

FRESCA 2

High Field Magnet Test Facility
SM18

19/07/2011

Summary

- Introduction
- Magnet parameters
- Cryostat concept
- P&ID

Introduction

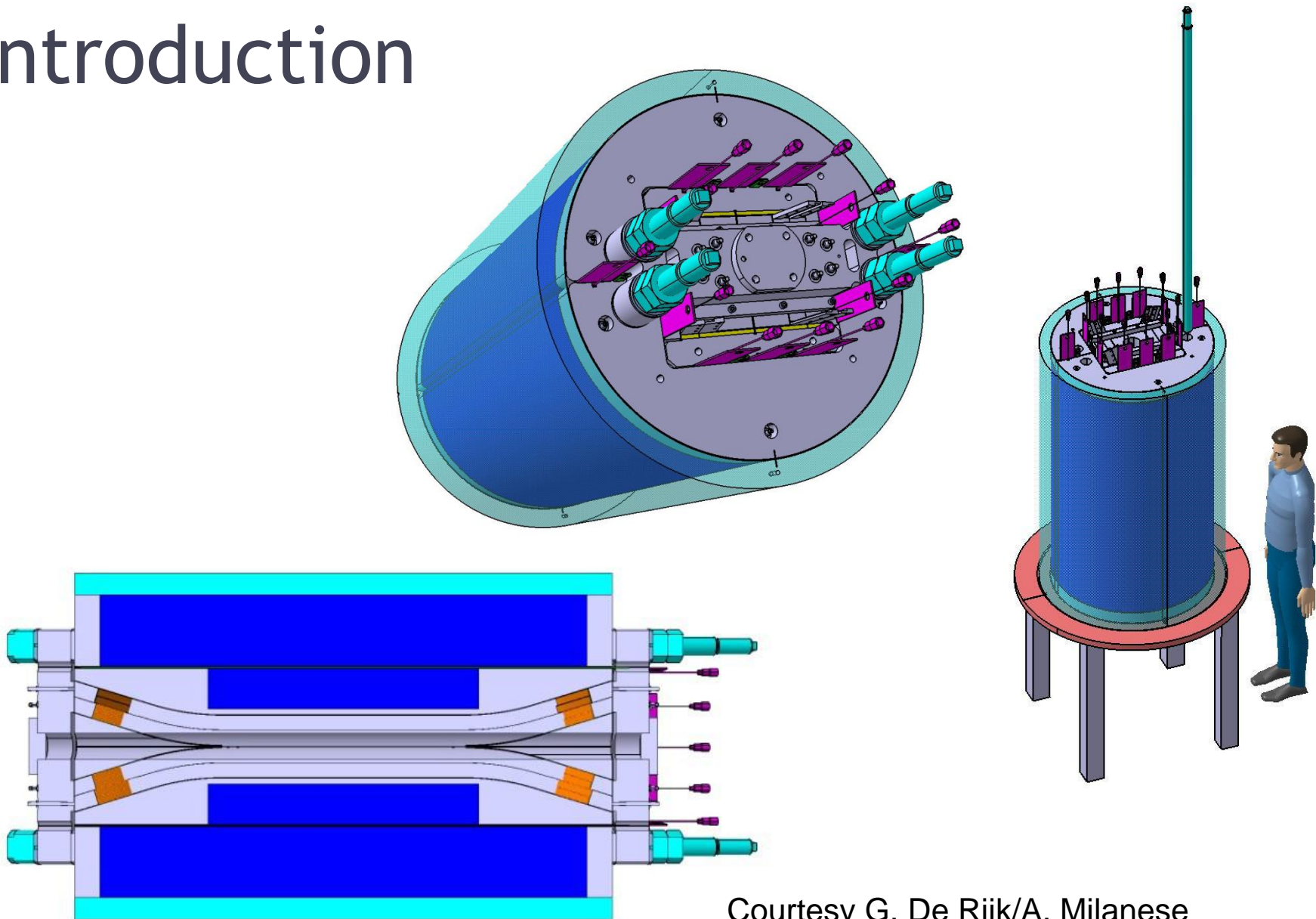
- **FRESCA**
 - Superconducting cable test facility
 - Vertical Dipole

