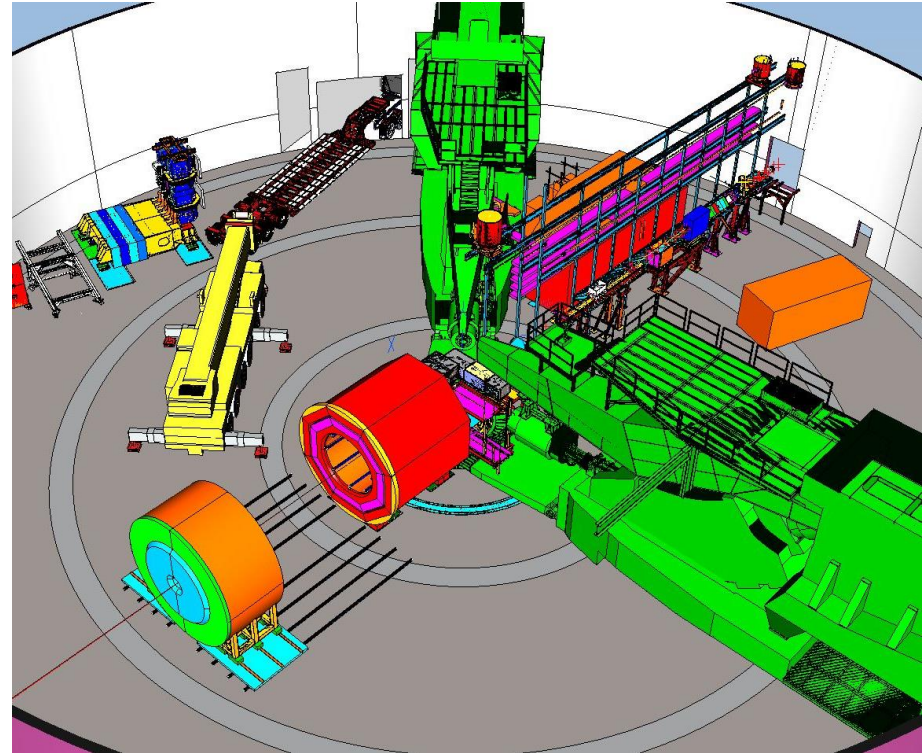


SoLID Collaboration Meeting

Magnet & Infrastructure Support

Whit Seay
January 8, 2021



Presentation Outline

Latest updates – Cold Test

- 1) Instrumentation
- 2) Test Lab Layout
- 3) Service Turret Removal
- 4) CCR
- 5) Magnet

Merged CLEO Refurbishment and Cold Testing (Phase 1)*

1. New Instrumentation and Control System – FY18

- Design the system – completed
- Identify hardware and software requirements – completed
- Procurement – completed
- Assemble and test the new I&C – in progress – preparing for assembly

2. New Cryo Control Reservoir – FY 19-20

- Design to interface w/ CLEO and JLAB ESR system – in progress
- Procurement: fabrication on-going – in progress nearing completion
- **Acceptance testing upon arrival-leak & pressure** – arriving end Jan

3. Static Testing of the CLEO Magnet – FY 18-20

- Check out existing instrumentation in the cryostat – completed
- HIPOT test the coil – completed
- **Tested 50% of the radial loadcells** – NEW – completed Nov 2020

