

Coupling Coil Update

MICE CM39 - Oxford
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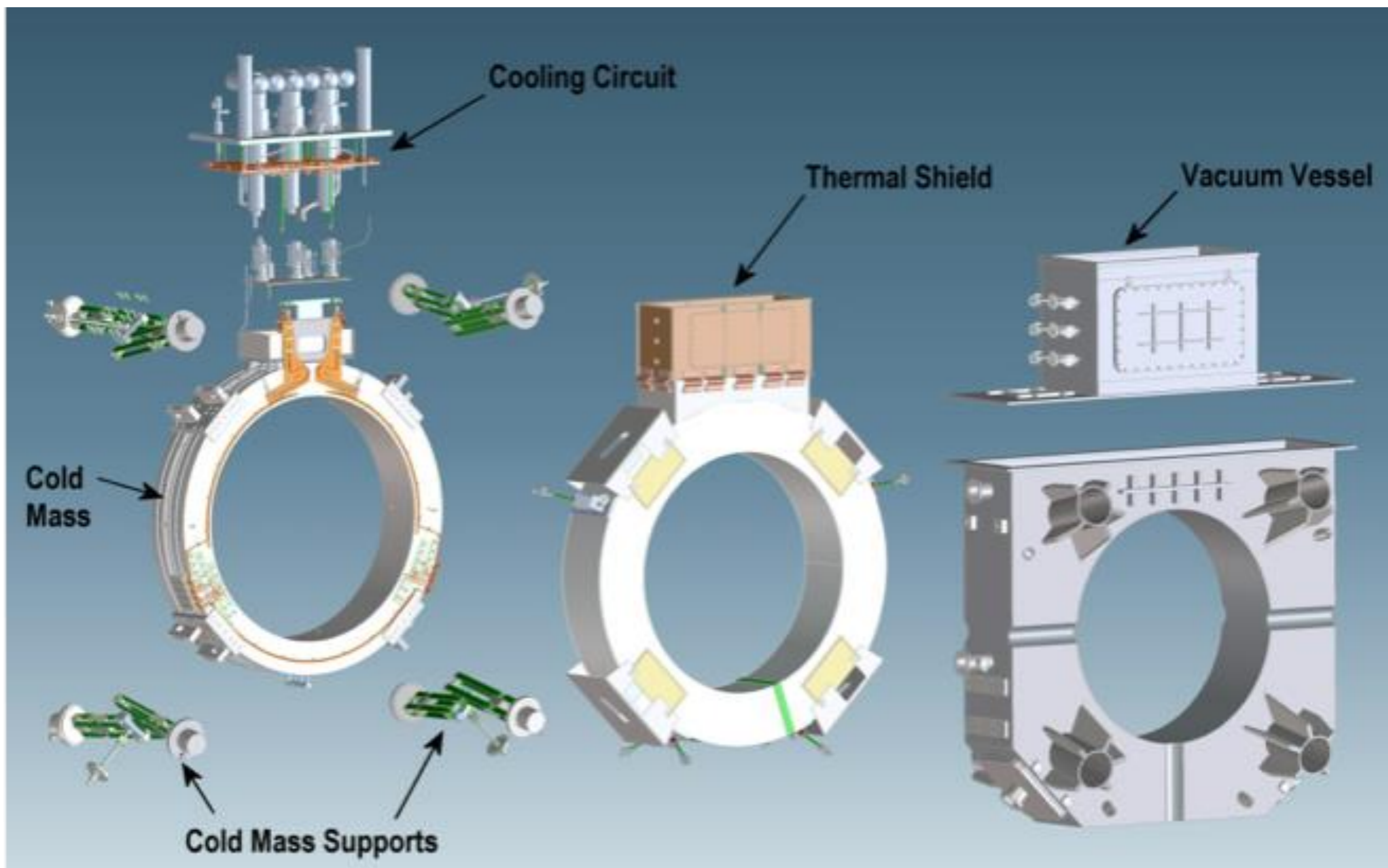


Topics



- Coil testing at Fermilab
- Cryostat fabrication
- Shield and cooling system design
- 2nd coil winding in China

