Detector Support Group

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

Weekly Report, 2023-03-15

Hall A – ECAL

Brian Eng, Tyler Lemon, and Marc McMullen

- Modified controls program to control the voltage to the heaters based on the temperature of the flange
- Installed an Omega process controller that will cut off voltage to the controls relay at 350º C to monitor the heater temperature on the test stand
- Updated the DSG-List with the new heater and controls information
- Started test to achieve 220º C at the crystal face
- Created model of new heater test in SpaceClaim
    - ✶ New heater under test has two cartridge heaters inside an aluminum block
- Working through process of creating a Fluent model for just the new heater

Hall A – GEp

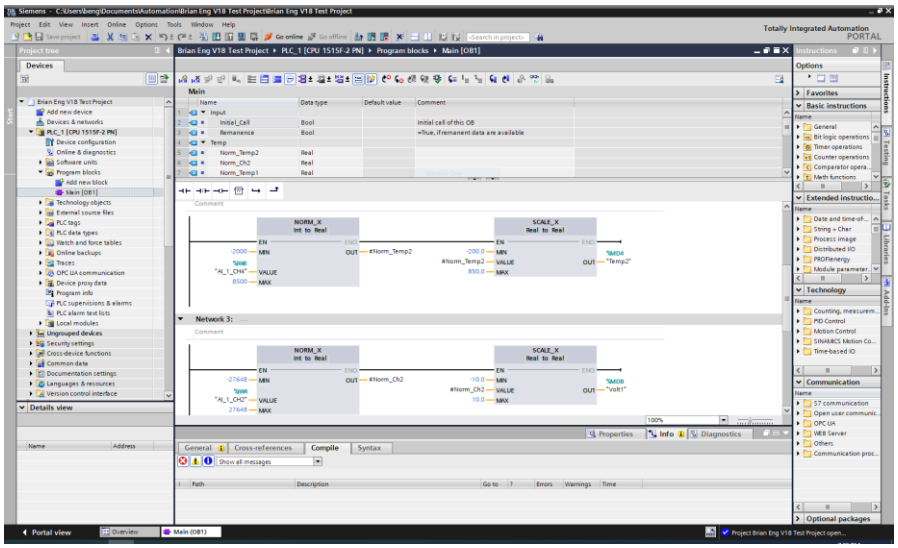
Mindy Leffel

- Cut all wires to length and crimped all pins for two Fischer, 27-pin connectors
- Cut 42 ground jumper wires and crimped with pins

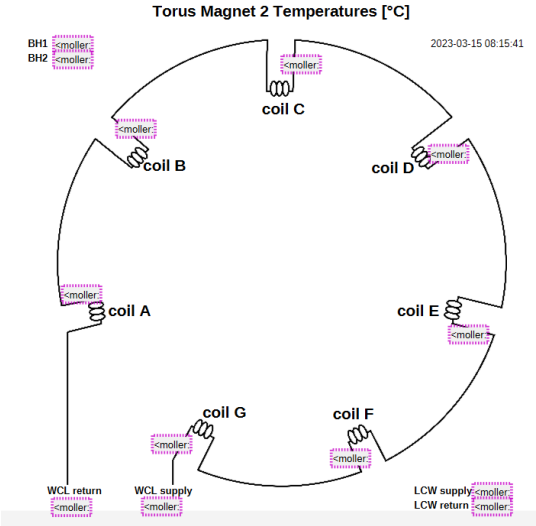
Hall A – Møller

Mary Ann Antonioli and Brian Eng

- Read RTDs with demo Siemens PLC
    - ✶ An analog input module loses half its channel count (four of eight channels are disabled) when channels are set to RTD



- Approved RTD drawings put on document control by Kaiyi
- Generated PVs for voltage taps
- Completed Illustrator diagram to be used for Phoebus screens for magnets 1, 2, and 3
- Completed screens for magnets 1, 2 (shown below), and 3 temperature displays



