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## Preparing the commissioning of the HL-LHC superconducting magnet circuits: from the inner triplet string to the CERN accelerator complex

*Wednesday 4 June 2025 16:00 (2 hours)*

The High Luminosity-Large Hadron Collider (HL-LHC) project at CERN aims to increase the integrated luminosity of the Large Hadron Collider by an order of magnitude compared to the LHC original design performance. To achieve this, the existing magnets surrounding the CMS and ATLAS experiments will be replaced with next-generation, high-performance superconducting magnets featuring larger apertures and higher magnetic fields than those currently used in the LHC. These magnets will be powered using a novel superconducting link and state-of-the-art power converters. Upgraded quench detection and protection systems will protect the magnet circuits.

This work provides a comprehensive overview of the HL-LHC magnet circuits and their associated complexities. The commissioning methodology for the HL-LHC magnet circuits is outlined, detailing its validation within the HL-LHC Inner Triplet String test facility, currently under construction, prior to deployment within the CERN accelerator complex. These procedures ensure the reliability and operational readiness of the upgraded systems, paving the way for a successful magnet circuits operation in the HL-LHC era.

### Footnotes

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