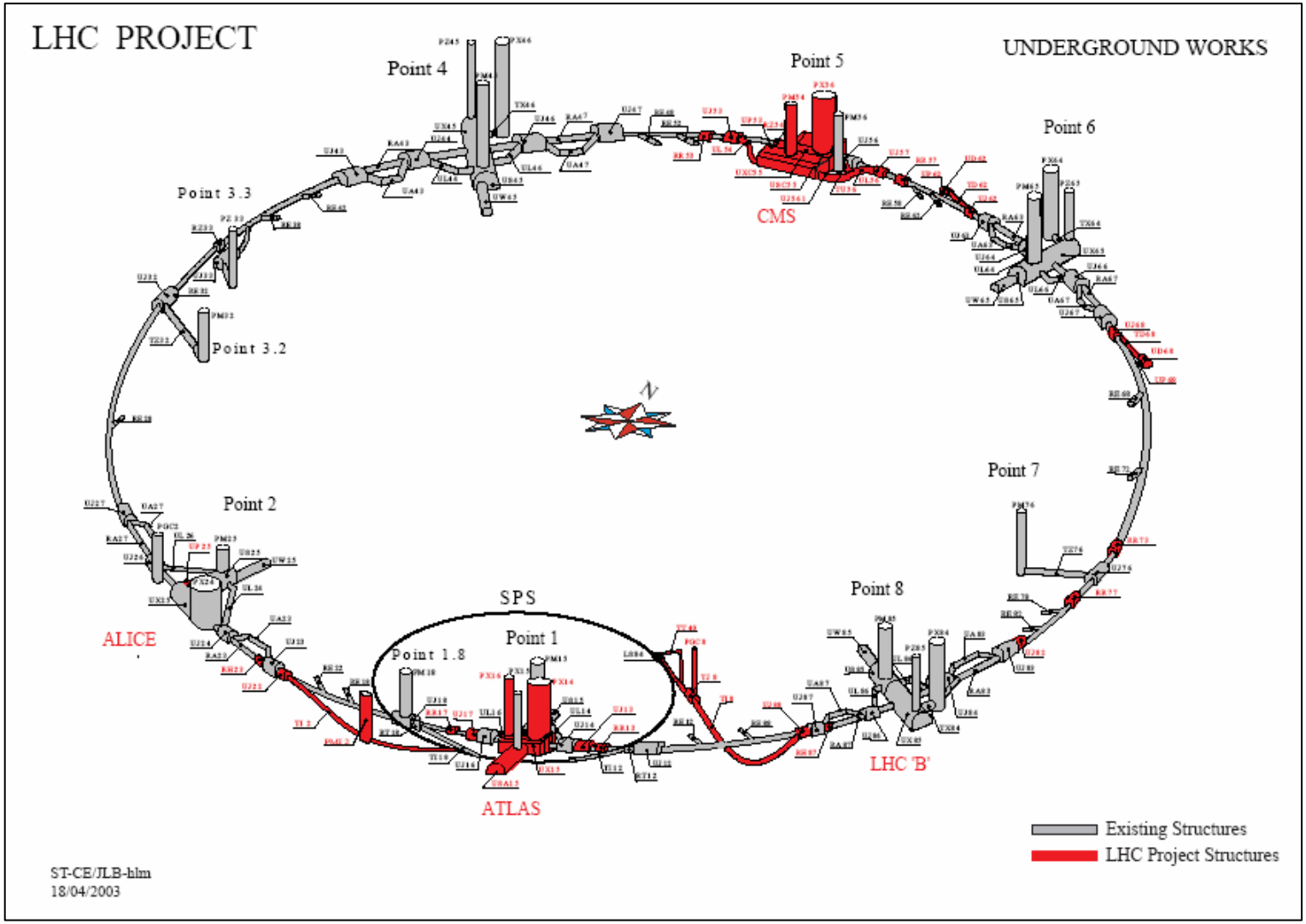
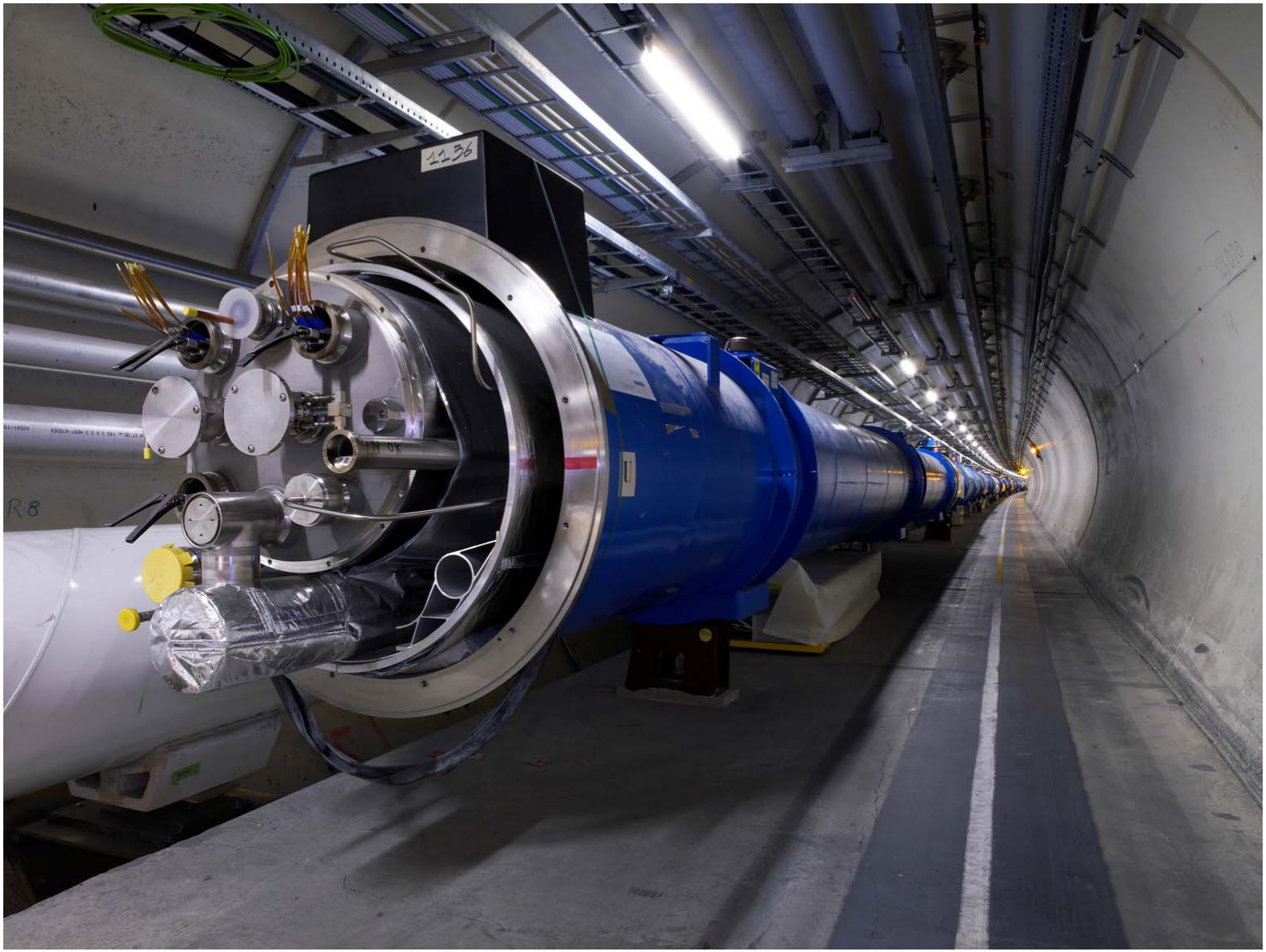
LHC STATUS

