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Cryogenics system: strategy to achieve nominal performance and reliable operation

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During the LHC operation in 2010 and 2011, the cryogenic system has achieved an availability level fulfilling the overall requirement. To reach this level, the cryogenic system has profited like many other beam-dependent systems from the reduced beam parameters. Therefore, impacts of some failures occurred during the LHC operation were mitigated by using the overcapacity margin, the existing built-in redundancy in between adjacent sector cryogenic plants and the “cannibalization” of spares on two idle cryogenic plants. These two first years of operation were also crucial to identify the weaknesses of the present cryogenic maintenance plan and new issues like SEUs. After the LS1, nominal beam parameters are expected and the mitigated measures will be less effective or not applicable at all. Consequently, a consolidation plan to improve the MTBF and the MTTR of the LHC cryogenic system is under definition. Concerning shutdown periods, the present cryogenic sectorization imposes some restrictions in the type of interventions (e.g. cryo-magnet removal) which can be done without affecting the operating conditions of the adjacent sector. This creates additional constraints and possible extra down-time in the schedule of the shutdowns including the hardware commissioning.

This presentation focuses on the consolidation plan foreseen during the LS1 to improve the performance of the LHC cryogenic system in terms of availability and sectorization.

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