

The LHC Long Shutdowns - impact on availability, reliability and routine machine operation

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The CERN accelerator complex is presently undertaking a long period of shutdown, meant to consolidate and upgrade its availability and performance. The Large Hadron Collider (LHC) operation relies on 1232 superconducting dipoles and 400 superconducting quadrupoles powered at 12 kA, operating in superfluid He at 1.9 K. A sophisticated magnet protection system allows safe energy extraction in case of a resistive transition (quench). Presence of metallic debris in the cryostats represented a problem in the past, originating a few short circuits in the diode connection. A consolidation process was deemed necessary. Besides, while the injector complex will be highly upgraded, several interventions are mandatory to cope with the improved situation. This Long Shutdown (LS2) is part of regular interruptions of operation carried out at CERN every three to five years. Furthermore, regular short interruptions also happen every year when the most urgent interventions are carried out. Due to the complexity of the infrastructure, these periods are vital to guarantee reliability and high performance standards of operation.

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