Lyndon Evans, CERN

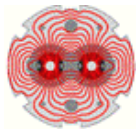
Machine Layout



LHC tunnel

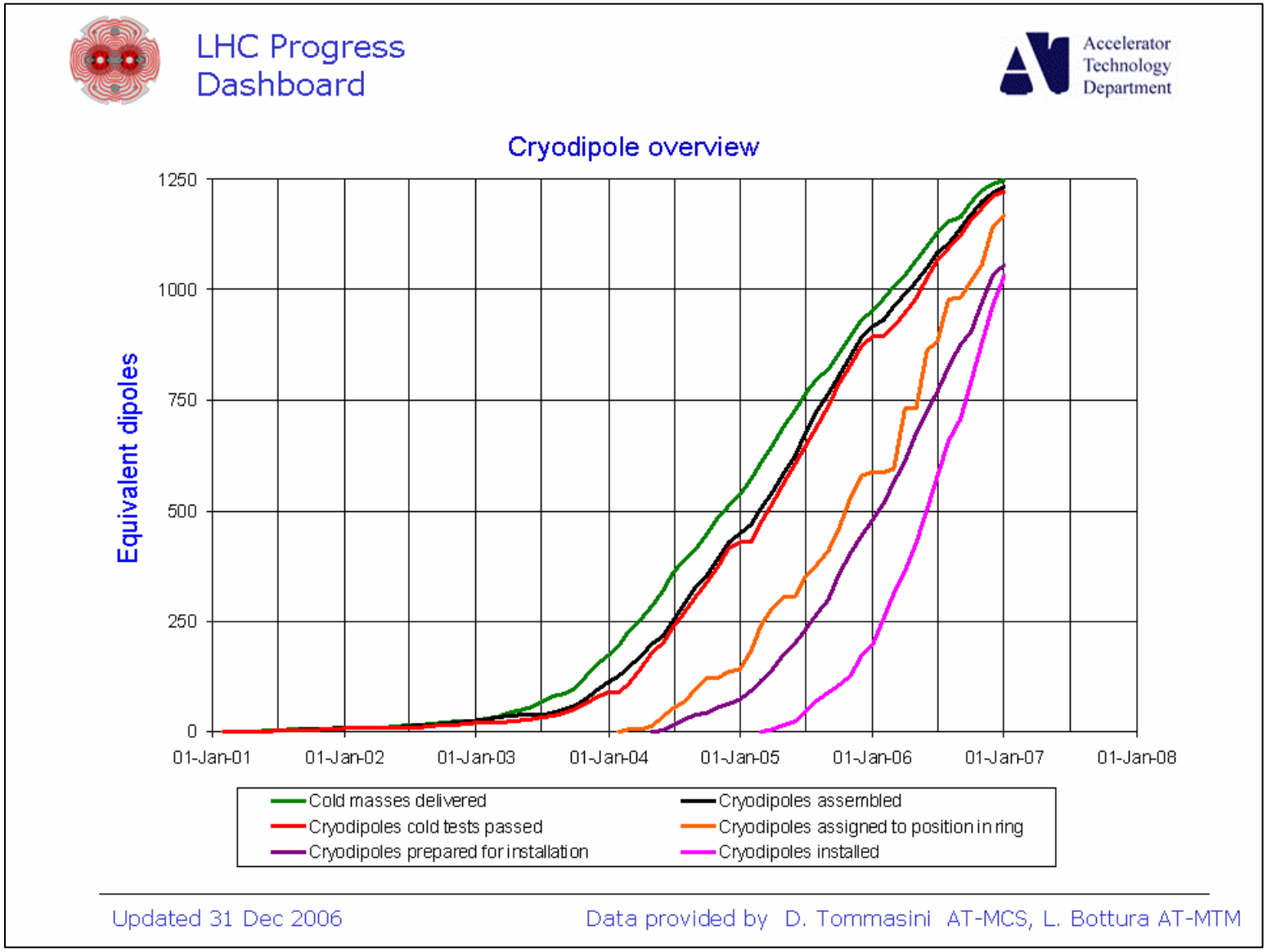


Superconducting magnets



Type	Number	Function
MB	1232	Main dipoles
MQ	392	Arc quadrupoles
MBX/MBR	16	Separation & recombination dipoles
MSCB	376	Combined chromaticity & closed orbit correctors
MCS	2464	Sextupole correctors for persistent currents at injection
MCDO	1232	Octupole/decapole correctors for persistent currents at injection
MO	336	Landau damping octupoles
MQT/MQTL	248	Tuning quadrupoles
MCB	190	Orbit correction dipoles
MQM	86	Dispersion suppressor & matching section quadrupoles
MQY	24	Enlarged-aperture quadrupoles in insertions
MQX	32	Low-beta insertion quadrupoles