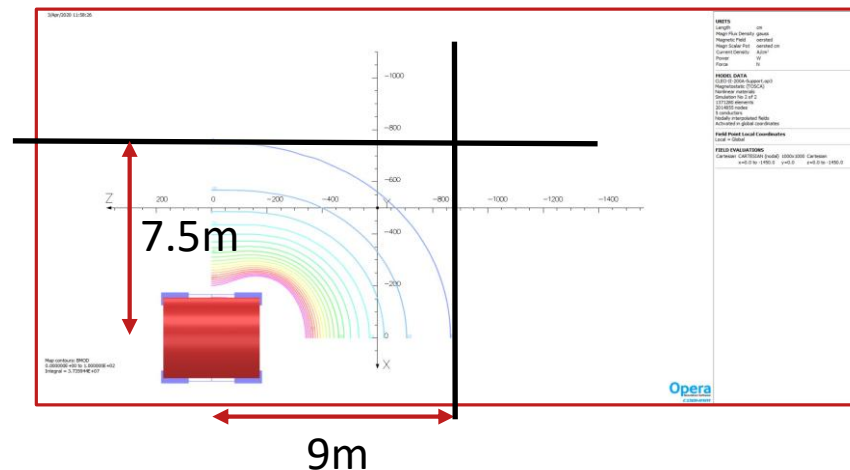
Merged CLEO Refurbishment and Cold Testing (Phase 1)*

4. Test Lab Layout – FY20

- Run a careful magnetic analysis of coil in test lab* – completed
- Identify 50 gauss and 5 gauss boundaries* – completed
- Identify existing transfer lines that can be used in test – completed
- Lock down final magnet position for test – in progress

5. Support Structures for Cold Test – FY 20-21

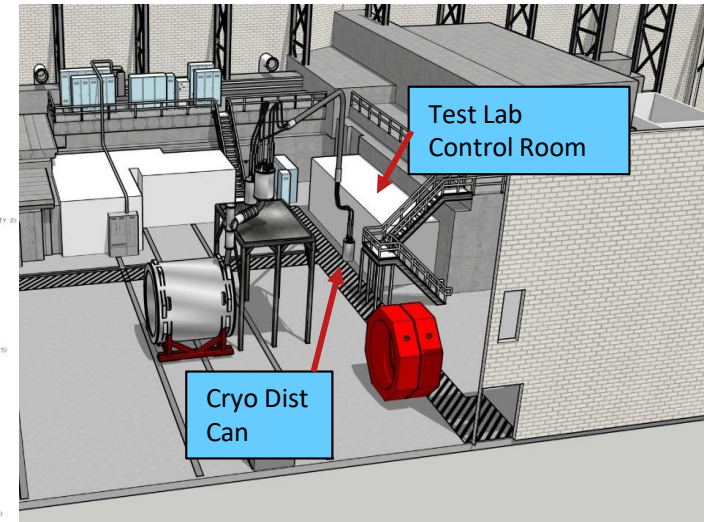
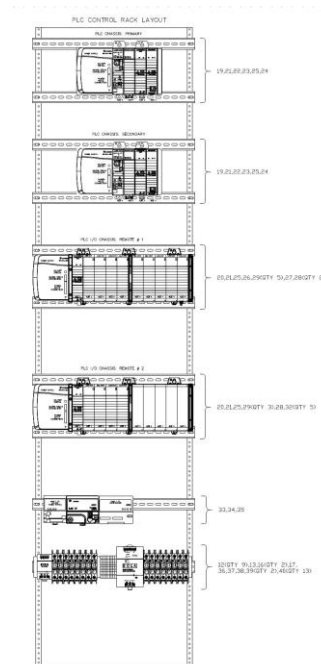
- Design platform to support CCR/personnel access – on going
- Design cryo line supports – in progress



