

Safety Relief Valve to Protect the Cold Masses of the LHC, C. DOERRENBACH, TEST-FUCHS - In order to protect the cold masses of the LHC when the magnets undergo a resistive transition a safety relief valve is developed. The valve acts as a safety device to limit the pressure of the helium in the magnet. It ensures a fast discharge with a $K_v > 30 \text{ m}^3/\text{h}$ into the cryogenic line. It is also used for filling and emptying the cold masses. The working condition is $T = 1.9 \text{ K}$, $p = 1.4 \text{ bar}$ in the inlet and $T = 5 \text{ K}$, $p = 1.3 \text{ bar}$ in the outlet. Under this condition the valve isolates the static superfluid helium with a minimum leak rate of less than 0.01 g/s and with a minimum heat inleak of less than 0.3 W to the superfluid helium. The valve opens at a set pressure of 12 bar (normal mode) or 20 bar (test mode). The main parts of the valve like seat, seals are exchangeable under cold conditions. The performance of the valve is not reduced by solid particles in the helium due from the magnets. The leak rate of the relief valve is measured. First performance tests are carried out on a test bench with liquid nitrogen. The presentation discusses the relief valve design and the test results.