Cryodipole overview



Cryogenic test stands

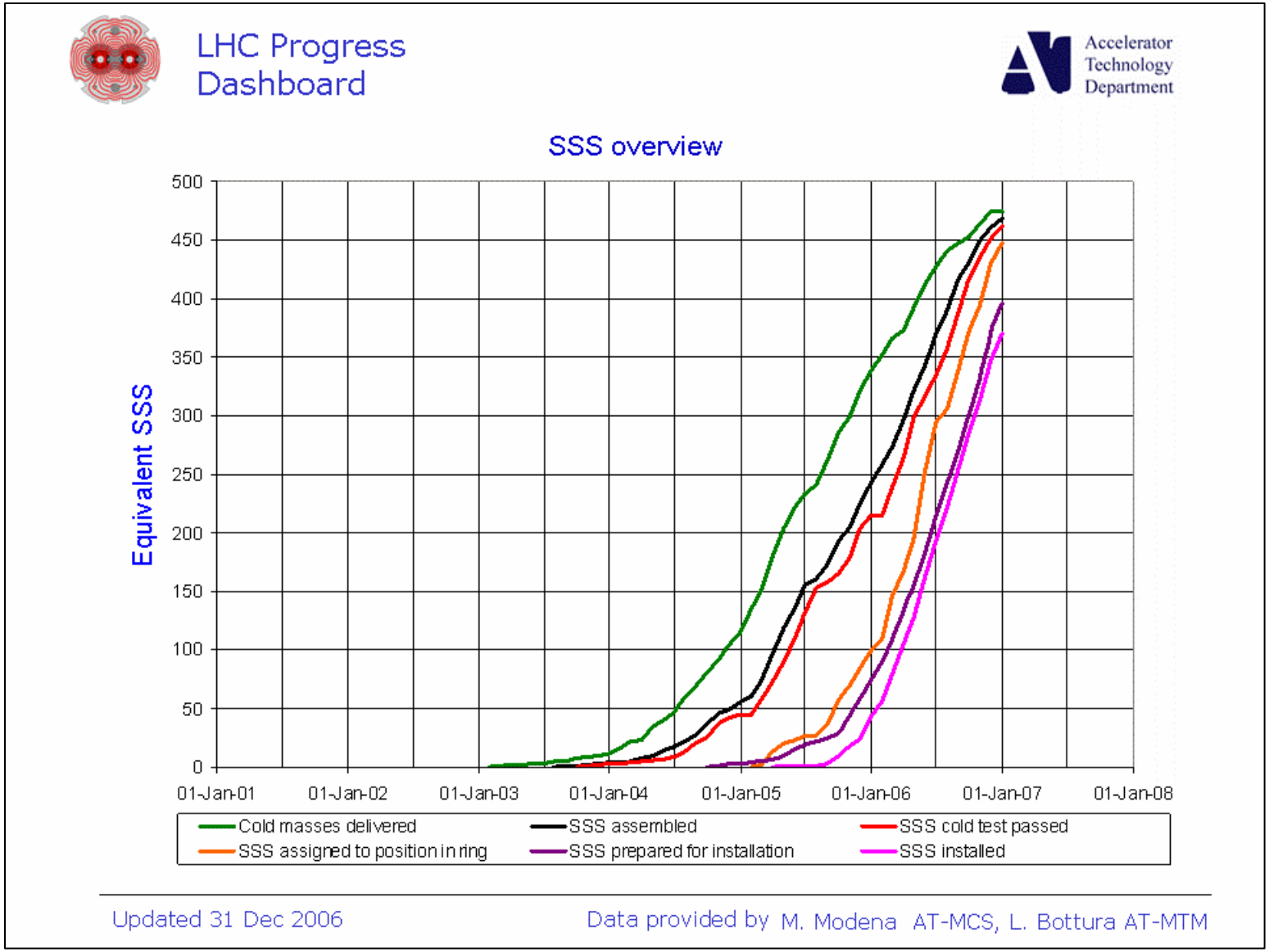
Lowering of a dipole

Underground transport

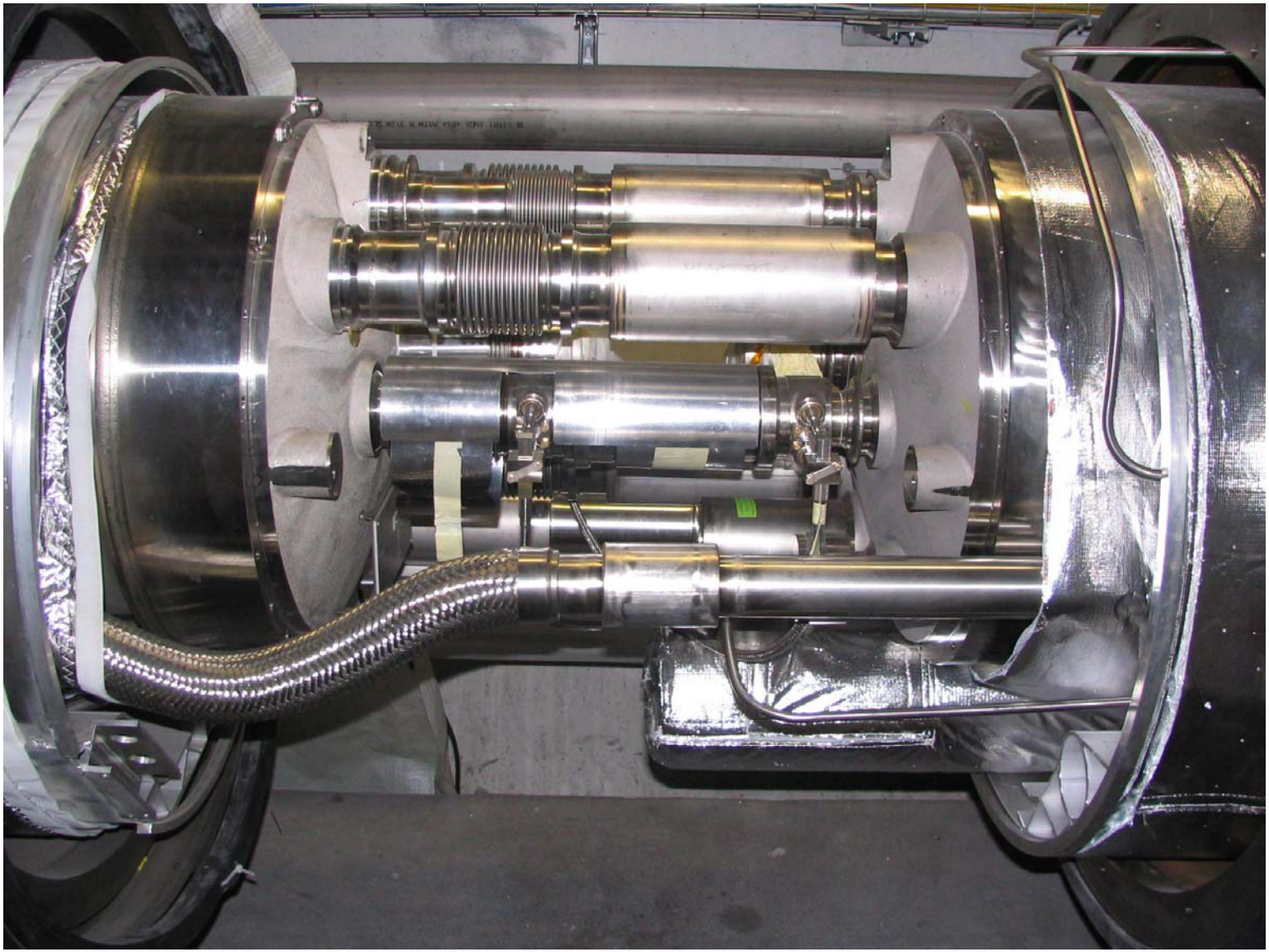
Magnet transfer

Jacks

