Magnet, Support and Infrastructure

Whit Seay
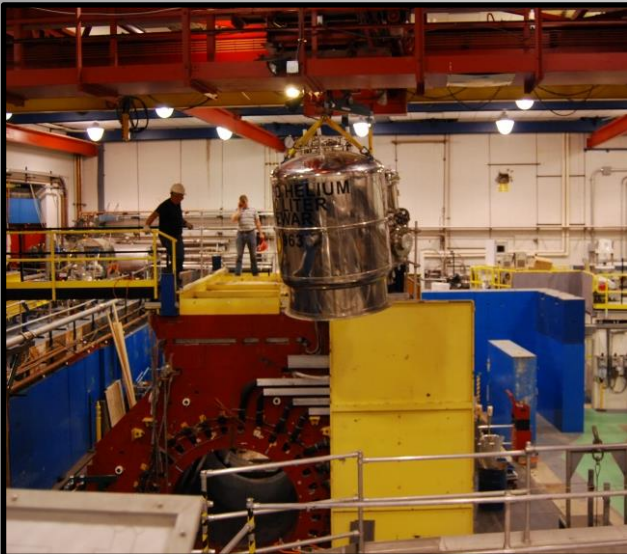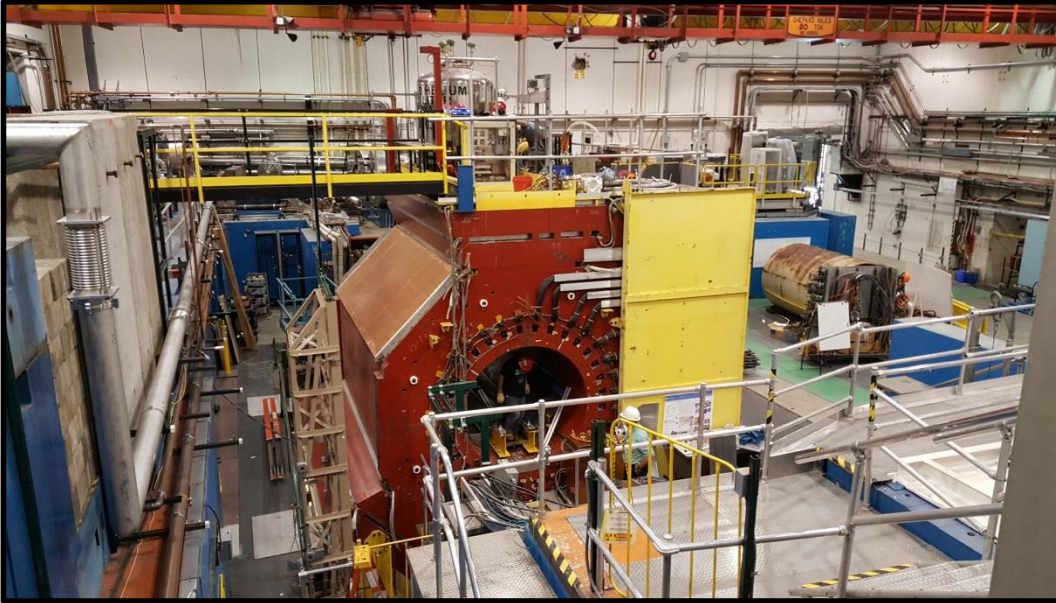
December 2, 2016

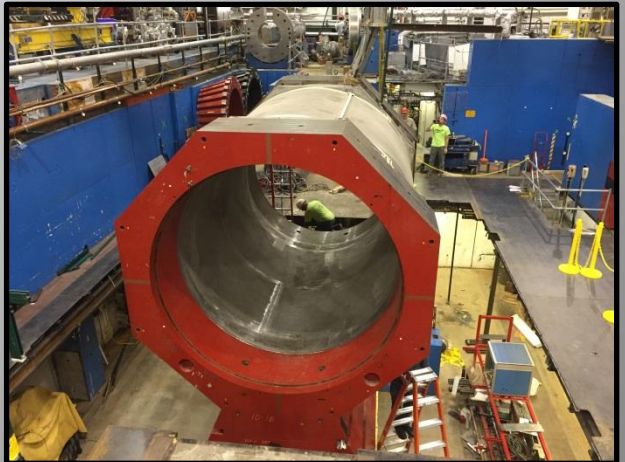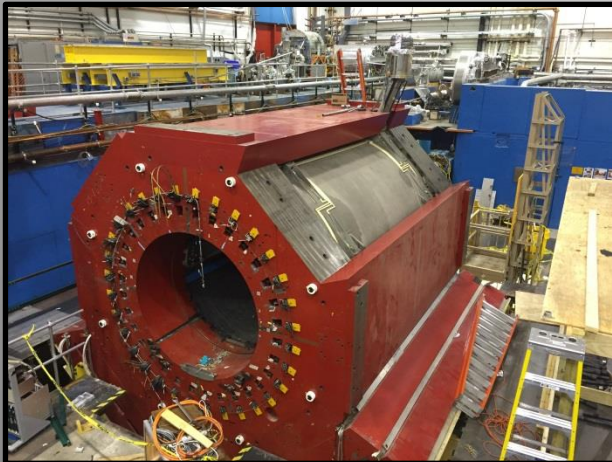# Magnet Disassembly & Transfer to JLAB (mostly complete)

