



## Cryogenics Operations 2018

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### LHC Cryogenics Operation: main achievements of Run 2 from low to high energy beam

After completion of the first major maintenance works performed during the Long Shutdown period (LS1, 2013-14), the LHC came back to operation with beam in April 2015. With the progressively increased beam energy scheme, the operational margins on the cryogenic capacity were drastically reduced. The non-isothermal 4.5-20 K dynamic thermal load, intercepted by the Beam Screens system (BS), is about in average 30% higher than the design value. This implies a high-level optimization of the cryogenic plants and the use of advanced process control system to drive the 585 cooling loops dedicated to the BS temperature control. The presentation will summarize the evolution of the global LHC cryogenic system configuration as well as the operational adaptation scenario. The main encountered issues and applied mitigation approaches will be developed. Finally, the benefits and remaining issues from the Run 2 (2015-2018) will be presented.

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