MICE Coupling Coil Update

Illinois Institute of Technology June 17, 2013

Allan DeMello Lawrence Berkeley National Laboratory

Status of Coupling Coil

- Cold Mass
 - Ruben Carcagno will update the cold mass work at Fermilab
- Cryostat
 - LBNL mechanical shops are fabricating the first cryostat vacuum vessel
 - Scheduled finish date is July 2013
- Thermal Shield
 - Drawings will be finalized by LBNL starting in early July
 - LBNL mechanical shops will fabricate the first thermal shield
- Cooling Circuit
 - Drawings will be generated by LBNL
 - LBNL mechanical shops will fabricate the cooling circuit parts
 - LBNL will assemble components into sub-assemblies



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Coupling Coil

Coupling coil magnet _____ integrated into the RFCC



RFCC Module



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Coupling Coil Sub-assemblies



Coupling Coil Cold Mass - Review

Superconductor Lead Stabilizers



- Preparation cold mass coil #1 finished at LBNL January 2013
- Preparation cold mass coil #2, #3 and #4 at LBNL scheduled to begin in 2014

Quench Protection

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Taps

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Gauges



Cold Mass Magnetic Test at Fermilab



Cold mass prepared for magnetic test at Fermilab



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Coupling Coil Cryostat Vacuum Vessel



- LBNL mechanical shop is in the process of fabricating the first cryostat vacuum vessel
- Estimated completion July 2013
- Drawings will be updated to reflect the "as built" cryostat vacuum vessel







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Coupling Coil Thermal Shield

Remaining Tasks

- Thermal shield design is nearly complete
- SINAP drawings will be finalized by LBNL starting in early July
- LBNL shops will fabricate the first thermal shield
- Scheduled to be delivered to Fermilab February 2014





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Cooling Circuit Assembly

Remaining Tasks

- Finalize cooling circuit design
- Create detail fabrication drawings
- Fabrication of component parts
- Assemble components into subassemblies
- Scheduled to be delivered to Fermilab February 2014





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Cooling Circuit Reservoir Cover

Remaining Tasks

- Assemble reservoir cover with feedthroughs and bellows
- Weld reservoir cover to top of cold mass
- Vacuum check the reservoir





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Cold Mass Assembly

Remaining Tasks

- Complete the cooling circuit with the installation of the helium fill tube, top off tube and bottom manifold
- Install the cold mass support brackets and support bands
- Wrap the cold mass with MLI

Fill and top off tubes



Bottom manifold



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Coupling Coil Integration



Remaining Tasks

- Cold mass prepared for integration with cryostat vacuum vessel
 - Assemble thermal shield around cold mass
 - Wrap assembly in MLI
- Insert cold mass into cryostat vacuum vessel from above
- Attach cold mass support bands to cryostat vacuum vessel
- Align magnet in the cryostat vacuum vessel



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Finish Coupling Coil Integration



Remaining Tasks

- Weld tower assembly to cryostat vacuum vessel
- Weld inner bore into cryostat vacuum vessel
- Weld the upper cooling circuit to the tower
- Weld the upper cooling circuit to the cold mass cooling circuit
- Vacuum check the cooling circuit



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Test Prototype Coupling Coil



Remaining Tasks

- Vacuum check the complete cryostat assembly
- Add cryocoolers to cooling circuit
- Coupling coil training and testing

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