

Spectrometer Solenoid Fabrication Status and Schedule

MICE CM20 @ RAL

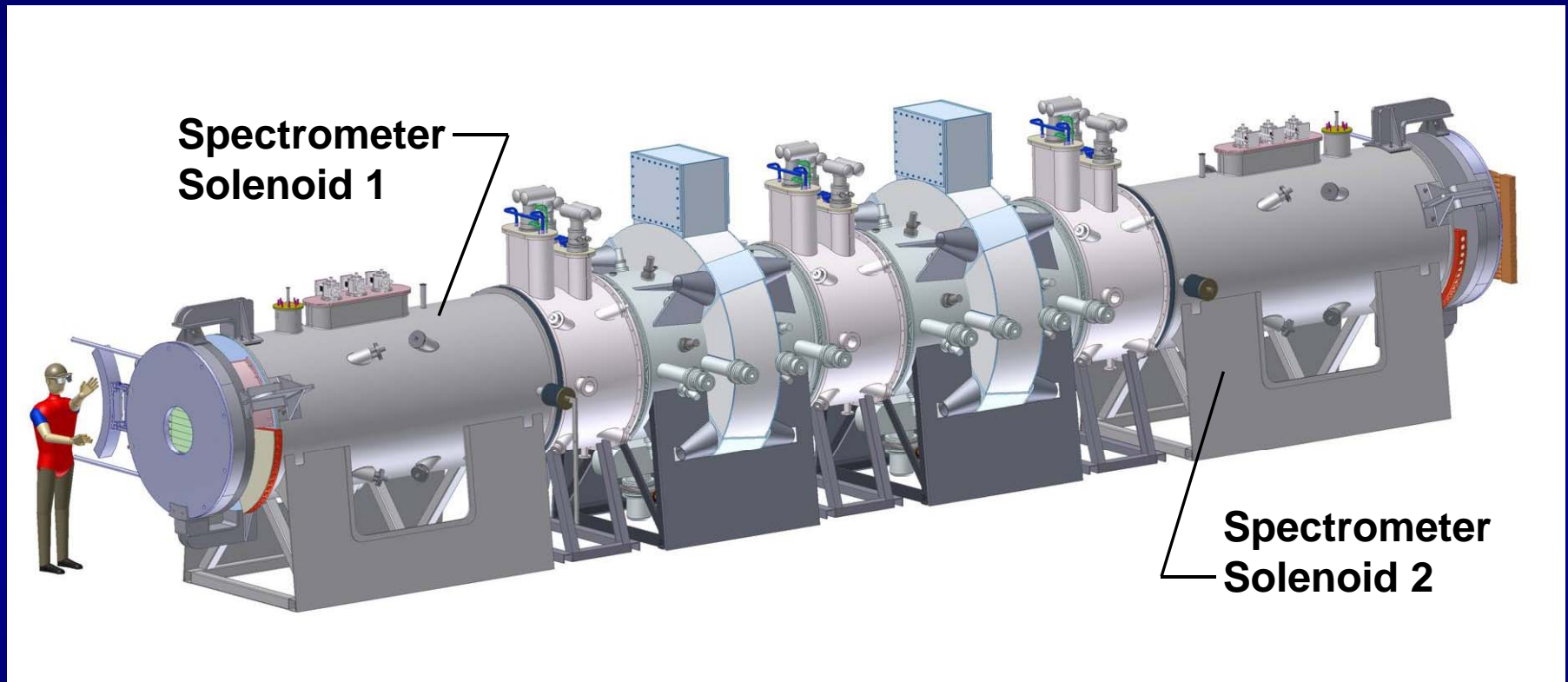
February 11, 2008

Steve Virostek

