



Detector Support Group

Weekly Report, 2017-05-17

Status

Solenoid

- Load cell interlocks added to PLC code.
 - * PLC code written to calculate imbalance of radial and axial load cells forces for upstream and downstream sides.
 - * Load cell data type modified to add second limit to each axial and radial load cell.
 - * Two new PLC routines written and added under magnet interlocks program.
 - *Load Cell_1st* – Evaluates defined controlled ramp down thresholds.
 - *Load Cell_2nd* – Evaluates defined PLC fast dump thresholds.
 - Code generated for magnet interlock PLC program (interlock evaluate routine) to fast dump magnet when second threshold load cell is exceeded.
- New PT100 for relief valve added to LV cRIO program.

Torus

- Still no errors seen on Cernox sensors, (running about 3 weeks).
- Voltage tap VT8-DAQ scale factor changed from 25x to 10x in FastDAQ cRIO.
 - * Change done in preparation for power-up to test ESR capabilities (date TBD).
 - * Change noted in HBTORUS logbook: <https://logbooks.jlab.org/entry/3473131>

Gas System

DC

- Bad pressure transducers replaced.
- Hot fill of Hall B 1500 gal. Ar dewar completed.

MVT

- Flow limiting orifices, flash arrestor, valves, fittings, and ASME relief valve for EEL test setup purchased.

RICH

- THA for assembly tasks requiring Loctite, two-part epoxy, or paint generated.
- All subVIs for hardware interlock system's EPICS interface completed.
- CSS screen updated for hardware interlock system to match variables monitored in real-time loops on cRIO.
- Generated EPICS PV spreadsheet for hardware interlock system's EPICS interface.
- Mirrors shipped on 5/16/17 from CMA to ECI for final coating .
- N₂ gas line routed.
- Tooling for Argonne collaborators ordered.
- Safety documents to cover painting and gluing in the clean room generated.

FT

- Meeting with Marco and Raffaella regarding interlock system.
 - * Status update and demonstration of EPICS interface control.
 - * Cables and pin-outs for calorimeter temperature and humidity reviewed.
 - * Interlock connections to Mpod LV crate identified.
- Calorimeter and hodoscope Mpod LV interlock interface bench-tested with cRIO.
- Test procedure for CAEN HV crate interlock operation developed.



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Hall D

- Logbook entries and EPICs screens monitored and analyzed daily.
 - * Repaired and re-calibrated Solenoid vapor-cooled lead flow controllers were installed and tested. Units were also tested for "Normally Open" operation, which is full flow upon power loss.
 - * On 05/15, Solenoid vapor-cooled lead for upstream and downstream displayed low flows rates of ~28 SLPM.



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Antonioli, Mary Ann

- Discussed LabVIEW interlock controls file problems with Peter. After initial fix by Peter, added more subVIs to project, which caused more problems. Appears to be fixed.
- Reviewed code written so far with Peter. Found some problems probably due to missing code. Re-wrote that code.
- **Compiled, edited, and formatted weekly report.**

Arslan, Sahin

Absent

Bonneau, Peter

Forward Tagger

- Met with Marco and Raffaella regarding interlock system.
 - * Gave a status update and demonstrated EPICS interface control.
 - * Reviewed cables and pin-outs for calorimeter temperature and humidity. Identified interlock connections to Mpod LV crate.
 - * Discussed re-programming of chiller for interlock control.
- Worked with Nathan Baltzell on EPICS test client application, part of investigation into loss of communication between EPICS and cRIO.
- Bench-tested calorimeter and hodoscope Mpod LV interlock interface with cRIO. Reprogramming of controller via USB is necessary to enable use of interlock signals.
- Developed test procedure for CAEN HV crate interlock operation.
- Worked with Mindy on cRIO chassis signal disconnects. Installed and tested disconnects for temperature, humidity, and chiller control and monitoring.

