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ESS accelerator plant process design

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The European Spallation Source (ESS) is a neutron-scattering facility being built with extensive international collaboration at Lund, Sweden. The ESS accelerator will deliver protons with 5 MW of power to the target at 2.0 GeV, with a nominal current of 62.5 mA. The superconducting part of the accelerator is about 300 meters long and contains 43 cryomodules. The ESS accelerator cryoplant (ACCP) will provide the cooling for the cryomodules and the cryogenic distribution system that delivers the helium to the cryomodules. The cryoplant will cover three cryogenic circuits: Bath cooling for the cavities at 2 K, the thermal shields at around 40-50 K and the power couplers thermalisation with 4.5 K liquid helium.
The open call-for tender for the ACCP had taken place in 2014 with Linde Kryotechnik AG being selected as the cryoplant vendor. This paper summarizes the progress in the ACCP development and engineering. Current status including basic process design, system configuration, machine concept and layout, main parameters and features, solution for the acceptance tests and further optimization is presented.

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