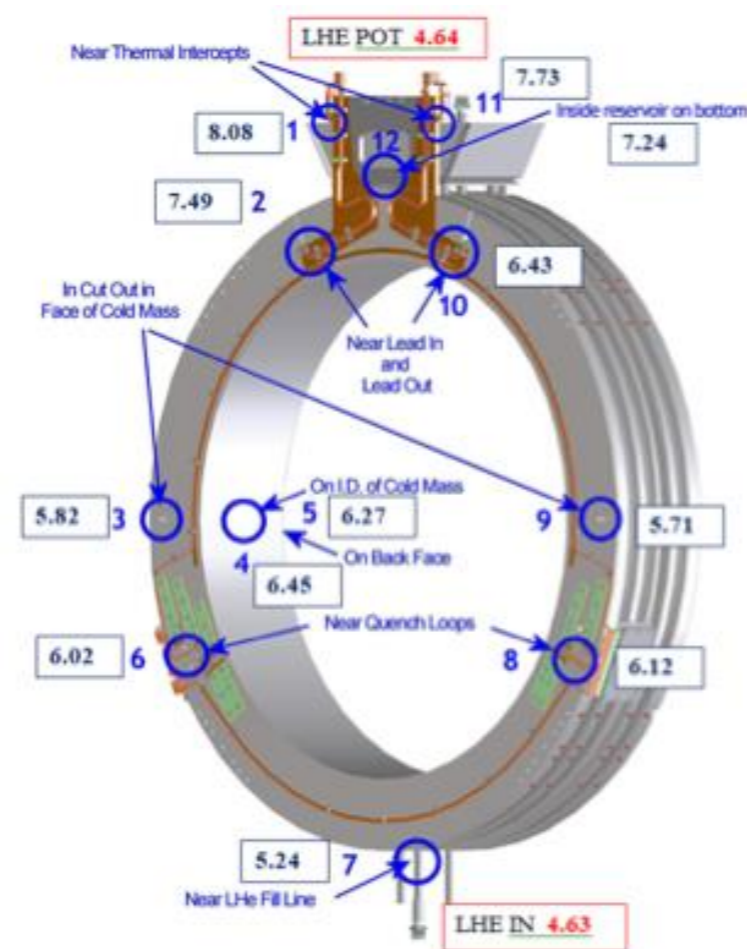
Coupling Coil Components



Coil Testing at FNAL

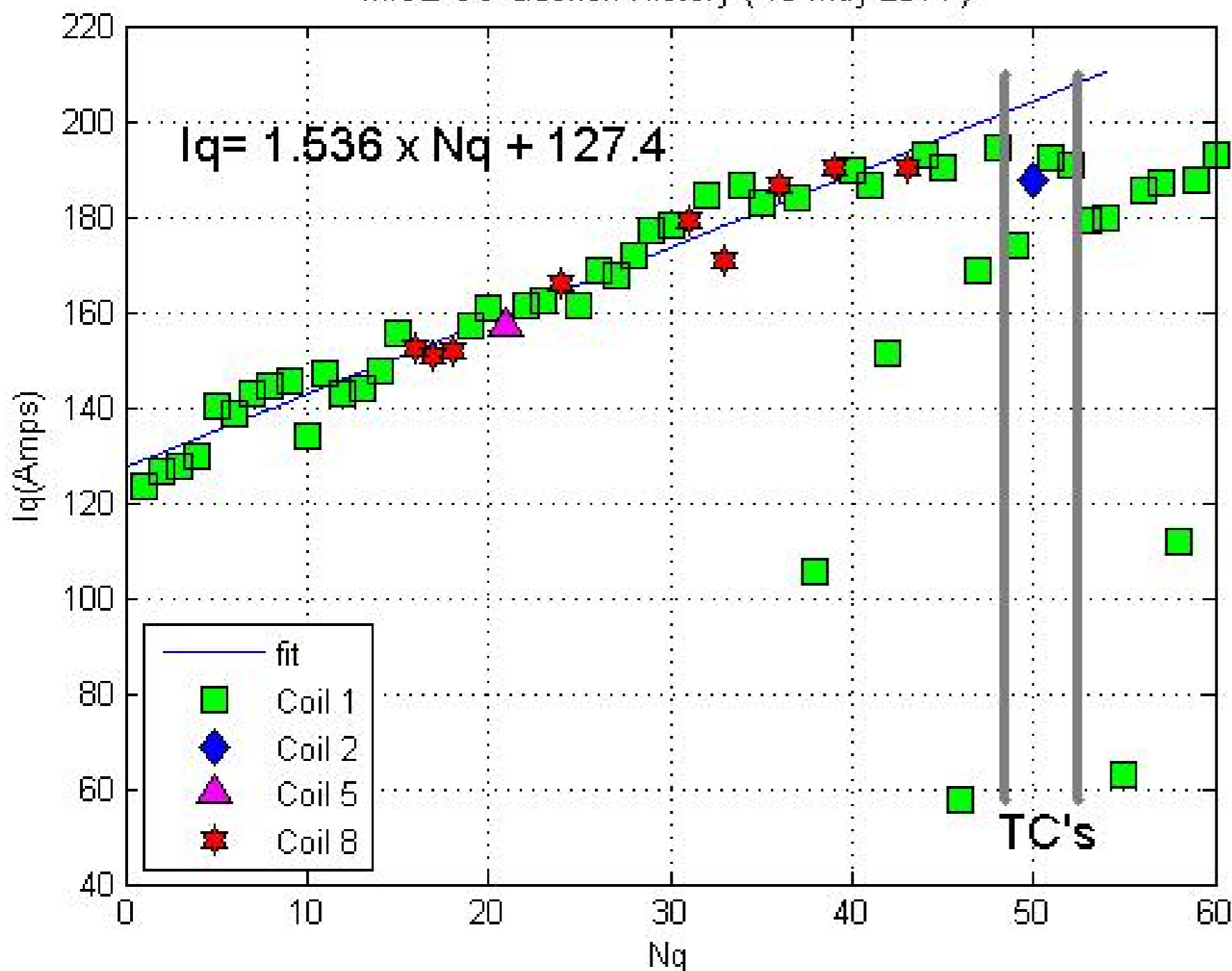


- Tests of first coil cold mass at Fermilab are now complete
- Reached >90% of 214A target
- No further testing of this coil planned



Coil Training History

MICE CC Quench History (16-May-2014)



- Very slow training progression (~60 quenches)
- Good memory after thermal cycles
- Peak current appears to be limited by cooling circuit limitations

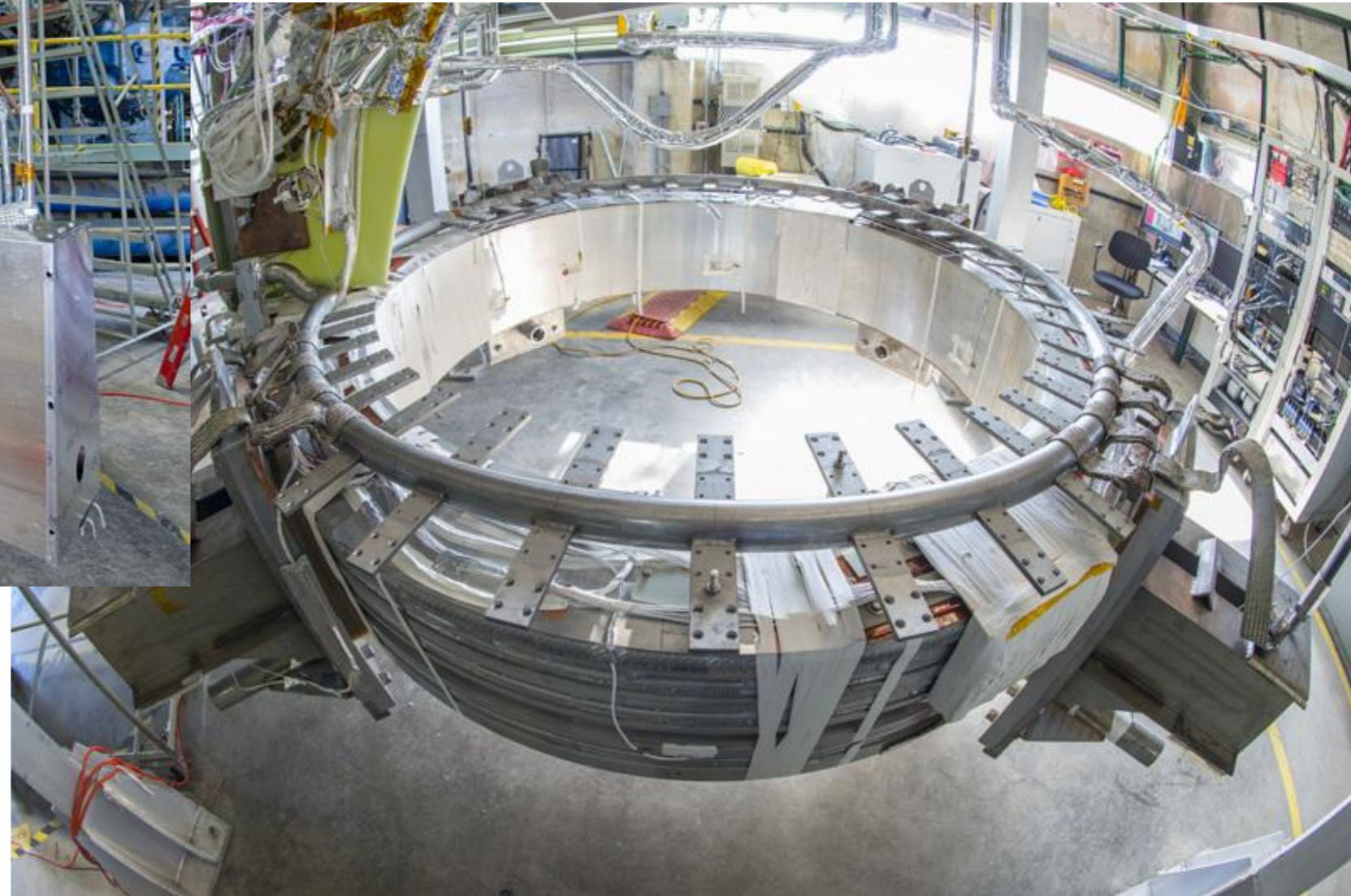
Removal from Test System



- The coil was disconnected, unwrapped, and dismounted from the top plate assembly
- No evidence of "damage" (eddy current/transformer effects from the collapsing field after a quench)
- Now crated and stored in the Industrial Center Bldg



