US HL-LHC Accelerator Upgrade Project

MQXFA13 Coils Acceptance Review

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1. Goal & scope

The HL-LHC AUP project is planning to start assembly of MQXFA13. This is the 6th series low-beta quadrupole magnet (MQXFA) for the Inner Triplet of the High Luminosity LHC. If MQXFA13 meets MQXFA requirements [1] it will be used in a Q1/Q3 cryo-assembly to be installed in the HL-LHC.

For MQXFA13 assembly AUP is planning to use QXFA coils: 139, 141, 227 and 229. Coil 218 is planned for future use in MQXFA07b and is a spare coil for MQXFA12. Coil 218 was reviewed during the *Coils Acceptance Review for MQXFA07b and MQXFA11* [2]. Another spare coil is coil 220. Coil 220 was reviewed during the *MQXFA10 Coils Acceptance Review* [3] and during the *MQXFA12 Coils Acceptance Review* [4].

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 strands, cables and coils, for the following coils: 139 (cable P43OL1164), 141 (cable P43OL1167), 227 (cable P43OL1156), and 229 (cable P43OL1161).

2. Charge questions

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 Discrepancies/Non-conformities, have they been adequately documented and processed?
3. Did the L3s properly identified critical Discrepancies/Non-conformities?
4. Is there any coil that you recommend not to use in MQXFA13?
5. Do you have any other comment or recommendation regarding these coils and their conductor for allowing MQXFA13 to meet MQXFA requirements [1]?

3. Technical information

Committee
Steve Gourlay (chairperson), LBNL
Arup Ghosh, BNL retired
Susana Izquierdo Bermudez, CERN

Date and Time
November 2, 2022. Start time is 7/9/10/16 (LBNL/FNAL/BNL-FSU/CERN)

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

Link to agenda with talks and other documents
https://indico.fnal.gov/event/56491/

4. References

1) *MQXFA Functional Requirements Specification*, US-HiLumi-doc-36
2) *Coils Acceptance Review for MQXFA07b and MQXFA11*, US-HiLumi-doc-4224.
3) *MQXFA10 Coils Acceptance Review*, US-HiLumi-doc-4186
4) *MQXFA12 Coils Acceptance Review*, US-HiLumi-doc-4321
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