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C1Or1B-02: Cryogenic operational experience from the LHC physics run2 (2015-2018 inclusive)

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With end of year 2018 the LHC has completed its second physics run and started its second two-years long shut down period dedicated to planned consolidation, maintenance and upgrade activities. The run2 –four-year physics operation period started in spring 2015 –was used mainly for luminosity production but also to allow the optimization and adaptability of the cryogenic system capacity to compensate the generated operational static and dynamic heat loads. Several tests and qualifications were studied and applied to the configuration of the available equipment in order to reach and deeply understand the real operation limits. Dedicated improvements were implemented in the control system, especially in regards of handling the beam induced dynamic heat load during transitory and operational states as well as to compensate dynamic heat load related to secondaries in the Inner Triplet magnets, close to the interaction points of the ATLAS and CMS detectors. This paper will give a general overview of the LHC cryogenics operation with specific information on encountered operational difficulties and applied solutions on the system. Helium inventory management, including process use and leaks, as well as the system overall availability indicators will be presented.

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