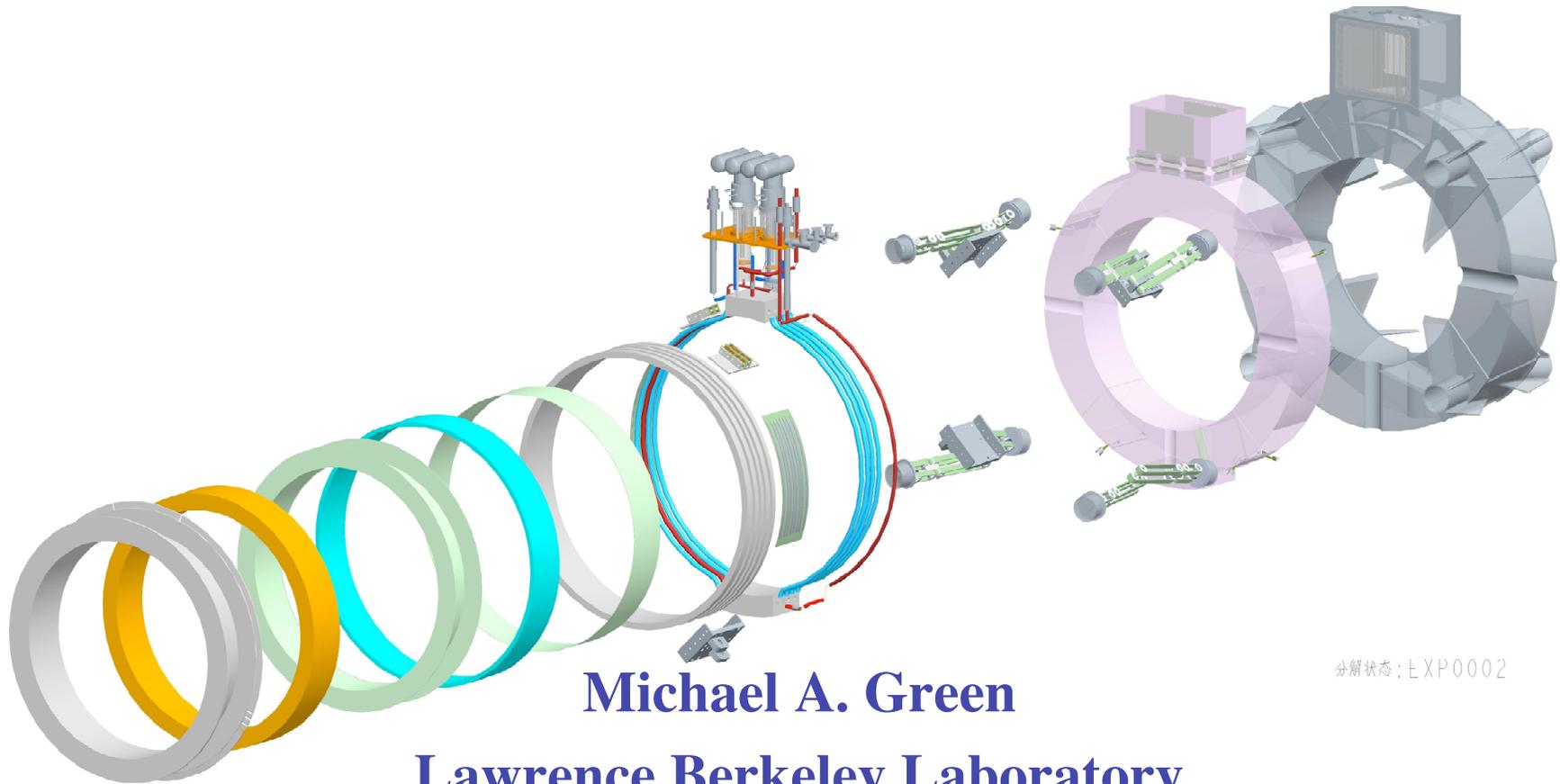


MuCool and MICE Coupling Coil



分解状态: EXP0002

Michael A. Green
Lawrence Berkeley Laboratory
and the ICST Staff

NFMCC at LBNL 26 January 2009

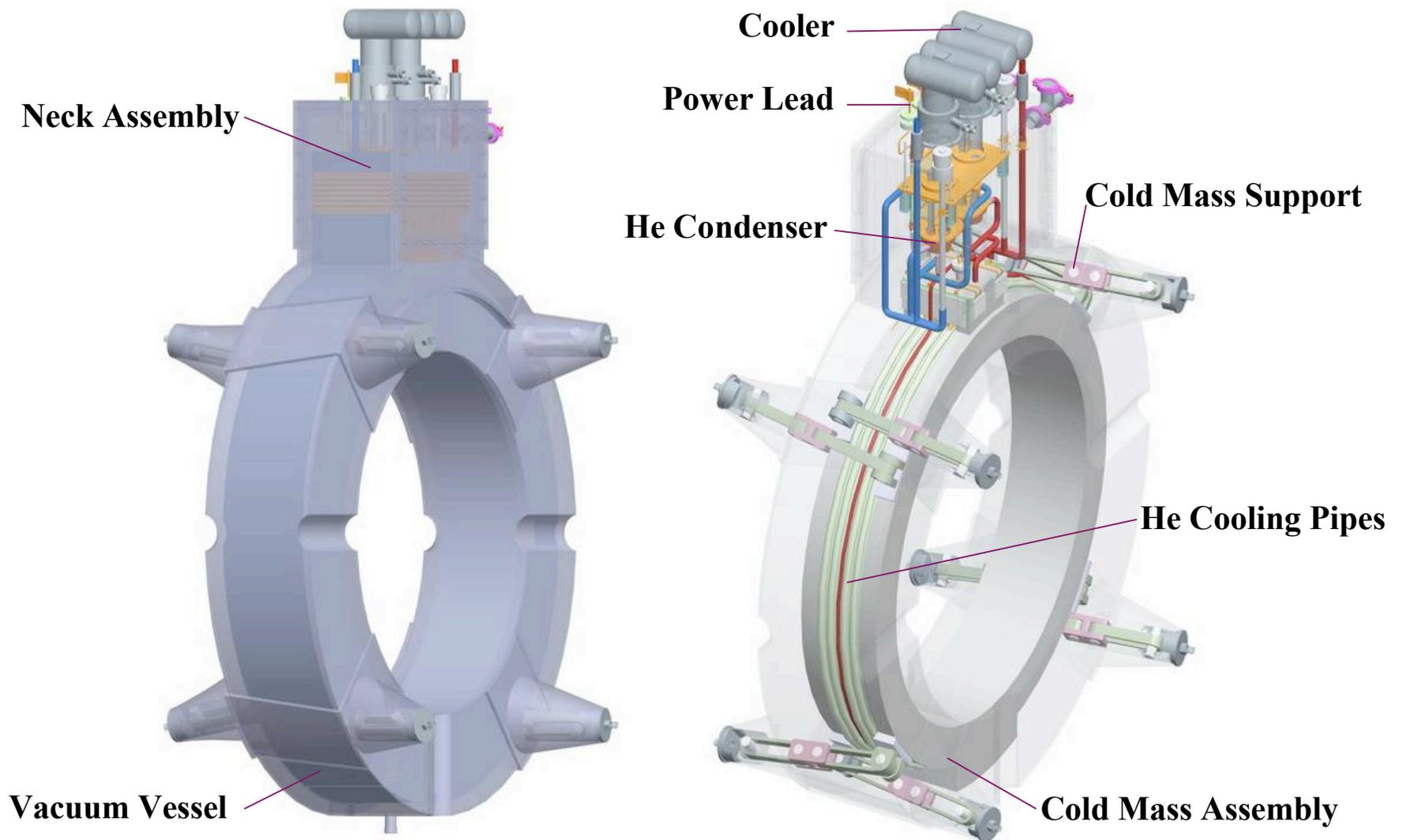
Coupling Coil Design and Fabrication

- **The coupling magnet design has been carried out by the Institute of Cryogenics and Superconductive Technology (ICST) at the Harbin Institute of Technology (HIT), Harbin China in partnership with LBNL.**
- **Fabrication and assembly of the coupling magnets will be carried out by ICST.**
- **Final assembly of the MICE coupling magnets with the RFCC modules of MICE will occur at LBNL.**

