Detector Support Group

We choose to do these things "not because they are easy, but because they are hard".

Weekly Report, 2022-02-02

Summary

Hall A – ECal

George Jacobs, Mindy Leffel, Marc McMullen

- Assembling supermodules – 15 of 57 complete
- Measured, and sorted by length, 47 lead-glass assemblies
- Cut 60 foils and wrapped 27 light guides

Hall A – GEM

Brian Eng, George Jacobs, Marc McMullen

- Continued rendition of gas flow sensor chassis model in NX12
- Started rendition of regulator panel in NX12

Hall A – SoLID

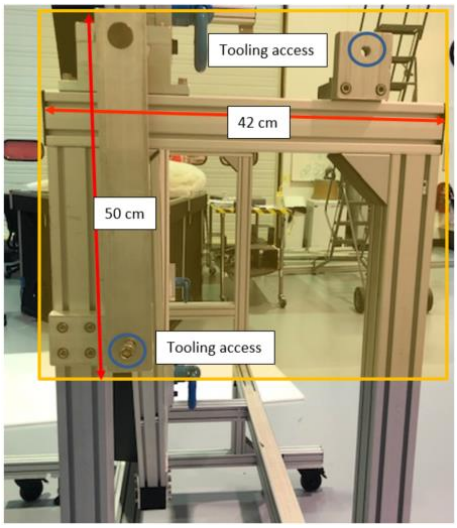
Mary Ann Antonioli, Pablo Campero, Brian Eng, Mindy Leffel, and Marc McMullen

- Configured Ethernet port to connect PLC to the Hall A dev subnet
- Powered up Instrumentation Racks A and B
- Tested 120 V supply to the PLC power supply chassis and to the communication module power supply located in Rack B
- Tested 24 and 5 V supply to instrumentation
- Cut 60 of 64, 100' cables; crimped ferrules on one end of all cables and labeled

Hall B – RICH-II

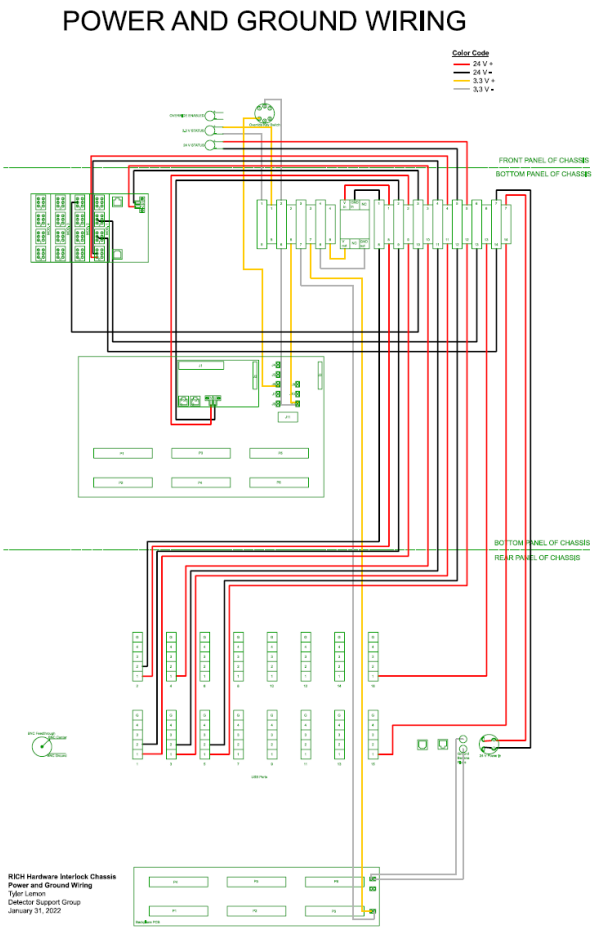
Mary Ann Antonioli, Peter Bonneau, Pablo Campero, Brian Eng, George Jacobs, Tyler Lemon, and Marc McMullen