- Disassembly is complete.
- Magnet, coil collars and miscellaneous equipment has arrived at JLAB.
- Only the transport of the return steel remains.
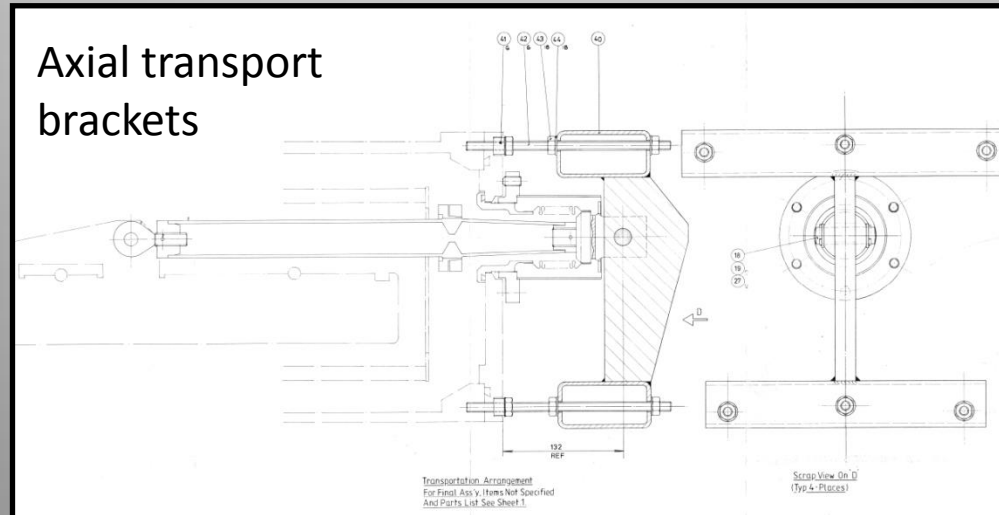
Magnet Disassembly

Steel Removal
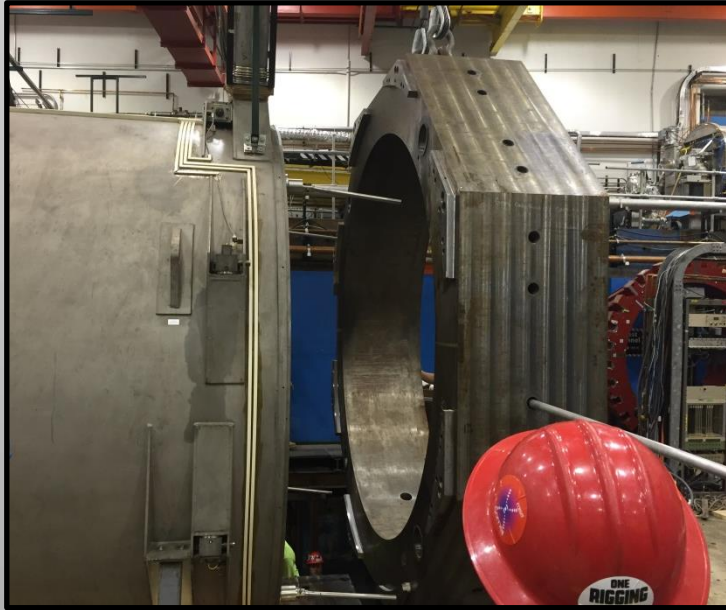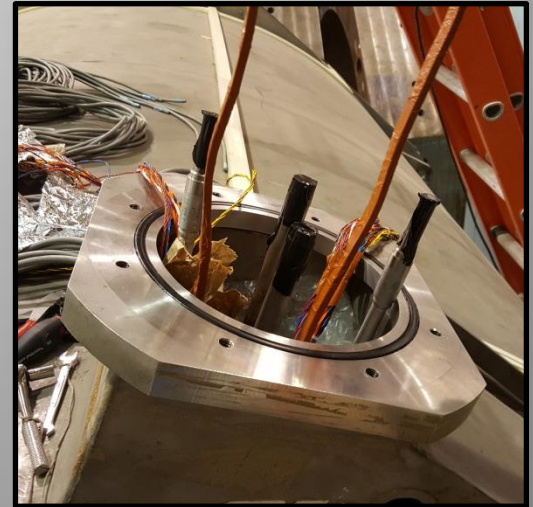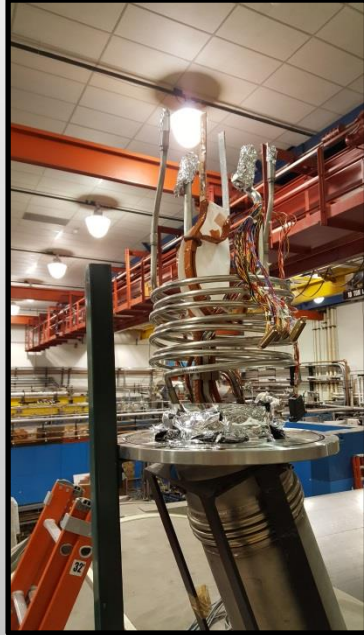