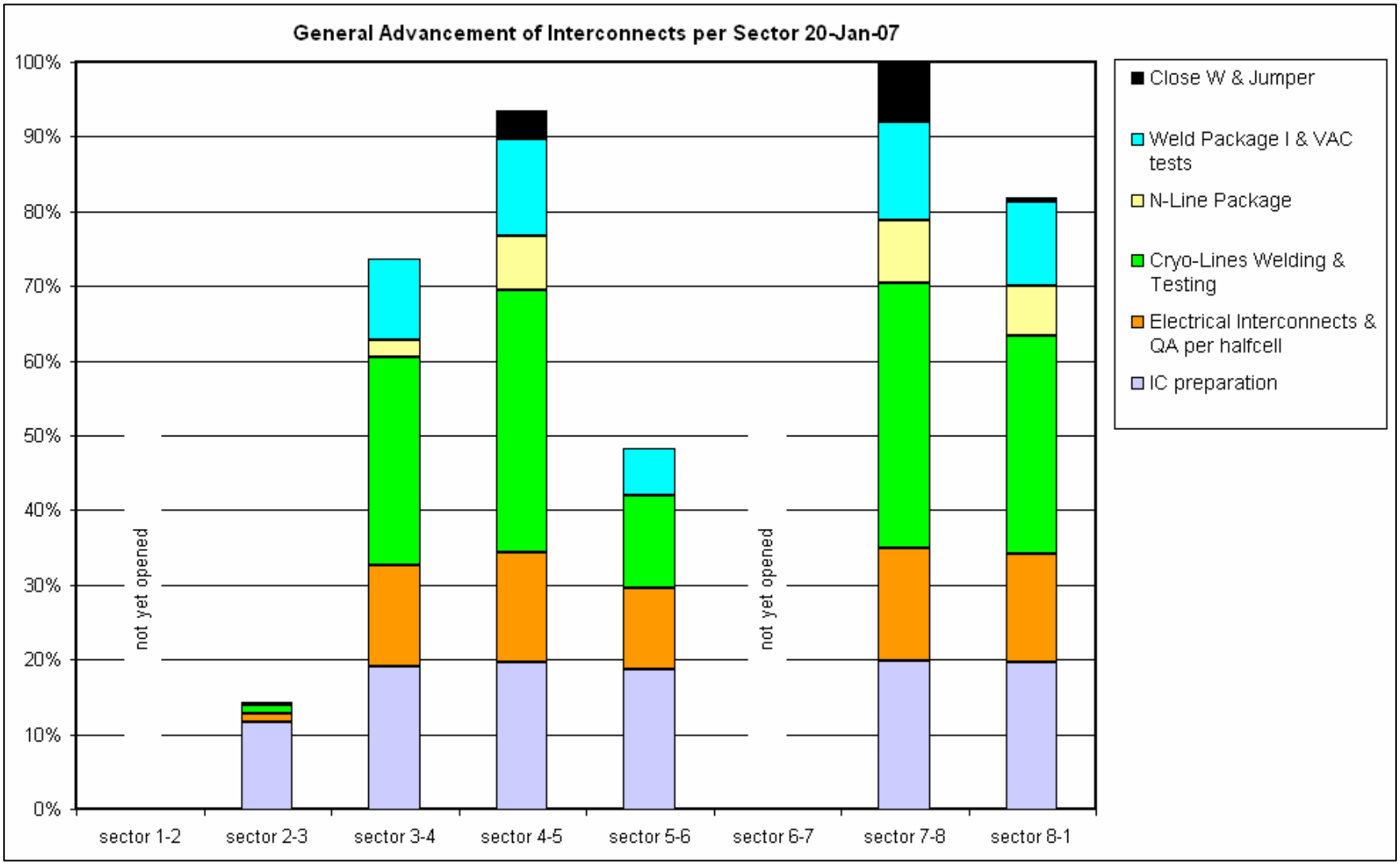
Short Straight Section overview



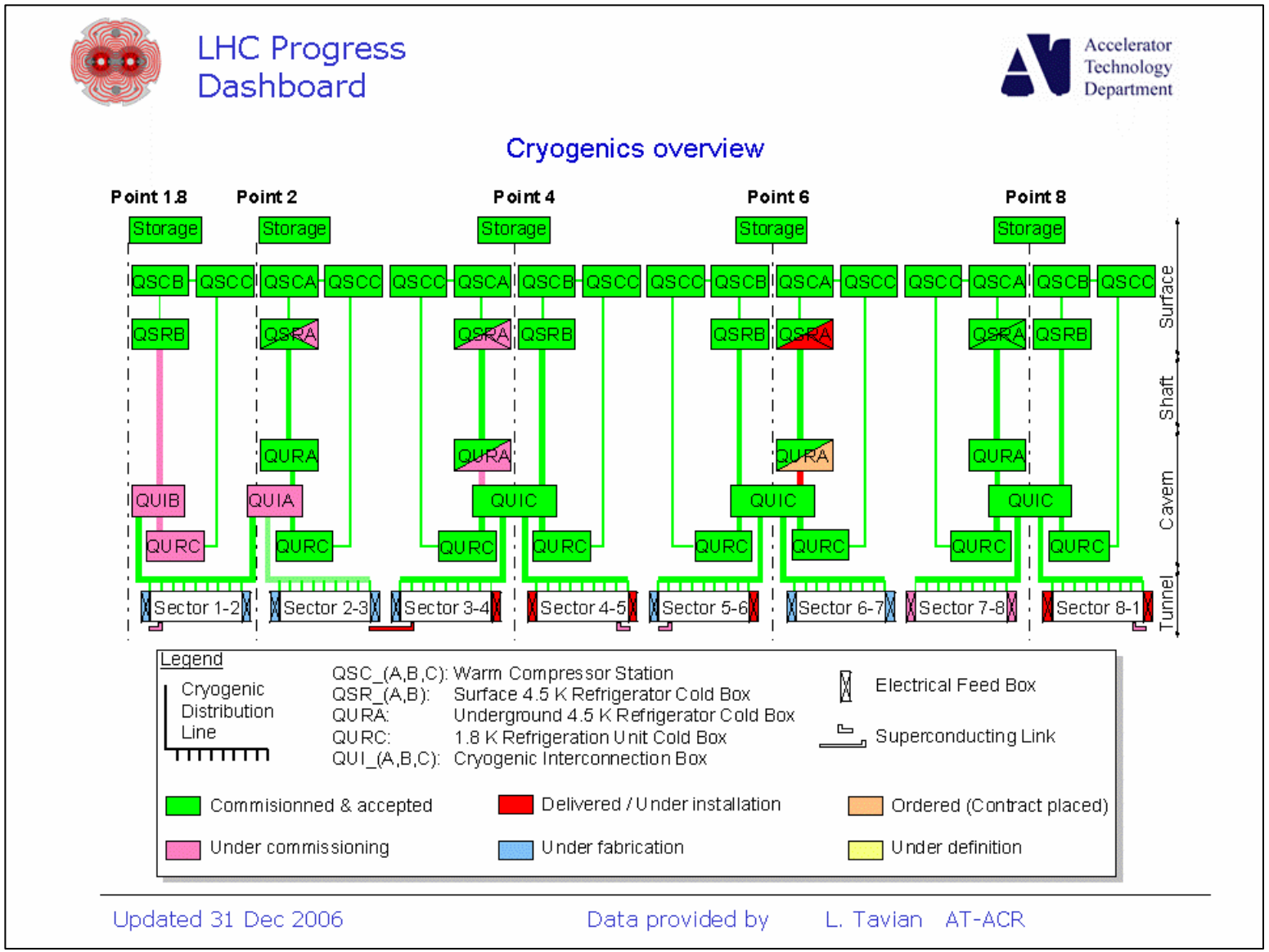
Dipole-dipole interconnect



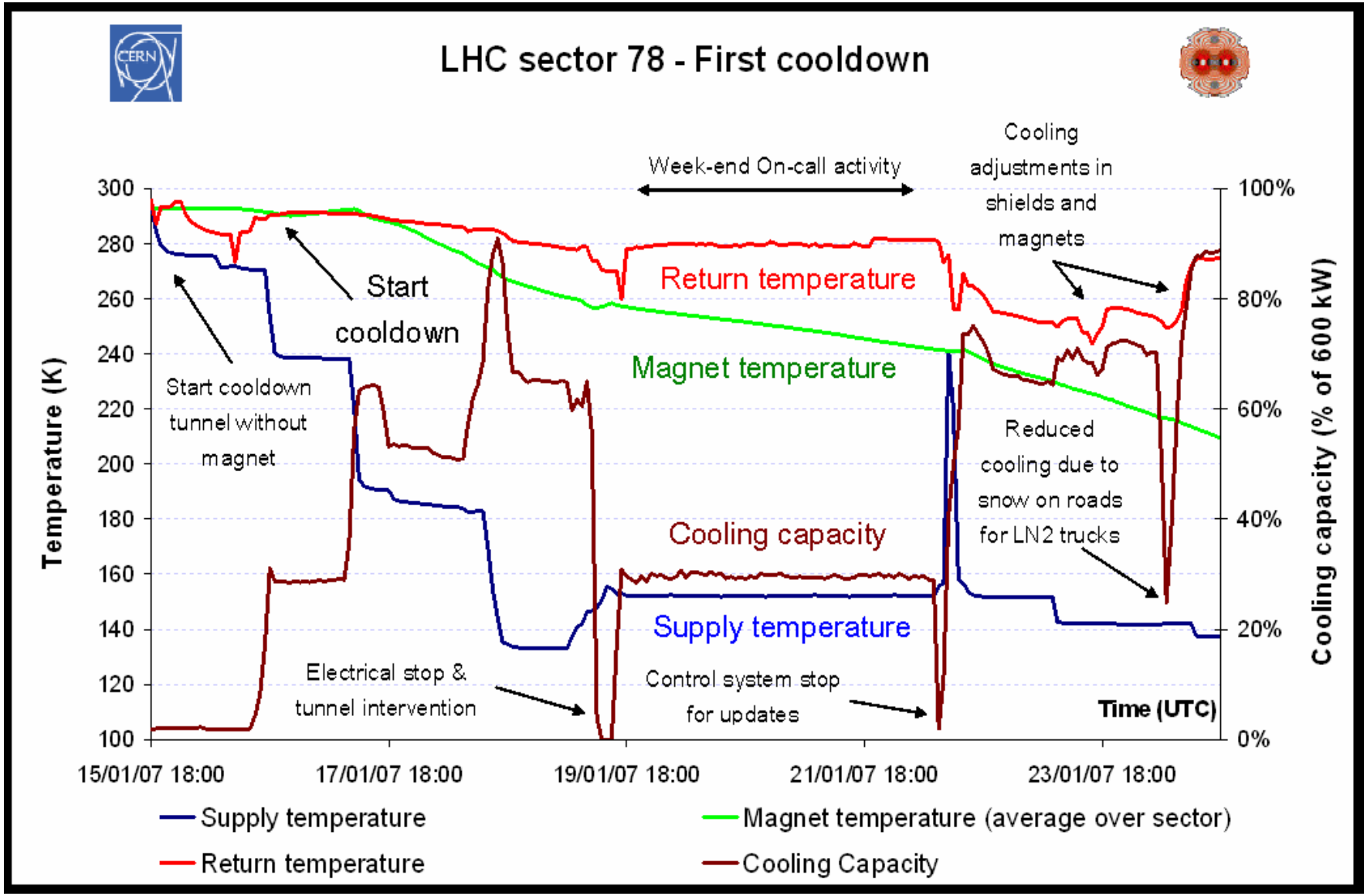
Interconnects status