Lawrence Berkeley National Lab



MICE Cooling Channel Layout



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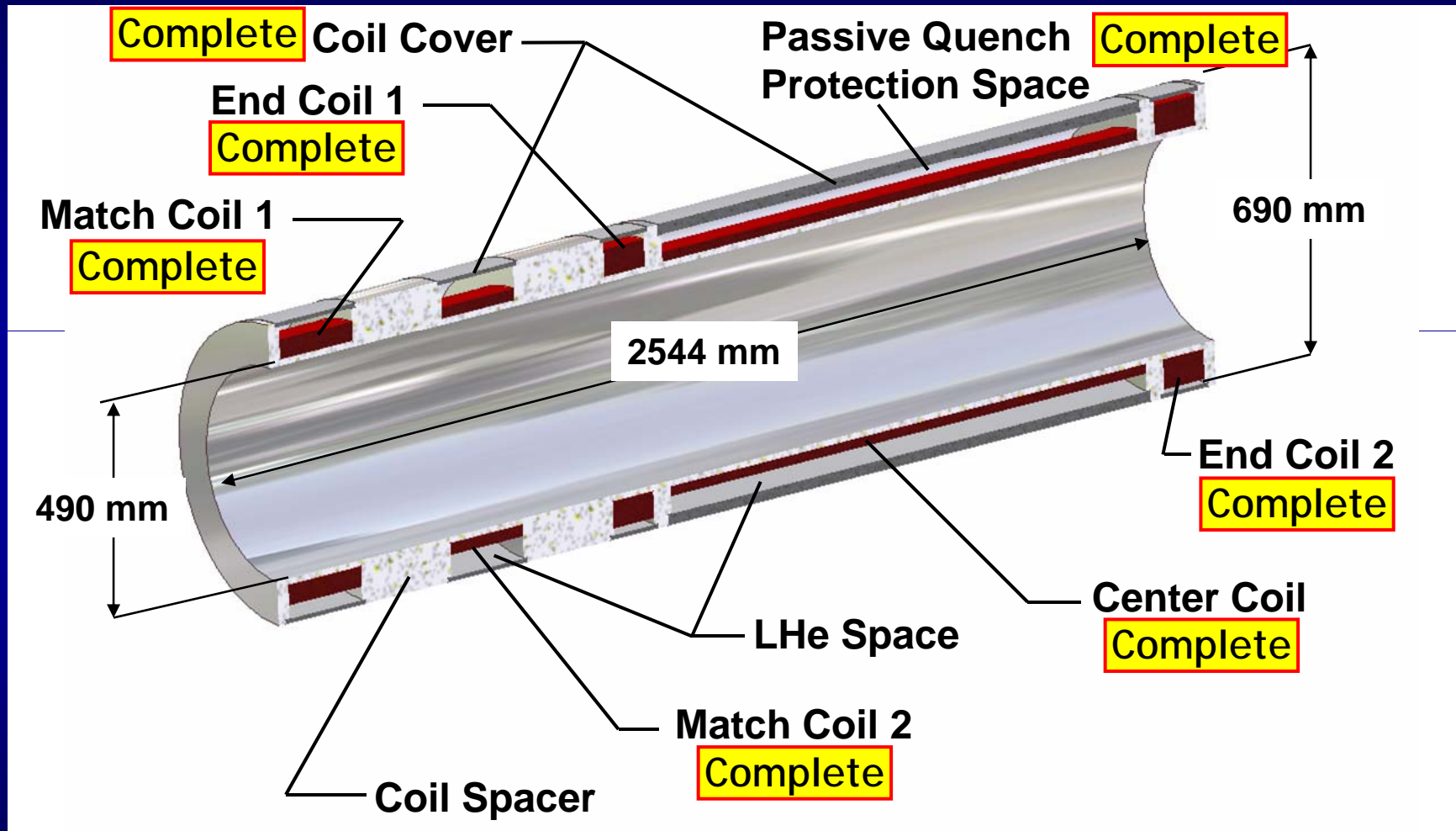