*Addresses technical suggestion from Director's Review

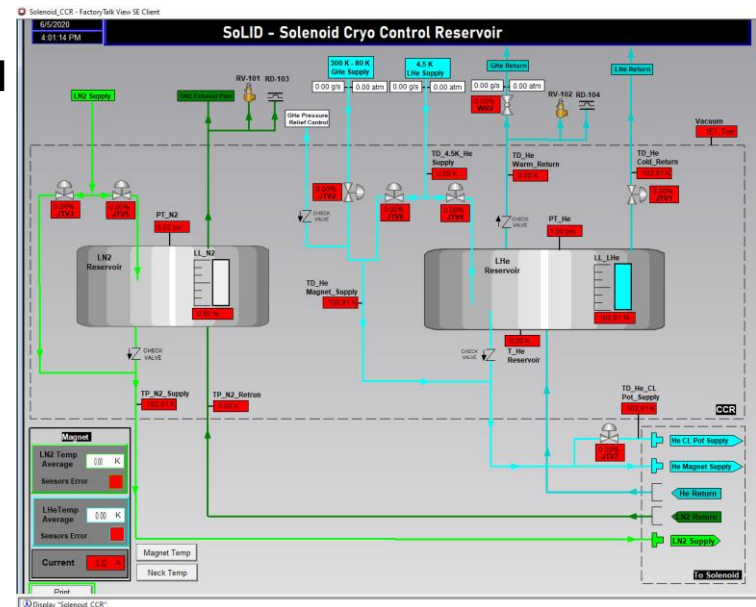
Magnet – Cold Test Update

- **Majority of our effort remains focused on the cold test**
- Merged the CLEO refurbishment/static test and cold testing into Phase 1
- **Detector Support Group (DSG) is making steady progress on SoLID control system**
- Hall C has provided engineering and design support for the CCR and interface with the current lead stack (turret). Performed an analysis of the coils in the test lab to identify magnetic field boundaries.
- Personnel access platform designed – working on support for CCR, heat exchanger, turret