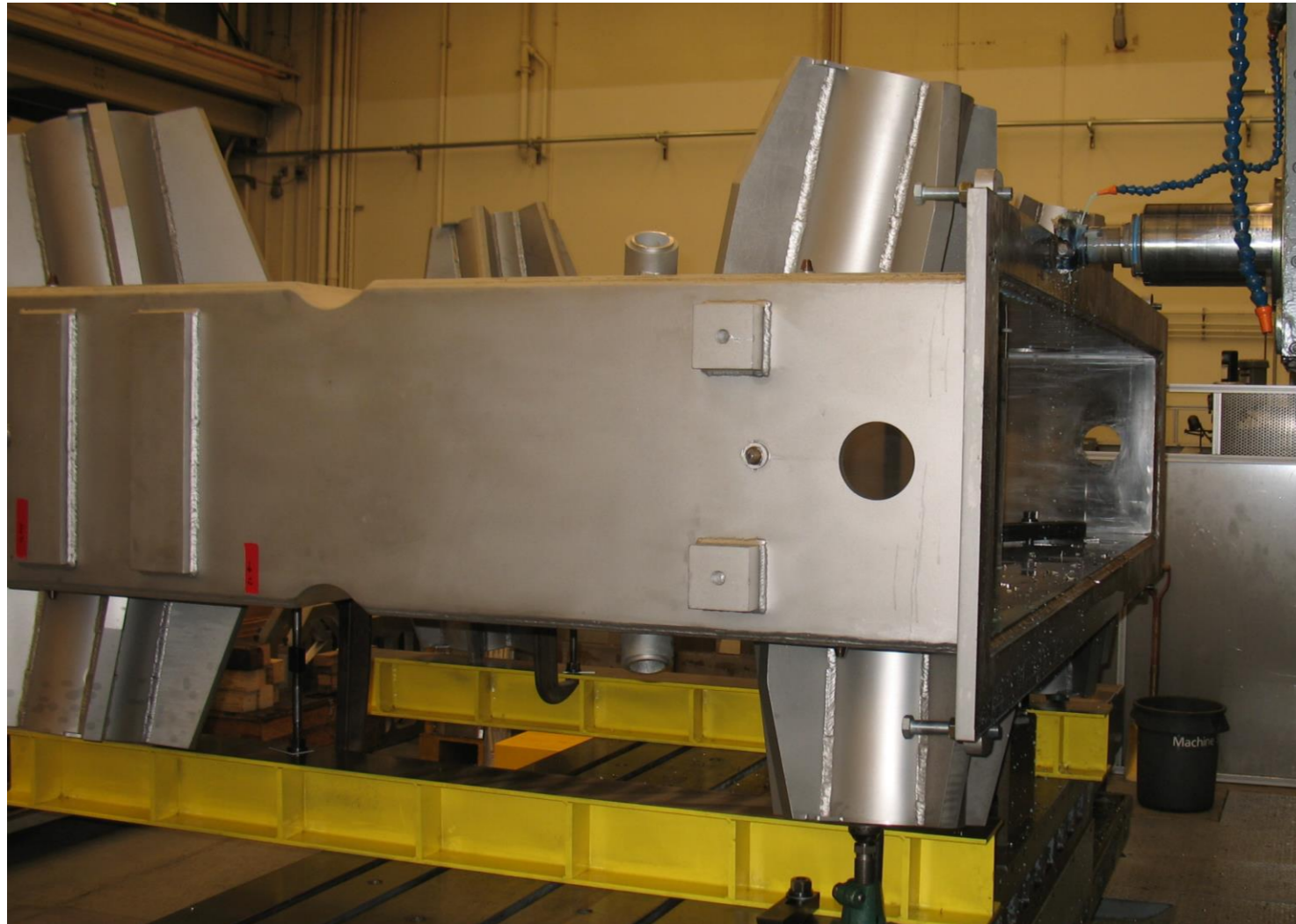
Removal from Test System



Cryostat Fabrication



Cryostat Fabrication

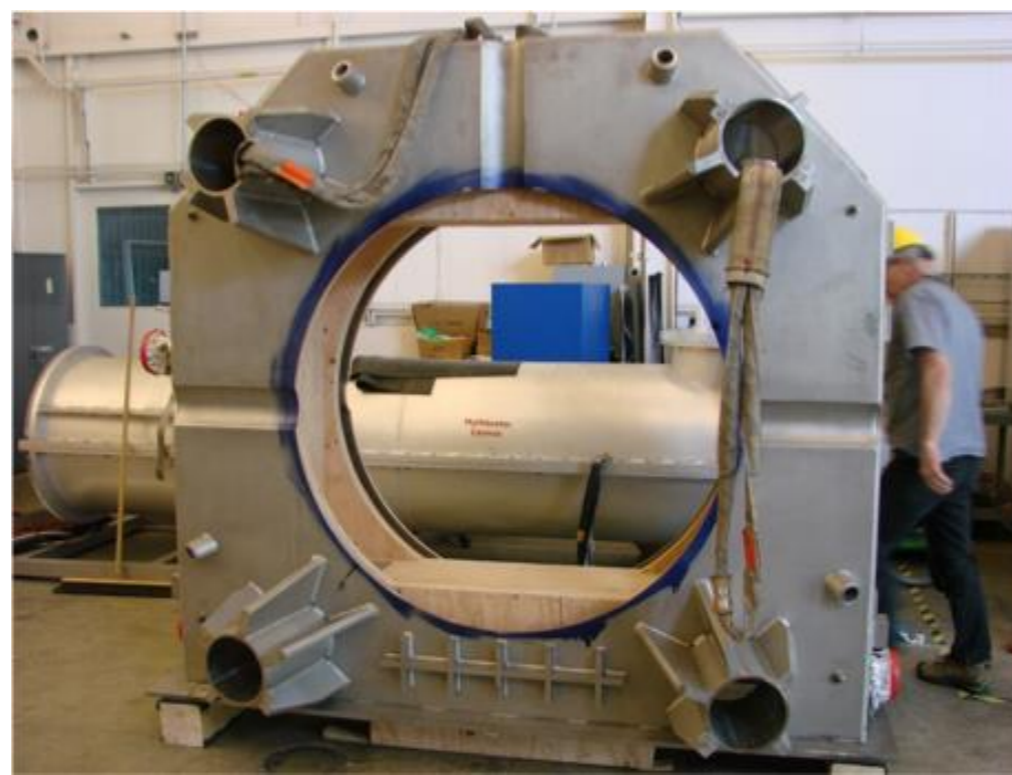
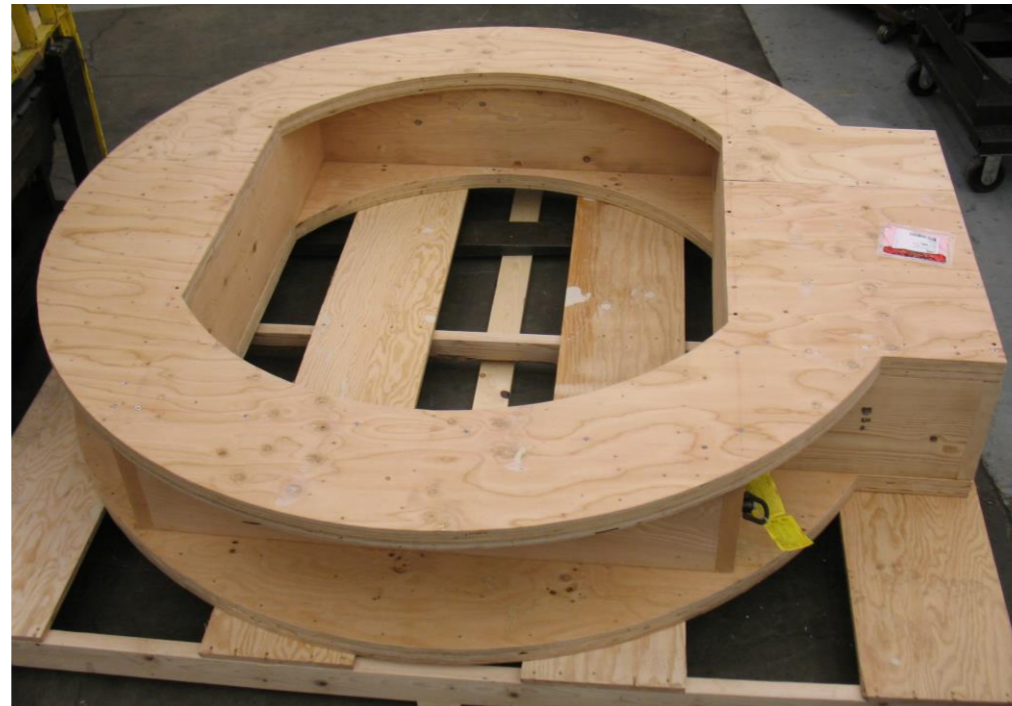


