Detector Support Group
**Weekly Report, 2018-05-16**

Summary

RICH

- Checked, visually, bottom of the air tank located on Hall B forward carriage.
  - ✦ Noticed base plug is epoxied shut; next lowest port was about a foot from bottom.
    - ▪ Opened port and looked inside with a light.
    - ▪ Plastic tube lowered and pushed it along the bottom of the tank.
  - ✦ No visible moisture found.

- Debugged air-cooling water concentration's PV connection to EPICS.
  - ✦ PV was not publishing to EPICS; value recorded as zero ppm when local sensor display and LabVIEW UI read concentration as ~1600 ppm.
  - ✦ Typo found in PV on N2 cRIO EPICS client; issue fixed.

- Debugged N2 cRIO EPICS connection issues.
  - ✦ PVs not read by softIOC after a cRIO reboot.
  - ✦ On softIOC side connection to cRIO not reinitialized after cRIO is rebooted.
  - ✦ Problem unique to N2 cRIO; EP cRIO does not have same issue.

- Tried making cooling-airflow independent of compressor's on-off cycle.
  - ✦ Air-cooling system's pressure regulator adjusted from ~45 psi to ~35 psi.
  - ✦ Change in regulator had no effect on airflow; still saw airflow following on-off cycle of compressor.
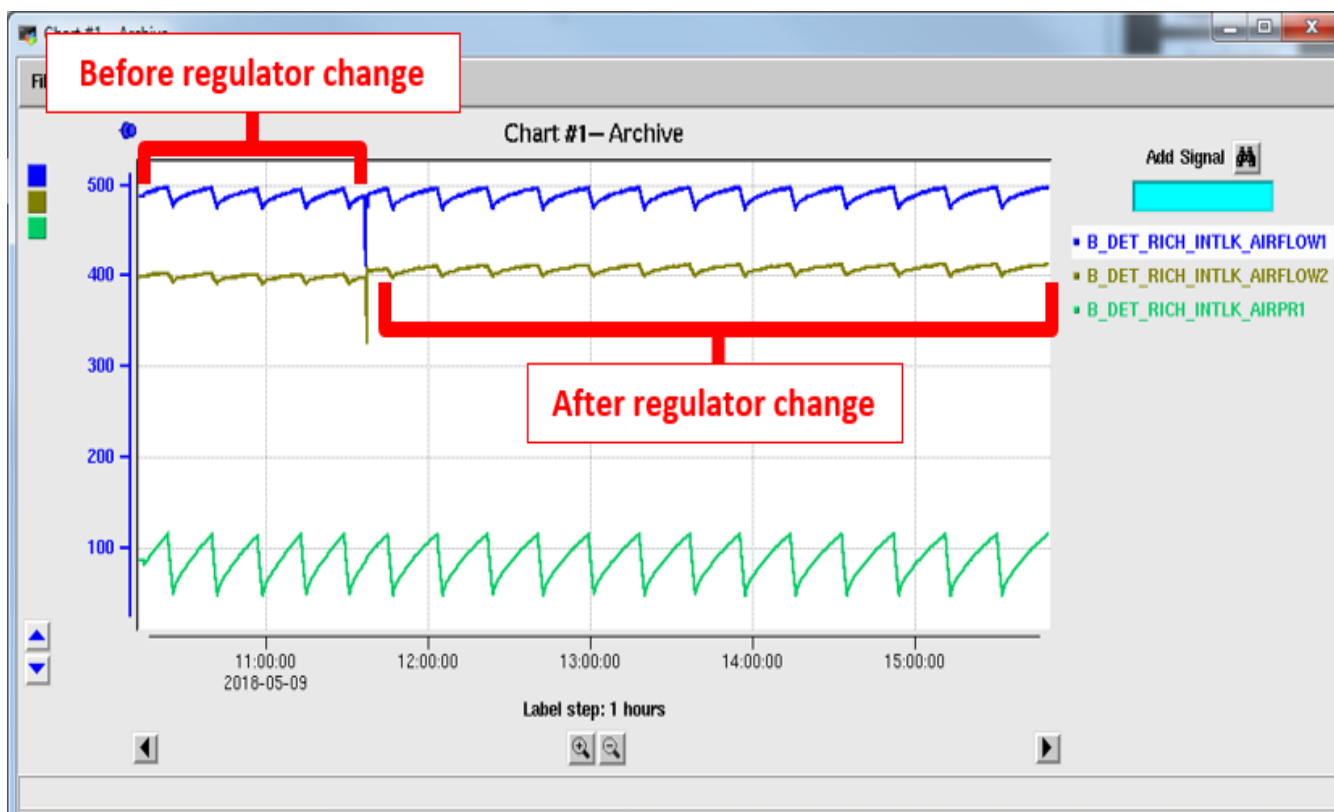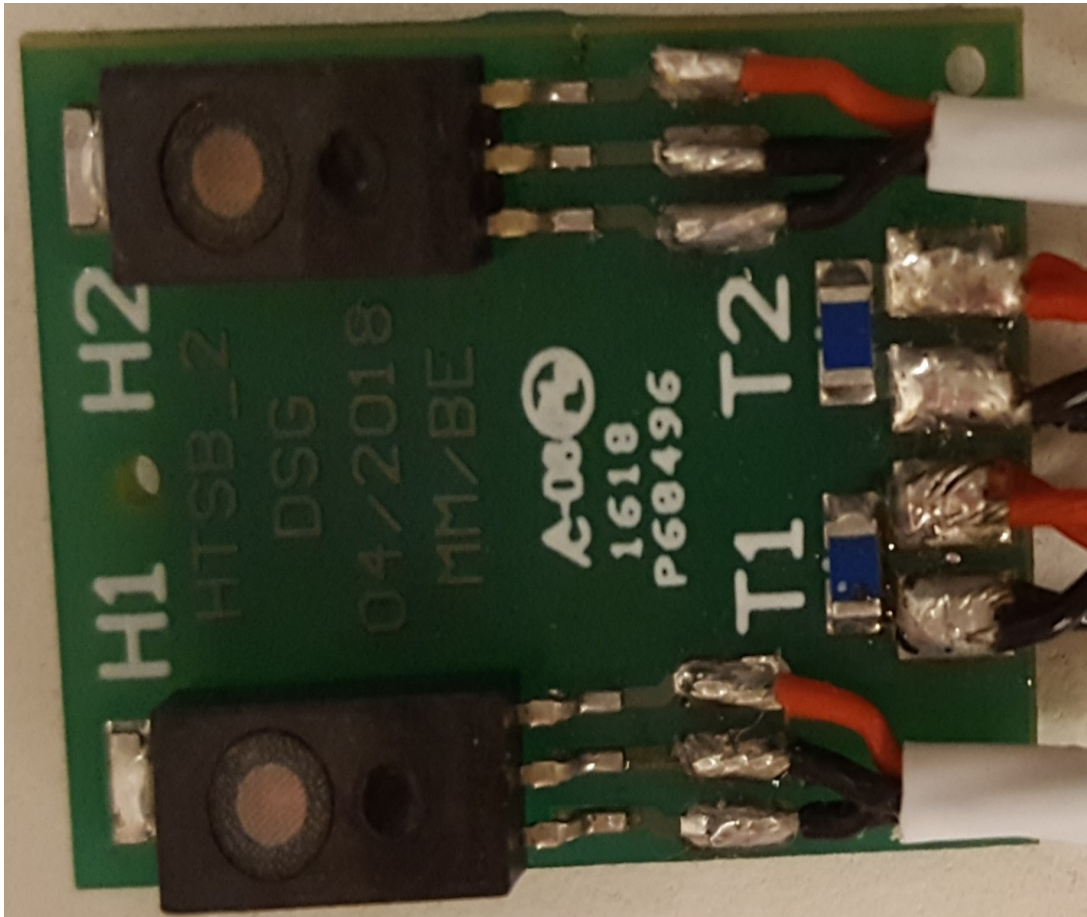

Archived airflow data from before and after regulator change. There was no observable change in airflow behavior after adjusting regulator.

