Detector Support Group

Weekly Report, 2017-05-24

Status

Solenoid

- PLC code developed for the *Vapor Cooled Leads interlocks* and *Cryo Interlocks* routines to display the single Cryo interlock indicator as 14 indicators on Solenoid Interlocks Status screen.
- Existing *Evaluate Interlocks* routine modified
- PLC code developed to interlock load cells during cooldown, if necessary.
- *Cryo* program in Solenoid PLC code rewritten.
- Distribution box, DBX, PLC code modified.

Gas System

DC

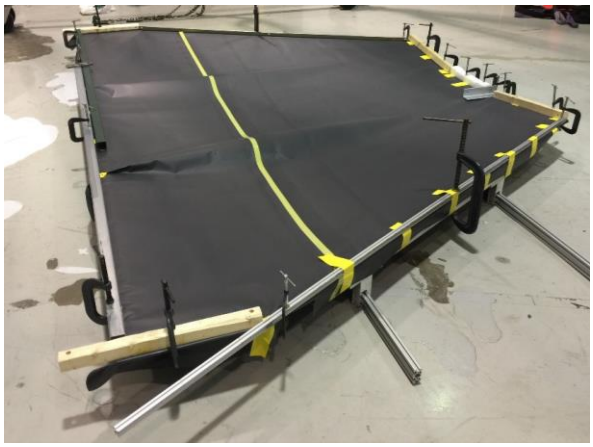
- Safety system chassis debugged and repaired.
- Operator's manual for gas system updated.

MVT

- EEL test setup ready for testing.

RICH

- Fabric made of tedlar-mylar-tedlar sandwich, glued to the exit window.



RICH exit window on EEL 124 floor after gluing fabric to its frame. Fabric was clamped to frame to ensure good contact during curing.

- Compressor and bertha rearranged to allow space for MVT testing in EEL124

FT

- Test procedure developed for hardware LV interlock testing for calorimeter and hodoscope.
- Interlocks on HV cards for calorimeter and hodoscope tested.

Hall D

- Logbook entries and EPICs screens monitored and analyzed daily.
  - ✶ Repaired VCL controllers have stabilized lead flow so that measurements are now consistent between two leads.

Antonioli, Mary Ann

- Tested and debugged **RICH** interlock code.
  Edited Pablo's Hall B **Solenoid** Cooldown Instrumentation and Controls power point presentation.

- Compiled, formatted, and edited weekly report.

Arslan, Sahin

Absent

Bonneau, Peter

Forward Tagger

- Developed test procedure for hardware LV interlock testing for calorimeter and hodoscope.
  - ✶ Incorrect LV interlock wiring found on Mpod hodoscope LV cable assembly (fabricated by FT Group).
- Interlock daisy-chain testing on CAEN HV disable showed that one signal could be used to drive three individual modules for each detector. This will save 3X on HV interlock cabling.
- Developed test program and implemented revised PV signals for EPICS test client application. Worked with Nathan Baltzell on softIOC implementation.
- Met with Wesley Moore regarding EPICS programming needed for interlock status signals for alarm handler.
- Completed programming for additional chiller status signals.
- Worked with Mindy on cRIO interconnects.

RICH

- Worked with Mary Ann to debug temperature signals on real-time interlock program.
- Worked with Amanda, Tyler, and Pablo on LabVIEW to EPICS interface for real-time program, showing procedure that was developed for FT.

- Held daily meeting on Hall D status and EPICS controls monitoring.
  - ✶ Repaired VCL controllers have stabilized lead flow so that measurements are now consistent between two leads.

Campero, Pablo

Solenoid

- Generated 14 *PLC tag* names for interlock indicators.
- Wrote additional PLC code for the *Vapor Cooled Leads interlocks* and *Cryo Interlocks* routines to display the single Cryo interlock indicator as 14 detailed indicators on Solenoid Interlocks Status screen.
- Modified existing *Evaluate Interlocks* routine, by adding the boolean of the 14 indicators to generate a controlled ramp down, if anyone of the 14 indicators has a fault.
- Wrote PLC code to interlock load cells during cooldown, if necessary.
  - ✶ Modified *Cryo* program in Solenoid PLC code.