- Aperture machining



- Flange plate machining

Dummy Coil/Shield Assy



- Dummy coil-shield assembly built w/plywood
- Cryostat dropped onto dummy coil as a fit check
- To be used in the future to facilitate assembly tooling design and testing

Completion of Cryostat



- Cryostat vacuum leak check



- Completed cryostat tower



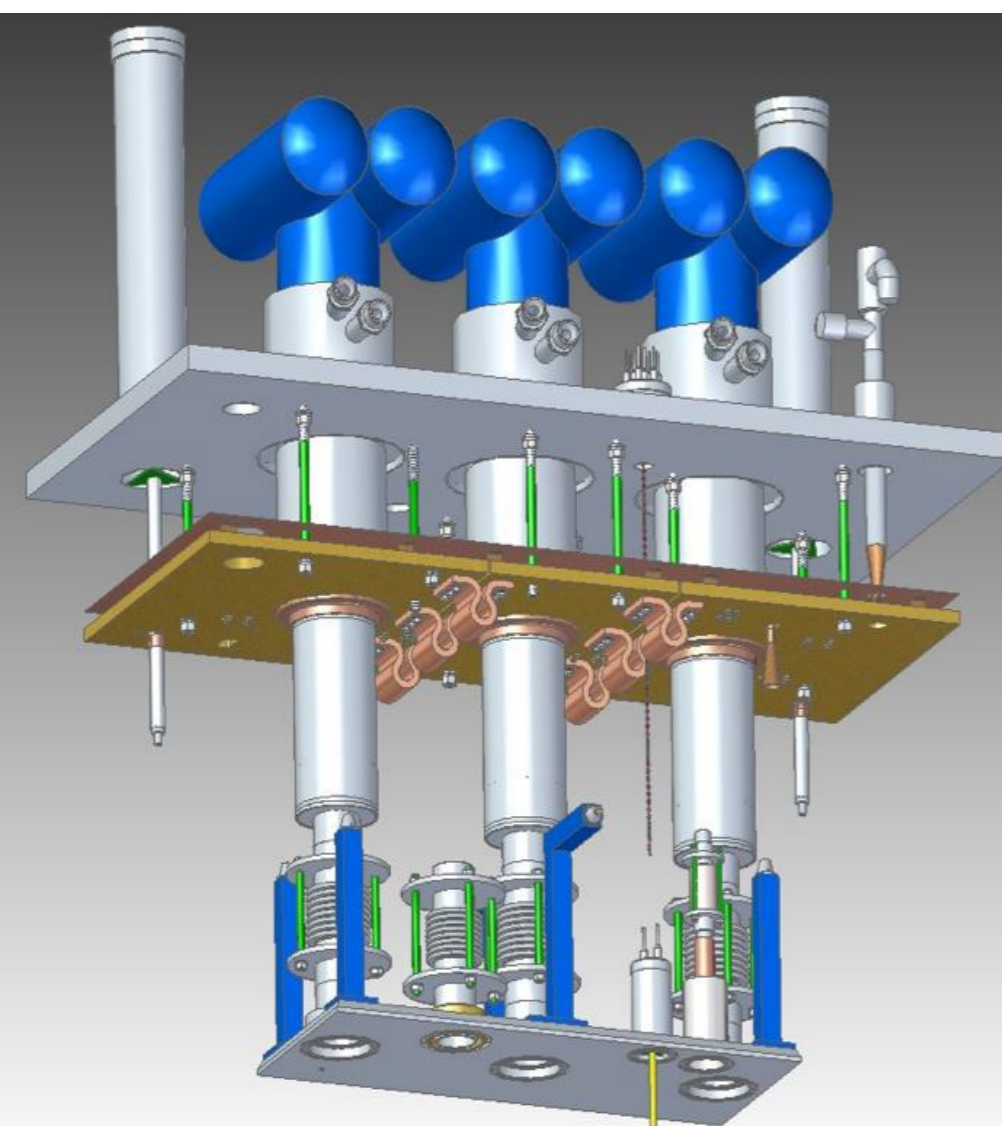
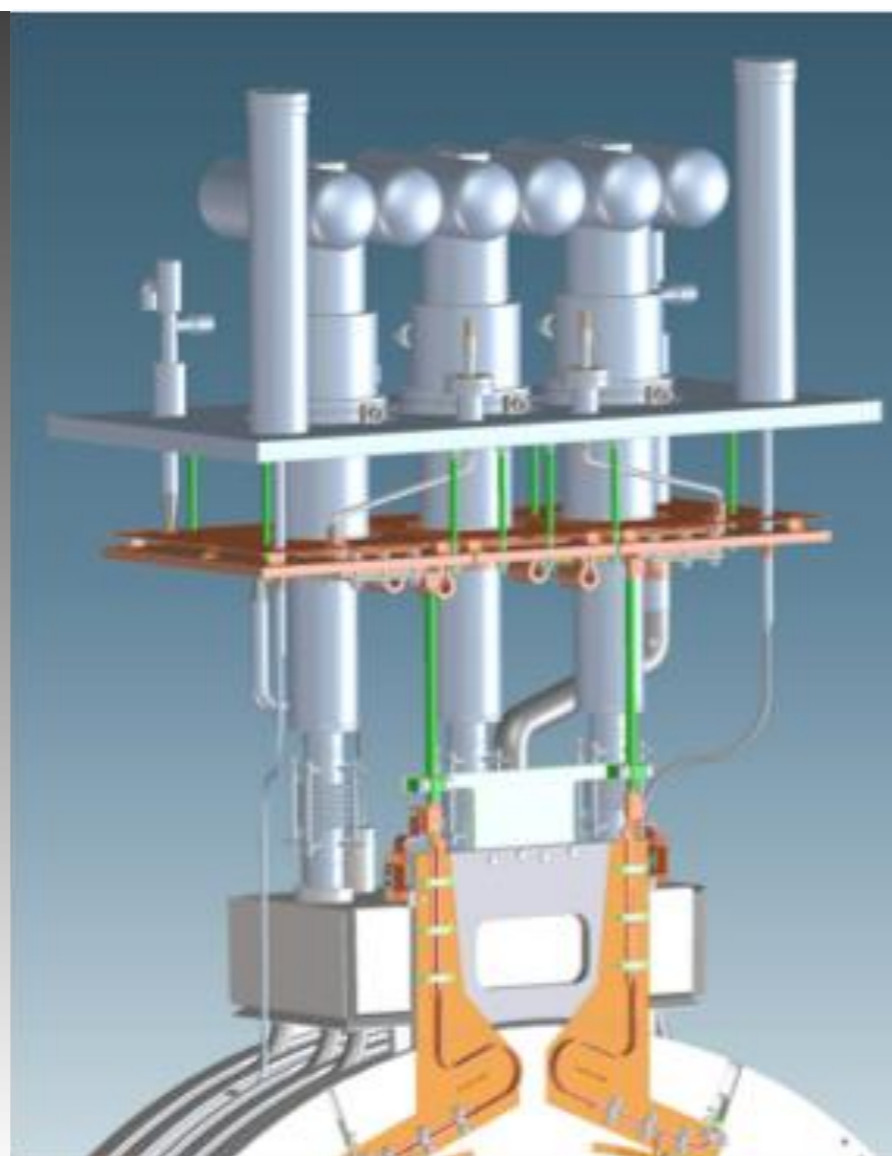
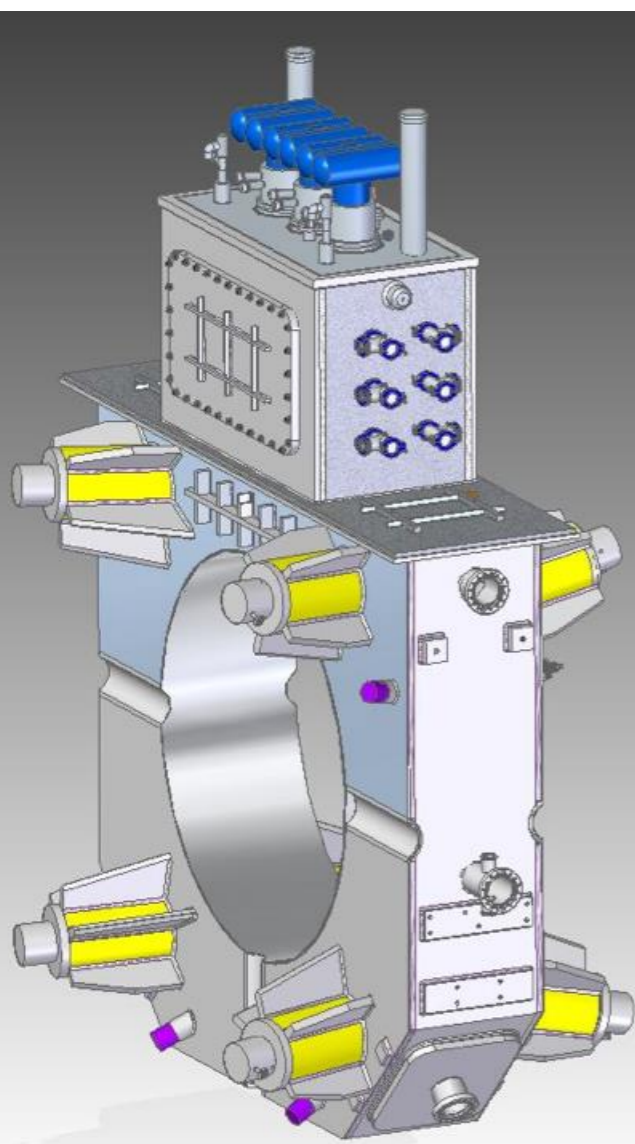
- Packaged for shipping

