



## Cryogenics Operations 2018

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### **Cryogenic safety considerations for Vertical Test Facility for qualifying high- $\beta$ SRF cavities for the European Spallation Source.**

A dedicated cryogenic infrastructure has been installed at STFC Daresbury Laboratory to qualify and deliver 84 high-beta SRF cavities for the ESS (European Spallation Source) under construction at Lund, Sweden. In order to meet the delivery schedule and optimise the test process efficiently a large 1.6 m diameter, 3.5 m tall liquid helium cryostat has been developed. RF tests are conducted on 3 cavities at 2K in one cool-down. There are 3 cryogenic circuits operating at 50K, 4.2K and 2K designed to handle a maximum helium mass flow rates of 4g/s. Considering large internal (beam pipe) and external surface areas of the cavities under test the pressure relief system has been designed very carefully. Various limiting scenarios and associated safety scheme are presented in detail in this paper.

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