

Target Group Meeting

100819@1400pmest

Topics of discussion

Safety Review

- Engineering note: Nitrogen Dewar Calculation
- Preliminary Results

Cabling & Rack Layout

- Current α -version layout
- Proposed changes & Responsibilities
- Cabling Plan

Target Cooling System & Radiation Concerns?

Safety Review

Agreement from FNAL:

Provide well-written engineering documents with best effort approximations of hazard analysis FNAL will review full system and make recommendations.

Current version is on DocDB under Safety – new version is currently in the works leveraging expert documentation from Oxford, Jefferson Lab, ASME calculations, and engineering literature.

New engineering documentation, current and future will be as close to FESHM 5031 standards as possible.

Safety Review - Preliminary Results

		Buckling Pressure	Max Pressure axial(circumferential)
Heat Flux	16,387 W		
Heat Flux Density	0.436 W/cm ²		
Pressure Drop	0.142 psi	31 psi	58.51 psi (29.25 psi)
Loss per day	8.89 L		

Since ASME documentation is not easily available for calculation of maximum allowable pressure, the yield strength with a safety factor of four was used as the maximum allowable stress on the pressure vessel.

$$Y = 20 \text{ ksi}/4 = 5 \text{ ksi}$$

Full document will be done this week and posted on DocDB. Pleasetake time to read it in full and give comments if possible.

Cabling & Rack Layout

After discussion today it was decided that the racks should be broken into categories

Microwave Controls - Josh

Low Voltage Controls - Carlos

Magnet Controls - Zulkaida

NMR Controls – Dustin & Misha

Once each rack layout is completed to the requirements laid out by Rick, we can move on to planning/completing the cabling.

Cabling & Rack Layout

Rack 1
Frequency Counter
EIO Safety Interlock Box
Motor Controller Box
Microwave Power Supply

Is there a plan for the EIP cabling?

Is there a plan for the EIP cabling?

Safety review for power supply? Do we have any guidance from FNAL?

Rack 2
Main flow; Flow meter/controller (separator); Magnet Boil-off flow meter
4He pressure readout <100Torr
4He pressure readout >100Torr
3He pressure readout
LHe nose level probe controller

Cabling & Rack Layout

The cables have multiple paths to the rack:

- Beam left penetration
- Beam right penetration
- Front penetration

Once we have finalized the racks we will make a cabling diagram showing where all associated cables will go and through which penetration.

This will also be planned in a sequential manner dependent on the installation plan listed in my latest target update talk (slides 17-29)

Target Cooling & Radiation Concerns

Original plan was to use FNAL water cooling system

This could be a problem.

We have two separate chillers available but this creates a ES&H issues.

Current status?

Controls & Safety Systems

- **Controls & safety system in progress.**
- **Backup interlock system and microwave controls box - Josh**
- **Lifter controls box & general interlock system - Carlos**
- **The plan for the backup interlock is to have it finished next week and ready to send to FNAL.**
- **Interlock needed for thorough microwave testing at FNAL.**