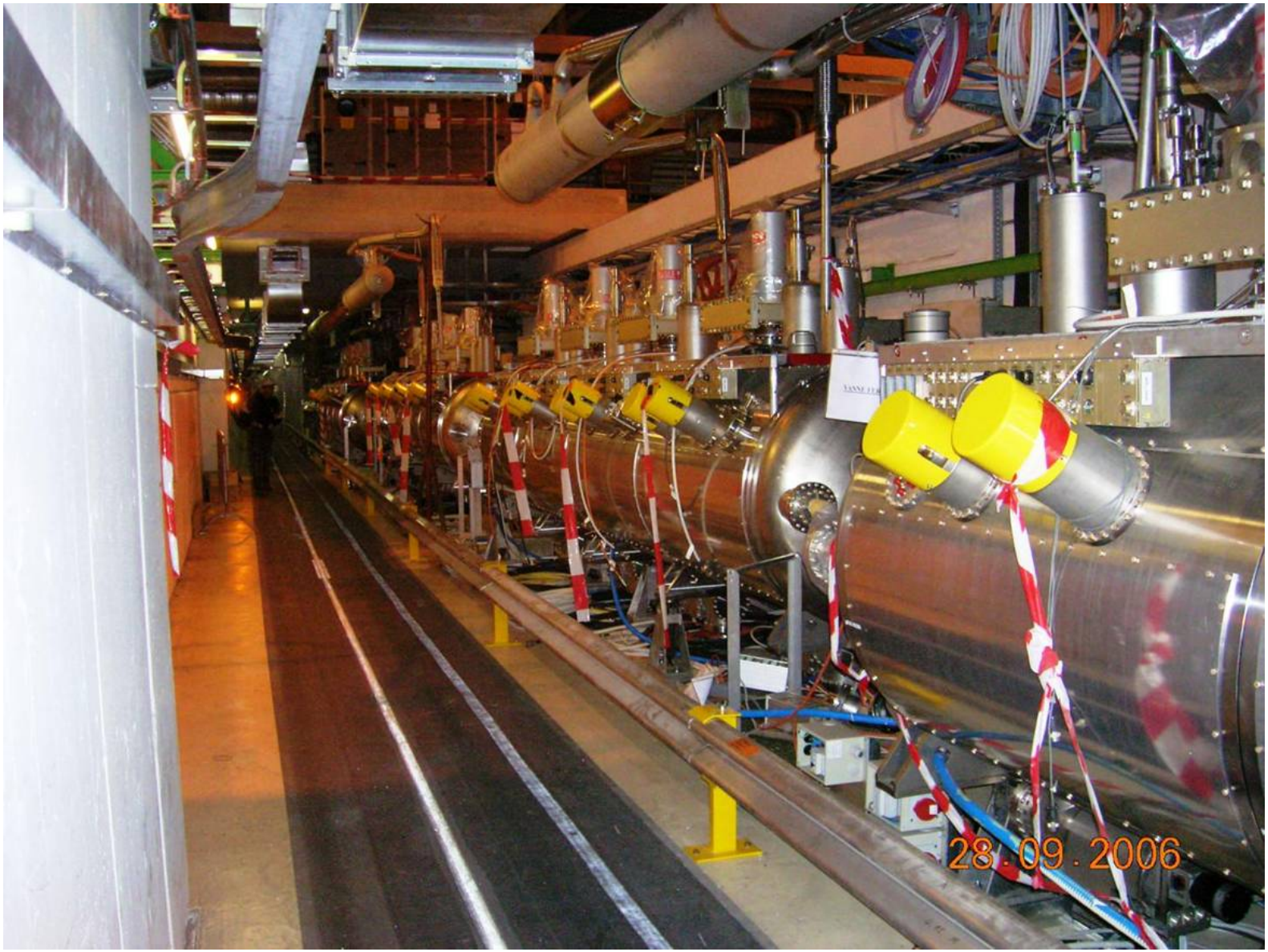
Cryogenics system



Cooldown of sector 7-8



RF cavities at Point 4



Two 300 kW klystrons with circulators and loads

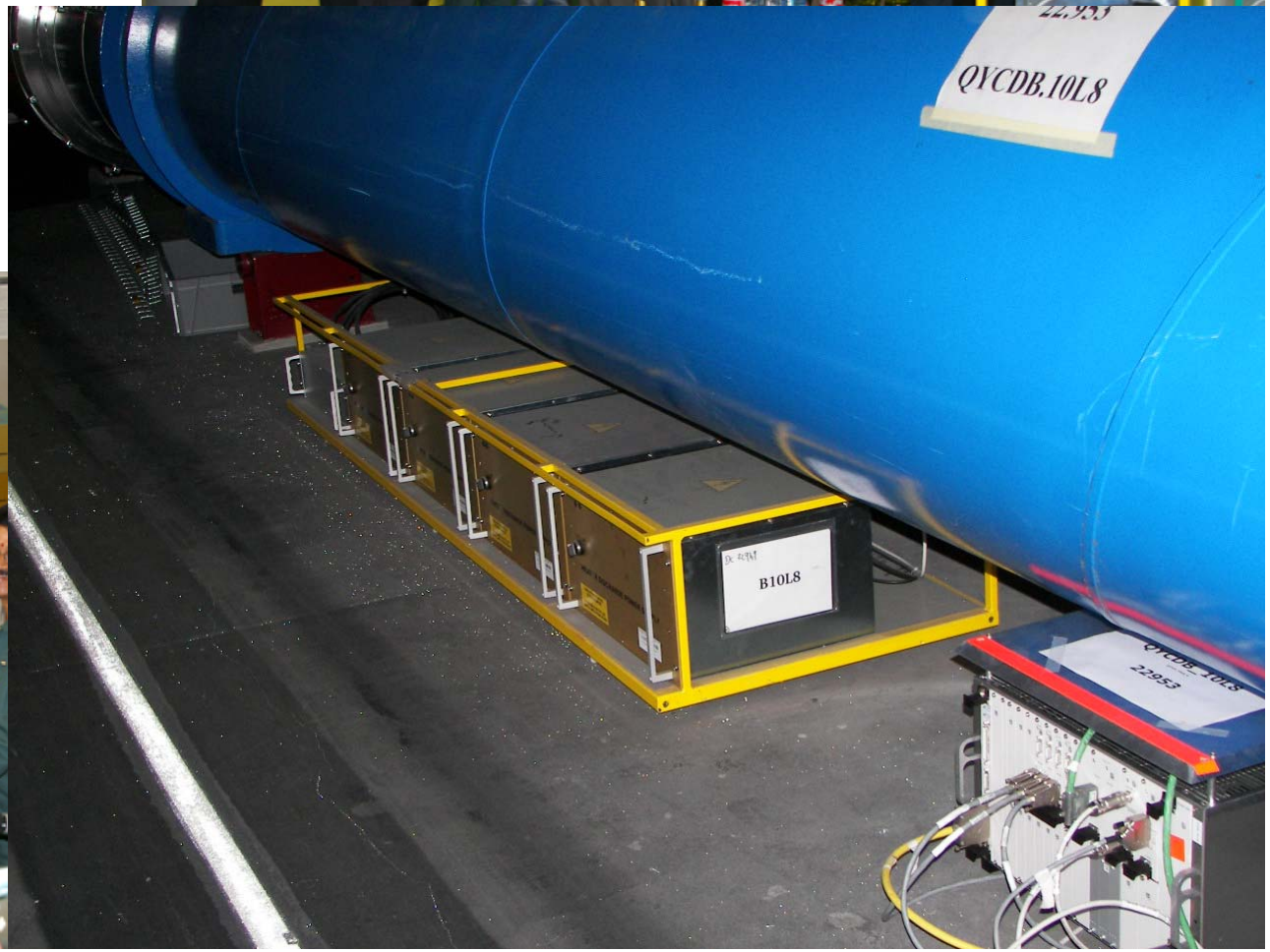
Power converters

