Integration of the Spectrometer Solenoid Magnets

MICE Collaboration Meeting – CM20

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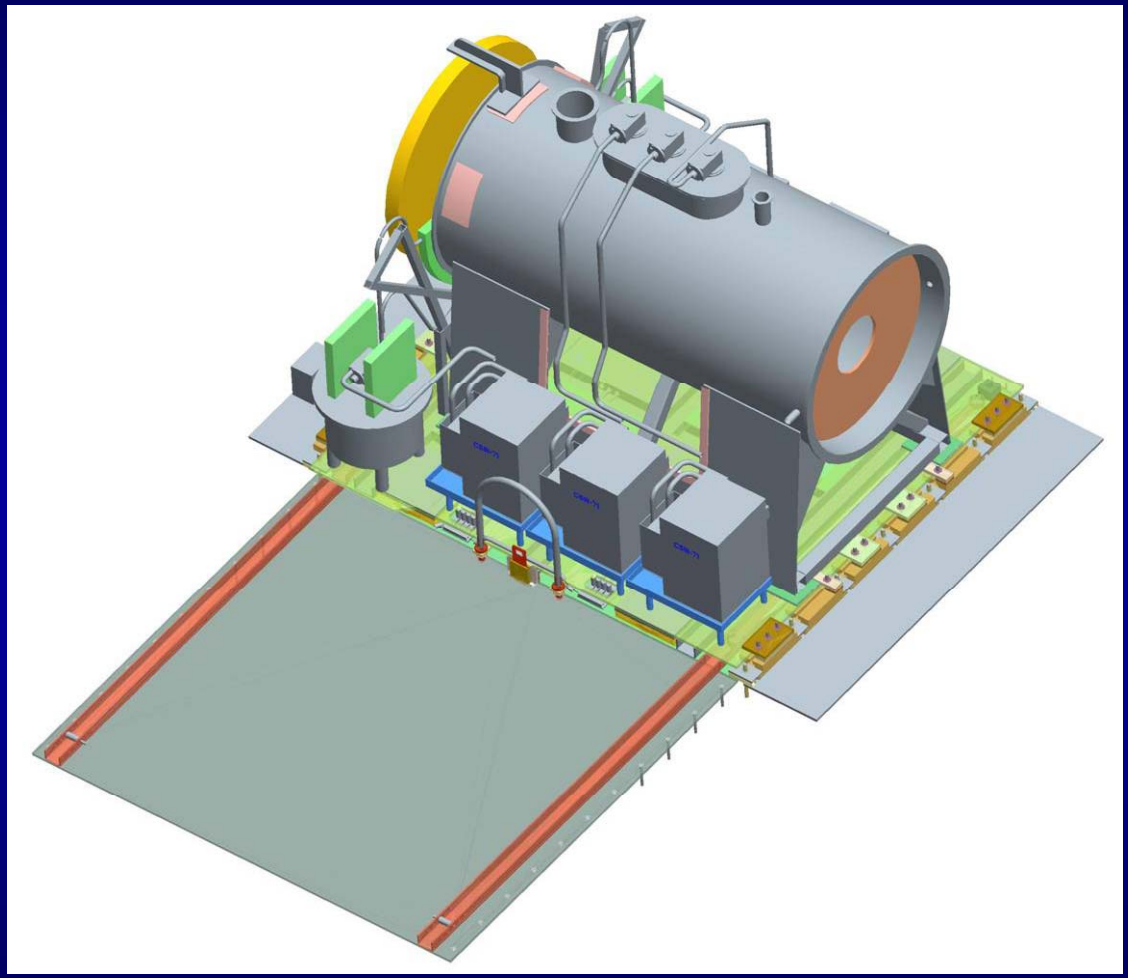
Integration and Installation Topics

- Support structure interfaces
- Module joint seal and load transmission
- Subcomponent interfaces
  - Tracker-to-warm bore, radiation shutter, patch panel, diffuser, iron shield
- Power req'ts, cabling & hose connections
- Instrumentation and controls