Cryostat Shipping to FNAL



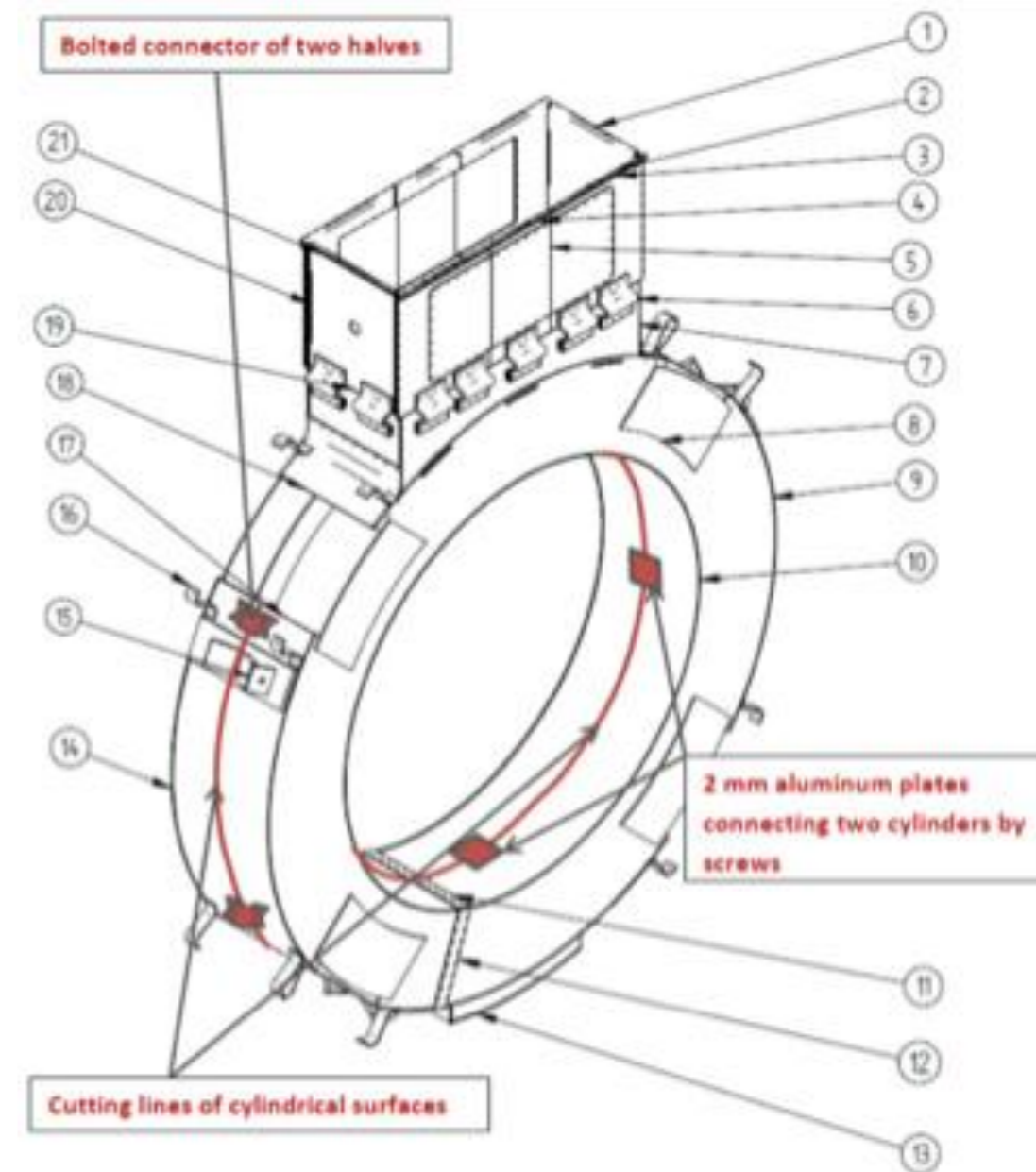
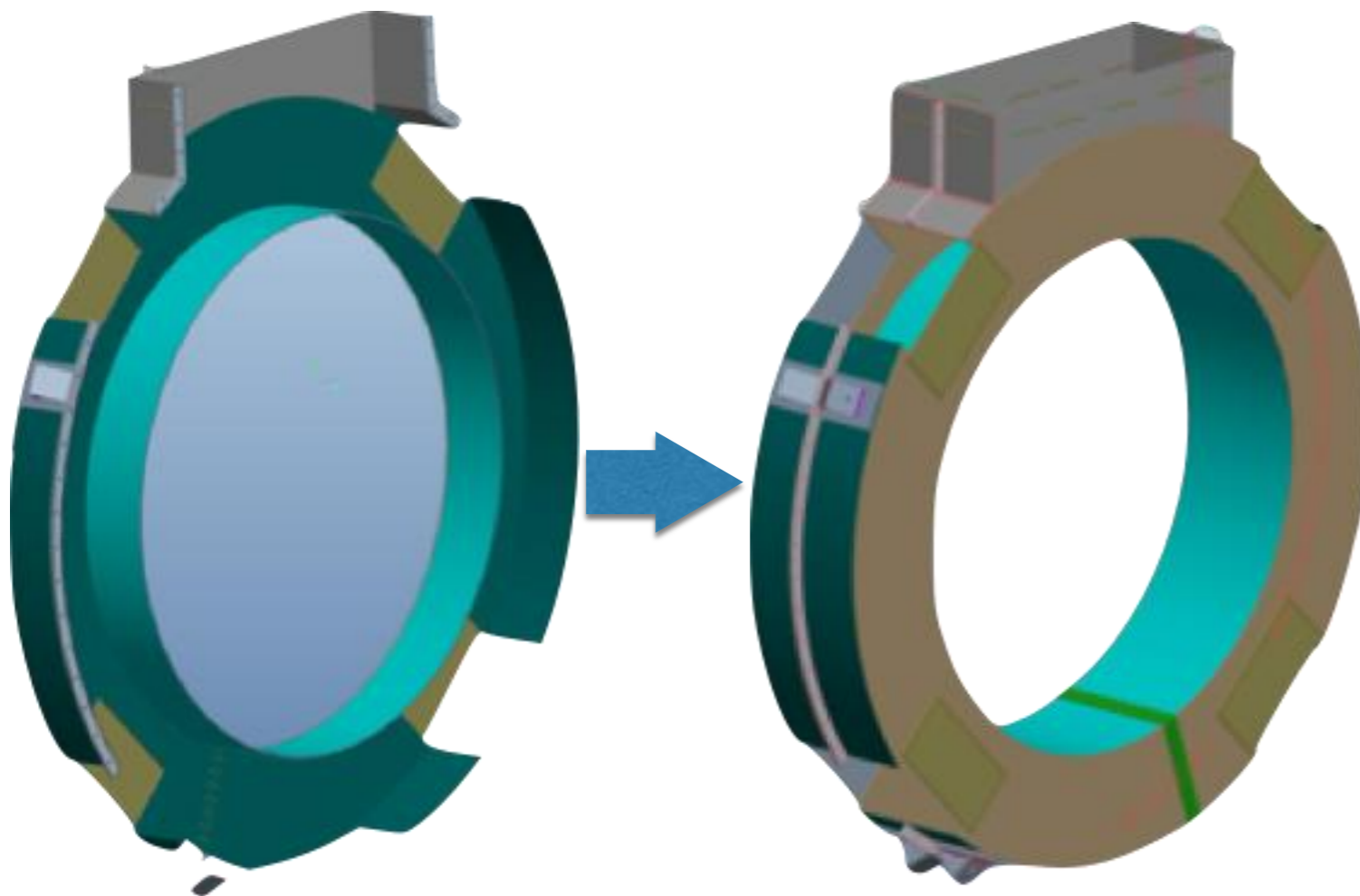
- Cryostat, tower, warm bore and dummy coil shipped to FNAL last week

- Significant modeling of tower cryogenic circuits completed
 - Needs design detailing, and fabrication of sub-assemblies

