Contribution ID: **18** Type: **not specified**

HL-LHC

Friday 13 May 2022 11:25 (1 hour)

The HL-LHC upgrade project will enable a tenfold increase in integrated luminosity delivered to the ATLAS and CMS experiments by the LHC. Achieving this objective started already recently by an upgrade of the machine protection, collimation and shielding systems during the second long shutdown (LS2) of the LHC, and is followed by the deployment of novel key technologies, including Nb3Sn based insertion regions and final focusing magnets, cold powering by MgB2 superconducting links and integration of Nb crab-cavities to compensate the effects of a larger crossing angle. After a period of intensive R&D and prototyping, the project is now entering the phase of industrialization and series production for all main components. In this presentation, an overview of the project status and plans for deployment and the machines performance ramp-up in Run 4 is presented. Progress on the validation of key technologies, status of prototypes and series production as well as the final integration studies for the HL equipment are summarized. These are accompanied by the imminent completion of major civil works and the start of infrastructure installations. Initial operational experience will be gained at the Inner Triplet String, presently in assembly at CERN's Superconducting Magnet Test Facility, which will enable a fully integrated test of the main magnets, powering, and protection systems in an HL-LHC final focusing configuration.

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