Translating Platform



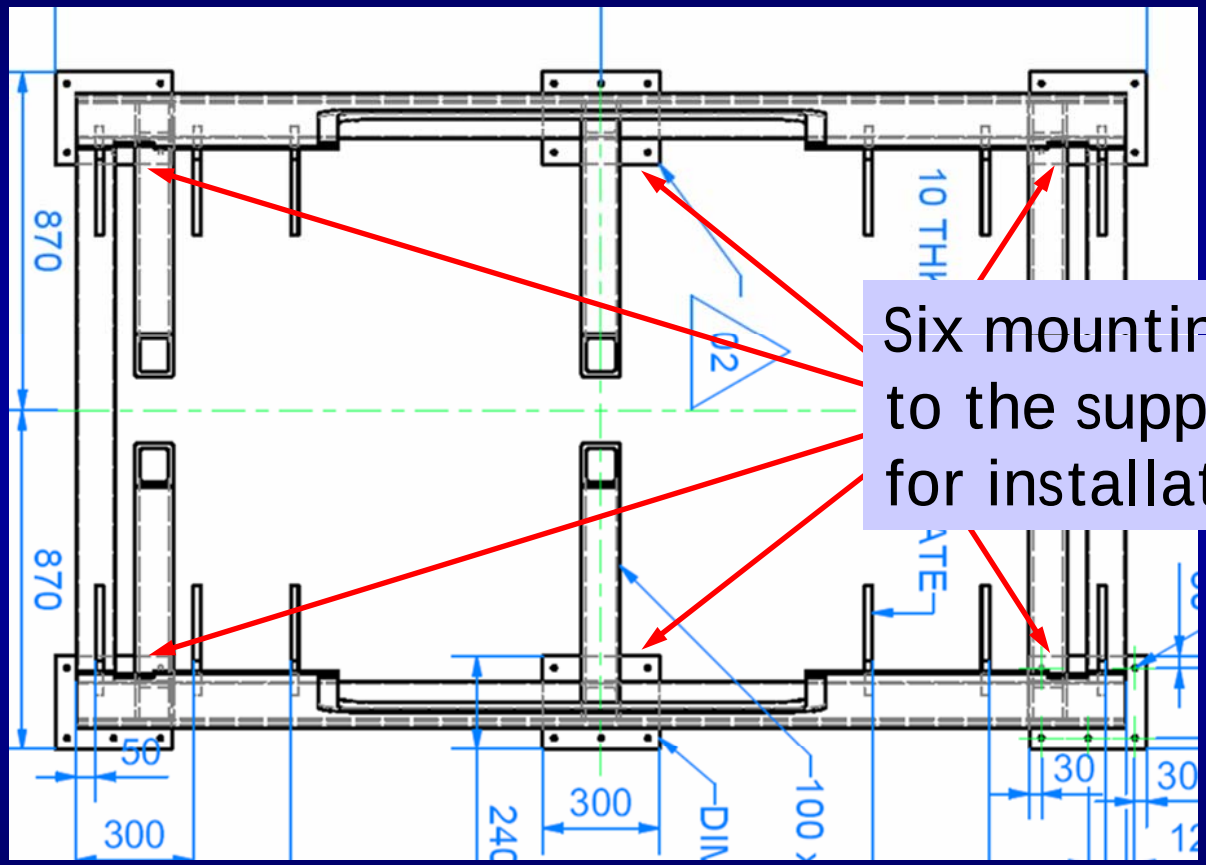
Progress Update

- **Fab of first magnet support stand is complete**
  - Six mounting pads added to design
  - Possible issue with clearance around holes
- **Features added to suppt allow lifting by slinging**
  - Vendor also adding welded lifting rings to vessel
- **Feature for mounting diffuser added to magnet**
- **Integrated iron shield/TOF shield design done**
  - Magnet interface remains unchanged
  - Parts to be procured soon