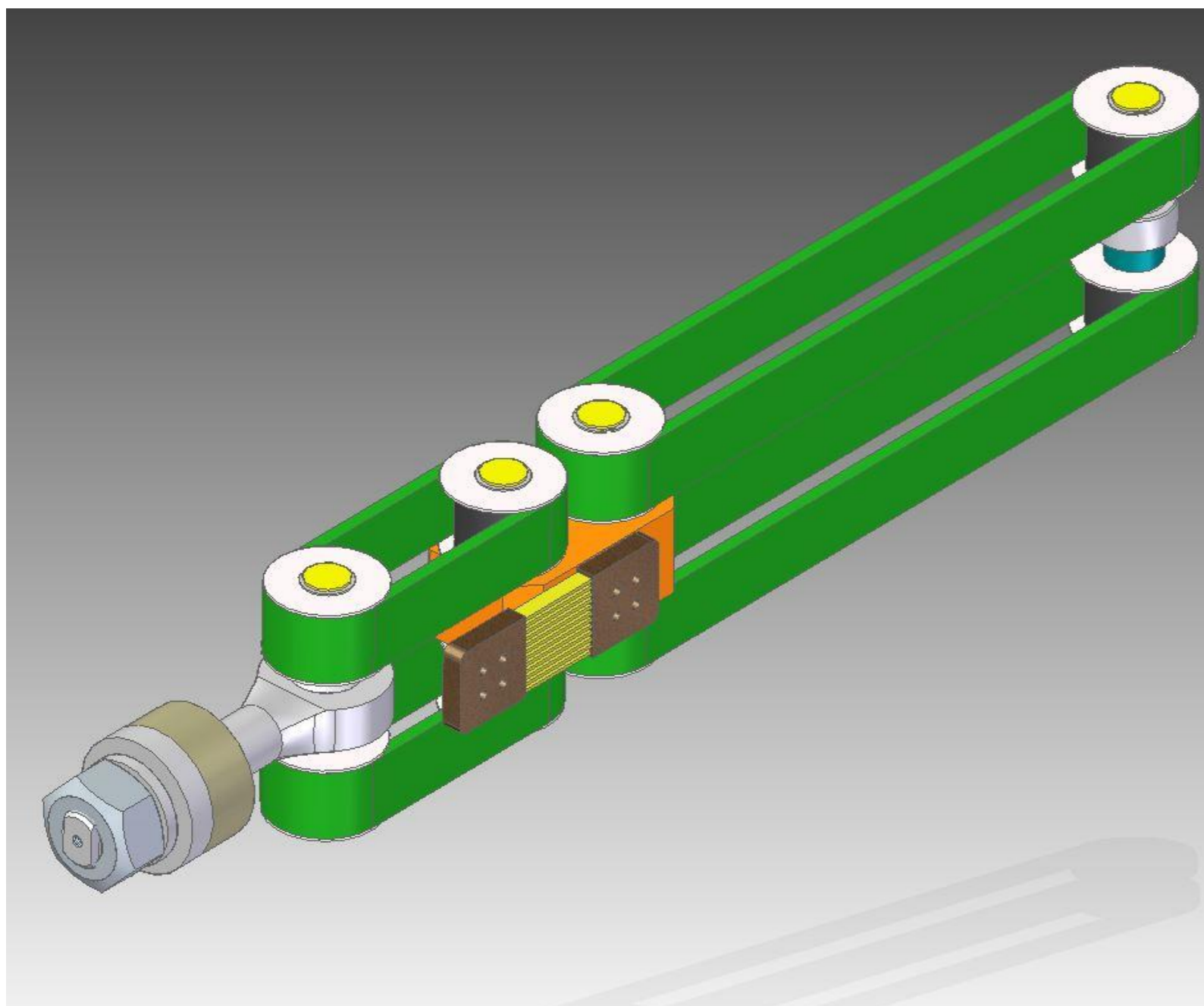


Thermal Shield Redesign

- New design will facilitate installation
 - Preliminary model needs review and detailing



Cold Mass Supports



- The existing HIT/SINAP design is similar in approach to that of the Spectrometer Solenoid
- The search for vendors to produce the cold mass support assemblies is under way
- Updated detail drawings will be generated prior to placing any orders