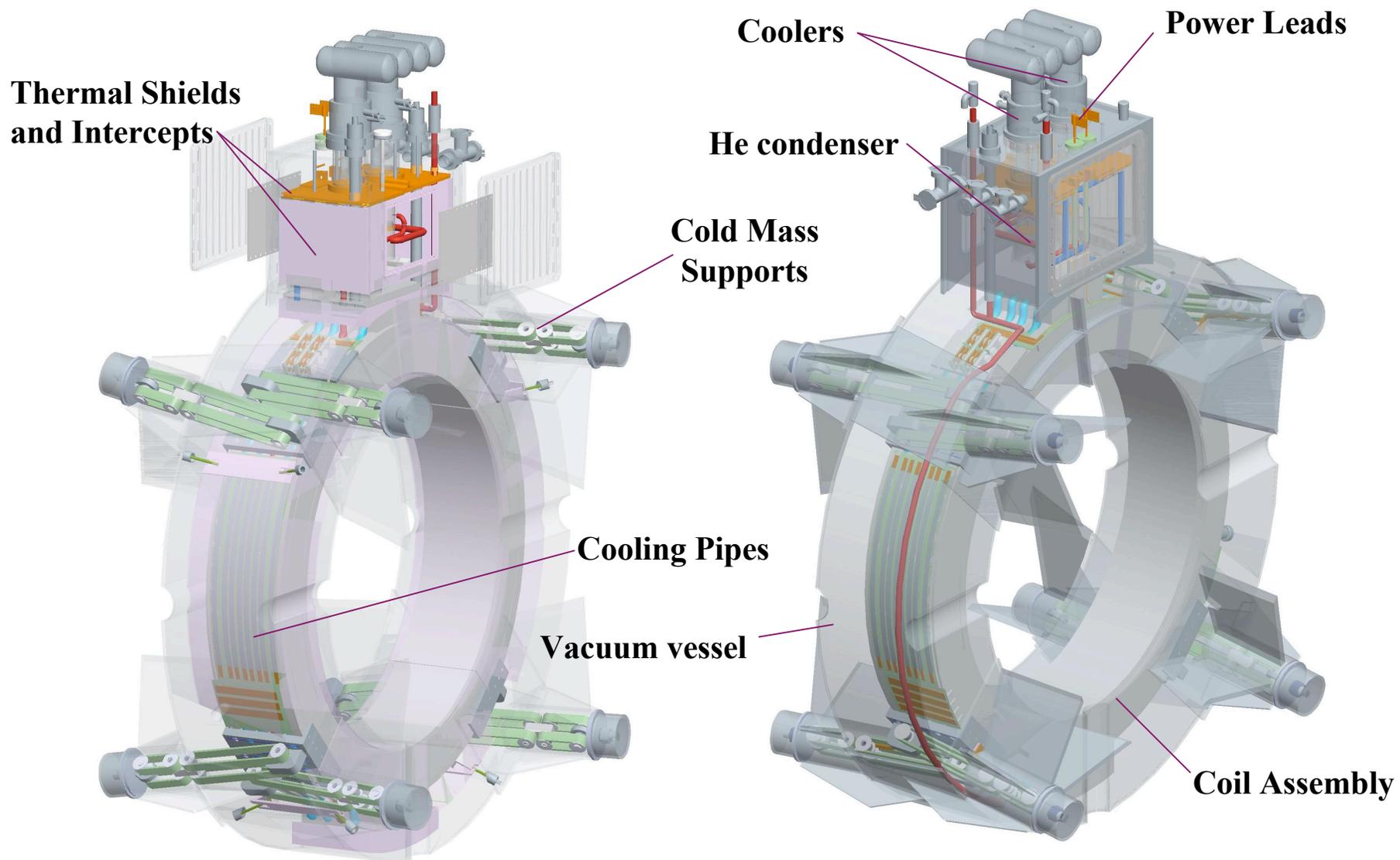
What is to Covered in this Report

- **The Status of the ICST Magnet Design**
- **The Status of the Two ICST Test Coils**
- **The Status of the ICST Test Facility**
- **The Schedule for the MuCool Magnet**
- **The Schedule for the MICE Magnet**
- **Concluding Comments**