Progress Update (cont'd)

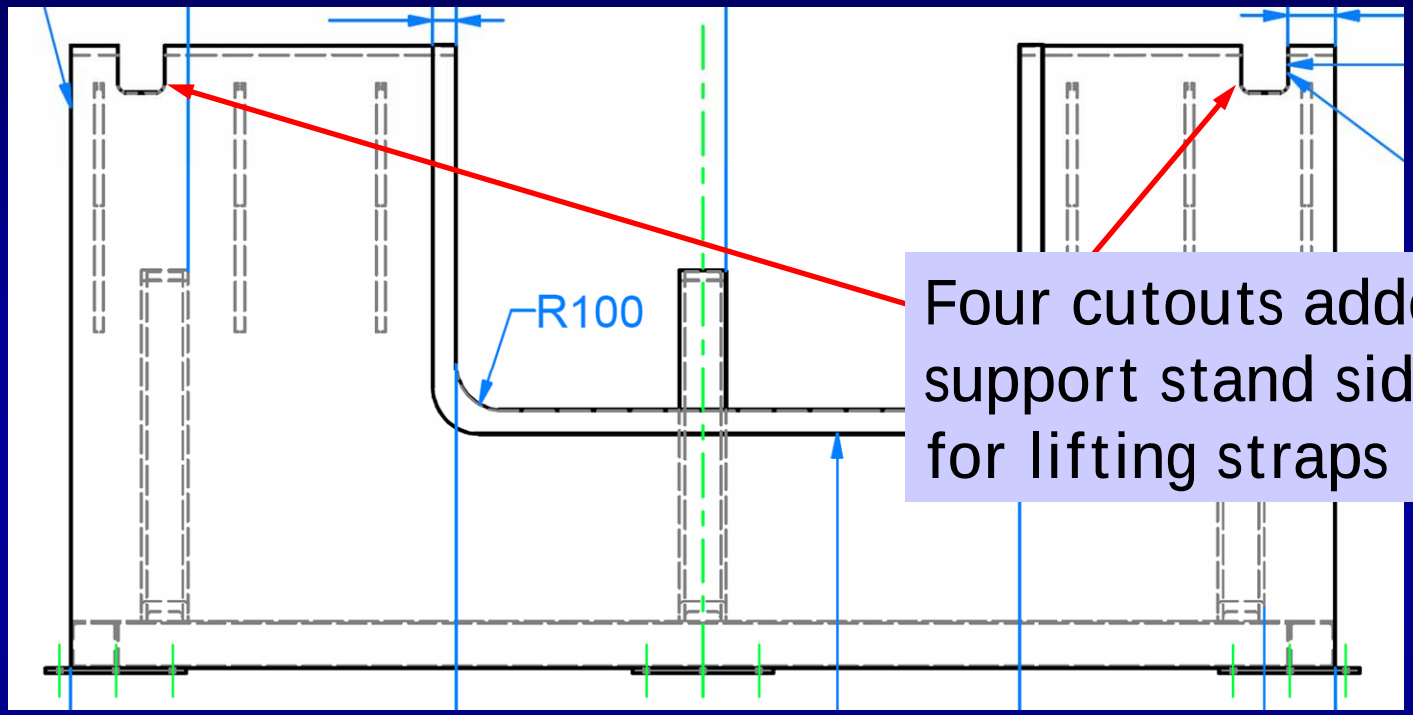
- **Helium-to-vacuum window design not done**
  - Preliminary plan was to use AFC style window
  - Mounting holes not included in magnet spec
- **Final design of bellows spool under way**
  - Bellows design & price quote obtained from Hyspan
  - Spool to connect two spectrometer solenoids being designed at RAL (two bellows spools also req'd)
- **Instrumentation readouts to be ordered soon**
  - Most instrumentation only needed during initial tests