Summary

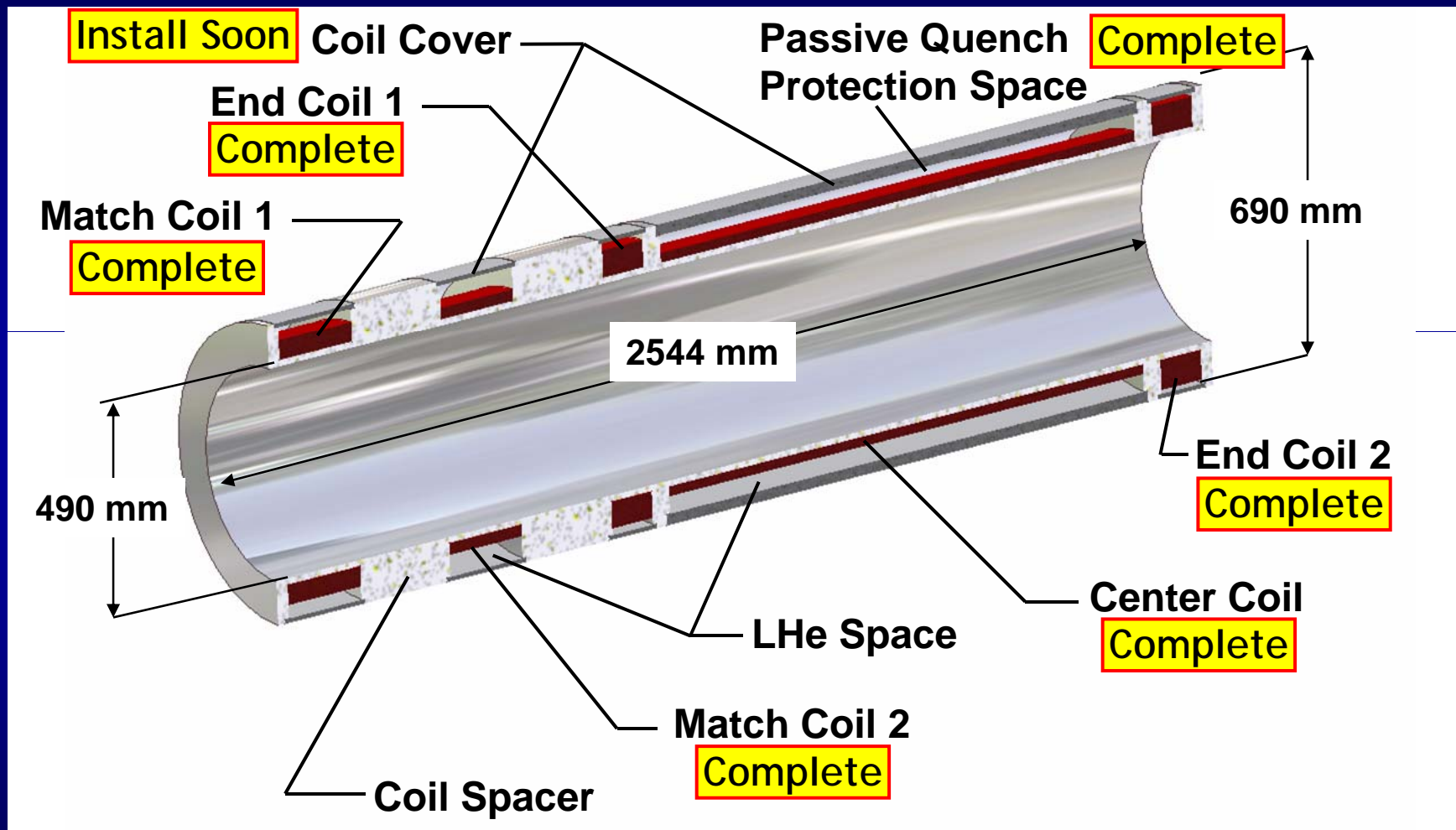
- Completion of first magnet has been delayed by an problem with cold mass support clearances
- Currently expect vendor testing and shipping to FNAL to be complete by the end of March
- Coil winding and banding of 2nd magnet finished
- Completion of the second magnet to follow the first by two to three months