Closed orbit power converters (80% of racks installed)

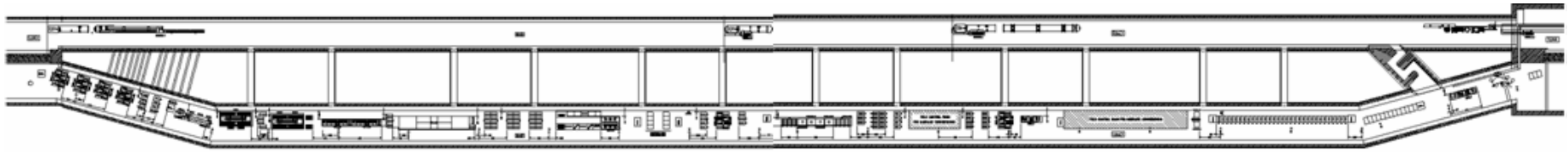
Thursday 27th April 2006

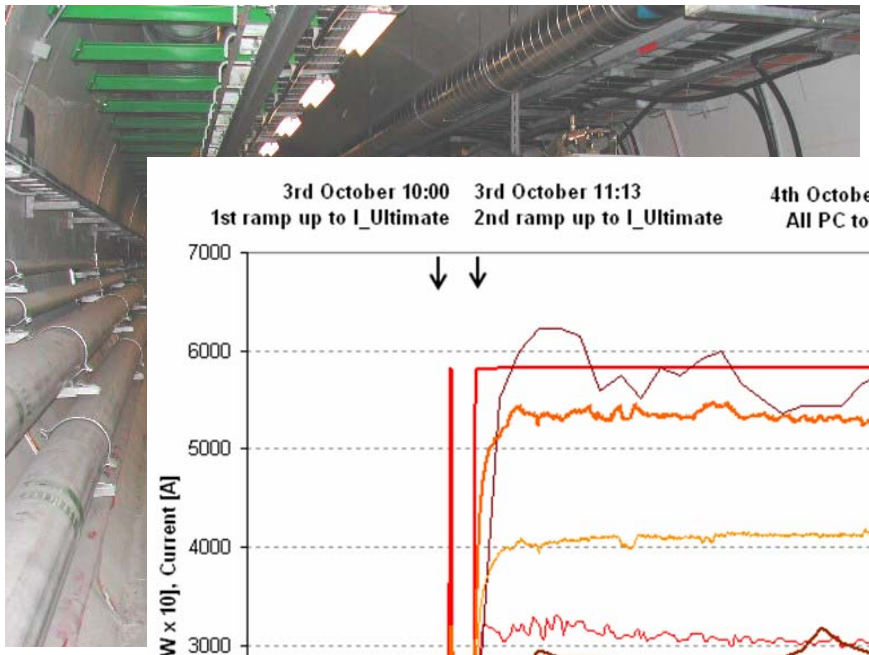
End of production and assembly of the QHPS