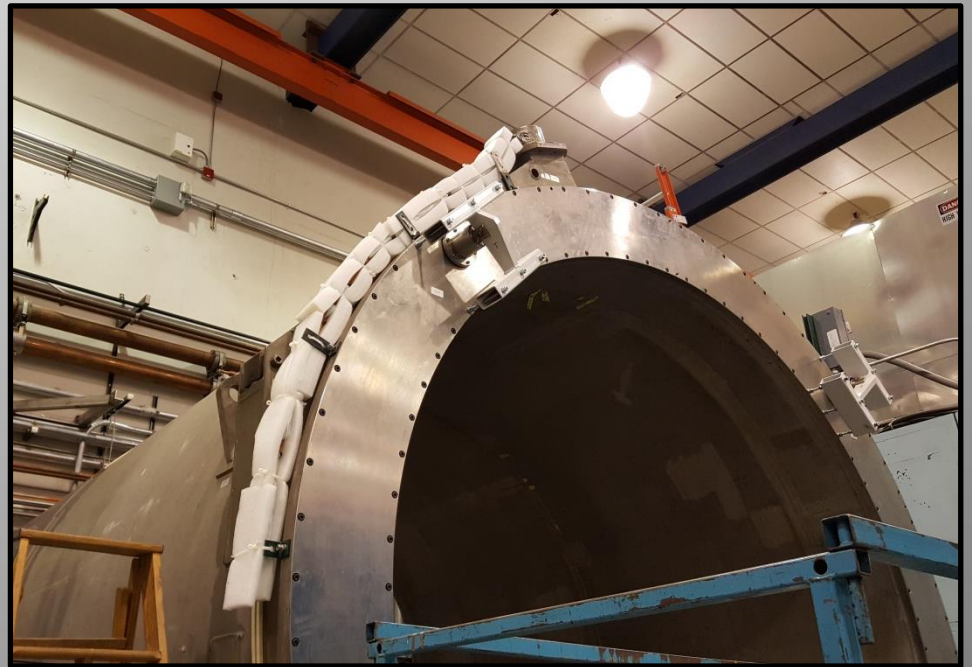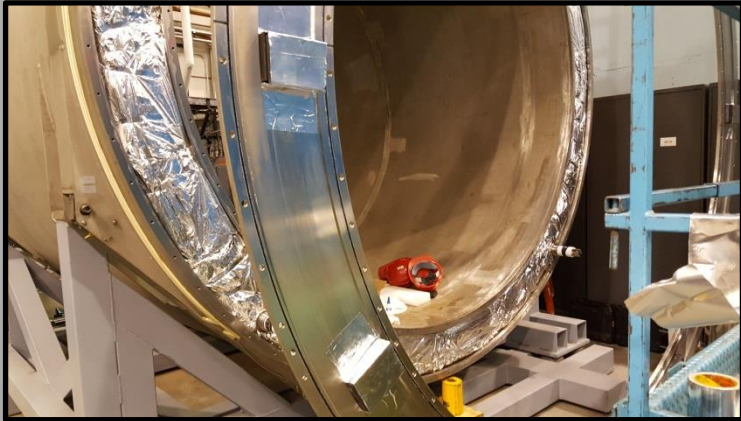1000 tons of steel moved

