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C1Po1E-01 [30]: Helium management of ESS cryoplants with common safety relief header and recovery system

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The European Spallation Source (ESS) is a neutron-scattering facility being built with extensive international collaboration in Lund, Sweden. Three cryogenic plants with a vast cryogenic distribution system meet the cooling requirements of the superconducting RF cavities in the accelerator (ACCP), the cold hydrogen moderators in the target (TMCP), a cryomodule test stand and the sample environments for neutron instruments (TICP). The first of the three plants, the TICP has been successfully installed, commissioned and acceptance tested in 2018 by Air Liquide Advanced Technologies. Meanwhile the other two cryoplants (ACCP and TMCP) are under commissioning and testing by Linde Kryotechnik AG. The cryoplants share common helium buffer tanks, safety relief headers and helium recovery system due to historical, economical and architectural reasons. The helium recovery strategy and system configuration will be described in the paper. Resulting challenges, risks and safety relevant events that happened during, especially parallel, commissioning activities will be presented. The measures implemented to mitigate major risk and lessons learned are addressed as well.

Primary author: Dr SU, Xiaotao (European Spallation Source ERIC)

Co-authors: Mr ARNOLD, Philipp (European Spallation Source ERIC); Mr NILSSON, Per (European Spallation Source ERIC); Dr WANG, Xilong (European Spallation Source ERIC); Prof. WEISEND, John (European Spallation Source ERIC)

Presenter: Mr ARNOLD, Philipp (European Spallation Source ERIC)

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