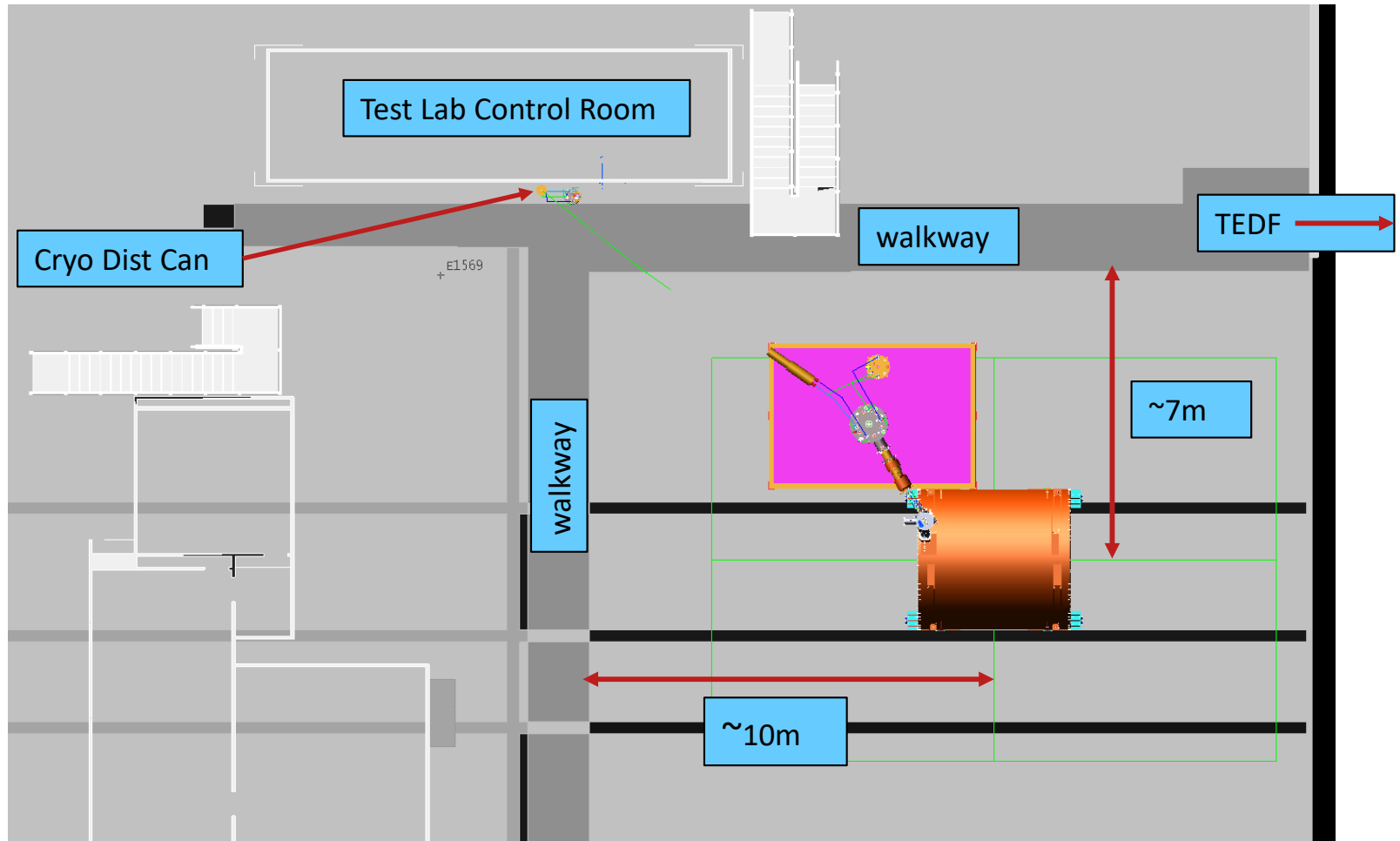
Magnet - Cold Test Update - Controls

- Detector Support Group (DSG) continues making steady progress
- **PLC code & HMI screen development are progressing well**
- Modifying a Hall C superconducting magnet controls program for use with SoLID
- Interface with cryo group and MCC ongoing (CSS)
- **Motor controller boards for JT valve control delivered**
- **Checking/reviewing the PLC code in the weeks prior to holiday shutdown**