- **FRESCA 1**
 - 10.3 T @ 2K
 - 88 mm diameter bore

- **FRESCA 2**
 - 13 T @ 4.2 K
 - 15T @ 1.9K
 - 100 mm diameter bore

19/07/2011

Introduction



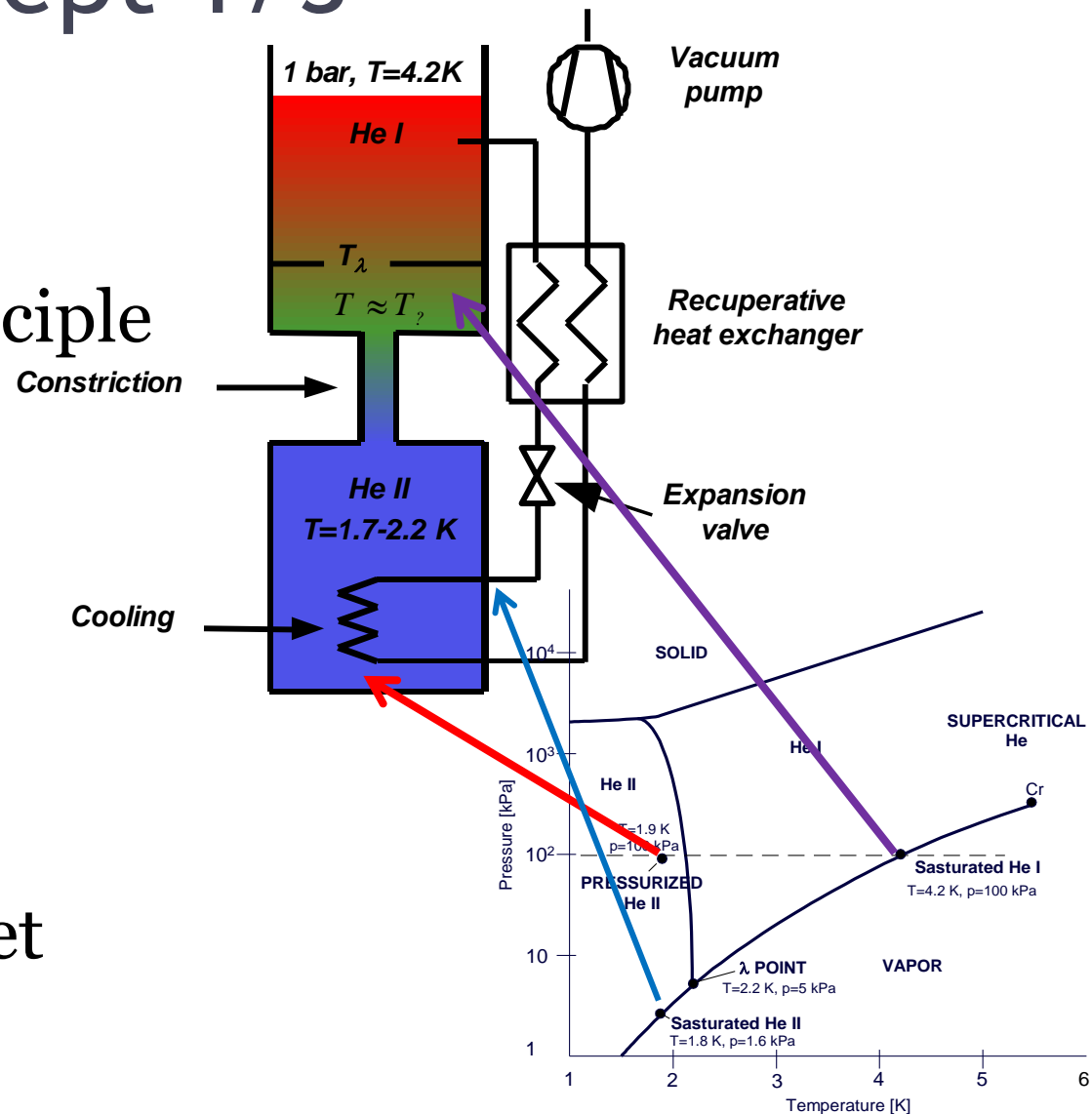
Courtesy G. De Rijk/A. Milanese

Magnet parameters

- Cylinder: 2.5m length
- Evolution
 - 08/2009 : 1.6 m outer diameter (27 tons)
 - 08/2010 : 1.2 m outer diameter (19 tons)
 - 12/2010 : 1.14 m outer diameter (11-20 tons)
 - 02/2011 : 1.02 m outer diameter (9 tons)
- Stored energy : 3 MJ
- 2 pairs of current leads
 - 2 x 20 kA (main magnet)
 - 2 x <10 kA (HTS insert)

