Detector Support Group

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

Weekly Report, 2022-03-02

Summary

Hall A – ECal

George Jacobs, Mindy Leffel, and Marc McMullen

- Assembling supermodules – 29 of 59 complete
- Inventoried parts needed for frames to complete project

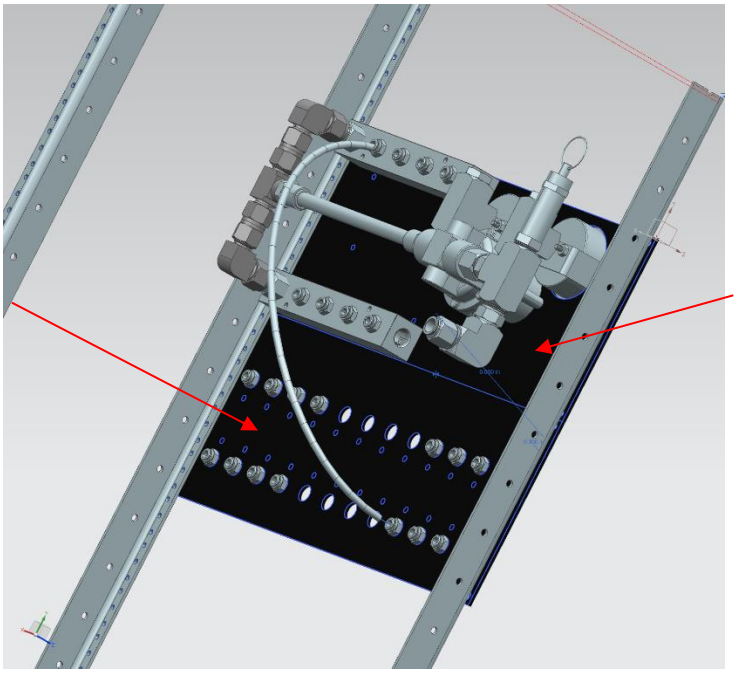
SM2 Frame Parts	Need for 9 frames	On-hand	Need
Spacers (long)	81	27	**54**
Set of flanges	9	5	**4**
Threaded rods (short)	36	10	**26**
Set of sides (long)	9	5	**4**

- Cut remaining springs for supermodules

Hall A – GEM

Brian Eng, George Jacobs, and Marc McMullen

- Rendering, using NX12, BigBite gas rack assembly



Rear view of the BigBite regulator and flow meter valve panels, with the start of gas line models

- Developing Python code to read out flow and pressure for all sensors on a single channel

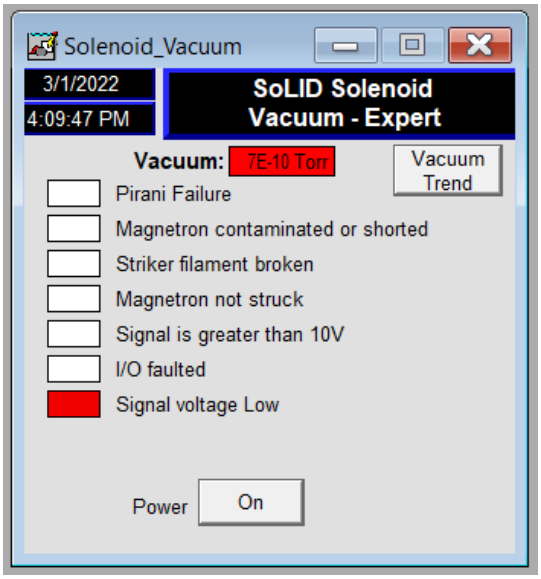
Hall A – SoLID

Pablo Campero, Mindy Leffel, and Marc McMullen

- Troubleshot, repaired, and tested CCS board #8 (spare PT-102)
- Developing HMI screens
  - ✶ Added trends for all rhodium-iron, diode, and PT-102 temperature sensors
  - ✶ Created *Solenoid Trend* HMI screen; added code to enable screen to be used for all trends
  - ✶ Trends can be accessed by clicking the readout display for each temperature signal
  - ✶ Tested trend plots for each temperature sensor

Example of trend for temperature sensor during testing

  - ✶ Modified and configured *CCR-Expert, Coil and Radiation Shield*, and *Turret Temperatures* HMI screens
  - ✶ Added trends for pressure and vacuum signals in *CCR-Expert* screen
  - ✶ Completed *Vacuum-Expert* HMI screen
    - ▪ Monitors gauge limit faults and PLC channel faults
    - ▪ Screen is accessible from *CCR-Expert* screen and from *Menu* screen
    - ▪ Programmed button to power cycle vacuum meter