- Powered down RICH compressor for summer shutdown.

SVT

- Fabricated three HTSB2 cables.
- Tested the 3 HTSBs using the new board design.

Humidity and temperature sensors on new HTSB2 board

HDice

- Replaced RF splitter/attenuator '*B*' in HDice RF box #1.
  - ✶ Measured resistance of attenuator B to be lower than resistance of attenuator *A*.
  - ✶ Design of RF box #1 hardware did not include pull-down resistors on the 7053-D input module; potential reason for failure.
  - ✶ Six 2.2 KΩ pull-down resistors wired to 7053-D input module, which has address 04.
- Fabricated trigger cable adaptor second CT box.
- Tested NMR program's subroutines, which were developed to correctly handle hardware failures.
  - ✶ Prior to implementing the subroutines, a hardware error (such as a bad cable) would cause the program to freeze.
  - ✶ Hardware communication time-outs incorporated into the NMR subroutines.
  - ✶ If hardware trigger to the lock-in amplifier fails, program aborts CT-box DAq and resets hardware.

LTCC

- Zeroed MFC of sector 1.
  - ✶ Temperature and flow recorded after zeroing MFC (T~37.12 and Flow ~43 cc.)

- Completed coding of test setup for leak testing in ESB.

- Moved test setup from EEL to ESB, waiting on networking and gas connections.

- Instrumented sector 1 to monitor leak rate after Hall B engineering added additional sealing to reduce the leaks.
  - ✶ Connected mass flow controller, process controller, and differential pressure transducer.

- Instrumented gas controls to monitor sector 5's C4F10 recovery.

Hall B Magnets

- Replacing eight 100k Ω resistors on quench detector board.

Hall C

- Contacted Allen Bradley distributor to get quotation for four RS-Logix Full Edition licenses (each license has one seat).

- Requested Mike Fowler and Steve Lassiter for HMS and SHMS PLC codes.

- Configured six DSG computers for support of hall C PLC controls.
  - ✶ Generated Computer Center Problem Request (CCPR) to modify the six computers as follow:
    - Change to Hall C Development subnet (129.57.195.XXX) to communicate to Hall C network from outside of the accelerator fence.
    - Rebuild computers to Windows 7.
  - ✶ Completed modifications for three computers.
  - ✶ Configured router (EEL 121) in the DSG control room to auto-switch to Hall C development subnet.

- Received from Hall C NMR Teslameter PT2026.
  - ✶ Starting development of communication between Teslameter and PLC via Ethernet.

- DSG-Hall C PLC controls meeting.
  - ✶ Discussed and verified type of current RS-Logix licenses.
    - License at "Skylla7" PC server allows access to one user; it is a professional edition license available for use only over Hall C network.
    - Local licenses running at "hallcsc-4" laptop, has a professional edition license.
  - ✶ Agreed on PLC code implementation procedures for SHMS and HMS PLCs.
    - New PLC codes must be tested in the PLC test station prior to its implantation to the HMS or SHMS PLCs.
    - PLC test station is located in the TED building on the Hall C Developmental subnet (129.57.195.12)
  - ✶ Defined location for storage of PLC code.