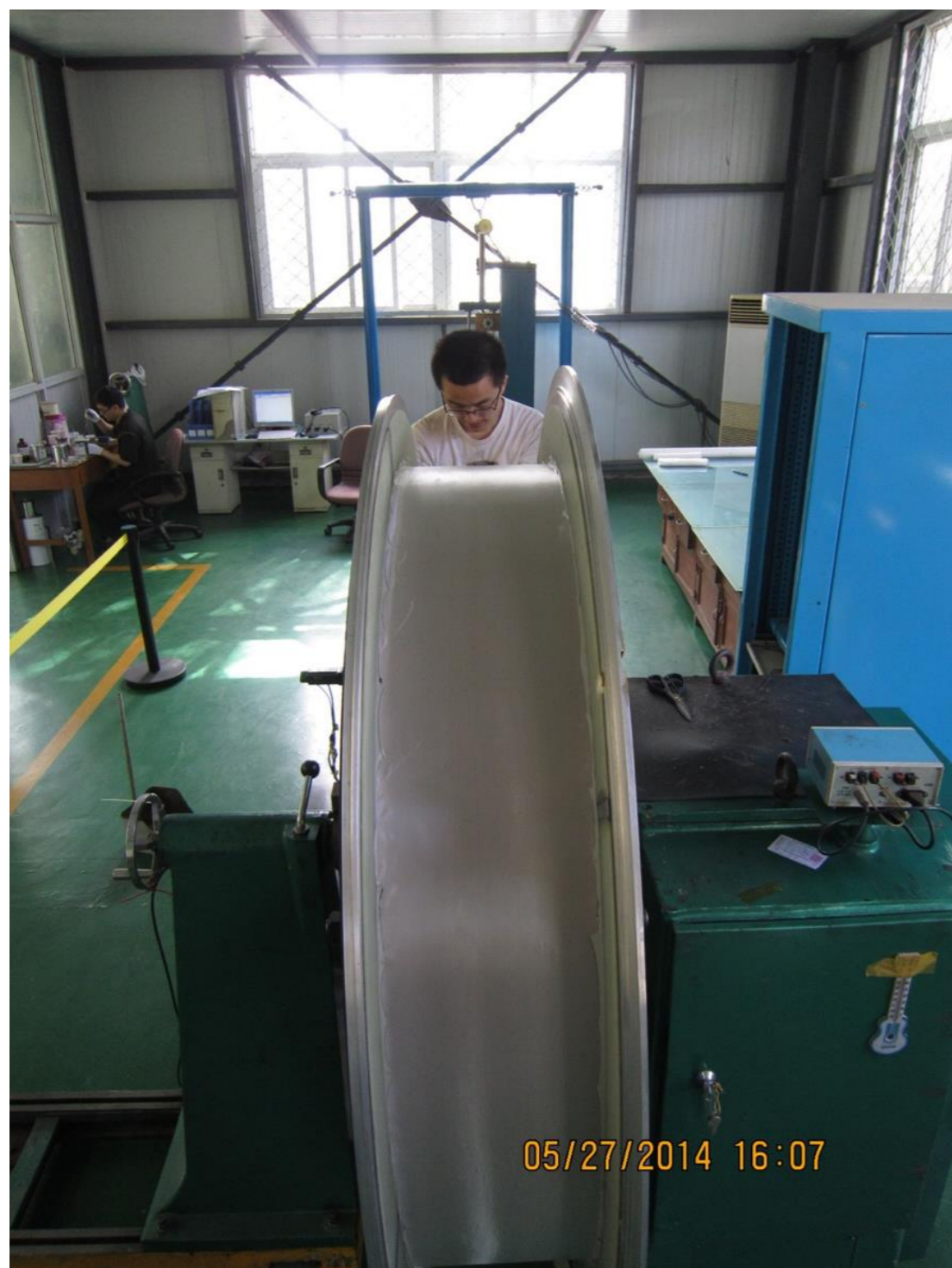


Design Work Summary

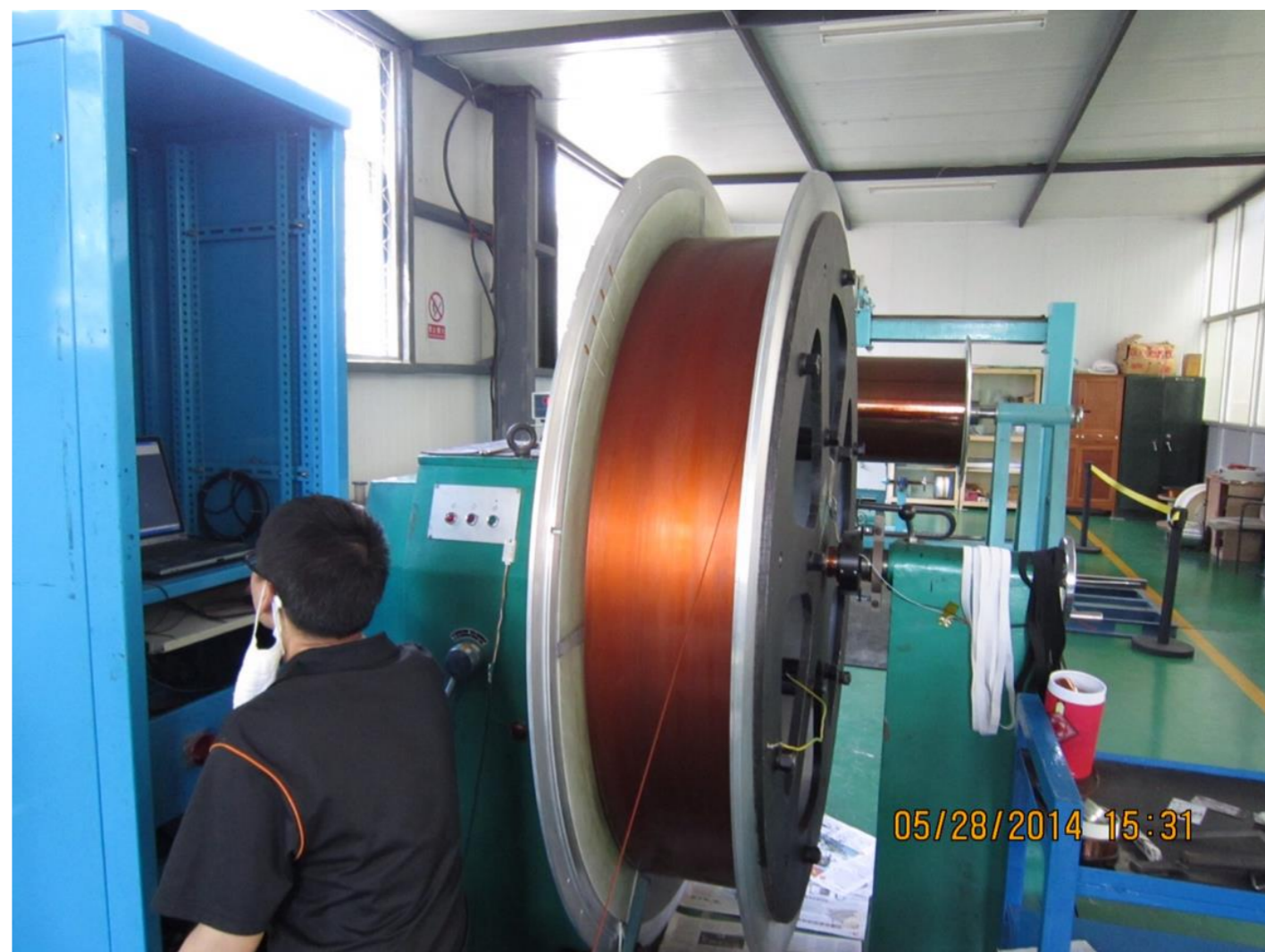


- **Lower cooling circuit assembly drawing package is ready for RFQ process**
 - Fiducial posts & features still to be detailed
- **Upper cooling circuit assembly design needs to be reviewed**
 - Fabrication and integration issues remain to be looked at in detail
- **Thermal shielding revision still to be detailed**
 - Split design is the plan going forward
 - Progress is currently resource limited
- **Cold mass supports**
 - Identifying viable vendors for fabrication
