Detector Support Group

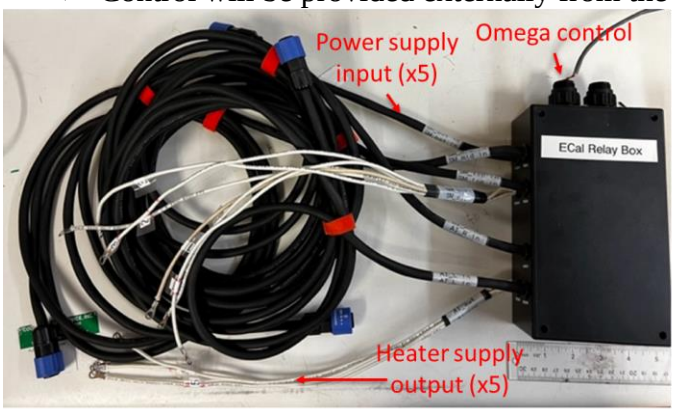
We choose to do these things "not because they are easy, but because they are hard".

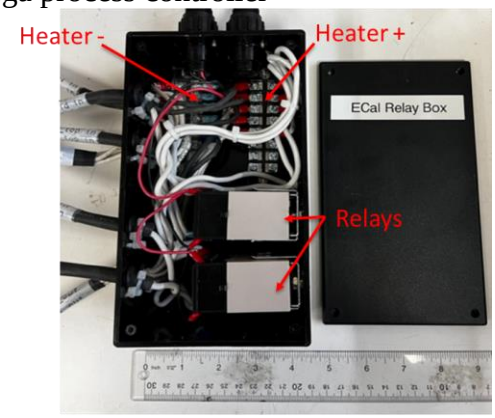
Weekly Report, 2023-08-02

Hall A - ECal

Brian Eng, Mindy Leffel, and Marc McMullen

- Designed, fabricated, and tested over-temperature relay box
  - ✶ Control will be provided externally from the Omega process controller





- Continued modifying controls software
  - ✶ All five control zones read back temperature and send the appropriate control value to the controls shared variable
- Fabricated one high voltage cable with Fischer connectors; 10/23 completed

Hall B - Central Calorimeter

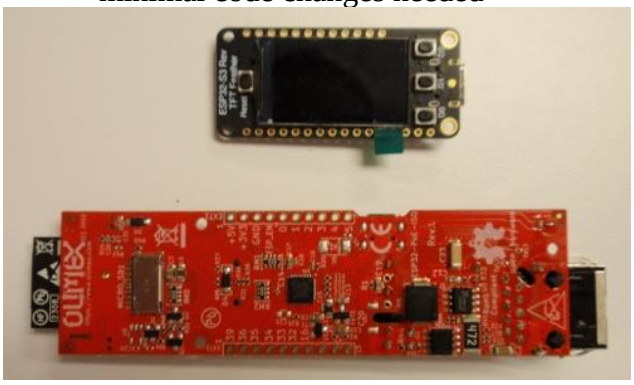
Mindy Leffel

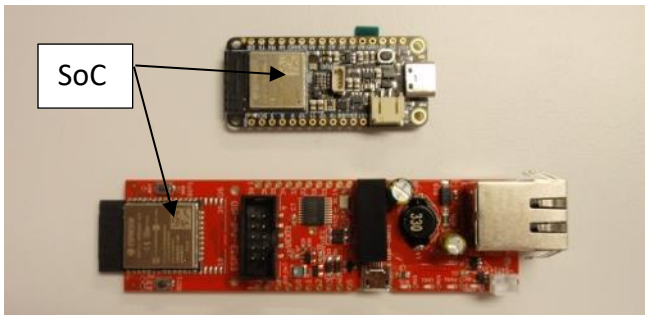
- Tested and labeled 24 LEMO and 28 SHV cables

Hall B – Gas System

Brian Eng

- Swapped to microcontroller with Power-over-Ethernet instead of WiFi for network access
  - ✶ Uses same family of SoC (System on a Chip) and also runs Arduino, so only minimal code changes needed