LERF

- Populating VME FSD fiber card boards for Machine Protection System.
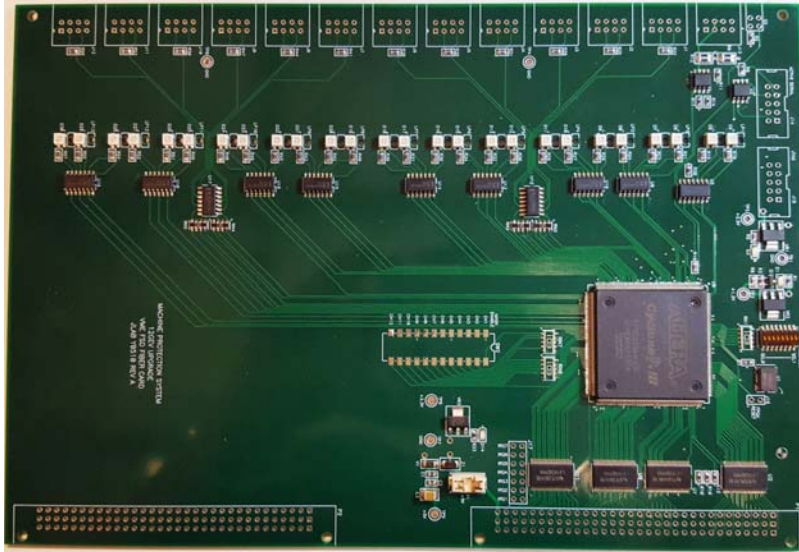
VME FSD fiber card - front view
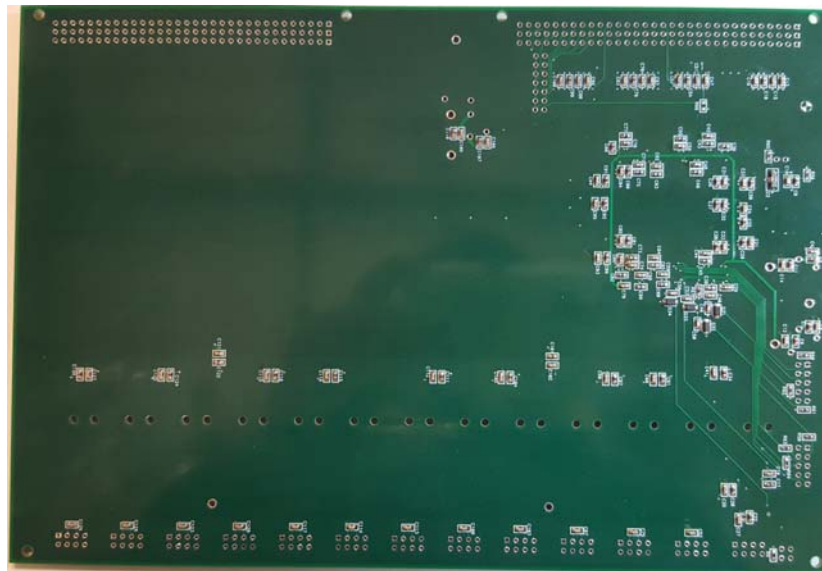
VME FSD fiber card – back view

cRIO Test Station

- Integral nonlinearity test code debugged and tested for manual voltage, auto voltage, and manual current, tests.
- Mary Ann, Tyler, Pablo attended NI's LabVIEW Core II training.

Antonioli, Mary Ann

- Replaced attenuator B and wired resistors to module address 04 of **HDice** RF box.

cRIO test stand

- Revised integral nonlinearity test for manual voltage, auto voltage, and manual current, tests.
  - ★ Tested and debugged.
- Working on button to stop the program.

- Attended Core 2 LabVIEW **training**.

Bonneau, Peter

HDice

- Developed, tested, and debugged subroutines for NMR program to correctly handle hardware anomalies or failures.
  - ★ Prior to the subroutines, a hardware error (such as a bad cable) would cause the program to freeze.
  - ★ Hardware communication time-outs were incorporated into the NMR subroutines.
  - ★ If the hardware trigger to the lock-in amplifier fails, the program will abort the CT-box DAq and resets the hardware.
- Worked with Mary Ann on the hardware debugging on the upgrade of RF splitter / attenuator box #1.
  - ★ Attenuator B will be replaced. The input resistance is higher than the other attenuators, which will float to a low level when the relay module output is open.
  - ★ The design of the RF box hardware did not include pull-down resistors on the 7053D input module. 2.2K pull-down resistors are being added to correct this problem.