 - Detailed designs need to be completed prior to placing order

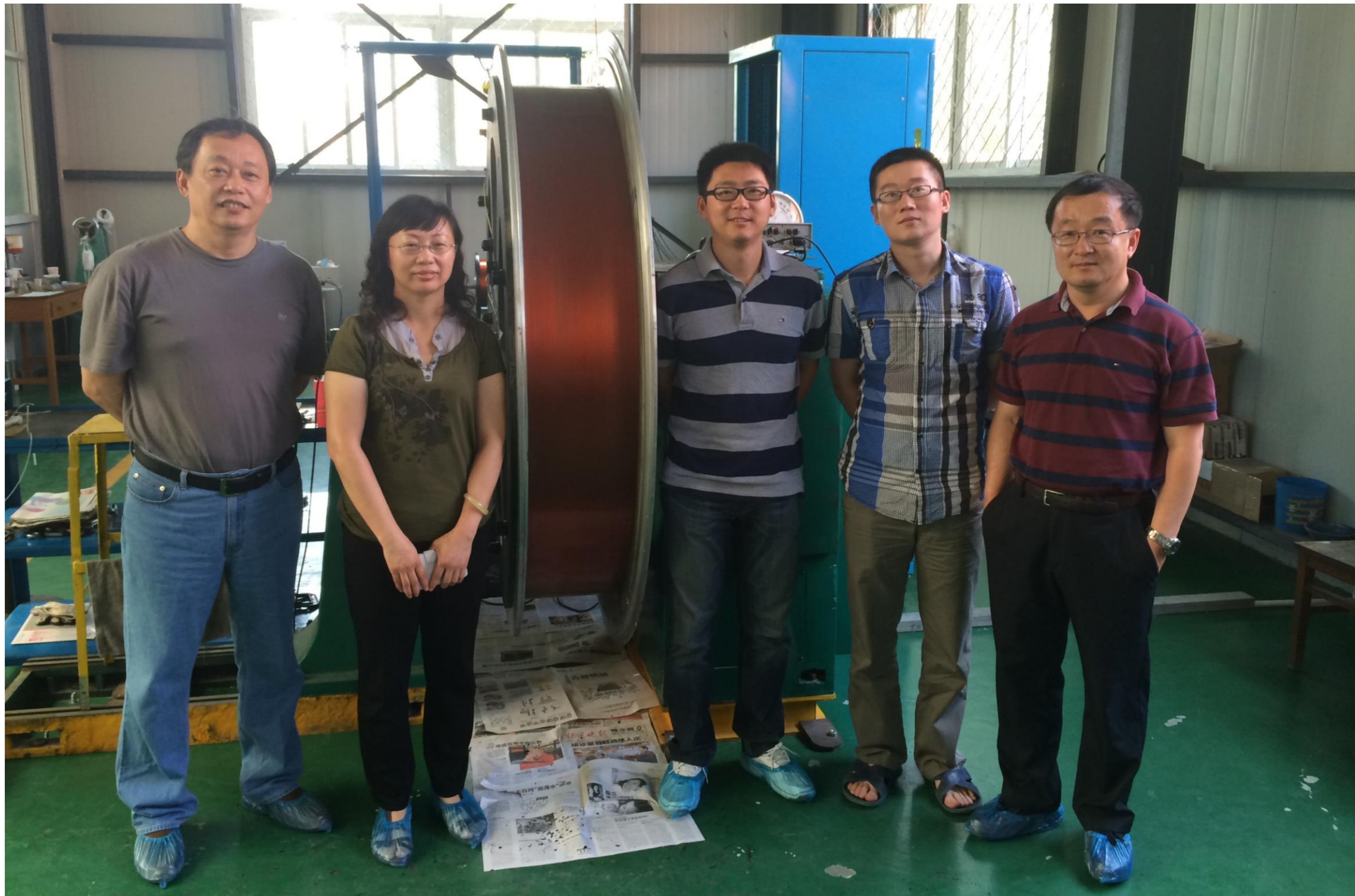
Winding of 2nd Coil in China



- Minimal changes to first coil design
- Coil winding is under way at QiHuan in Beijing
- Approximately 30% complete to date
- 2nd coil will have fewer joints (4 vs. 12)



Winding of 2nd Coil in China





Progress Summary



- Training/qualification of first cold mass is complete
- Completed cryostat shipped to FNAL
- Cooling circuit and shield design details well under way
- 2nd coil winding in progress at QiHuan
- Assembly plan under development