Installation of the Axial Transport Brackets

Axial transport brackets

Cryostat Removal

Neck Removal

Securing the Leads and the Radscreen

Loading the Magnet

Unloading the Magnet into the Test Lab

Load Monitoring During Transit

- Two accelerometers mounted to end plate to measure loads during transit
- Programmable 3 axis MEMS
- Setup to record a data point every 20 sec. (reporting interval)
- Records highest acceleration measured during reporting time interval
- Samples @ 100Hz per axis
- Max acceleration of 0.8 g (Vertical direction)
- Most loads under 0.5 g
- Also reports vector magnitude MAX and AVG $r = \sqrt{x^2 + y^2 + z^2}$
- The Oxford Operating Manual states the magnet was designed to withstand a 3g load.

Magnet Position in the Hall Layout

SIDIS

BEAM

Polarized ³He target
center 145 cm from pivot

495 cm
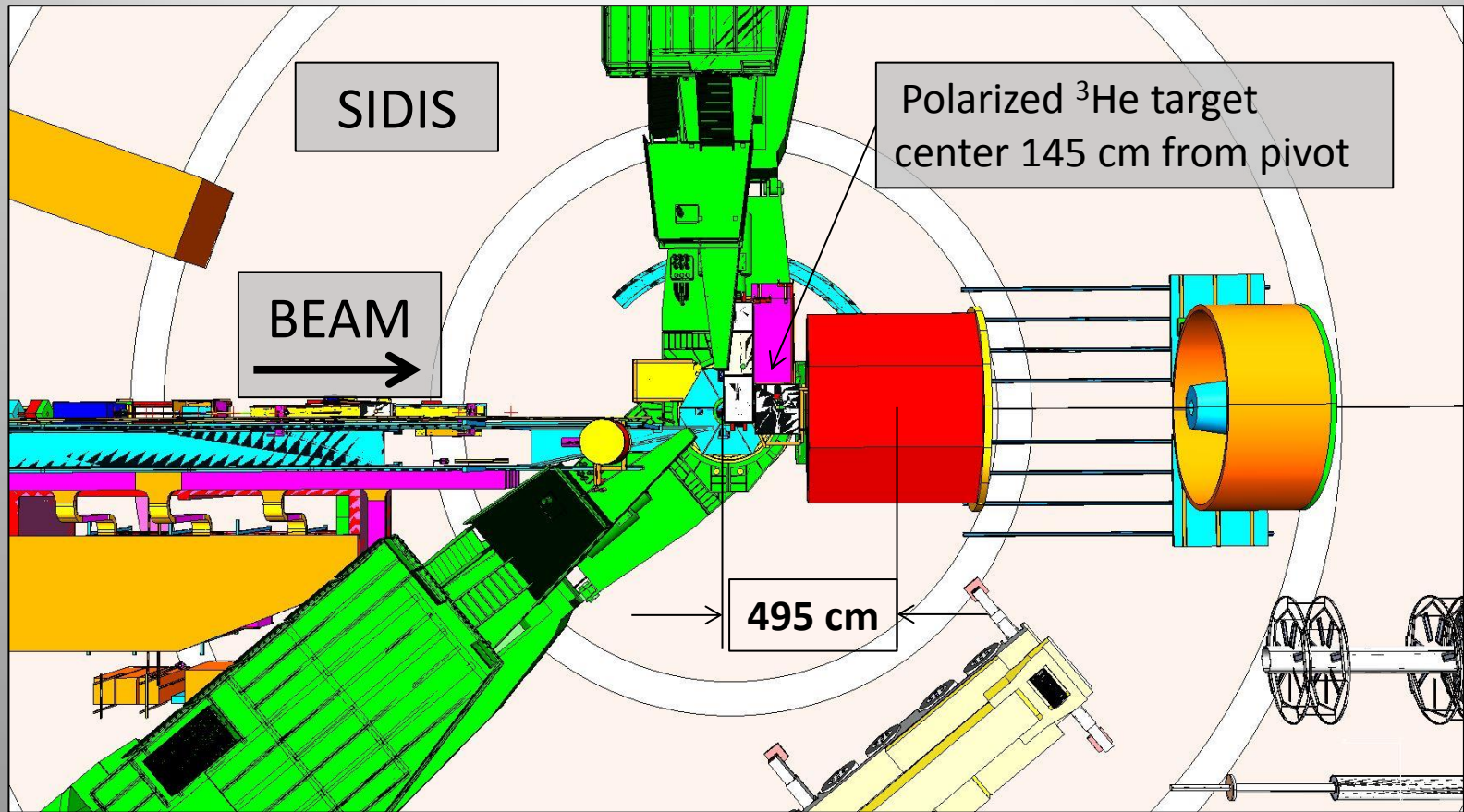
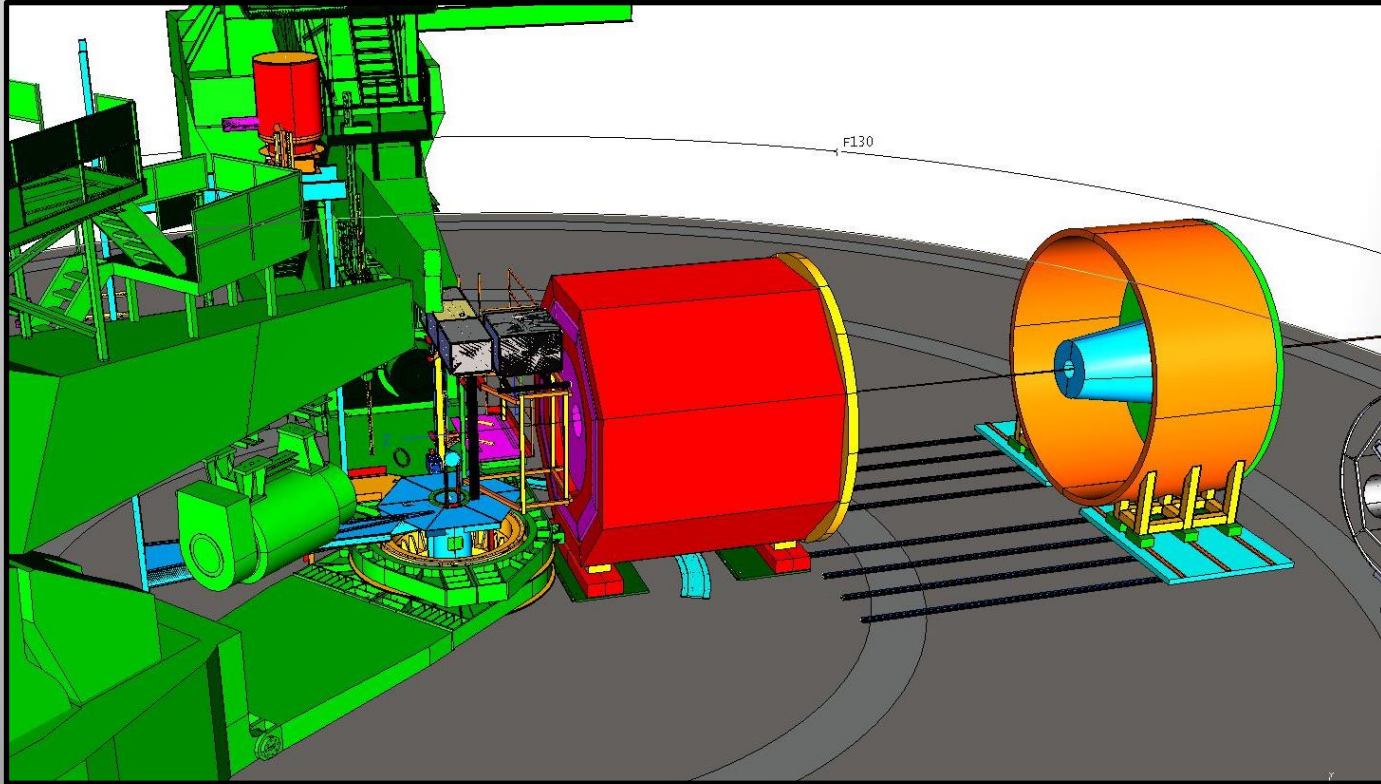- HRS beam right spectrometer moved back beyond the truck ramp opening and will allow direct access for delivery of SoLID items.
- Polarized ³He target to be 145cm downstream of pivot for magnet to clear pivot bearing. Maintained the distance between coil center and target center of 350 cm.

