
- 4) *MQXFA Functional Requirements Specification*, US-HiLumi-doc-36
- 5) *Specification for Quadrupole Magnet Conductor*, US-HiLumi-doc-40
- 6) *Cable Specification*, US-HiLumi-doc-74
- 7) *Quadrupole Magnet Cable Insulation*, US-HiLumi-doc-75
- 8) *QXFA Series Coil Production Specification*, US-HiLumi-doc-2986
- 9) *QXFA Series Coil Fabrication Electrical QC plan*, US-HiLumi-doc-521