RICH

- Corrected issues with real-time cross-linked project files in hardware interlock system.
- Discussed with Pablo initialization programming for signal-monitoring array for interlock system user interface.
- **Held daily meeting on Hall D status and EPICS controls monitoring.**
 - * **Repaired and re-calibrated Solenoid vapor-cooled lead flow controllers were installed and tested. Units were also tested for "Normally Open" operation, which is full flow upon power loss.**

Campero, Pablo

- Working on RICH LabVIEW interlock system user interface.
 - * Modified user interface with "initialize I/O" and "initiate connection" subVIs.

Solenoid

- Added load cell interlocks to Solenoid PLC code.

Added PLC code to perform calculation required for imbalance forces for upstream – radial and axial load cells and downstream - radial and axial load cells.

 - * Modified load cell data type to add second limit to each axial and radial load cells.
 - * Added two new PLC routines under magnet interlocks program.
 - *Load Cell_1st* – Evaluates defined controlled ramp down thresholds.



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- *Load Cell _2nd* – Evaluates defined PLC fast dump thresholds.
- Added code to magnet interlock PLC program (interlock evaluate routine) to fast dump magnet when second threshold load cell is exceeded.
- Monitored and analyzed logbook entries and EPICS screens daily.
 - ★ On 05/15, Solenoid vapor-cooled lead for upstream and downstream displayed low flows rates of ~28 SLPM.

Eng. Brian

- Met with Walt and Jason from plant services about setting up Bertha unit for RICH compressor. Tyler verified that voltage supplied by the Bertha will work for unit we have.
- Still no errors on Torus cernox sensors since last start-up; will continue to run/monitor values.