Spectrometer Solenoid Cold Mass #1



Spectrometer Solenoid Cold Mass #2



Completed Cold Mass Assembly - Magnet #1



Cold mass prior to welding of support bands



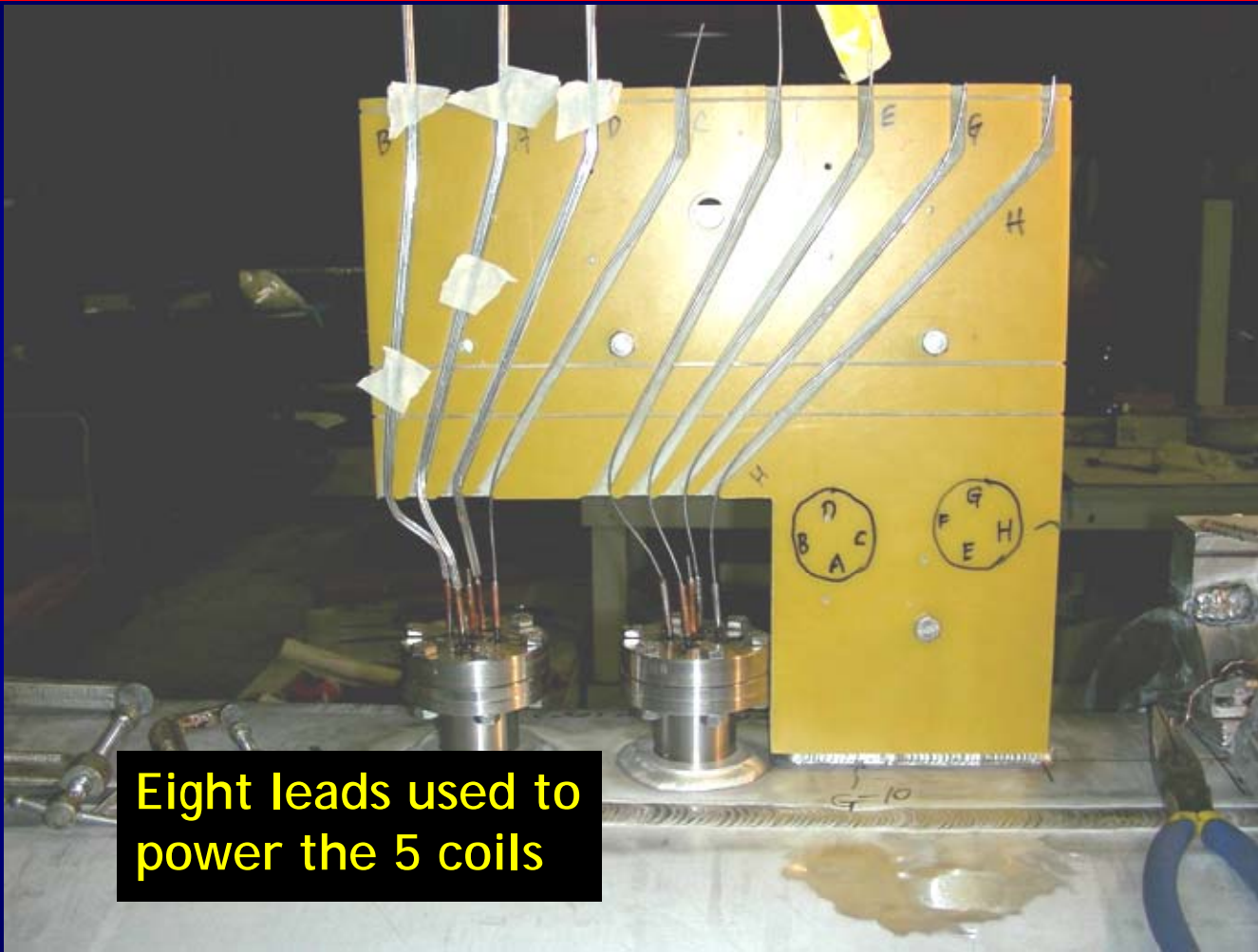
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Magnet Power Leads