Cryostat concept 1/3

- Vertical cryostat
- Claudet bath principle
- Installed in SM18 Pit
 - 3 m diameter
 - 4 m deep
- For testing magnet

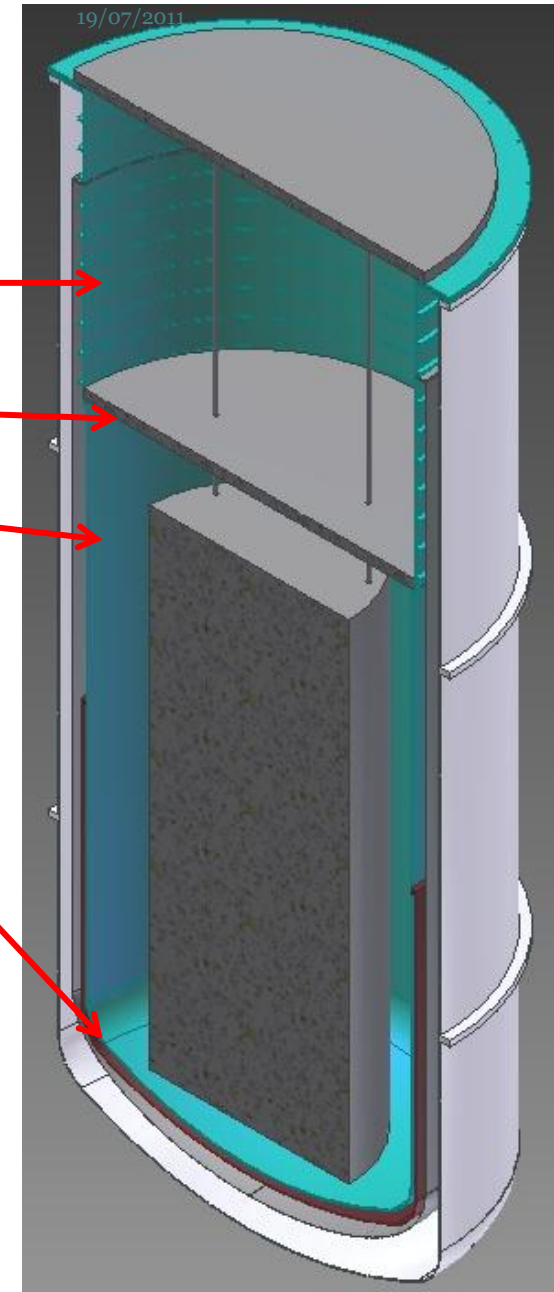
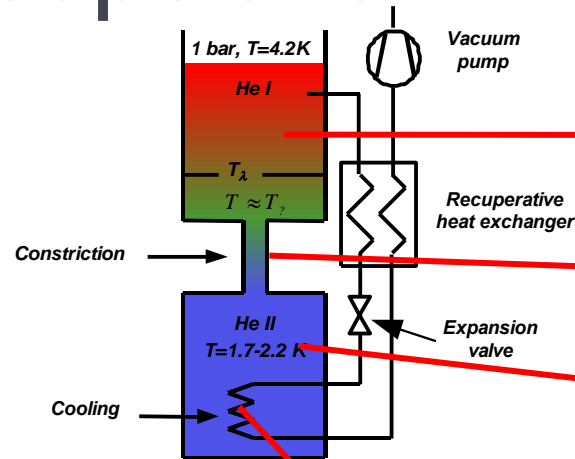


Cryostat concept 2/3

- Test cryostat → remove easily the magnet
 - Few connection to remove
- Pre-cooling the magnet (avoid stress)
 - Heat exchanger fixed to the magnet
- Straight field → horizontal force
 - Horizontal support for the magnet
- Designed for Berkley magnet
 - $L = 2,5 \text{ m}$; $OD = 1,36 \text{ m}$
 - Stored energy = 7,5 MJ