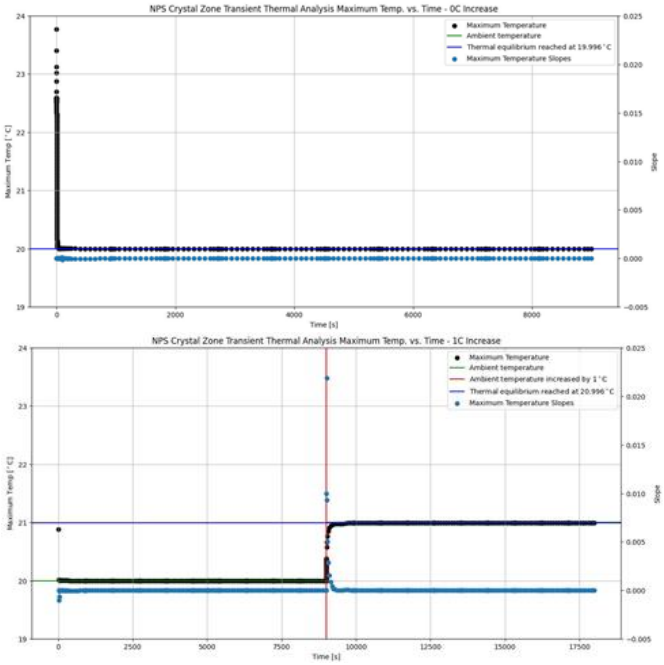


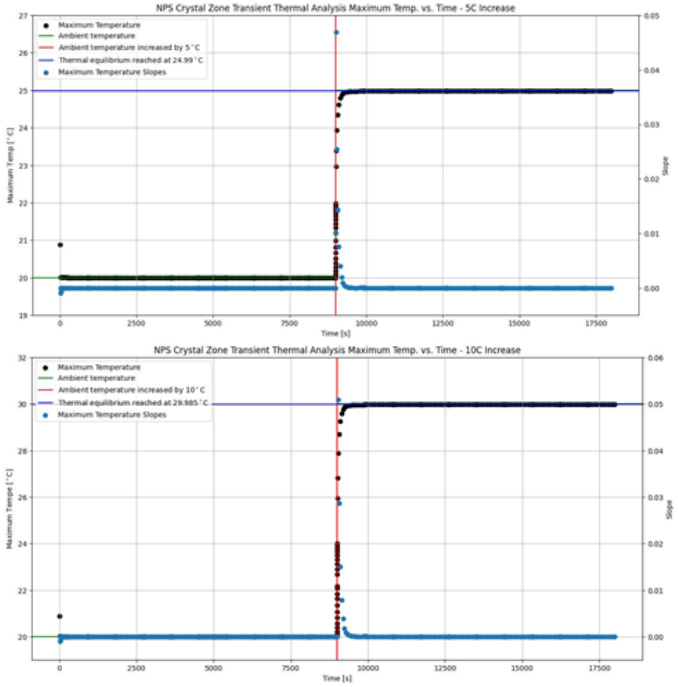
Top (black) = previous board, bottom (red) = new board

Hall C – NPS

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

- Debugging thermal readback and chiller controls LabVIEW program
  - ✶ After the LabVIEW program is stopped and restarted, the chillers do not read back the correct value for the temperature setpoint—default value is 20°C, but are reading 634.4°C
    - LabVIEW code is written so that the chillers cannot be turned on if the setpoint and the readback setpoint do not match
    - To recover, temperature setpoint must be changed to a value other than 20°C until the chiller reads back the correct value
    - Contacted company; awaiting reply
- Troubleshooting random failure of *create subVI* option in LabVIEW menu
  - ✶ NI suggests copying folder or reinstalling software; can work around issue, but takes more steps to create subVI
- Creating subVIs from array loops; completed trip delay enable break-out and hi limit break-out
- Worked with Ansys technical support on why the steady state and transient simulations didn't match; there were two causes
  - ✶ When the geometry of the steady state simulation was copied to the transient simulation, material assignments did not get copied—all model components were assigned the default of structural steel
  - ✶ The applied heat load of 0.3 W was done as heat flux instead of heat flow
- Ran simulations for 0°C, 1°C, 5°C, and 10°C increases in ambient temperature
  - ✶ Results confirm that the temperature of the crystals is dictated by the ambient temperature





- Debugging surface mesh and volume mesh of module for thermal analysis due to errors received when trying to perform the volume mesh
  - ✶ Checking minimum and maximum size of mesh cell elements for faces
  - ✶ Checking local sizing options for conflicting sections and parts
  - ✶ Checking minimum and maximum size of mesh cell elements for volumes
- Made Visio drawing of Phoebus alarm test station simulator
- Completed integrating alarm system with signal simulator
  - ✶ Signal simulator generates EPICS PVs
  - ✶ Phoebus alarm system server programmed to monitor simulator PVs
  - ✶ Test of alarm system monitoring of PVs in progress

Hall D – JEF

Mindy Leffel

- Populated 40 PMT bases; 485 of 1200 completed

EIC

Brian Eng

- Presented latest results with multi-layer insulation
  - ✶ Suggestion made to try additional layers
  - ✶ Concerns about how to get higher flow into the detector versus the four, ½" lines being used in the test stand

EIC - DIRC

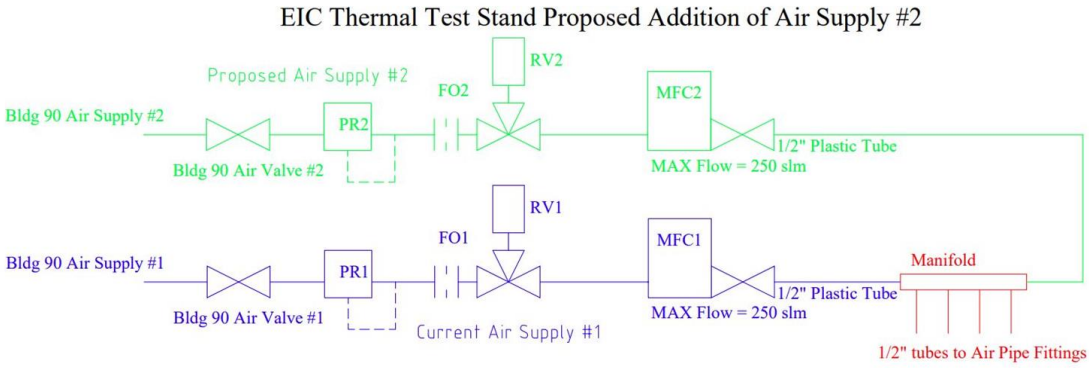
Mindy Leffel, Tyler Lemon, and Marc McMullen

- Testing and debugging laser interlock system PCB
  - ✶ Solid state relay inputs were drawing too much current, causing them to fail closed; 24 V output remained enabled even when an interlock was present
    - Solved by adding resistors to relay inputs to lower current drawn by component
  - ✶ Some inputs were floating high, causing inputs to ICs to always be true
    - Solved by adding pull-down resistors to any input floating high
- Began Visio flowcharts of DIRC user interface; completed main program and serial connect sub-routine
- Ordered additional relays for the interlock system PCB
- Developing Phoebus alarm system test
  - ✶ Researched and procured readout hardware for test

EIC - Thermal Test Stand

Pablo Campero, Brian Eng, George Jacobs, and Marc McMullen

- Created drawing with second air supply



- Discussed additional compressed air line with the pressure systems design authority