- To stop cooldown of Solenoid when thresholds defined on *EM Forces calculations and EPICS Screen for EM forces V1*spreadshet are exceeded.
- Generated new *produced tag* to be a shared-variable with DBX PLC control systems.
- Created *Load Cell* data type (number+booleans) to communicate with the DBX the status of each load cell interlock.

✶ Modified DBX PLC code.

- Created *Load Cell* data type to check status of communication with tags received from Solenoid PLC.
- Generated new *consumed tag*.
- Generated logic to check errors during transmission of load cell interlocks status tags from Solenoid to DBX PLC.
- Modified *Sol_Interlock_Valve* routine to close Solenoid cryogenics supply valves.

RICH

- Completed *Hardware Interlock Monitoring* LabVIEW VI loop.
- Added *Interlock User Interface main VI* to current project file.

- Monitored and analyzed logbook entries and EPICs screens daily.
  - ✶ Solenoid vapor-cooled lead flows are stable at 28.2 SLPM.

Eng, Brian

- Still no errors on **Torus** cernox sensor since last start-up; will continue to run/monitor values.

Gas System

- Added pressure sensor signal for CO_2 supply to cRIO, after sensor was installed.
- Replaced oxy.IQ sensor for DC supply as it has hardware failure according to GE; have requested information on getting it repaired.
- Replaced pressure sensor for Mix 1 after original went bad. Replacement sensor also was bad.
- Found four unused PVs for DC gas in alarm handler; Nathan will remove later.
- Debugged and repaired safety system chassis on SFL3 with Marc after Hall B found that R1-2 wasn't flowing any gas past rotameters: https://logbooks.jlab.org/entry/3473653

Hoebel, Amanda

- Analyzed **LTCC** leakage with Tyler and Pablo.
  - ✶ Created Python script to determine amount of gas lost over certain time period.

Forward Tagger

- Tested interlocks on HV cards for calorimeter and hodoscope.
  - ✶ HV trips off when daisy-chain is removed.
- Used MUSE program to test interlocks on LV cards.
  - ✶ Configured card properties for internal sense connection and enable external inhibit.
  - ✶ Connected 5 V supply to test connector.
  - ✶ Tested interlock by toggling on/off 5 V supply.

Jacobs, George

GAS Systems

- Assembled MVT EEL test setup; ready for testing.
- Troubleshooting and testing of DC safety solenoid valve power and interlocks.
- Installed pressure transducer on CO_2 gas supply.
- Met with MVT EEL Test Setup gas system DA multiple times.
- Ordered CO_2 dewar for DC.
- Updated DC Gas Operators Manual.

Leffel, Mindy

Forward Tagger

- Fabricated two temperature adaptor cables, D-sub to Molex.
- Worked on cRIO chassis.
    - ✶ Bundled cables, affixed to chassis as needed, and generally tidied chassis interior.
    - ✶ Punched hole and attached selector switch.

RICH

- Contributed to relocation of window frame.
- Assisted with reorganization of small cleanroom.
    - ✶ Moved equipment from mezzanine and control room.
    - ✶ Rearranged tables and set up equipment.

Lemon, Tyler

- Reverted addition of new relief valve PT100 to **Solenoid** LV cRIO.
    - ✶ PT100s added to Cryo-con unit instead of LV Chassis.

RICH

- Merged LabVIEW EPICS interface into Hardware Interlock System project.
    - ✶ Real-time interface of project previously developed by Mary Ann.
    - ✶ Added automatic EPICS server deployment logic developed by Peter to project.
- Updated PVs on CSS screen for Hardware Interlock System to reflect PVs generated by automatic deployment of EPICS server.
    - ✶ CSS screen still requires testing.
- Using two-part G-Flex epoxy, glued exit window fabric to frame with Argonne collaborators.
    - ✶ Exit window fabric is a tedlar-mylar-tedlar sandwich.