Hall C

- Setup of the computers for the development of Hall C PLC controls.
  - ★ The Hall C development subnet (129.57.195.XXX) is the subnet we want to use to communicate to the Hall C network from outside the accelerator fence.
  - ★ The stand-alone PLC in the TED (129.57.195.12) is on the Hall C development subnet.
  - ★ The router in the DSG EEL R121 lab has been configured to auto switch to the Hall C development subnet based on the connecting computers MAC address.

Campero, Pablo

RICH

- With Tyler adjusted air-cooling system's pressure regulator from ~45 psi to ~35 psi.
  - ★ The adjunction was made to get the lower number of on-off cycles in the compressor, which could be stabilized the airflow input to the electronic panel.
  - ★ Monitored air flow behavior and noticed no change in the number of on-off cycles after pressure was decreased, compressor was power off.

Hall C

- Investigated about current RS-Logix licenses used in Hall C.
- Contact Allen Bradley distributor to get quotation for four seats/users RS-Logix Licenses.
- Requested PLC codes for HMS and SHMS.
- With Tyler set up six computers to be used in for the support of hall C controls.
  - ✦ Generated Computer Center Problem Request (CCPR) to modify the six computers as follow:
    - Change to Hall C Development subnet.
    - Rebuild computers to Windows 7.
    - Three computers completed with the modifications.
- Acquired NMR unit PT2026 from Hall C to start one of the tasks proposed in the "Hall C PLC Support" list.
- Set up meeting with Mike Fowler and Steve Lassiter.
  - ✦ Discussed and verified type of current RS-Logix licenses.
    - Two licenses available at "Skylla7" computer and "hallcsc-4"laptop.
    - Each license allows the access to one user/seat at the time.
  - ✦ Agreed procedures to be followed prior to any PLC code implementation in the SHMS and HMS PLCs.
  - ✦ Defined location to storage developmental PLC code.

- Took National Instruments Core II **training.**
  - ✦ Course attended on May 10th and 11th.
- Edited and reformat DSG weekly report.

Eng, Brian
SVT

- Tested the 3 HTSBs using the new board design that Mindy fabricated.

RICH

- Checked for condensation in air tank with Marc, nothing was visibly seen, but could only remove small side plug as the large one on the bottom had some sort of sealant on it.

LTCC

- Re-zero'd MFCs: https://logbooks.jlab.org/entry/3574231
- Finished coding test setup for leak testing in ESB
- Moved test setup from EEL to ESB, waiting on networking and gas connections for final testing.

- DSG met with Mike and Steve to discuss license setup and to get latest versions of plc code for HMS and SHMS in **Hall C.**
  - ✦ Got PLC code from HMS.
  - ✦ Hall C only has 2 seats, one on a server they run and a local copy on a laptop.

Hoebel, Amanda
LTCC
- Assisted Brian and Tyler in the attempt to set up leak test in ESB.
  - Attempt to ping Omega process controller failed.
    - Would ping in EEL but not ESB.

Hall C
- Picked up 2 computers from computer center, with Tyler.
- Attended meeting to discuss PLC program with Pablo, Tyler, Pete, and Brian.

- Brought SVT Controls computer to control room, with Tyler.
- Completed ODH1 renewal **training**.
- Started Rad Worker 1 renewal **training.**

Jacobs, George
- **Finalized Hall B LTCC gas system status power point presentation.**

Leffel, Mindy
HDICE
- Made second CT box trigger cable adaptor, D-sub to BNC.

SVT
- Fabricated three HTSB2 cables for SVT.

