



Detector Support Group

Weekly Report, 2017-04-26

Status

Solenoid

- Signals needed for implementation of additional vacuum pump monitoring researched
- Interlocks trips on MPS remote board investigated.
 - * 435-NBX module configuration revised to get response from MPS to PLC.
 - * Wiring between MPS board and PLC Relay output module verified.
 - * PLC code added to *Magnet Interlocks* routine.

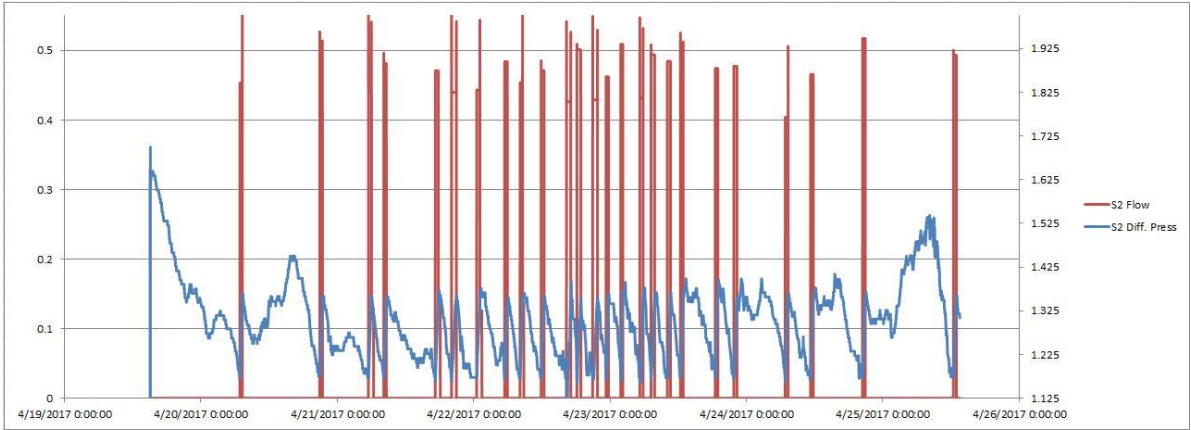
Torus

- LV cRIO program updated to use fixed target voltage instead of power.
<https://logbooks.jlab.org/entry/3470593>

Gas System

LTCC

- Leakage rate determined



LTCC Sector 2 flow (LPM) vs. differential pressure (IWC); 04/19/2017 to 04/25/2017.

Sector	C ₄ F ₁₀ L/day	C ₄ F ₁₀ kg/day
1	95	1.06
2	32	0.36
3	118	1.32
4	38	0.43
5	27	0.30
6	101	1.13

Leakage rate of sectors



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DC

- Procedures for pressure test of piping edited; submitted for OSP.
- P&I diagram with new orifice locations updated.
- Flow-limiting orifices for R1, R2, and R3 supplies installed.
- Ordered and received relief valves for DC pressure systems testing.
- Flow-limiting orifices from solenoid panel removed.
- “Test Block” for pressure testing gas systems assembled.
- Testing fixture for CGA320 CO₂ supply assembled.
- OSP for DC pressure testing reviewed and signed.
- Liquid Ar and liquid CO₂ dewars ordered.

SVT

- R2 S6 U2 failures (no data) being debugged.

RICH

- Cable path length on forward carriage measured.
- MK5 gateway module for on/off relay detection researched (cost ~\$2,000).
- Python code developed to analyze tension on gantry when detector is lifted.

ET

- An EPICS CSS-Boy GUI test interface developed, tested, and debugged for threshold controlling, monitoring, and interlocking of calorimeter and hodoscope signals.

Hall D

- Logbook entries and EPICs screens monitored and analyzed daily.
 - * Liquid level on Solenoid nitrogen tank has stabilized to greater than 50% after fill value was manually changed.
 - * On 04/20, DS BCAL chiller was swapped with original US BCAL chiller.
 - * Noted on 2017-04-24 that all Hall D detectors, except for TOF, are powered off.



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Antonioli, Mary Ann

- Continued writing **RICH** LabVIEW code for hardware interlock system.
 - ★ Completed testing and debugging of configuration file subVIs.
 - ★ Wrote 21 cases for messaging handling loop; one remaining.
 - ★ Added watchdog loop.
- Imported, formatted, and edited Amanda's HDice Note.
 - ★ Researched problem of pixelated pictures. PNG files are not compatible with InDesign.
- Made final changes to my Note on RICH interlock system. Posted to website (2017-01).
- Changed website photo.