- Completed Illustrator diagram for magnet 4 Phoebus screen

Hall A – SoLID

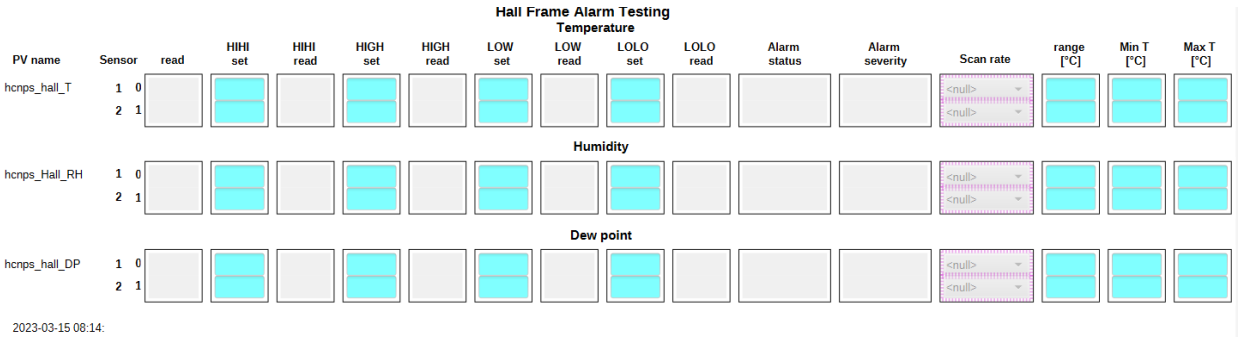
Pablo Campero

- Modified PLC and HMI code to allow control of JTV1, helium cold return valve, from EPICS
- Debugged warnings in FactoryTalk View data logger system of failure to reconnect automatically to the database file
    - ✶ Database reached file size of 2 GB; new file path being used for database

Hall C – NPS

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

- Upgraded Phoebus from version 4.6.10 to 4.7.1 from source code, including core and alarm system applications
    - ✶ Updating and testing the Phoebus system configuration files written for the NPS alarm test system
    - ✶ Updating Apache Kafka and Apache Maven on development computer
- Made Phoebus alarm testing screens for detector frame, electronics zone, hall (shown below), and chiller coolant