Module Mounting Provision



Six mounting plates added to the support stand base for installation on rails

Module Lifting Provision

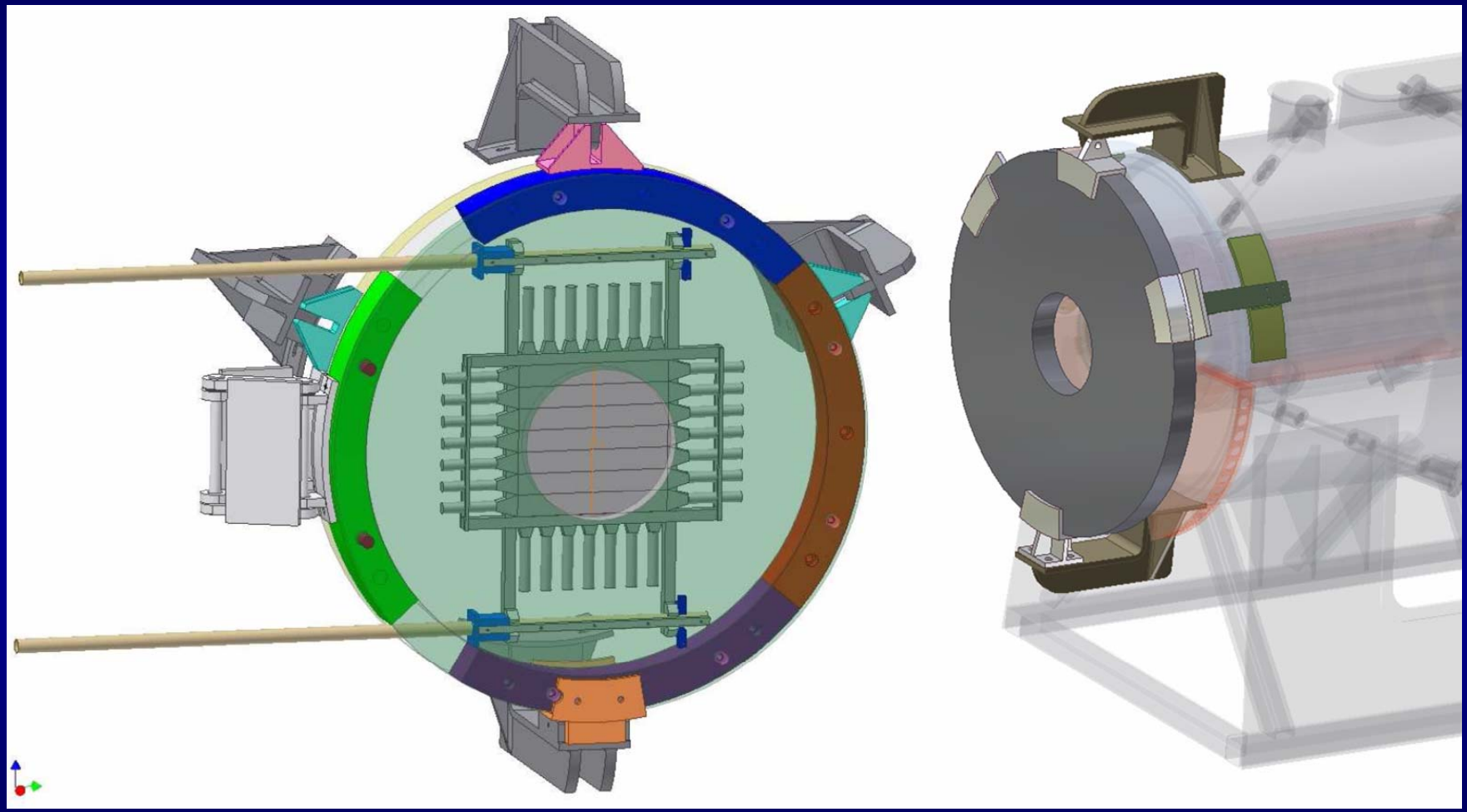


Four cutouts added to the support stand side walls for lifting straps

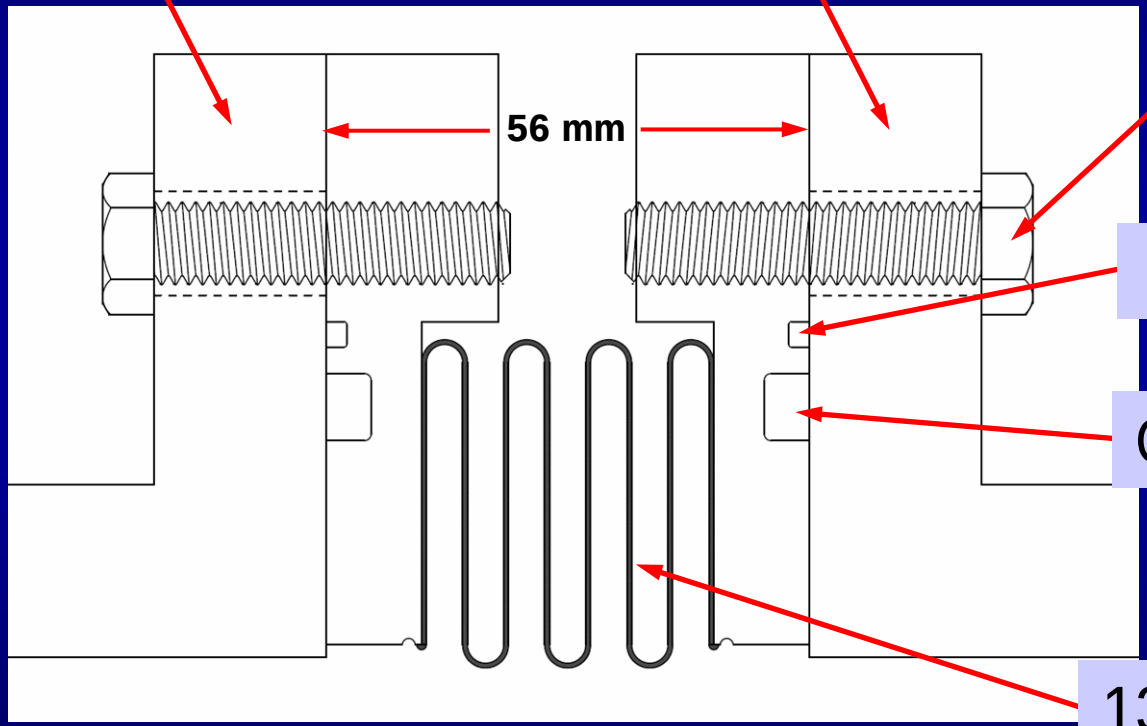
Open issues: Will a lifting fixture be required?
Can we lift w/iron shield in place?

Support Stand Modifications

Iron Shield and TOF Cage



Spectrometer Solenoid-AFC Module Joint



Magnet Utility Requirements

- Cryomech Model PT-415 cryocoolers (4 or 6 each total)
  - 50 Hz AC: 10.5 kW @ 380/420 V, 3 phase
  - Cooling: minimum 3 gpm of water @ 80°F max
- 300 A Power Supplies – American Magnetics (3 ea total)
  - 50-60 Hz AC: 3.5 kW @ 208 V, 3Φ, forced air cooled, rack mnt.
- 60 A Power Supplies – Lake Shore Cryotronics (4 ea tot.)
  - 50-60 Hz AC: 0.3 kW @ 208 V, 3Φ, forced air cooled, rack mnt.
- Vacuum: 10^{-3} torr @ startup thru a 25 mm flanged port
- Liquid cryogens: 600 liters LN_2, 1000 liters LHe (x2)
- Instrumentation monitoring requirements
  - Various voltages, temperature, He level, heaters, pressure, vac.