- Neck temperatures, radial and axial supports and radial and axial support expert CSS-BOY screens created
- **Latest version of CCR control HMI updated**
- **Electrical drawings are being updated**
- **Start assembly of control system soon**



Cold Test Update – Test Lab Layout

Magnet location in test lab



Cold Test Update – Service Turret Removal

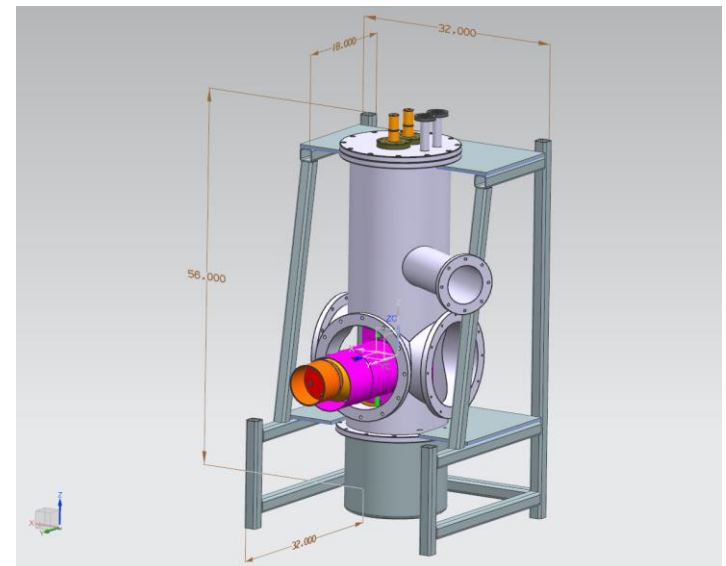
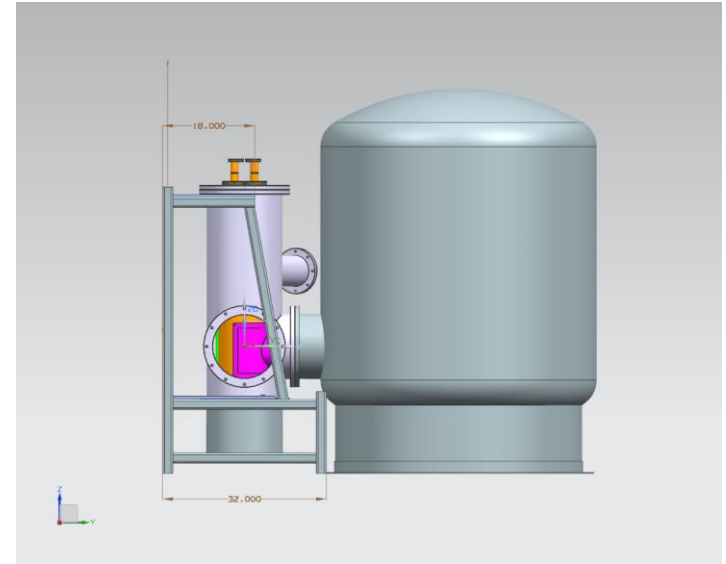
Service turret housing SC leads must be removed from 700L CLEO dewar.

