

Cable and Strand test facility

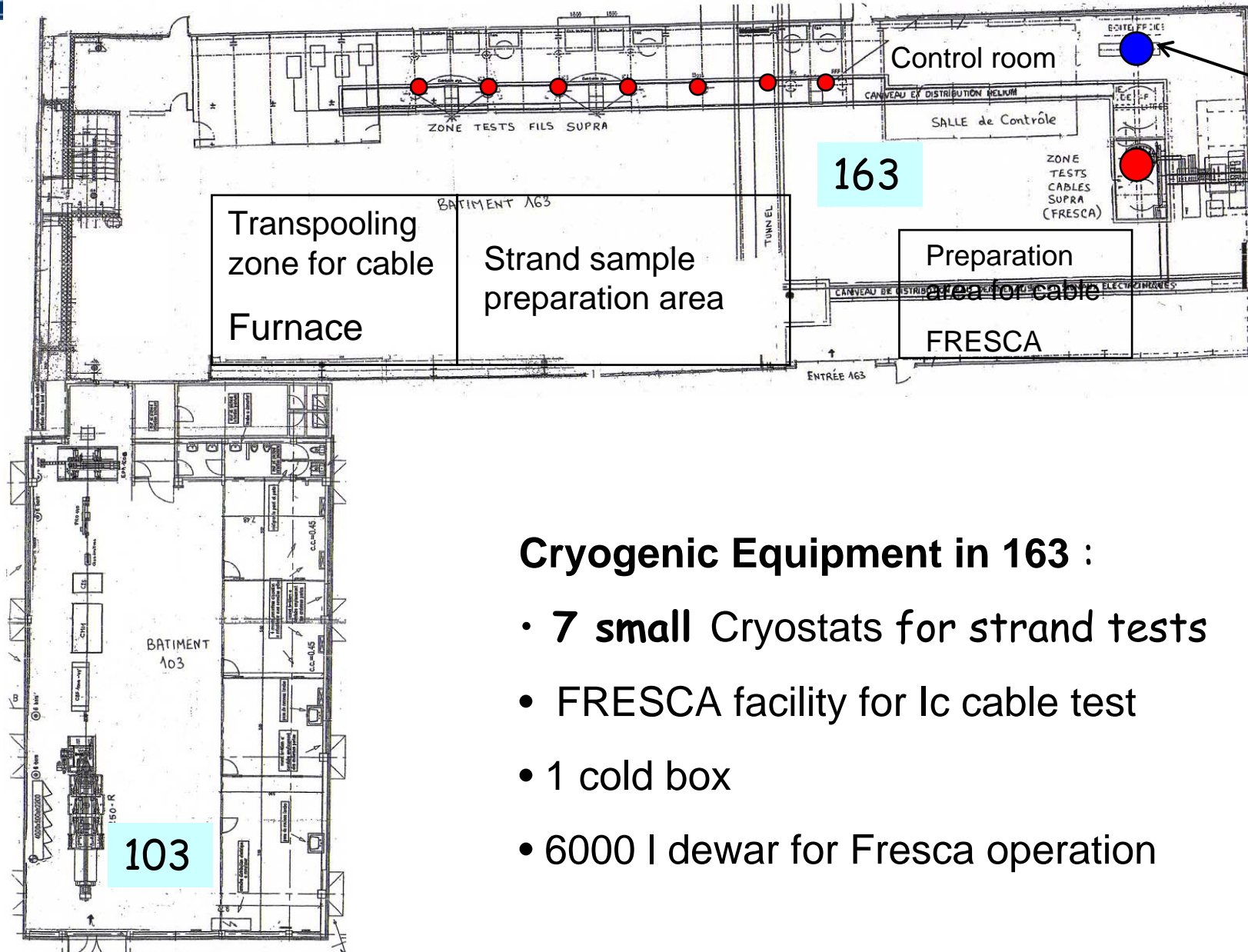
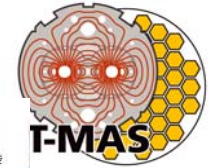
L. Oberli, A. Verweij

Outline :

- Test facilities installed in 103 and 163
- Cryogenic equipments to characterize the superconductors in 163
- Test program for coming years



Map of the Buildings 103 and 163



Cold Box
130 l/h

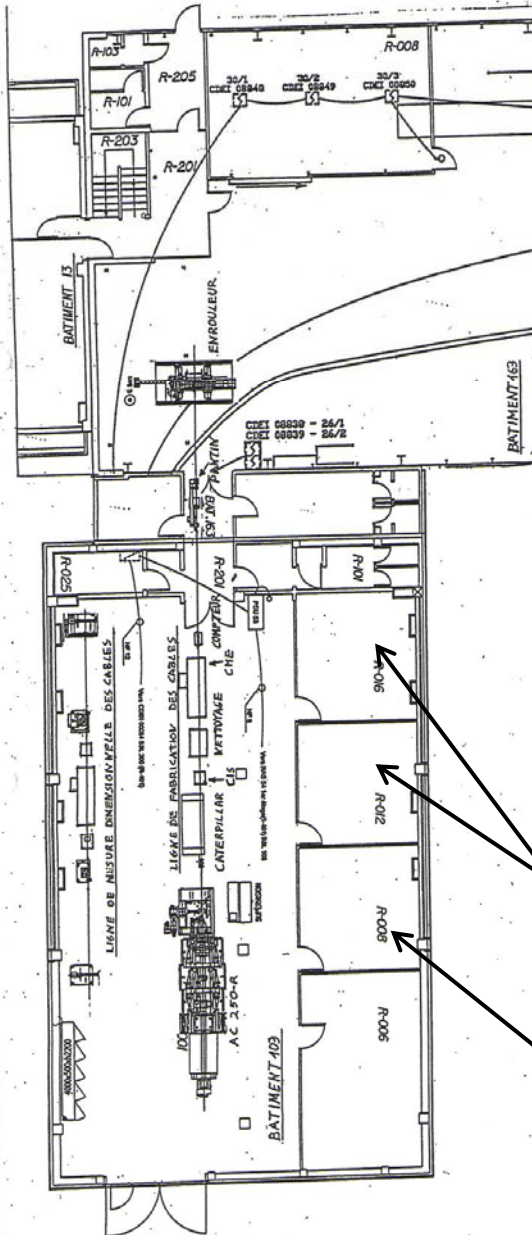
Cryogenic Equipment in 163 :