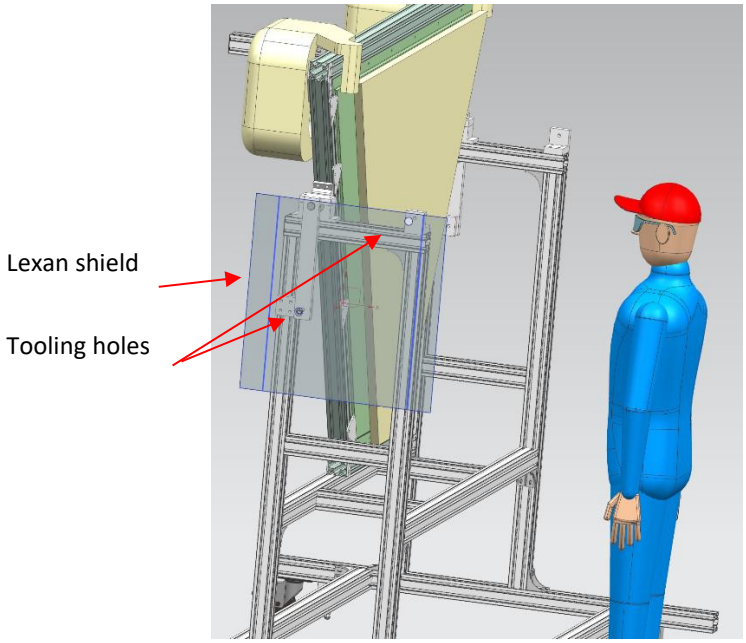
Vacuum-Expert HMI screen

- Grounded backplanes for 11 signal conditioning modules to the rack
- Terminated four, 12-conductor MIOS connector cables – 14 of 14 complete; tested and labeled all 14
- Terminated, tested, and labeled two of two, 4-conductor military spec connector cables
- Configuring pinout for 41-pin MS connector

Hall B – RICH-II

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

- Debugged and modified hardware interlock system sensors' immediate status and latched status indication in EPICS
  - ✶ Previous version had treated a sensor's immediate status or latched status as a single Boolean array that was converted to an integer for the corresponding EPICS PV
  - ✶ Due to 200 individual scripts running in background, screen was slow opening
    - 100 sensors read by system x (1 immediate status + 1 latched status) = 200 total sensor indicators
    - 100 sensors = 48 temperature + 48 humidity + 2 airflow + 1 air pressure + 1 nitrogen flow
  - ✶ Consequently, the idea to only use integers for the status was abandoned and PVs for individual sensor's immediate status and latched status were added
    - RICH-I system also uses individual PVs for statuses
- Developed user-level CSS-BOY screens for hardware interlock system
- Designing and fabricating electronic panel covers (Lexan shields) – safety component which will eliminate pinch points caused by rotation of the electronic panel



View of the Lexan shield design developed for the e-panel cart in NX12

- Completed all 36, 3-D printed, spring support mounts
- Rewired five Molex-to-RJ45 cables and terminated two additional cables; tested all seven

Hall C – NPS

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

- Revising Keysight scanning program
  - ✶ Removing unnecessary VIs – initiate and abort VIs
  - ✶ Channels are now scanned by multiplexer instead of sensor type
- Generating spreadsheet of EPICS PV names
  - ✶ Includes sensor type and location, units, and Keysight channel number
- Developing Phoebus hardware monitoring program user interface; completed 11 screens

Hall D – JEF

Mary Ann Antonioli, Aaron Brown, George Jacobs, and Mindy Leffel

- Cut 70 ESR foils
- Foil pre-shaping – 233 of 1600 complete

EIC

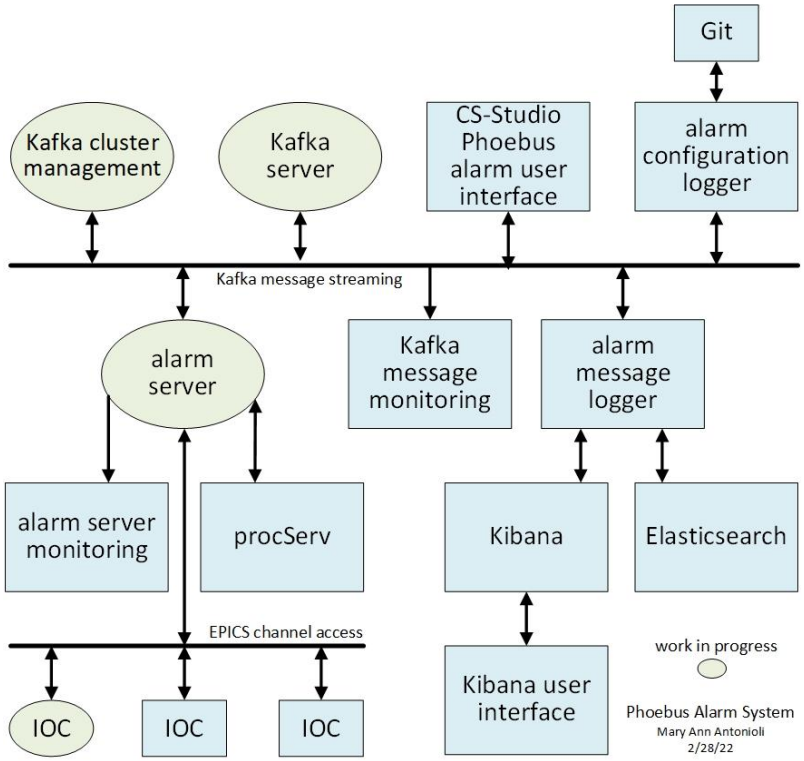
Pablo Campero, Brian Eng

- Generated standalone system project to work with Ansys Fluid Flow Fluent software
  - ✶ Simulated heated beam pipe effects on Si sensors with air flow between layers
  - ✶ Got first Fluent results; need to verify setup (possibly boundary conditions) as temperature values seem incorrect
- Attended Silicon Consortium meeting

DSG R&D – EPICS Alarm System

Peter Bonneau

- Completed custom rebuild of Phoebus core and applications
  - ✶ The alarm system requires a custom build of Phoebus from source code
  - ✶ Sections of the Phoebus core and applications (including alarm system code) were updated at the end of 2021
  - ✶ As a prerequisite for the build, the system configuration files created for first system build were edited and used in this rebuild
- Generated Visio drawing of block diagram of programs used by the Phoebus alarm system



Block diagram of Phoebus alarm system