The new CCR replaces dewar to allow the system to be compatible with JLAB cryo system.

A structural stand has been designed to support the turret during extraction and will be used to safeguard the turret and leads during movement and storage.

Fabrication of stand can start soon.

Coordinating shop space to facilitate removal work.

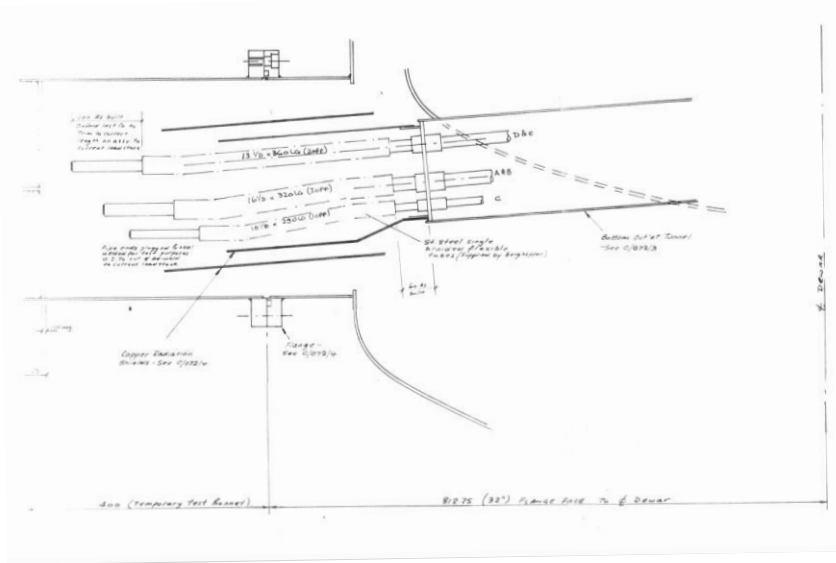
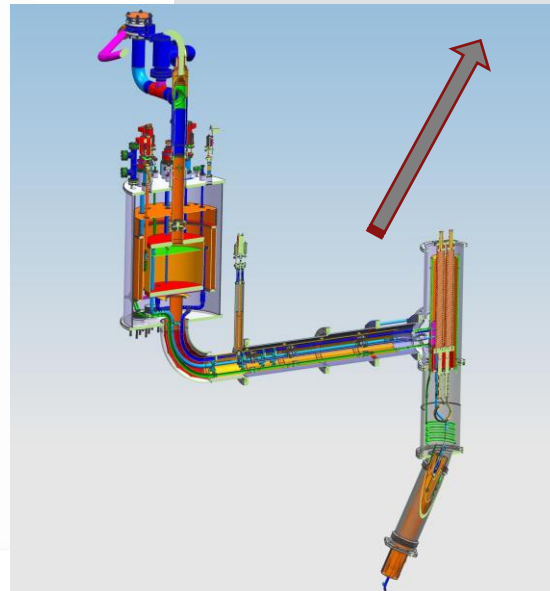
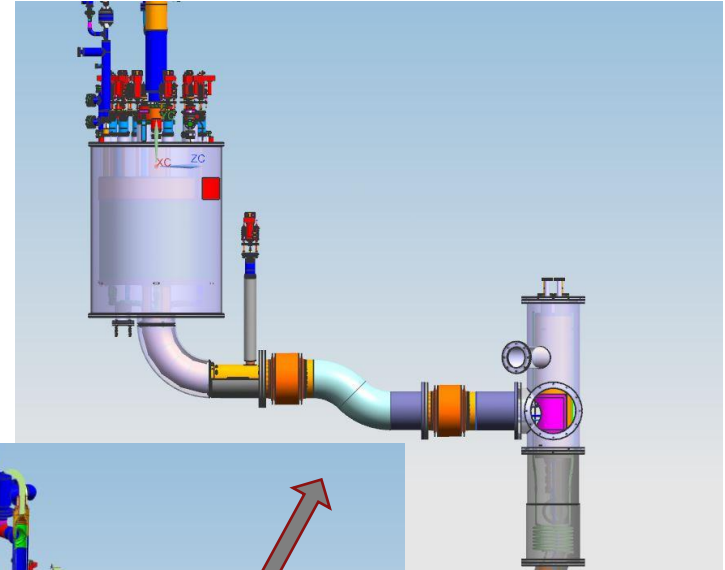