Eight leads used to power the 5 coils



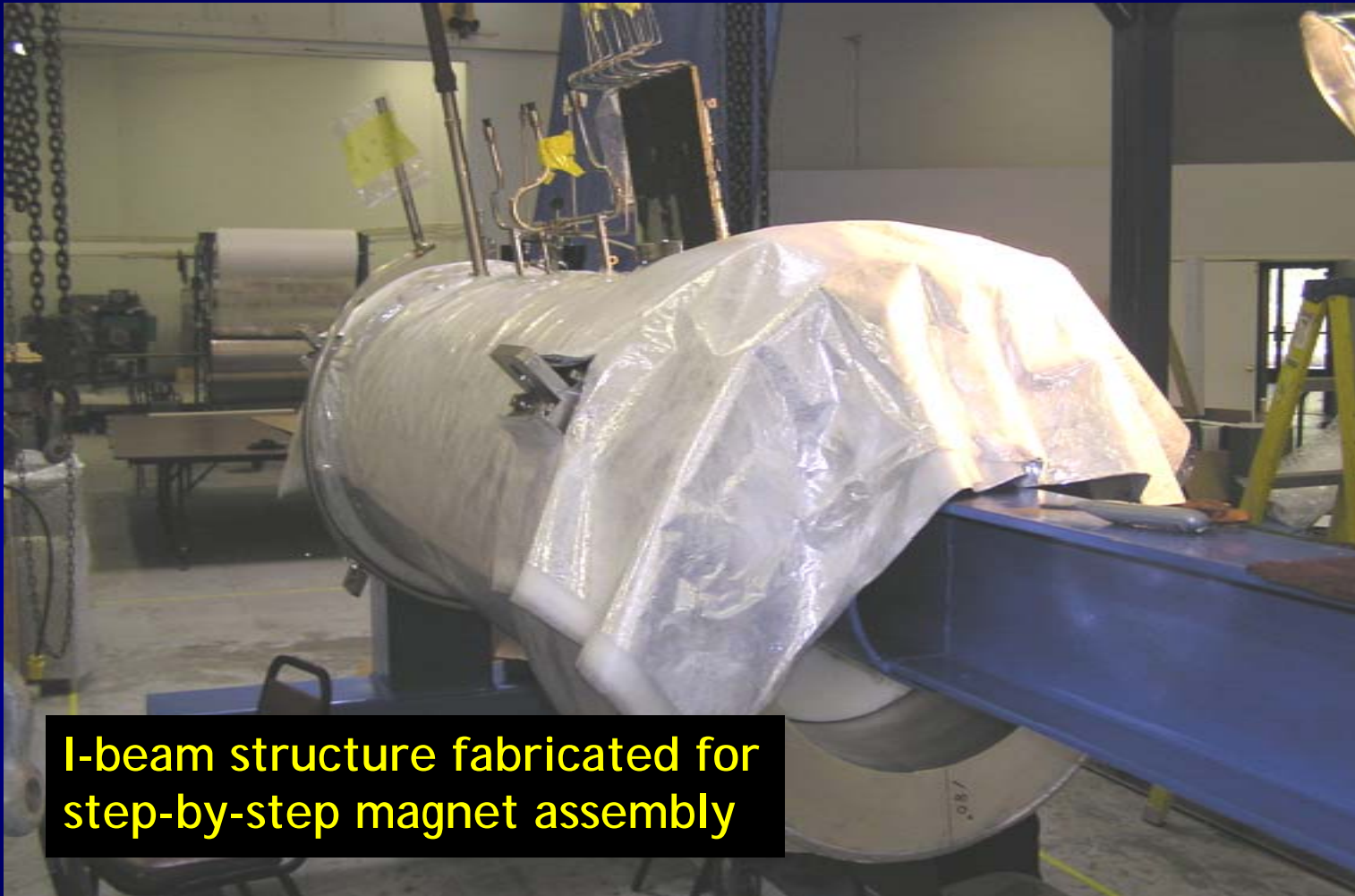
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MLI Wrapping of Cold Mass Assembly