Arslan, Sahin

Absent

Bonneau, Peter

- Working with Pablo on **Solenoid** instrumentation and interface to PLC system.
 - ★ Signals needed for implementation of additional vacuum pump monitoring was researched

Forward Tagger Interlock System.

- An EPICS CSS-Boy GUI test interface was developed, tested, and debugged for threshold controlling, monitoring, and interlocking of calorimeter and hodoscope signals.
- Contacted Wesley Moore regarding addition of FT EPICS interface to CLAS 12 menu structure and addition of signals CLAS alarm handler.
- Worked with Mindy on cable and connections design.

RICH

- Discussed with Mary Ann hardware interlock system
 - ★ subroutines for watchdog timer
 - ★ testing and debugging subroutines for storage of configuration and threshold levels.
- Worked with Amanda on hardware connection design and interface for instrumentation interlocking.
- Resubmitted DSG computer procurements for Jlab computer center.
- Held daily meeting on Hall D status and EPICS controls monitoring.
 - ★ Liquid level on Solenoid nitrogen tank has stabilized to greater than 50% after fill value was manually changed.

Campero, Pablo

Solenoid

- Worked on monitoring of Guard Vacuum Pump status.
 - ★ Contacted MOOG vendor to get information about output signal that is connected to hall switch sensors of vacuum pump.



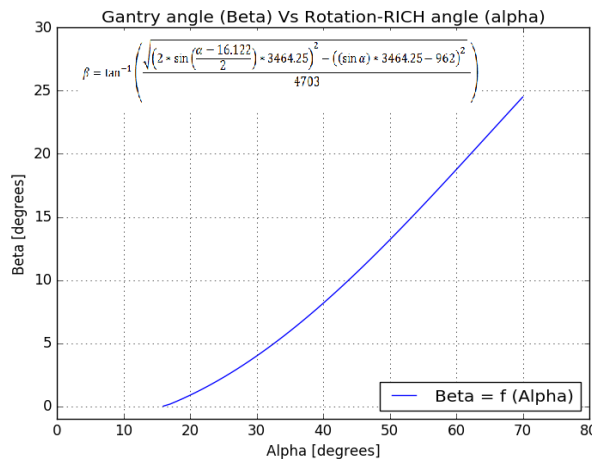
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- ★ Measured voltage (~3.09 V) and frequency (0-400 Hz) of output signal (pulse train) at hall switch of controller.
- ★ Proposed Signal Conditioner as inexpensive solution to convert frequency signal to 4-20 mA signal and use existing installed analog input module.
- With Tyler, solved issues with Solenoid MPS.
 - ★ Checked interlocks trips on MPS remote board.
 - ★ Revised 435-NBX module configuration to get response from MPS to PLC.
 - ★ Verified wiring between MPS board and PLC Relay output module.
 - ★ Added PLC code to *Magnet Interlocks* routine.
- Corrected first version of Solenoid Cooldown Controls and Instrumentation ERR presentation.

RICH

- Corrected equation to relation beta angle (Gantry angle) with alpha angle (angle of RICH rotation).



Plot shows relation between Beta and Alpha angles for rotation of RICH structure (Alpha angle) at 16° – 70° (Max rotation angle supported by gantry)

- Monitored and analyzed logbook entries and EPICs screens daily for Hall D.
 - ★ On 04/24, LN₂ level in Solenoid returned to normal range, ~ 54%.

Eng. Brian

- Debugging SVT R2 S6 U2 failures (no data). Has output line failures from register scan. So far: data cable connectors at crate end look fine, swapping to different VSCM has no effect and wires under fiberglass wrap seem okay. Further debugging will have to wait until R4 removal.
- Updated Torus LV cRIO to use fixed target voltage instead of power: <https://logbooks.jlab.org/entry/3470593>

Gas System

- Connected solenoids on safety system for DC, temporarily using wire nuts while waiting for ordered connectors/pins to arrive.



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- Switched Forward Carriage to real-time executable after Space Frame didn't have any issues.
- Starting looking into putting LabVIEW code on GitHub, but JLab ran out of private repositories; Wesley is investigating.

Hoebel, Amanda

RICH

- Worked on hardware.
 - ★ Measured cable path on forward carriage to determine cable lengths, with Tyler and Pablo.
 - ★ Researched MK5 gateway module to use for on/off relay detection (cost ~\$2,000).
- Created Python code to analyze tension on gantry when detector is lifted.
- Discussed CSS BOY with Pete.

- Monitored EPICS and logbook.
 - ★ On 04/20, DS BCAL chiller was swapped with original US BCAL chiller.