- 7 small Cryostats for strand tests
- FRESCA facility for Ic cable test
- 1 cold box
- 6000 l dewar for Fresca operation

12th April 2006

Workshop on test facilities

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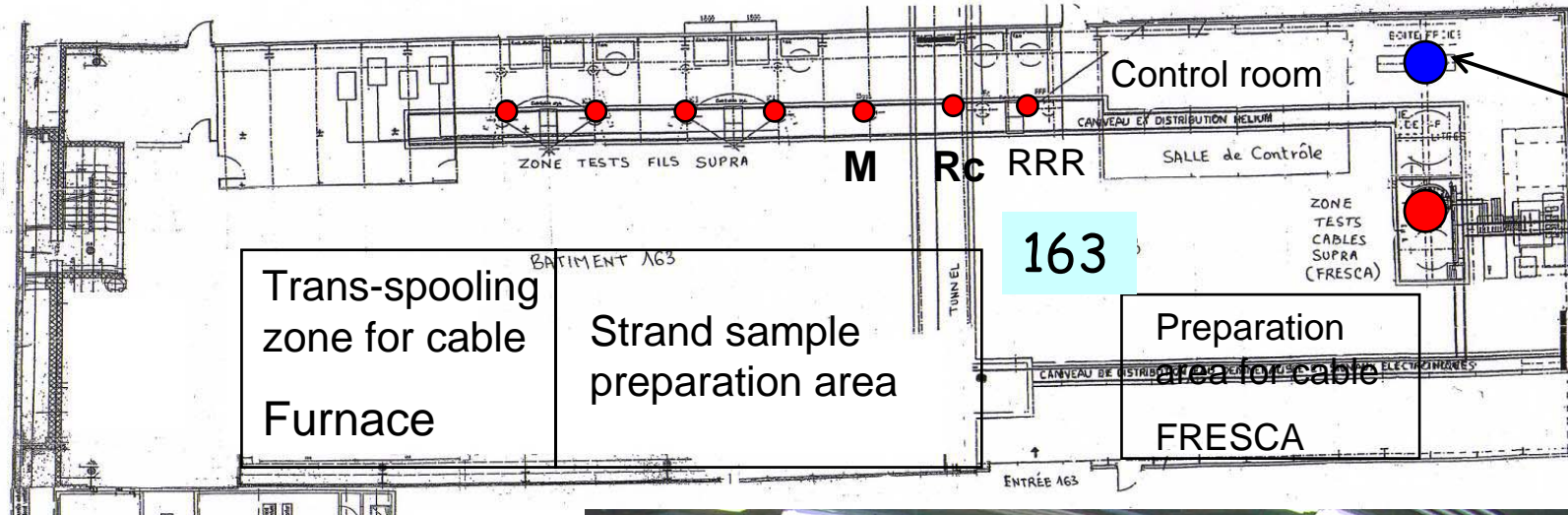
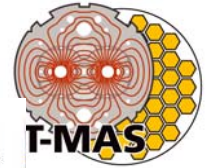


Strand and cable samples characterization

“Chemical” room : Cu/Sc and metallography preparation



Building 163

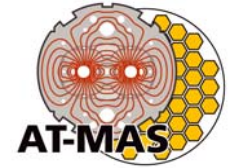


Cold Box
130 l/h





163 : Trans-spooling equipment and preparation area for strand samples



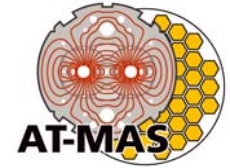
12th April 2006

Workshop on test facilities

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163 : Cryogenic test facility for strand and cable samples



7 small cryostats for strand samples tests :

- 2 cryostats for Ic on NbTi strand : 1 kA, B = 11 T at 4.2 K, 13 T at 1.9 K

Sample holders for 10 samples

- 1 cryostat for Ic test on Nb₃Sn strand : 4 kA, B = 12.5 T at 4.2 K

Sample holder for 2 kA and a single sample

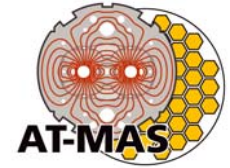
- 1 cryostat for thermal transfer measurements on insulated cable :

$$1.8 \text{ K} < T < 2.1 \text{ K}$$

- 1 cryostat for Rc test on cable samples : 4.2 K
- 1 cryostat for RRR test on NbTi and Nb₃Sn strands
- 1 cryostat for Magnetisation test on NbTi strands
(to be upgraded to measure Nb₃Sn strands and
electromagnetic instabilities)



163 : Test program for coming years



Characterization of Nb₃Sn strand by **I_c** and **RRR** measurements for NED and CERN programs

I_c measurements on LHC strands and on strands with very small filament diameter (~ 1 μm)

Evaluation of the transfer of heat from the coil of the LHC dipole magnet to He II

R_c test to qualify different types of coating for AC cables, tests on core cables and on LHC cables

Magnetization measurements on LHC strands, Nb₃Sn strands, strands for Neuro-spin project, strands for AC applications