Cold Test Update - Section cut through CCR and Current Lead Pot

Connection between CCR and current lead stack turret updated in Dec 2020

Vacuum jacket and radiation shielding design completed and preliminary drawings ready

Cryo piping updated – may require some revision after turret is separated from dewar



Cold Test Update – CCR Fabrication - Testing

In lieu of in-person inspections at the vendor, due to COVID19, videoconferencing and recorded videos of leak testing provided to JLAB

In process welding paperwork checked by JLAB QA weld inspector on completed work to ensure compliance with JLAB requirements

Vendor projects final leak check on finished CCR on Jan 15th

If test is successful - scheduled to ship to JLAB on Jan 22nd

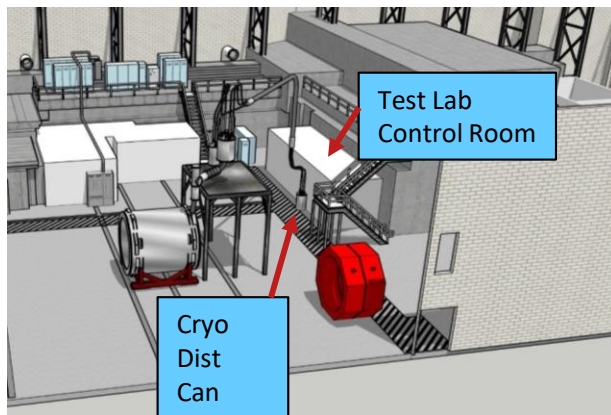
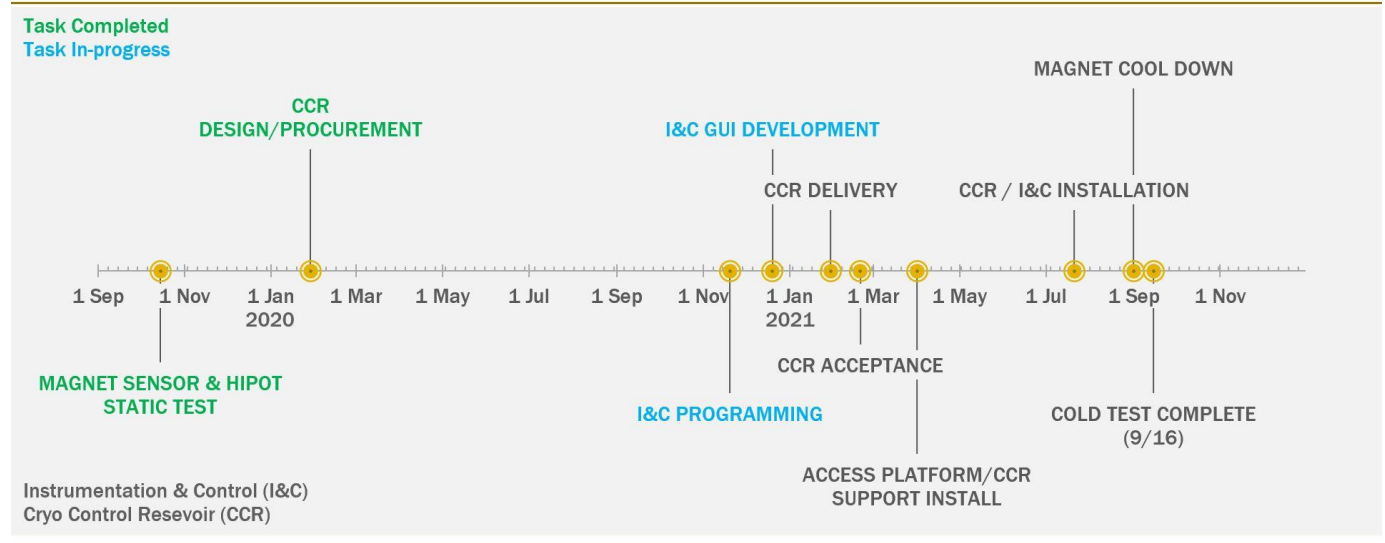
Visual inspection, leak check and pressure test to begin after delivery for final acceptance test

Installation of pressure & vacuum gauges, JT valve actuators and etc.



Cold Test Update – Cold Test Milestones

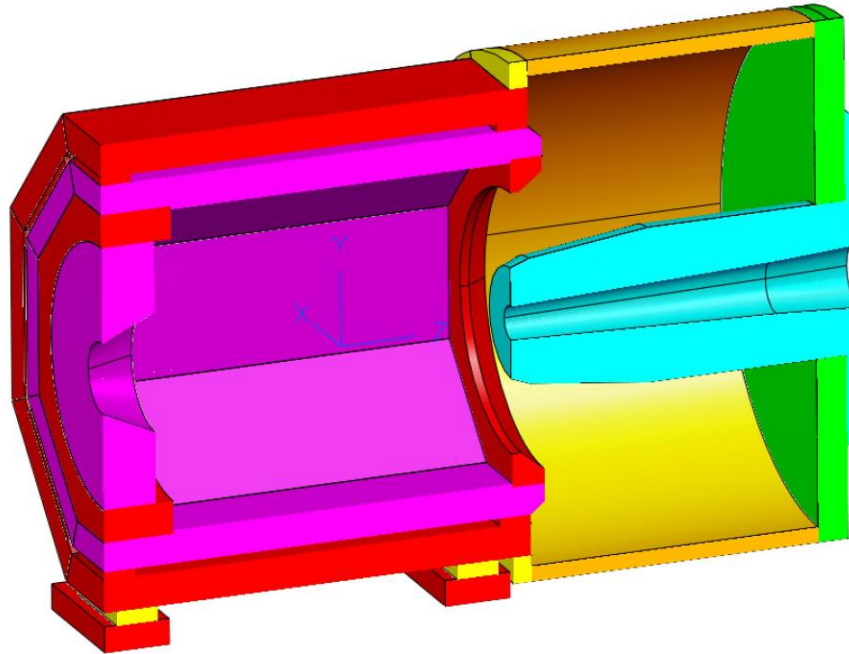
Phase 1 Solenoid Rehab Milestones



- Solenoid rehab will confirm condition of the magnet
- Provide risk reduction to the project
- Improve magnet cost estimate
- Estimated completion 16 Sept 2021

