US HL-LHC Accelerator Upgrade Project

MQXFA14 Coils Acceptance Review

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1. Goal & scope

The HL-LHC AUP project is planning to start assembly of MQXFA14. This is the 7th series low-beta quadrupole magnet (MQXFA) for the Inner Triplet of the High Luminosity LHC. If MQXFA14 meets MQXFA requirements [1] it will be used in a Q1/Q3 cryo-assembly to be installed in the HL-LHC.

For MQXFA14 assembly AUP is planning to use these QXFA coils (including a spare one): 142, 143, 230, 231, and 220. Coil 220 was reviewed during the *MQXFA10 Coils Acceptance Review* [2] and during the *MQXFA12 Coils Acceptance Review* [3].

Conductor and series coil specifications are presented in [4-8]. 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: 142 (cable P43OL1172), 143 (P43OL1173), 230 (P43OL1166), 231 (P43OL1168).

2. Charge questions

The committee is requested to answer the following questions:

1. Have all recommendations from previous reviews [9] been adequately addressed?
2. Have Discrepancies and Non-conformities been adequately documented and processed?
3. If there are critical Discrepancies/Non-conformities, have they been adequately documented and processed?
4. Did the L3s properly identified critical Discrepancies/Non-conformities?
5. Is there any coil that you recommend not to use in MQXFA14?
6. Do you have any other comment or recommendation regarding these coils and their conductor for allowing MQXFA14 to meet MQXFA requirements [1]?

3. Technical information

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

Date and Time
December 16, 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/57433/

4. References

1) *MQXFA Functional Requirements Specification*, US-HiLumi-doc-36
2) *MQXFA10 Coils Acceptance Review*, US-HiLumi-doc-4186
3) *MQXFA12 Coils Acceptance Review*, US-HiLumi-doc-4321
4) *Specification for Quadrupole Magnet Conductor*, US-HiLumi-doc-40
5) *Cable Specification*, US-HiLumi-doc-74
6) *Quadrupole Magnet Cable Insulation*, US-HiLumi-doc-75
7) *QXFA Series Coil Production Specification*, US-HiLumi-doc-2986
8) *QXFA Series Coil Fabrication Electrical QC plan*, US-HiLumi-doc-521
9) *MQXFA13 Coils Acceptance Review*, US-HiLumi-doc-4609