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## **C1Po1E-03: A backup compressor system for the ESS accelerator cryoplant**

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The European Spallation Source ERIC (ESS) is a neutron-scattering facility being built with extensive international collaboration in Lund, Sweden. An essential part of the project is the linear 2.0 GeV proton accelerator (linac). Its superconducting part is cooled by means of a dedicated 2K refrigerator, the Accelerator Cryoplant (ACCP). 2K are achieved with three serial turbo compressors and a warm sub-atmospheric screw compressor. The ACCP operates in a four-pressure process with three warm oil-flooded screw compressors providing these pressures, one of them with sub-atmospheric suction pressure. Every one of these three compressors is a single point of failure for the entire ESS facility. Even worse, periodic maintenance on the high pressure (HP) machine would not be possible without warming up the plant and with it the superconducting linac. It has therefore been decided to implement a backup compressor that can replace any of the existing warm compressors.

The paper summarizes all project phases from initial decision to conceptual design, specification, procurement, execution, installation, commissioning and acceptance testing. Particularly mechanical and controls integration challenges are described in more detail as well as lessons learnt and planned improvements.

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