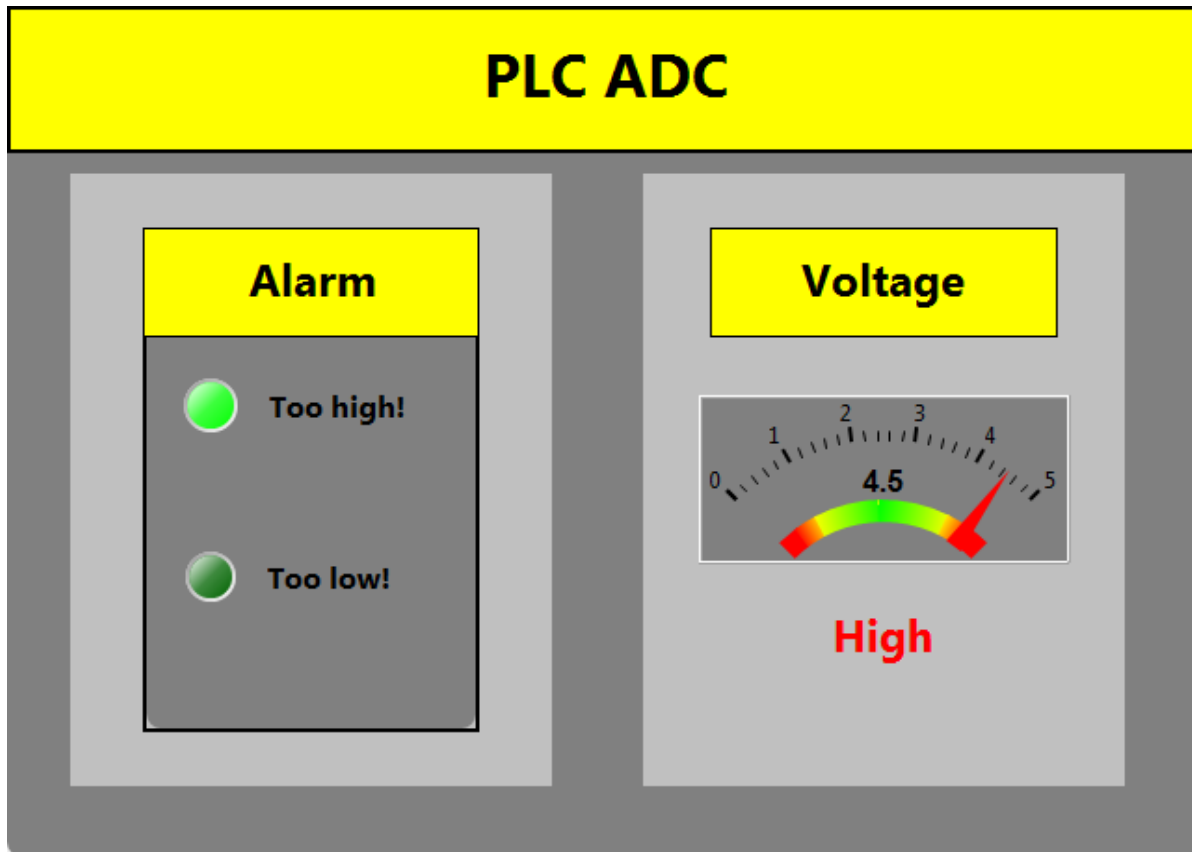
Gas System

- Swapped mix 2 CO₂ GE250 MFC with GE50 from LTCC C4F10 MFC in gas shed.
- Tested TCUs, both are non-functional. TCU 1 is outputting ~100 mA (output is supposed to be 4–20 mA) and TCU 2 is outputting 0 mA (despite drawing the correct current from 24 VDC supply).
- Reverted CPU usage-reporting from real-time executable on SF cRIO as it was crashing the cRIO periodically.
- Changed code for DC mixing pressure after George clarified how he wanted it to work and later changed limits.

Hoebel, Amanda

Forward Tagger

- Troubleshooting interlocks for CAEN HV modules.
 - ★ Interlocks LED light would not turn off when 50-ohm terminator was removed.
 - ★ Reconfiguration of jumpers inside card did not solve problem.
 - ★ Problem fixed when interlock connection pins on front panel were shorted.
- Monitored EPICS and logbook.
 - ★ Solenoid vapor-cooled lead flow controllers repaired and recalibrated on 05/11/17.
- Created EPICS GUI to monitor voltage output from PLC test stand.
 - ★ GUI is read from variables created in LabVIEW.
 - ★ Voltage is displayed on meter.
 - Values above 4 V trigger “too high” alarm.
 - Values below 1 V trigger “too low” alarm.



EPICS GUI for PLC and LabVIEW

Jacobs, George

GAS Systems

- Revised gas supply P&I diagram for MVT EEL test setup.
- Purchased flow limiting orifices, flash arrestor, valves, fittings, and ASME relief valve for MVT EEL test setup
- Meeting with Bob M. on changing DC gas bubbler line sizes to 2".
- Troubleshooting, rewiring, and testing of DC safety solenoid valve interlocks.
- Completed hot fill of Hall B 1500 gal. Ar dewar
- Had multiple meetings with MVT EEL test setup DA.
- Replaced bad DC pressure transducers.
- Disassembled argon isobutene gas mixing system in EEL rm 124.

Leffel, Mindy

- Moved Bertha unit from physics storage to EEL for **RICH**.
- Worked on **Forward Tagger** Cables.
 - ★ Discussed types and placement with Peter, Marco and Harkirat.
 - ★ Tested calorimeter temperature cable connections.
 - ★ Cables terminated and tested: two LV disconnects, one 25-pin D-sub/D-sub, one N₂ gas flow cable, and various jumpers.



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Lemon, Tyler

- Reverted **Torus** voltage tap VT8-DAQ scale factor from 25x to 10x in FastDAQ cRIO.
 - ★ Change done in preparation for power-up to test ESR capabilities (date TBD).
 - ★ Change noted in HBTORUS logbook: <https://logbooks.jlab.org/entry/3473131>
- Added new PT100 for **Solenoid** relief valve to Solenoid LV cRIO program.
 - ★ Waiting for PT100's serial number before deploying changes to cRIO.