I-beam structure fabricated for step-by-step magnet assembly



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Outer Thermal Shield



**Shield assembled from
3/16" aluminum sheet**



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MLI Wrapped Thermal Shield



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Installation of Thermal Shield over Cold Mass



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Installation of Thermal Shield over Cold Mass



Thermal shield is positioned with hoist during installation



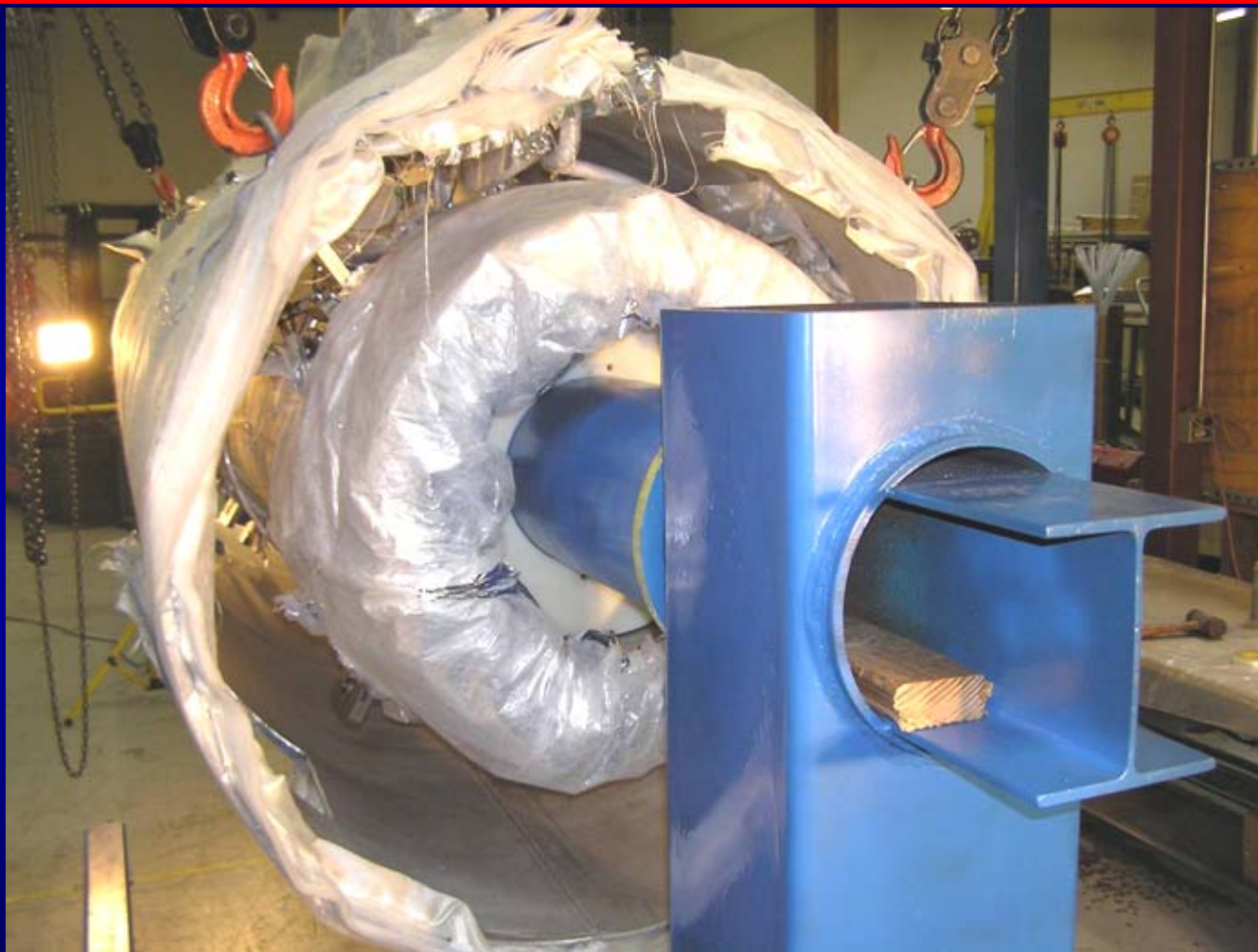
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Installation of Thermal Shield over Cold Mass