Magnet – Return Iron Update

- Front endcap conical opening updated to match Jay's study
- Geometry of the endcap nose updated to match Zhiwen's study.
- New CAD model is available on the new SoLID wiki page.
- https://solid.jlab.org/wiki/index.php/Engineering_Integration_and_CAD

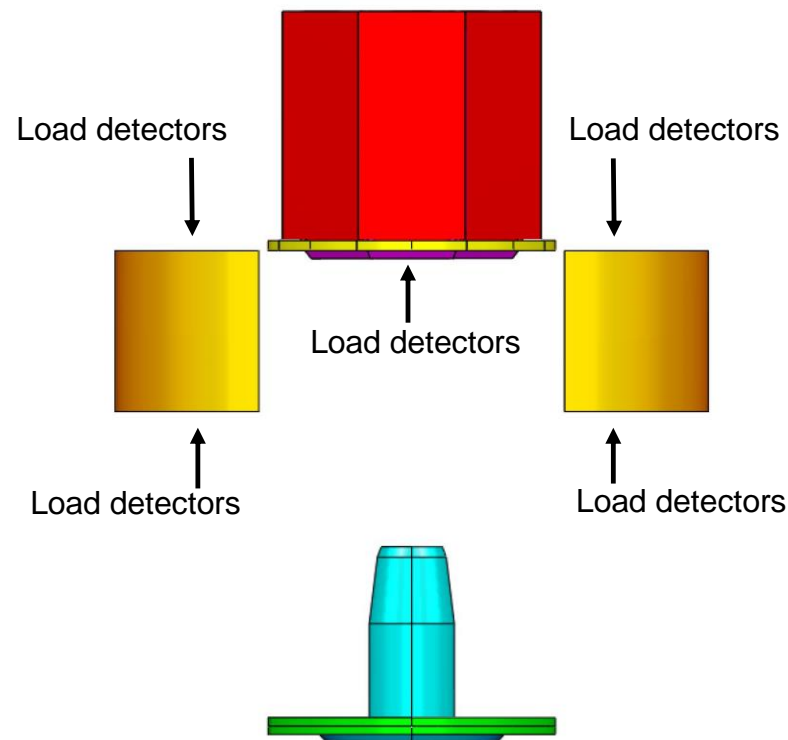
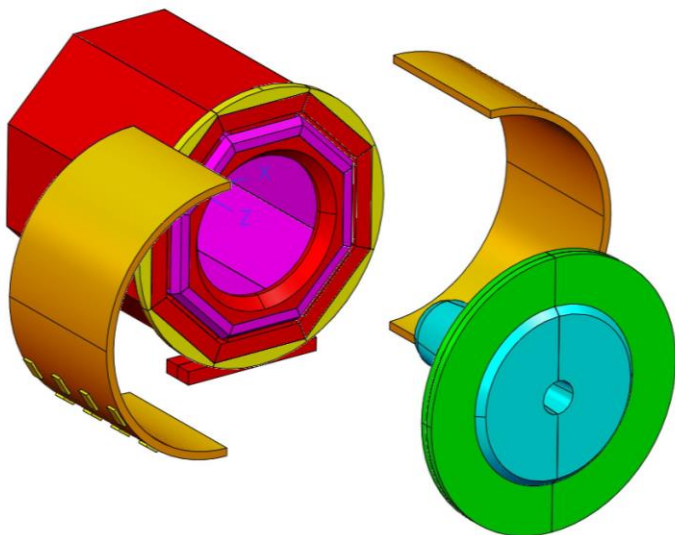


Magnet – Endcap Motion Concept

Decouples the nose and backplates from the half cylinders

Provides additional access points for installing and servicing detectors

Simplifies motion system and tracks mounted to the floor



Questions/Comments?

wseay@jlab.org