- Rotated RICH to horizontal position
- Completed test installation of electronic panel (EP) to verify new procedure
    - ✶ EP will be installed while detector shell is horizontal
    - ✶ EP installation frame is lowered on to detector shell with gantry
    - ✶ EP is leveled using a three-point leveling setup on frame
    - ✶ EP is lowered the last few inches into place using threaded rods on installation frame
- Determined that EP frame needs covers fabricated to eliminate pinch points
    - ✶ Cover size should be 42 cm x 50 cm with side walls



EP frame cover dimensions

- Created wiring diagrams for hardware interlock chassis – one for power and ground, one for signals

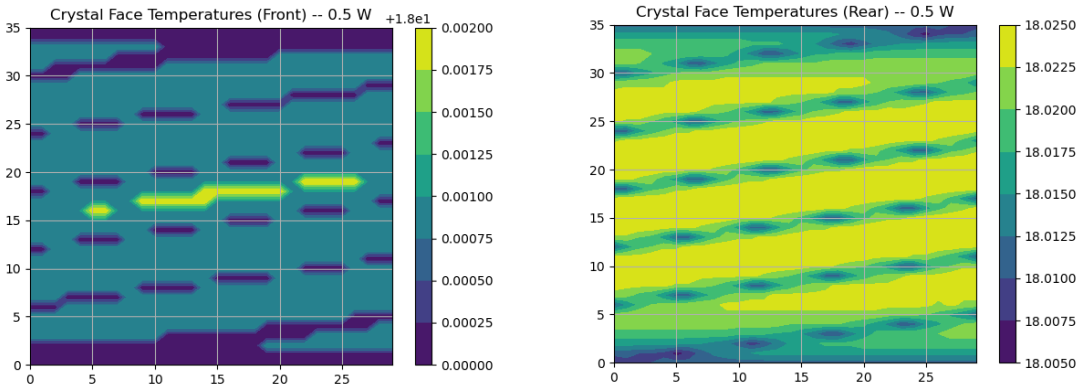


Power and ground wiring diagram for chassis

Hall C – NPS

Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng, George Jacobs, Mindy Leffel, Tyler Lemon, and Marc McMullen

- Modified Python script to parse results file from Ansys thermal analysis of crystal array
  - ✶ Added code to generate contour plots of front and rear crystal face temperature probe values
    - Initial plots indicate problems with the code



Contour plots of front and rear crystal face temperature probe values

- Developing LabVIEW chiller device drivers to read from and write to the chillers – four of nine complete
  - ✶ Write temperature
  - ✶ Write over temperature limit
  - ✶ Write under temperature limit
  - ✶ Write offset calibration
- Installed 15 K-type thermocouples in Keysight terminal block #1 – 47 of 112 installed

Hall D – WEDM

Tyler Lemon

- Updated WEDM screens for COMCAL chiller, BCAL chillers, and GlueX overview
  - ✶ Corresponding CSS screens for COMCAL and BCAL chillers had been modified to display more information and add an expert control screen
  - ✶ GlueX overview screen had minor corrections needed
- Created new WEDM screen for Magnet and Power Supply LCW monitoring