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Cold Mass Support Connection Point



Old mass supports pass through openings in thermal shield



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Vacuum Vessel and Support Stand



Vacuum vessel ready for assembly with cold mass



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Inner Vacuum Vessel



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Service Tower Assembly



Service tower accommodates
3 cryocoolers and fill/vent
lines



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Magnet Cooling Line Connections



**Fit check without 70K
thermal shield in place**



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Magnet Power Leads



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Cold Mass Support Assemblies



Copper strap provides for intermediate temperature connection to thermal shield



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Cold Mass Support Installation



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Cold Mass Support Clearance Issue

Cold mass prior to welding of support bands



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Drop-in Cryocooler Sleeves



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Exterior Condenser Details



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Interior Condenser Details



Copper ring interfaces
with 1st stage of cooler



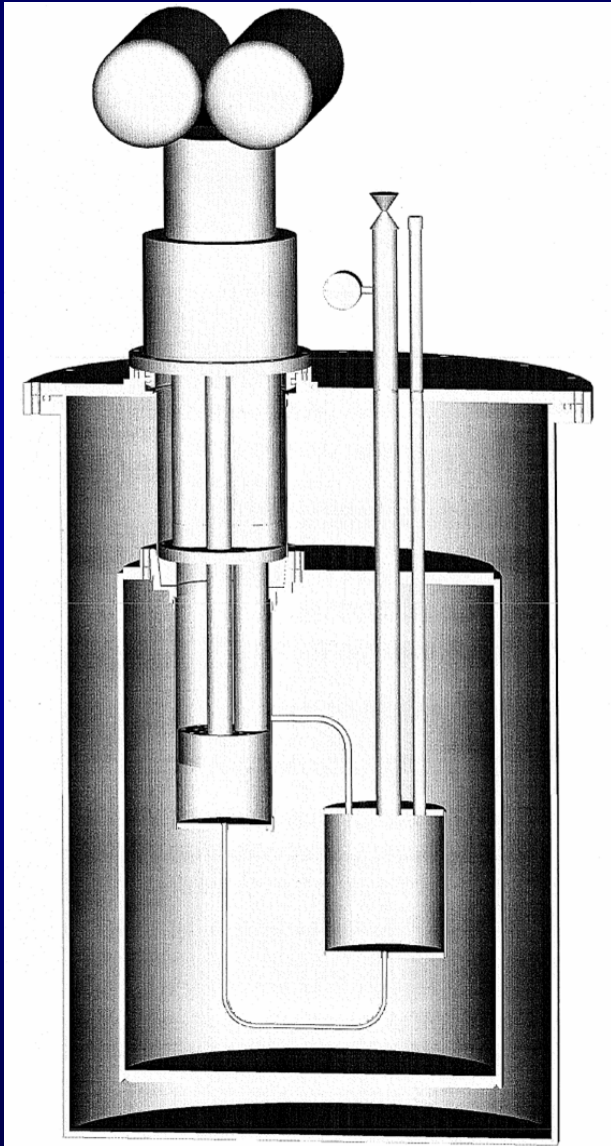
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Cryocooler Experiment



Purpose:

- Measure cooler performance @ 2.5-22 K
- Confirm drop-in mode, measure heat leak

Update:

- 1st series of tests completed in November
- Results were not conclusive due to some deficiencies in the test apparatus
- System was modified including addition of a larger liquid He storage vessel
- Tests are resuming now
- Experiment hardware will be available for future testing

Cryocooler Experiment



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Magnet #2: Cold Mass Winding Assembly



**2nd magnet to follow
1st by 2 to 3 months**



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Magnet #2: Cold Mass Winding Assembly



Coil banding and welding of internal stiffeners complete



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Magnet #2: Cold Mass Winding Assembly