Hall D – JEF

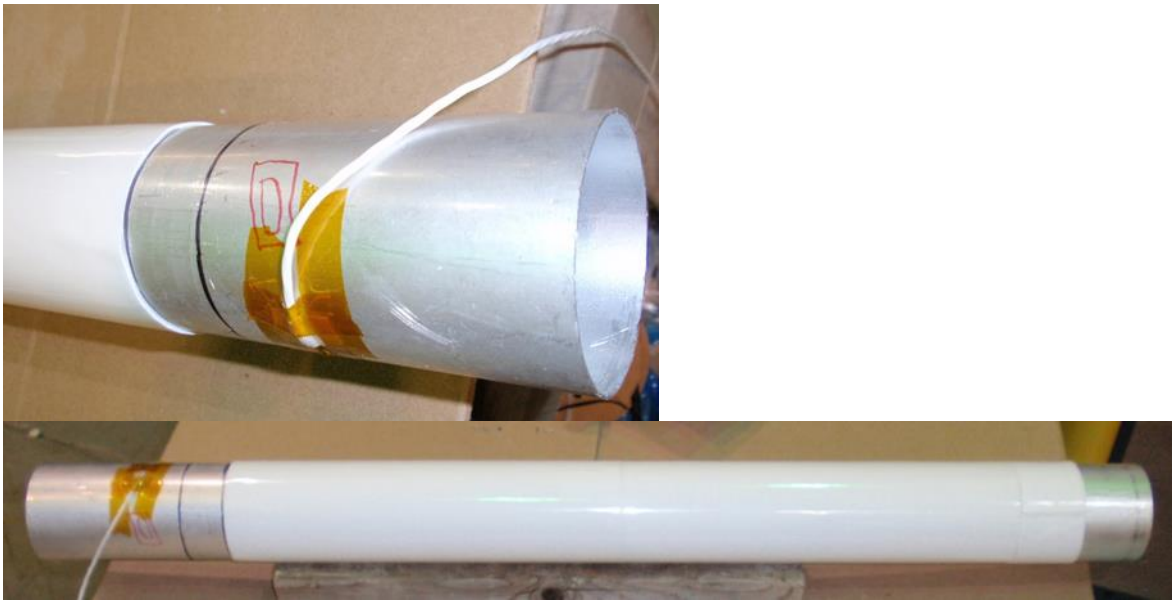
Mindy Leffel

- Populated 70 PMT bases

EIC

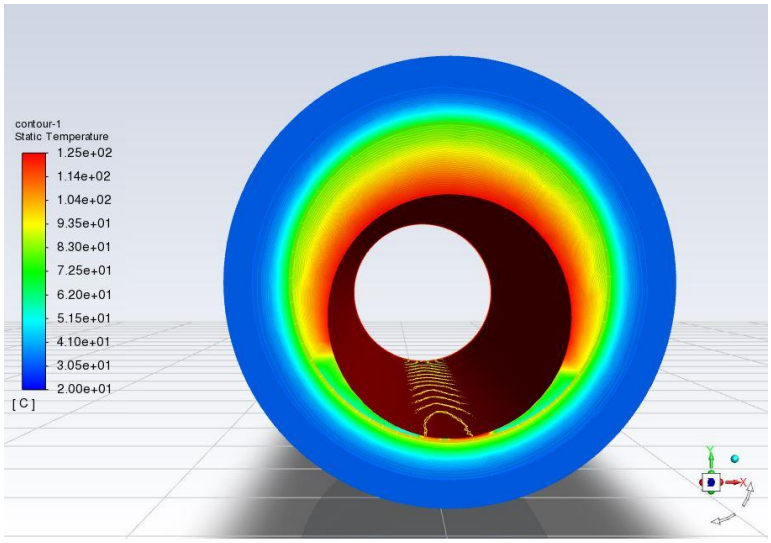
Brian Eng, Pablo Campero, George Jacobs, and Marc McMullen

- Added aerogel to the test stand beampipe



- Completed Ansys Fluent setup to perform thermal simulations of the beampipe used in test stand
  - ✶ Set temperature of 125°C at the outer face of the volume used to represent the heater and a temperature of 20°C at the annulus space
  - ✶ Used coupled method (pressure-velocity scheme)
  - ✶ preliminary results below

Air flow velocity [m/s]	Si sensor max. T [°C]	Si sensor min. T [°C]
1E-07	119.43	118.92
0.1	89.54	86.11
0.2	70.13	66.08
0.5	46.88	43.17
1	37.60	34.63
1.6	33.23	30.71
2.1	31.36	29.12

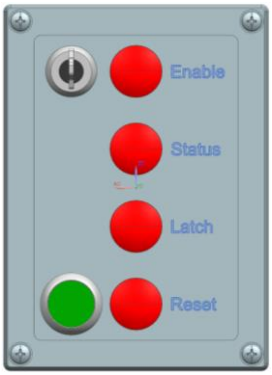


Front (inlet) view of temperature contour results for model with air flow velocity of 1.6 m/s at 20 °C

EIC-DIRC

Tyler Lemon and Marc McMullen

- Started PCB layout of the laser interlock board
- Investigating circuit options for photodiode readout
  - ✶ Option 1: passive current-to-voltage converter
    - Read voltage drop over a known resistance
    - Value of resistor used to read voltage drop sets circuit gain
  - ✶ Option 2: active transimpedance amplifier
    - Uses an operational amplifier to convert current to voltage
    - Feedback resistor in inverting amplifier configuration sets circuit gain
- Researching how to model a photodiode in simulation to test options
- Designed exterior control unit for laser control area with LED indicators, keyed enable switch, and a reset button (all on hand)
  - ✶ Enclosure will be procured and drilled with holes



Screenshot of exterior control unit model. Red circles are LEDs, green circle a pushbutton, and grey circle the keyed enable switch

DSG Website

Peter Bonneau

- Revised and added additional content to the Talks, Weekly Reports, Monthly Memos, Meeting Minutes, Technical Documentation, Mailing Lists, and Publications webpages