Jacobs, George

GAS Systems

- Edited procedures for pressure test of DC piping; submitted for OSP.
- Updated DC P&I diagram with new orifice locations.
- Installed flow-limiting orifices for DC R1, R2, and R3 supplies.
- Ordered and received relief valves for DC pressure systems testing.
- Removed flow-limiting orifices from DC solenoid panel.
- Assembled “Test Block” for pressure testing gas systems.
- Assembled testing fixture for CGA320 DC .CO₂ supply.
- Reviewed and signed OSP for DC pressure testing.
- Ordered liquid Ar and liquid CO₂ dewars for DC.
- Discussed with Saclay team the availability of MVT gas supply for EEL testing.
- Met with RICH system DA.
- Met with DC system DA.
- Discussed with Airgas the “Hot Fill” of 1500 gal liquid Ar dewar.
- Created P&I diagram for RTPC detector gas supply.
- Discussed with procurement the bulk liquid Ar delivery.

Leffel, Mindy

- Worked with George on DC gas system.
 - ★ Attached R3 solenoid piping to L3 gas panel.
 - ★ Modified a connection and labeled valves in gas shed.
- Worked with Peter on ET cable configuration and collected components.
- RICH HTSB cables are too short, so extensions will have to be soldered.
 - ★ Extracted pins from connectors.
 - ★ Cut staggered lengths to accommodate heat shrink.

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Lemon, Tyler

- Collaborated with Amanda and Pablo to calculate lift forces on gantry chain during RICH rotation.

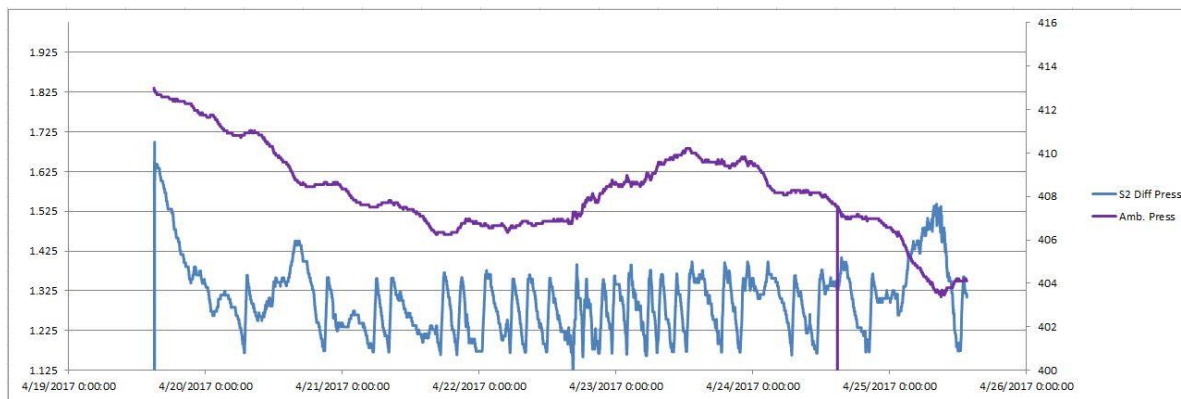
Solenoid

- With Pablo, resolved issue where Solenoid MPS interlocks could not be reset.
 - Found that PLC Interlock routine was missing two tags to energize relay outputs, which indicate no interlock trips or ramp downs initiated.
 - ★ Added missing tags to Solenoid PLC Interlock routine. Tags do not have any function, but system is wired in a way that requires two additional energized outputs.
- Monitored logbook and EPICS on a daily basis.
 - ★ Noted on 2017-04-24 that all Hall D detectors, except for TOF, are powered off.

McMullen, Marc

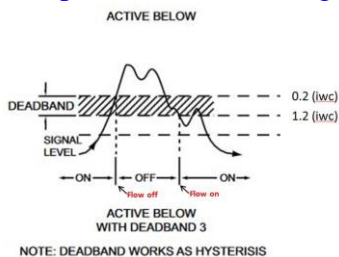
Gas System

- With Brian, connected DC safety system solenoids. Pressure system testing to begin this week.
- Wrote document on steps required to service gas to MVT in Hall.
- Plotted LTCC sector flows vs. differential pressure and differential pressure vs. ambient pressure.



LTCC Sector 2 differential pressure vs. Hall B pressure (IWC) 04/19/2017 to 04/25/2017.

- Verified process controller signals from Omega DP25s.



Pressure set point and dead band range.



Magnehelic and Omega DP25.