Magnet Position in the Hall Layout

- Need to consult with the JLAB Target Group to understand the implications of the 30 cm shift for the two SIDIS and the J/ψ targets. The PVDIS target design may be affected as well.

3D Magnet Analysis and Future Work

- Provided Jay Benesch our 'mock-up" CAD model for use in OPERA
- Informed Jay that structural analysis from several years ago indicated the need to thicken the downstream coil collar
- Will use magnetic forces extracted from Jay's study for next iteration of structural analysis
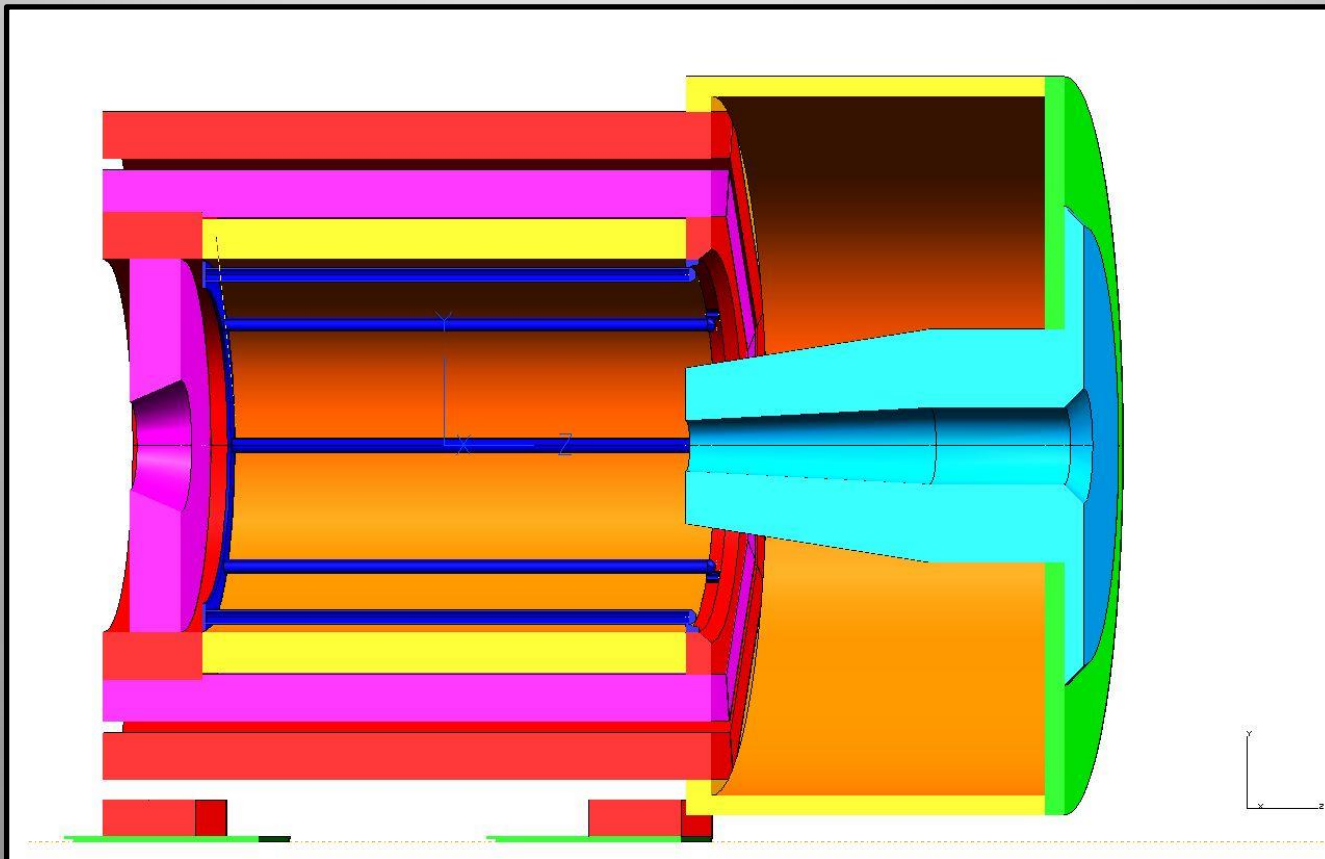
Future Work – FY17

- 1 designer and 1 engineer available Spring 2017
- Migrate mock-up model to new CAD system (NX) and start adding details
- Start the next iteration of structural analysis which will combine magnetic forces with weights of the return steel and detectors
- Update model with latest detector CAD files and make 1st attempt to resolve space issues and cabling routes.