SM18
cryogenic test facility for superconducting magnets

The main magnetic system of LHC consists of 1232 twin-aperture, high-field superconducting dipoles (plus 40 spare) and 480 twin-aperture, high-gradient superconducting quadrupoles (plus 10 spare) operating in pressurized super fluid helium below 1.9 K. All these magnets were tested in this hall (SM 18) before their final installation in the accelerator tunnel. Reception tests include complex procedures such as fast cool down and warm up, powering to nominal current and possible training, magnetic measurements in the apertures, leak tightness etc.

12 CFBs were used for LHC magnet series test. At full capacity 2 LHC magnets were tested per day.

In order to run these test benches a complete cryogenic infrastructure was necessary. This infrastructure consists of combined cryogenic and cooling/warming line, two cooling units (CWU), few types of heaters, circulating compressors, cold compressors, warm pumping units and helium supply buffered by the 25 000 l liquid helium Dewar.

COLD COMPRESSOR (CC)
The compressor pumps saturated helium at 3 K and at 10 mbar and compress it to 30 mbar.

COOLING UNIT (CWU) and GHe HEATER
Maximum cooling power is 120 kW.
The warming up power is 200 kW.

TEST SEQUENCES
1) Installation of the magnet
2) Test of tightness and electrical test
3) Cool down to 1.9 K
4) Powering to nominal current
5) Warming up
6) Dismantling

SM18
cryogenic test facility for superconducting magnets