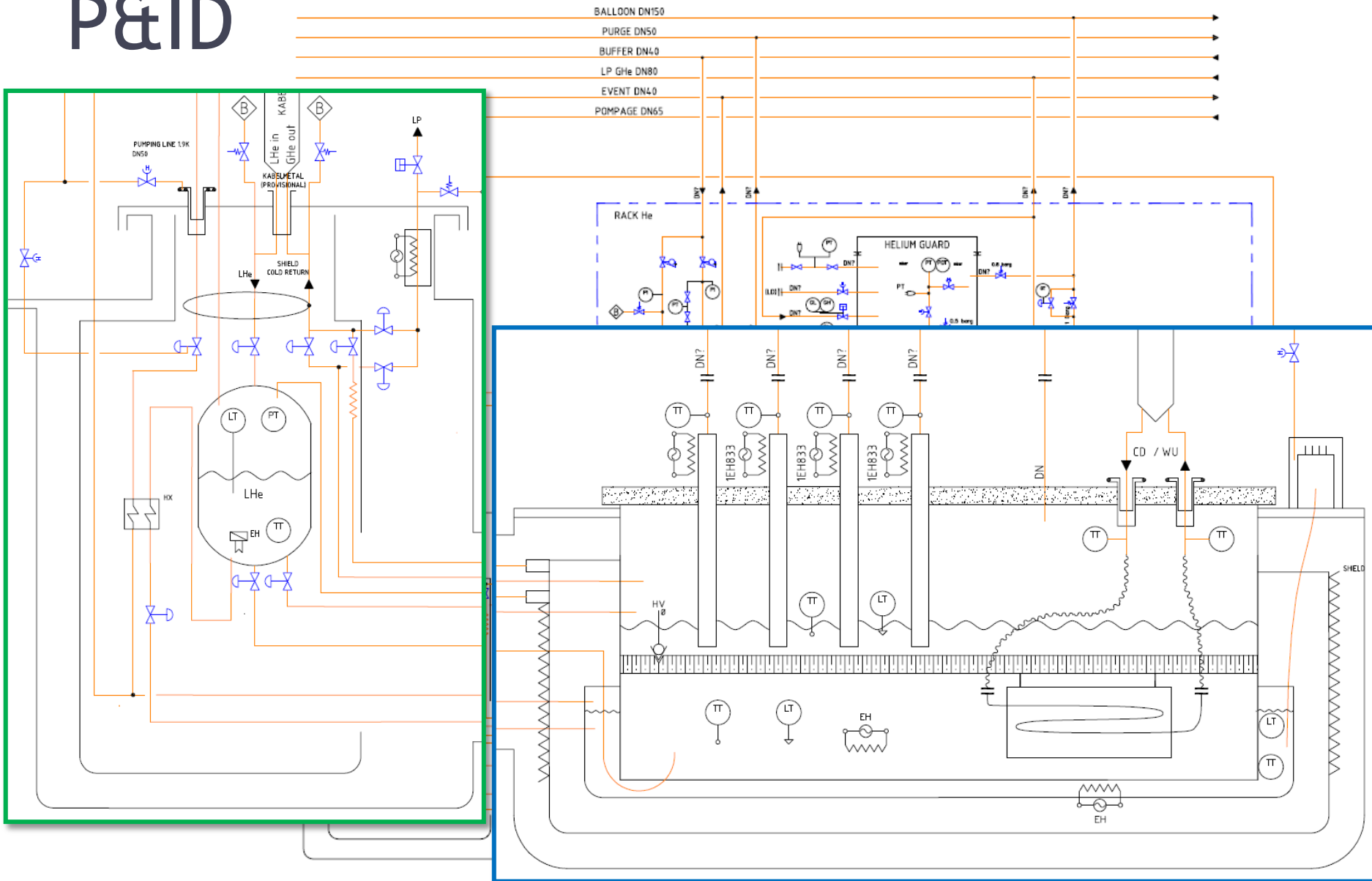
Cryostat concept 3/3

- 3 parts cryostat
 - Vacuum vessel
 - Helium vessel
 - Insert
- Magnet supported by top plate through lambda plate
- Thermal shield thermally anchored to neck
- Double walled helium vessel



19/07/2011

P&ID



Next

- Just started design
- Beginning of September → “conceptual review”
- Installation in SM18 : end of 2012