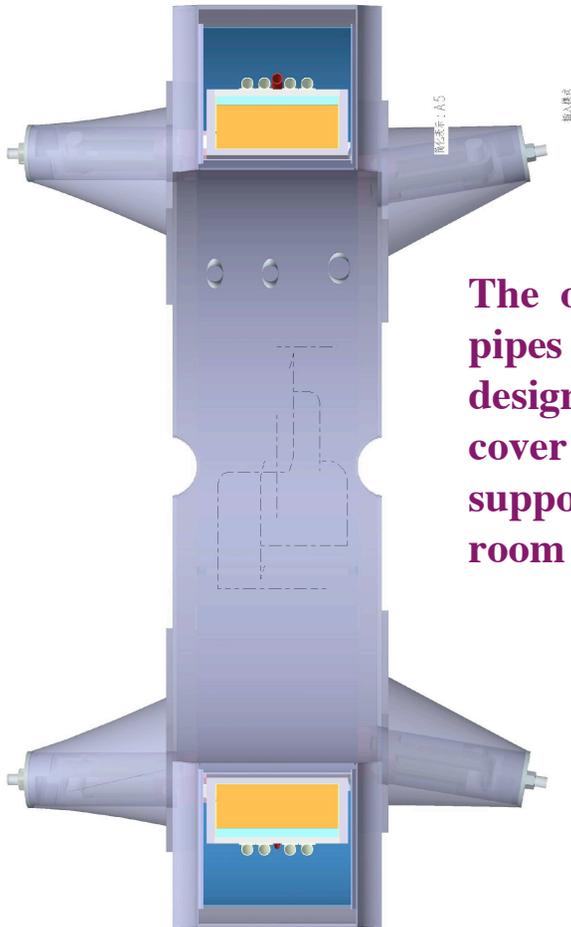
Previous ICST Magnet Design



Improved ICST Magnet Design



Improved Cooling Pipe Design



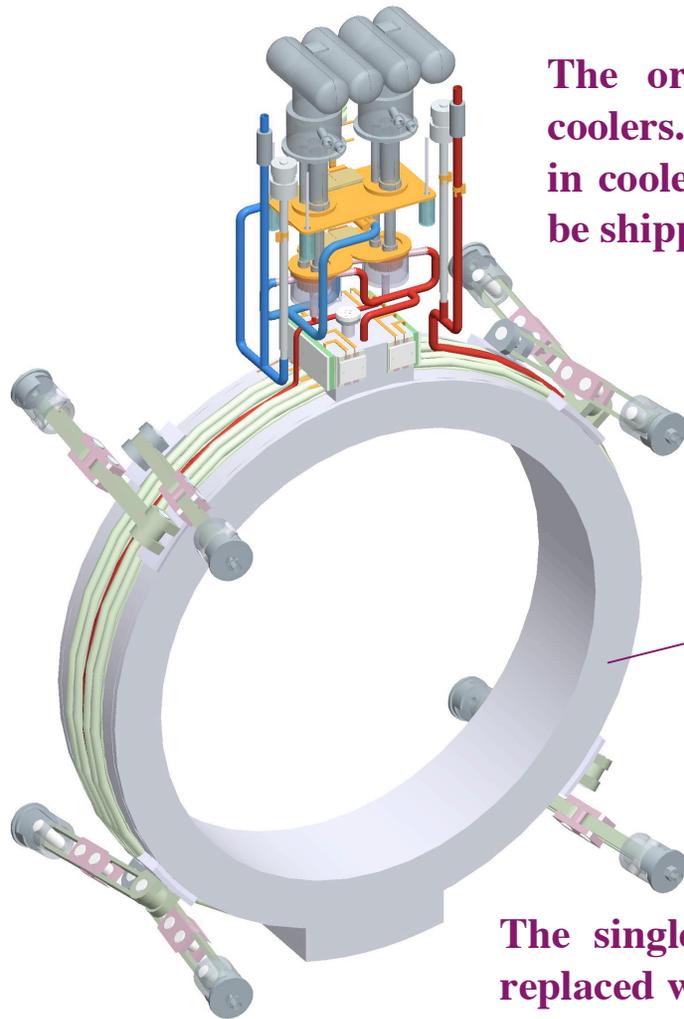
Old Design

The original design called for cooling pipes outside of the cold mass. The new design call for cooling pipes within the cover plate. As a result, the cold mass support system is improved and there is room for quench protection resistors.