McMullen, Marc

- Met with Walt Akers and Saclay representative to discuss **MVT** EEL setup and gas supply.
- With Tyler, rearranged **RICH** compressor and bertha to allow space for MVT testing in EEL124
- Added 3inches of oil to all **LTCC** overpressure bubblers. Started new leak study.

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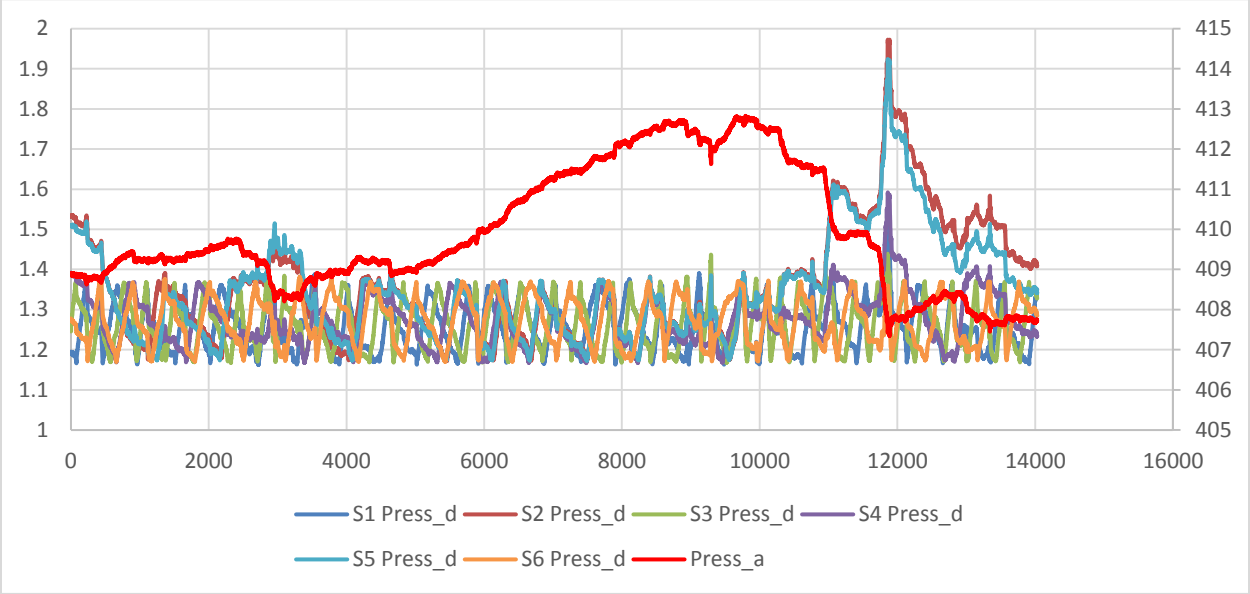

Ambient pressure, Press_a, and differentitial pressure of the six sectors, S# Press_d, # ∈ [1, 6] with 3inches of oil in the exhaust bubbler, as a function of time.

Data from 5/18 to 5/23		S1 Flow		S2 Flow		S3 Flow		S4 Flow		S5 Flow		S6 Flow	
total time (sec)	402241	total flow	450.16	total flow	165.14	total flow	572.31	total flow	213.66	total flow	151.39	total flow	556.94
total time (days)	4.66	daily use over total time	96.60	daily use over total time	35.44	daily use over total time	122.81	daily use over total time	45.85	daily use over total time	32.49	daily use over total time	119.51

DC

- Troubleshot issues on Mix 1 pressure transducer. Newly installed 740c reads ~60 psi too high. Possibly just needs to be zeroed.
- Cable was made for a +/- 15 V transducer; re-terminated it for 15 V.
- Repaired Gas Safety System local box on space frame, with Brian.
  - ✶ Hall B mechanical requested assistance with troubleshooting solenoid safety panel. After verifying continuity, found burned jumper wire in solenoid power distribution.
  - ✶ Found warped barrier block, removed it, and relocated all contact wires to previously jumpered block.
  - ✶ Discovered barrier block power cables were only rated for ~5As, but load was calculated to be ~6As. Replaced 18 awg cables with 14 awg cables and tested.