EIC

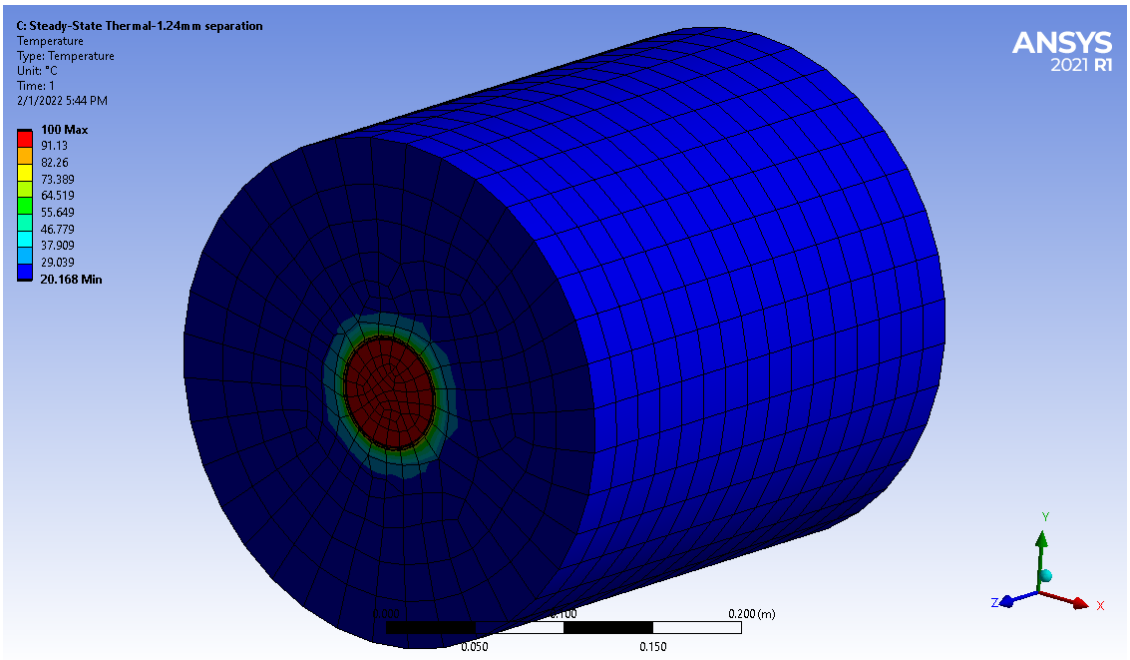
Pablo Campero, Brian Eng

- Installed Ansys *Fluid Fluent* software (uses cell-centered analysis); unable to use software since licenses were not available
- Continued with thermal analysis of Be section using Ansys *Fluid (CFX)* which uses vertex-based analysis

- ✶ Added virtual components which have properties of air on the outside and N_2 inside to the model with an enclosure to simulate fluids inside the Be pipe and in the annulus space formed between the Be pipe and the Si sensor L1
- ✶ For the simulation, created fluid and solid domains
  - Air flow velocity = 5 m/s (per Leo Greiner)
  - N_2 flow velocity = 2 m/s (initial values selected)
- ✶ Unable to run CFD *solver* due to unavailable site licenses for *solver*; no results

- Continued with Ansys steady state thermal analysis of Be section
  - ✶ Added components to model with enclosure to simulate fluids inside Be pipe and in annulus space formed between Be pipe and Si sensor L1
  - ✶ Ran simulation for two models with 1.24 mm and 2 mm separation

Separation between Be-Pipe and Si-Sensor L1 [mm]	Be Pipe Outer face Temp [°C]	Max. Si Sensor L1 Temp [°C]	ΔT between Be Pipe & Si Sensor L1 [°C]
1.24	100.00	72.00	28.00
2.00	100.00	61.94	38.06



Steady state thermal analysis results; temperature profile shows max. and min. temperatures for model

- Meeting with Silicon Consortium and ITS3 group about work package 3 (WP3) tasks to see how JLab can contribute

DSG R&D – EPICS Alarm System

Peter Bonneau

- Debugging Phoebus alarm system server
  - ✶ The alarm server monitors process variables on the network via EPICS channel access
  - ✶ Upon start of the alarm server, the command console correctly reads the .xml configuration file and starts the initialization process
  - ✶ The alarm server initialization reports *"Fetching passed alarm states"*
    - An error is shown indicating *"connection to node could not be established"*
  - ✶ Conclusion: Apache Kafka (the database for the alarm system) *must* be configured for the alarm system *and* operational before starting the alarm server, this was not mentioned in the documentation