New Design

Cold Mass Supports and Coolers

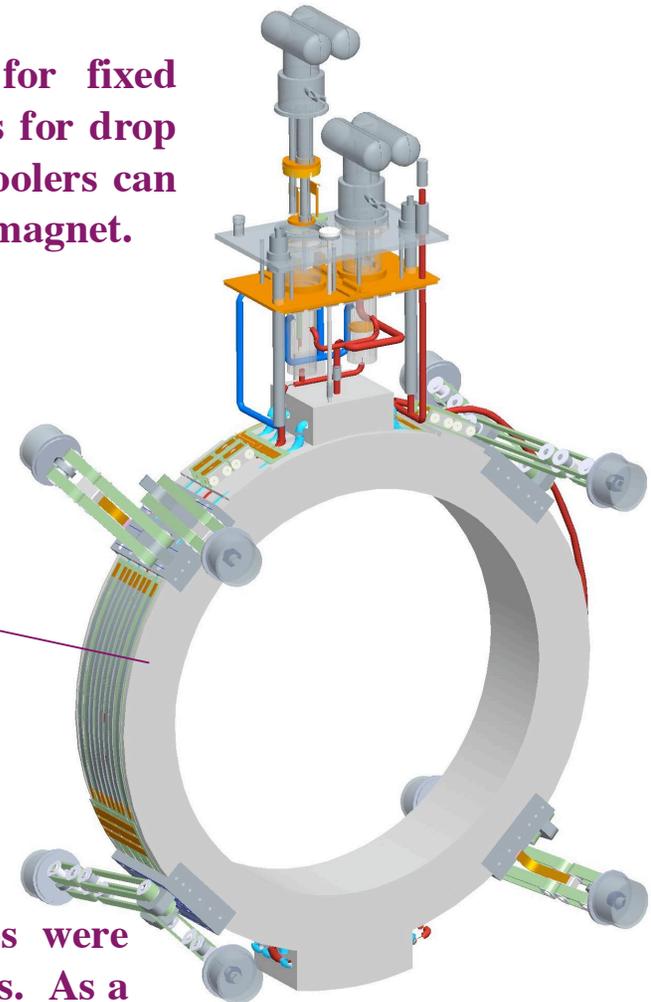


Old Design

The original design called for fixed coolers. The new design calls for drop in coolers. As a result, the coolers can be shipped separate from the magnet.

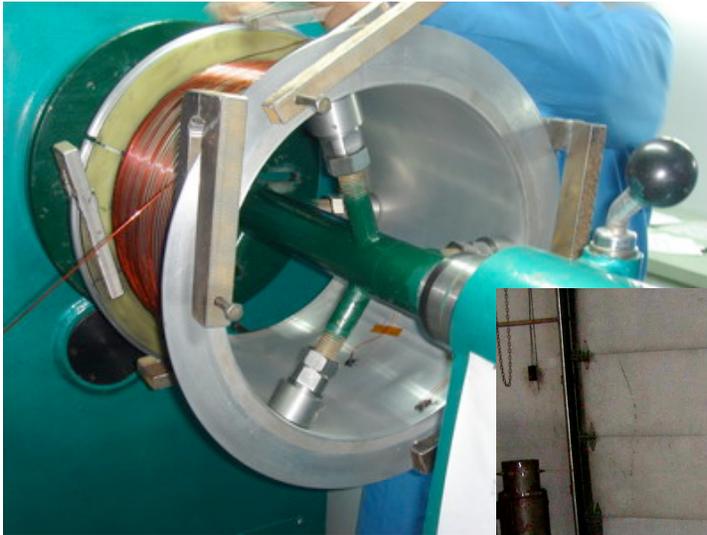
Cold Mass Assembly

The single band support straps were replaced with double band straps. As a result the overall stress in the support system parts is much lower.