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Quench Protection Assembly



**Quench protection system
assembled, installed and wired**



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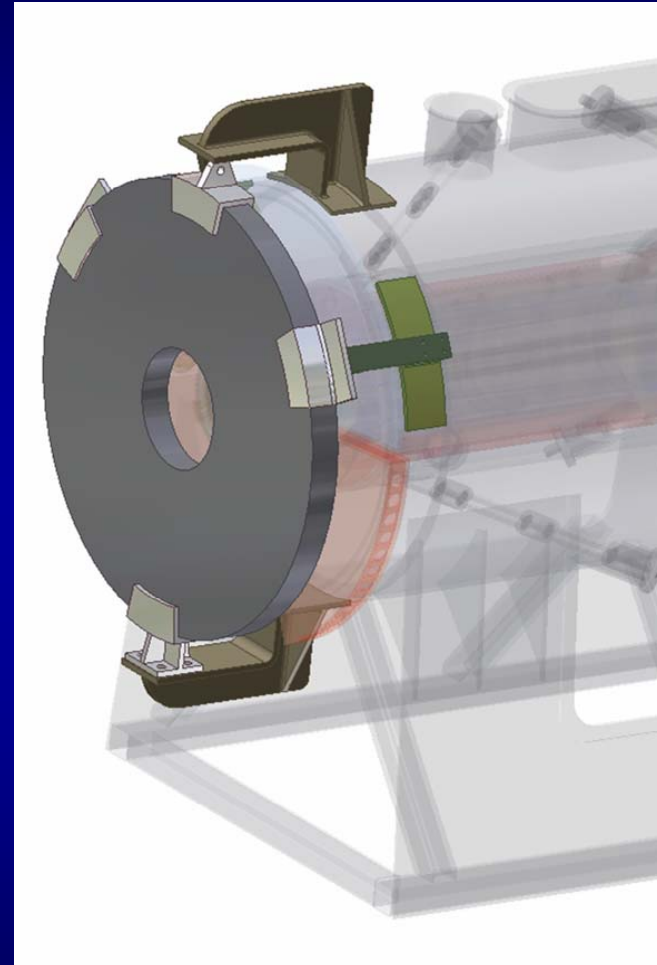
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Spectrometer Solenoid Iron Shields

- Design integrated with TOF shield, and all fabrication drawings are complete
- Two sets of shields needed at FNAL and two sets at RAL
- Awaiting final quote from JK Mfg near FNAL before placing order
- A separate 2nd set of shields @RAL may be req'd (TBD)



Updated Schedule Summary

Task Description	2006												2007												2008							
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug					
Place Magnet Order with Wang NMR (LBNL)	◆ Complete																															
Complete Magnet System Design & Review													◆ Complete																			
Deliver Superconductor to Wang (LBNL)	◆ Complete																															
Procure Coil Formers, Leads, Instrumentation, etc.													Complete																			
Wind Coils on Coil Formers													Both magnets complete																			
Deliver 4 ea Cryocoolers to Wang (LBNL)													◆◆◆◆ Complete																			
Buy Power Supplies & Send to Wang (LBNL, UCR)													◆ 4 ea 60 A ◆ 4 ea 300 A																			
Assemble and Leak Check He Shell													Complete												This month							
Fab System & Perform Cryocooler Tests																									2nd tests now							
Fab and Load Test Cold Mass Supports													Complete																			
Assemble Shield, Vac Vessel, Cold Mass Suppts																																
Install Hi-Tc Leads, Recondensers & Cryocoolers																																
Leak Checks, Cooldown & Acceptance Tests																																
Prepare, Package and Ship Magnets																																
Magnet Setup at FNAL																																
Magnetic Measurements & Commissioning at FNAL																																
Ship Magnets to RAL for Installation																									◆◆							



Summary

- 1st magnet expected to be complete this month
- Vendor testing and shipping to FNAL in March
- Completion delayed by cold mass support issue
- Coil winding and banding of 2nd magnet finished
- 2nd series of cryocooler tests to be done soon
- Magnet #2 to follow 2 to 3 months after #1
- Iron shield fabrication awaiting vendor quote