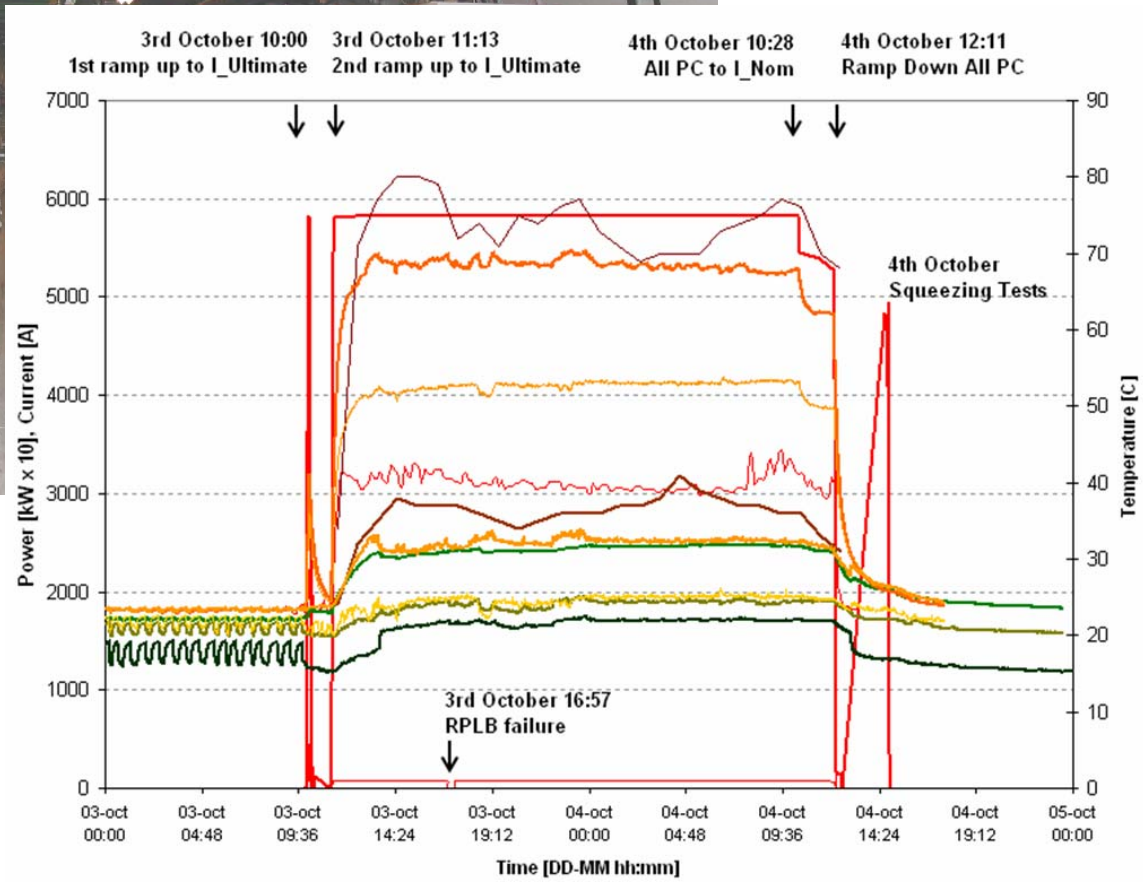
Total of 5’500 units

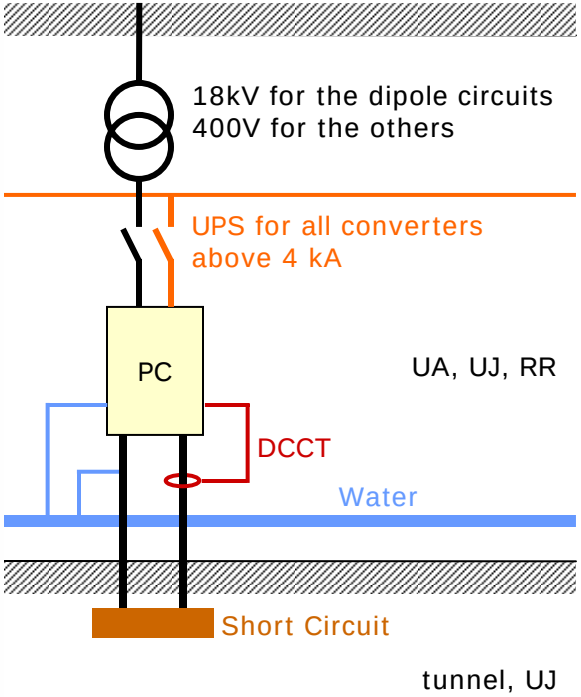


Powering areas



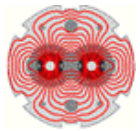






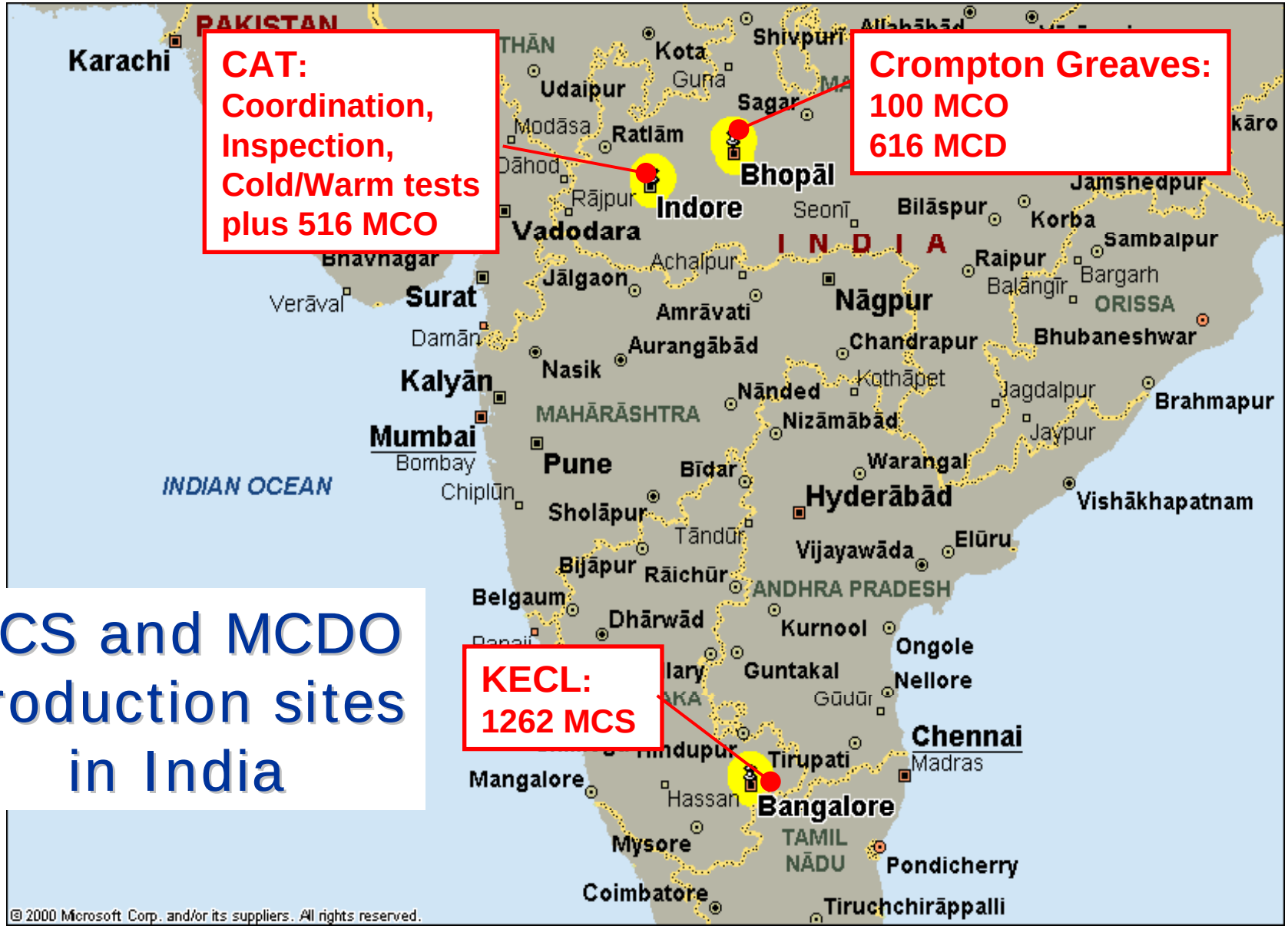
Current feed boxes

CERN-CAT collaboration



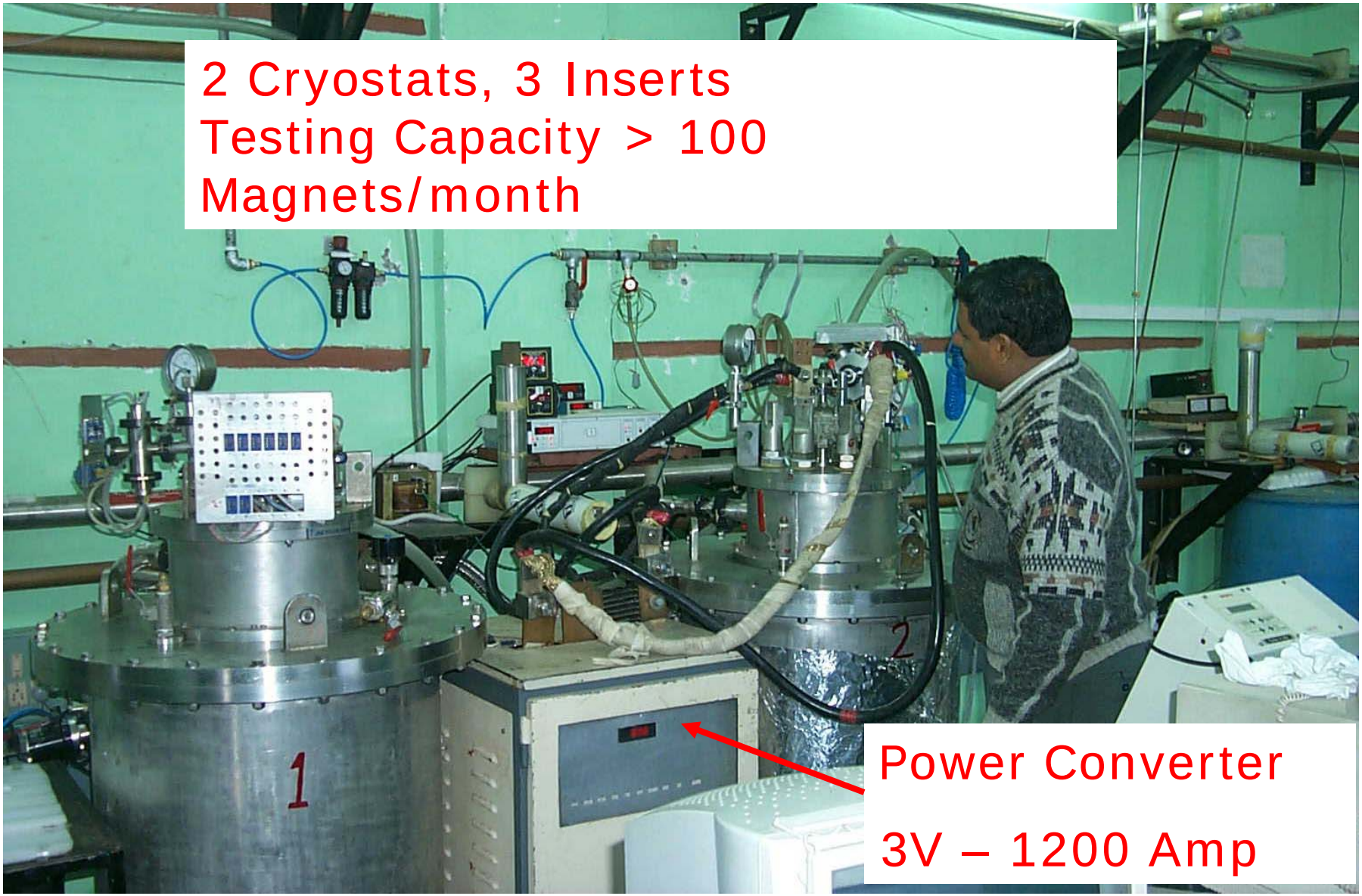
- In LHC 1232 MCDO and 2464 MCS superconducting correctors are mounted on the main dipoles to correct field quality
- Collaboration agreement with the Center of Advanced Technology (CAT), Indore, India for making ½ of these correctors in India: 618 MCDO & 1232 MCS.
- MCS made by KECL, Bangalore and MCDO made by Compton Greaves, Bhopal (see map).
  - Due to technical difficulties most MCO inserts of the MCDO were however made by CAT (ca 520).
- CAT was responsible for contract follow-up and quality control measurements, in particular:
  - Quench testing at 4.2 K
  - Joint resistance measurements at 4.2K by a field decay method
  - Magnetic measurements at 300K
  - Varius electrical tests

MCS and MCDO production sites in India

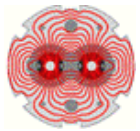


MCSs and MCDOs from India

Cryogenic test station at CAT



Conclusions



- All major hardware procurement for the LHC Project is now complete. Installation of equipment in the tunnel is proceeding smoothly and commissioning of major sub-systems is starting. The first LHC sector (7-8) is complete and cooldown to 1.9 K is proceeding normally.
- The schedule is too tight to allow full commissioning of all eight sectors up to the nominal design current corresponding to 7 TeV operation before the 2007-8 winter shutdown. It has therefore been decided that only the first two or three sectors will be fully commissioned in 2007. The remaining sectors will be able to operate safely at their injection level and will allow beams at 450 GeV to circulate in both rings. The RF system will then be activated to capture the beams, hopefully with a good enough lifetime to allow the beams to be brought into collision, providing first events in the detectors. This will be invaluable for early debugging of both the machine and detectors and will give a flying start to a high energy physics run in 2008 once all sectors have been commissioned to nominal current during the shutdown.

Acknowledgements

Many people, both inside and outside CERN have been dedicated to this Project. On behalf of my CERN colleagues, and in view of the location of this Conference, I would like to thank our Indian colleagues for their contribution of the highest quality.