New Design

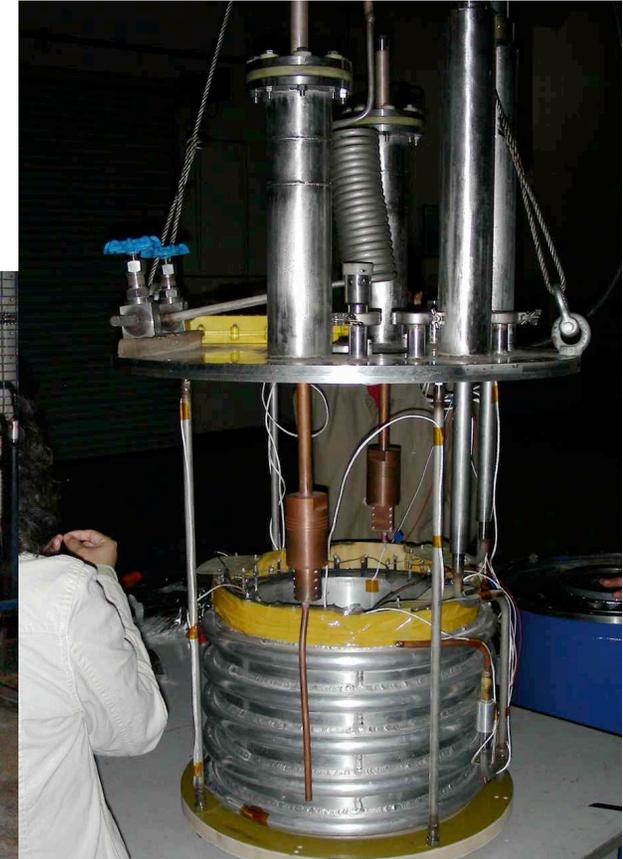
Small Test Coil



Small Test Coil Winding

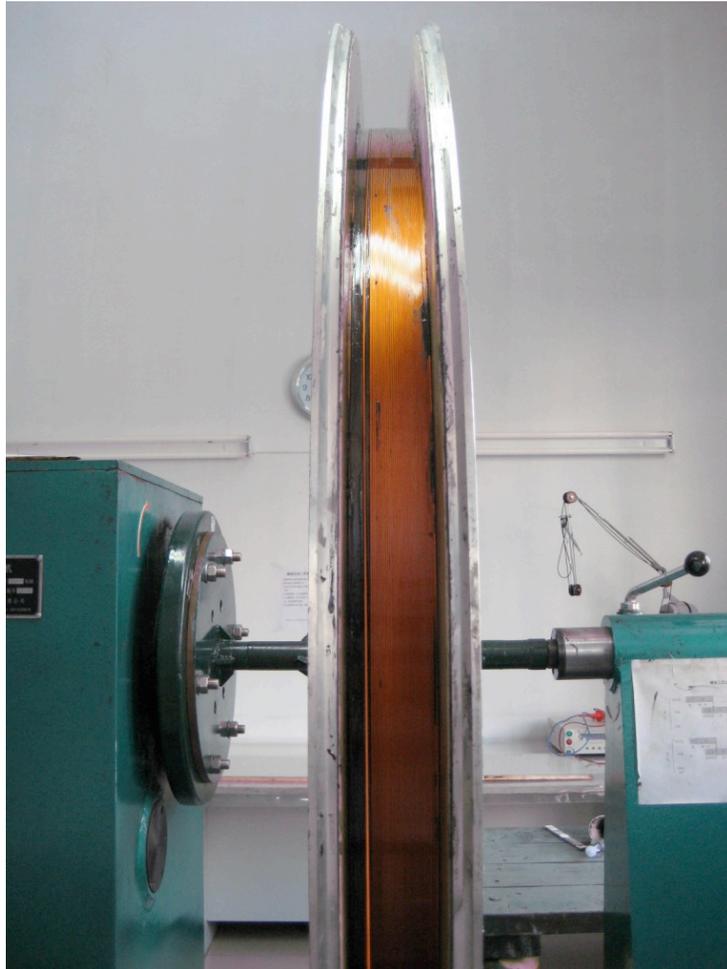


Small Test Coil Vacuum Vessel



Small Test Coil Cooling

Large Test Coil



Winding of the Large Test Coil



Welding of the Large Test Coil



Assembly of the Large Test Coil

Full Sized Test Cryostat and Cryogenic System



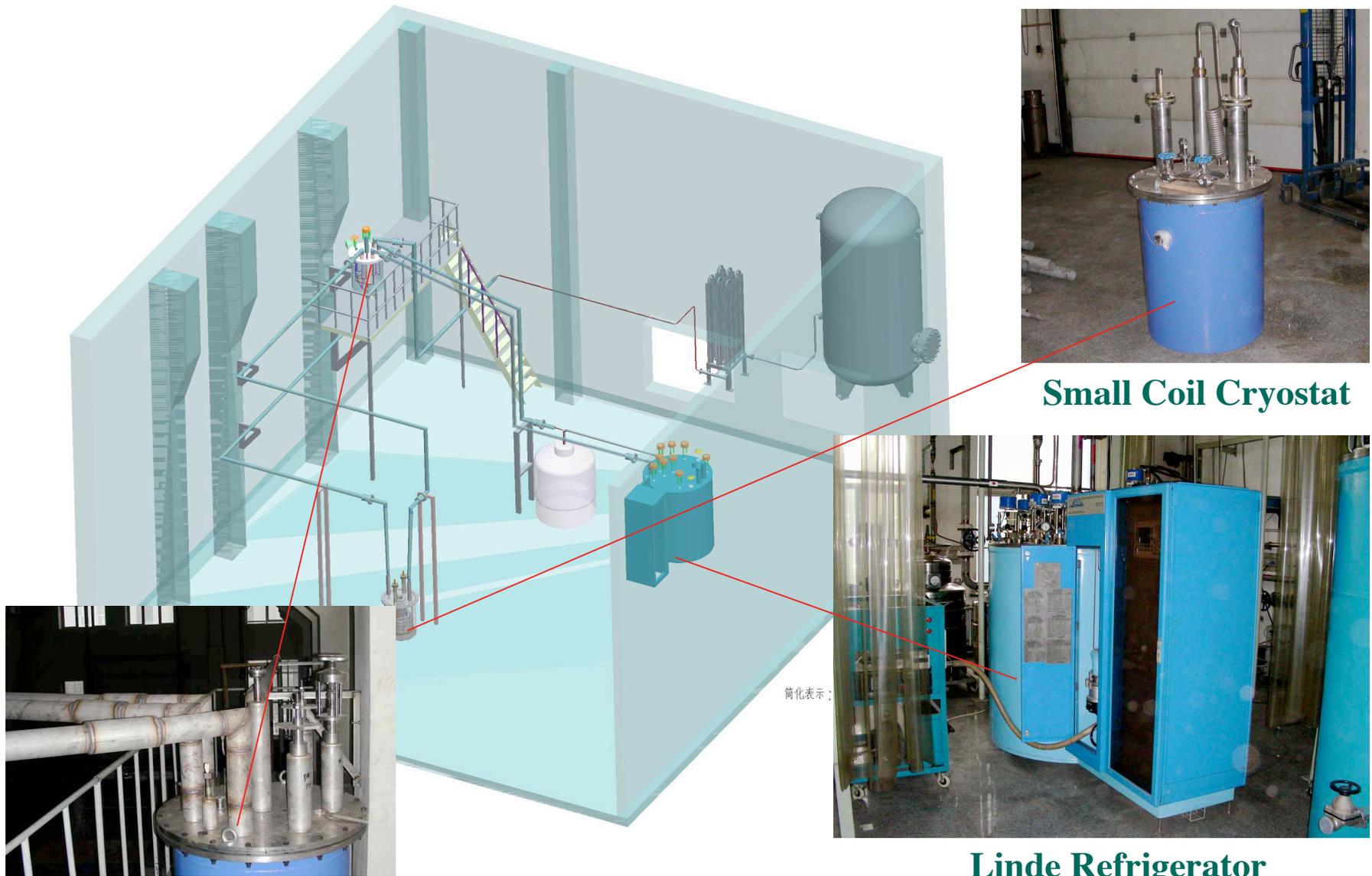
Full Sized Coil Test Cryostat



Magnet Cryogenic System with the Small Test Coil Cryostat

The cryostat used for the large test coil will be used for training the MuCool and MICE coils. During the training process the magnets will be cooled using a Linde 20 liter per hour liquefier.

ICST Test Station and Cryogenic System



Small Coil Cryostat



Valve Box



Linde Refrigerator

Testing of the Test Coils

- **The large test coil will be tested around the middle of march. The large test coil will be trained to its short sample current. The following will be tested:**
 - **The quench protection system**
 - **The effect of stress at the magnet short sample current**
- **The small test coil will be tested after the test of the large test coil. The small test coil will be used to provide magnetic field for measuring the forward voltage of the diodes at various orientations at 300 K, 77 K, and 4 K.**

Timeline for MuCool and MICE Magnets

- **The MuCool coil winding finished ~15 May 09**
- **The MuCool cold mass assembly to be finished ~15 July 09**
- **The MuCool coil training finished ~ 1 Sept. 09**
- **MuCool Magnet Assembly finished ~15 Dec. 09**
- **Ship MuCool Magnet ~20 Jan. 10**

- **Ship first MICE magnet ~15 June 10**
- **Ship second MICE magnet ~ 15 Nov. 10**

Some Concluding Comments

- **The design of the coupling magnet is complete.**
- **Two test coils have been wound and will be tested in March and April.**
- **The coupling magnet cold mass will be fabricated and tested at ICST.**
- **The MuCool magnet will be wound as soon as the large test coil has been tested.**
- **The magnet cryostats will be sub-contracted.**
- **LBL will provide the magnet cold mass supports.**
- **The magnet assembly will probably occur at ICST.**