RICH

- Met with ESH&Q representative to discuss hazards for exit window assembly tasks requiring Loctite, two-part epoxy, or paint.
- Wrote THA with Marc for assembly tasks requiring Loctite, two-part epoxy, or paint.
- Completed all subVIs for hardware interlock system EPICS interface.
 - ★ subVIs will be incorporated into real-time loop EPICS interface subVI.
- Updated CSS screen for hardware interlock system to match variables monitored in real-time loops on RICH cRIO.
- Generated EPICS PV spreadsheet for hardware interlock system EPICS interface.
- Coordinated shipping of spherical mirrors from CMA to ECI for final coating.
 - ★ Mirrors shipped 2017-05-16.
- Noted on 2017-05-15 that downstream VCL flow controller on Solenoid was replaced with refurbished flow controller.
 - ★ DS-VCL flow was previously not at set point due to flow controller malfunction.
- Installed LabVIEW packages and drivers on DSGCOMP1, the new CUE subnet PC for DSG Control Room.

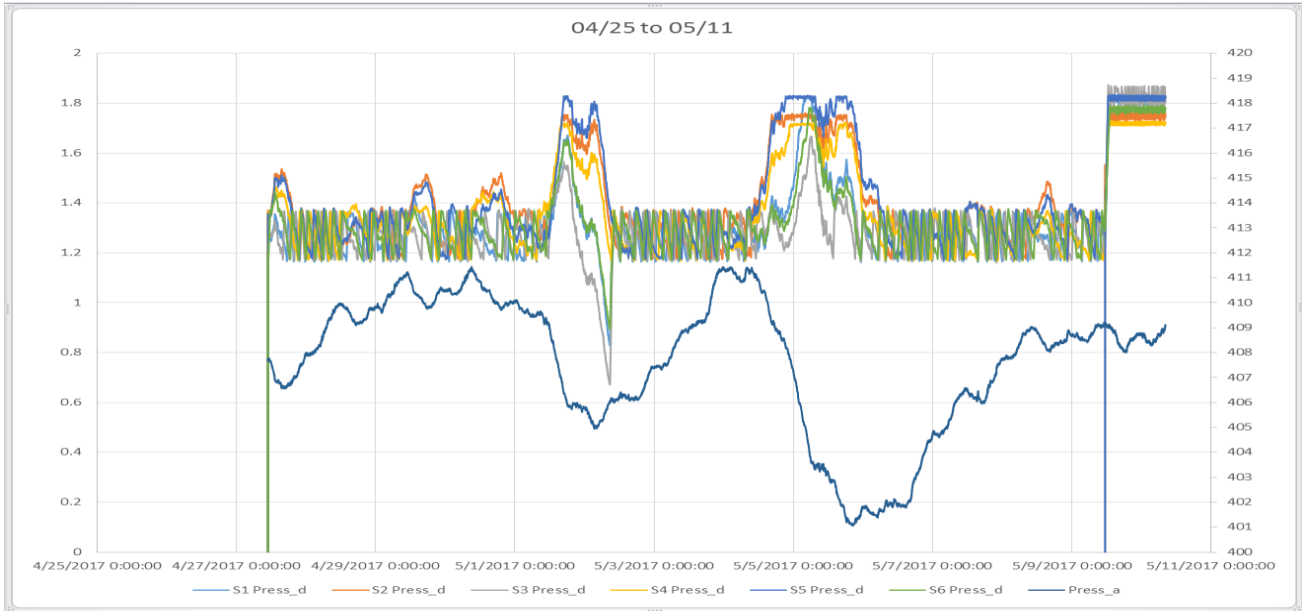
McMullen, Marc

- Changed **SVT** N₂ bottles.
- Contacted **MVT** DA to ensure MVT will be in compliance when testing in EEL 125.
- Hall B asked for estimate on how long **LTCC** C₄F₁₀ on hand will last in one sector.
 - ★ We will add oil to all sectors and continue to take data before giving final estimate.
 - ★ Additional oil will prevent bubbling out during periods of low ambient pressure.



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Long term pressure study of all LTCC sectors v. ambient pressure (Press_a). Shows behavior of sectors in relation to changes in ambient.

RICH

- Routed N₂ gas line.
- Ordered tooling for Argonne collaborators.
- Wrote safety documents to cover painting and gluing in the clean room with Tyler.