Humidity and temperature sensors at HTSB2 board
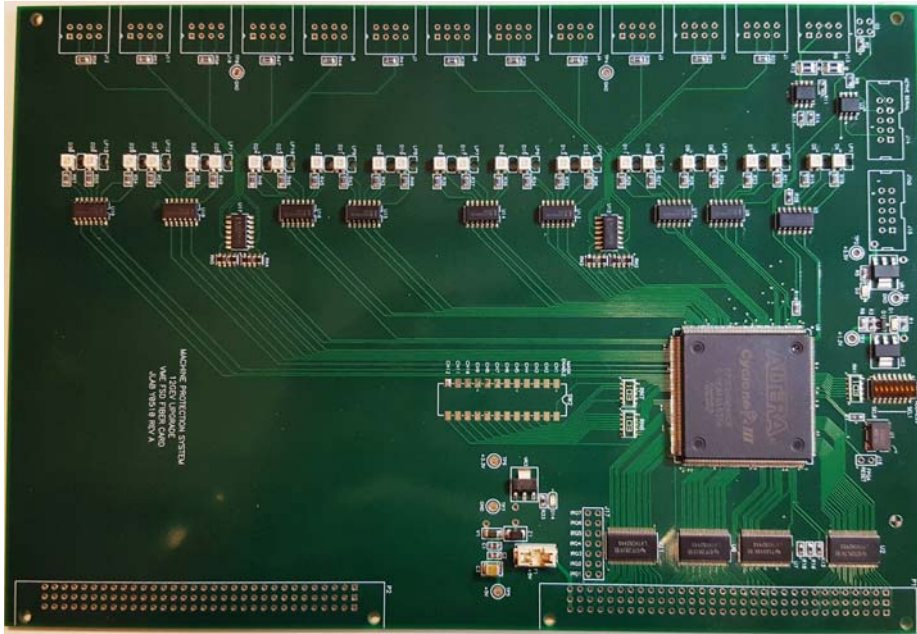
Magnets
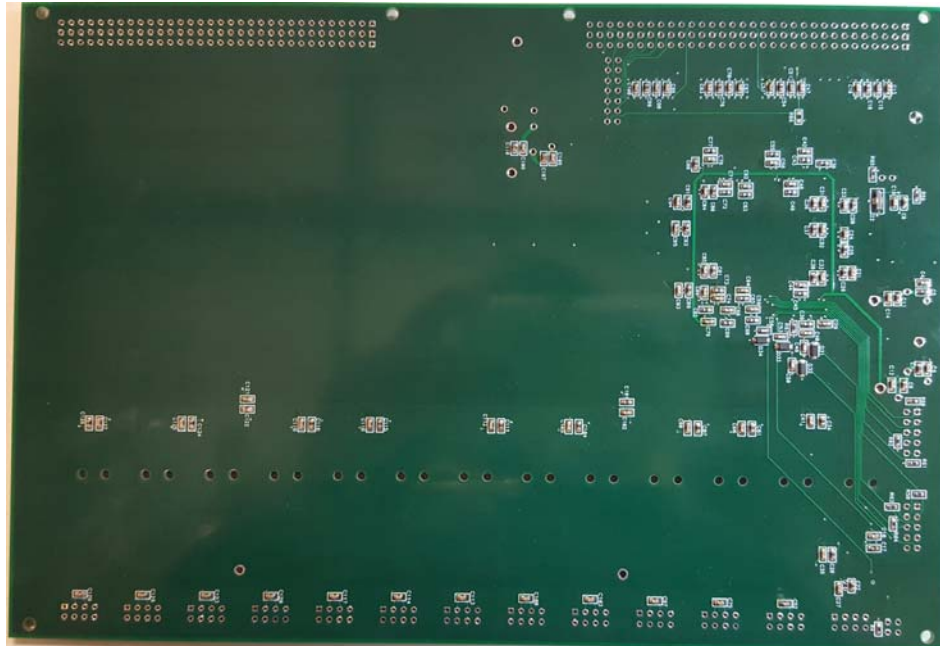- Started replacing eight 100k ohm, variable resistors on quench detector board.

LERF
- Continued populating one of six VME FSD fiber card boards for Machine Protection System.

VME FSD fiber card - front view


VME FSD fiber card – back view

Lemon, Tyler
RICH
- Debugged air-cooling water concentration's PV connection to EPICS.
    - PV was not publishing to EPICS; value recorded as zero ppm when local sensor display and LabVIEW UI read concentration as ~1600 ppm.
    - Found typo in PV on N2 cRIO EPICS client; correcting PV fixed issue.
- Debugged N2 cRIO EPICS connection issues.

- ✴ PVs were not being read by softIOC after a cRIO reboot.
- ✴ Nathan Baltzell found on softIOC side that connection to cRIO was not reinitialized after cRIO is rebooted.
- ✴ Problem is unique to N2 cRIO; EP cRIO does not have same issue.
- Powered down RICH compressor for summer shutdown with Pablo.
- Adjusted air-cooling system's pressure regulator from ~45 psi to ~35 psi with Pablo in attempt to make cooling-airflow independent from compressor's on-off cycle.
  - ✴ Change in regulator had no effect on airflow; still saw airflow following on-off cycle of compressor.
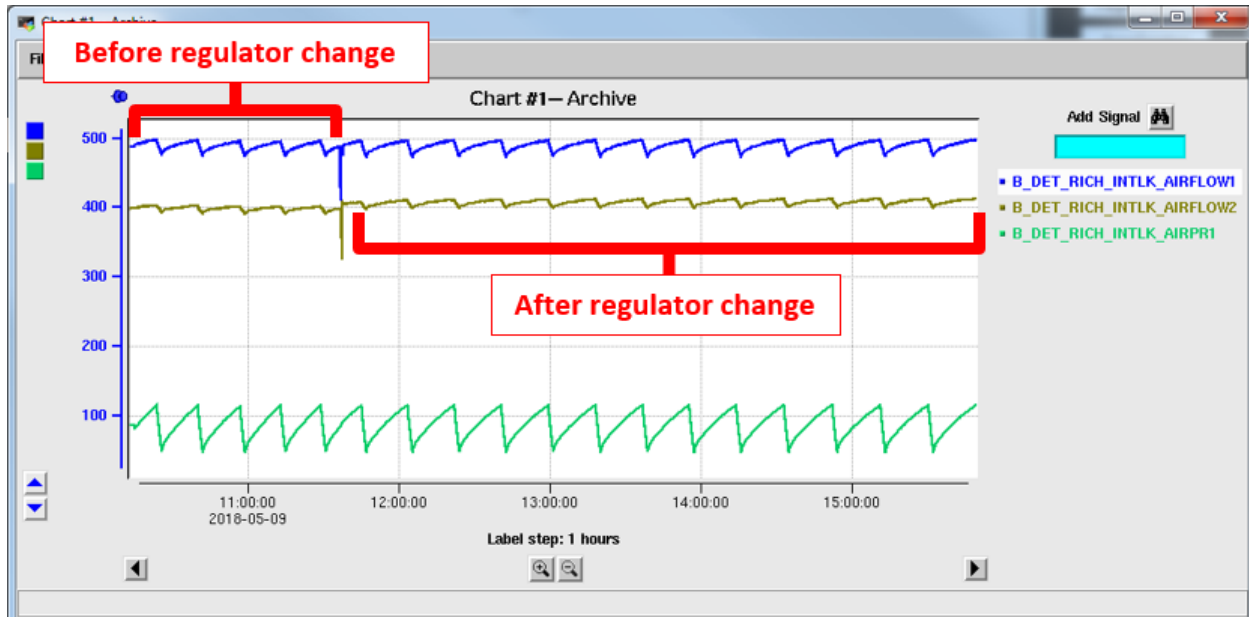
Archived airflow data from before and after regulator change. There was no observable change in airflow behavior after adjusting regulator.

- Met with Mike Fowler, Steven Lassiter, Pablo, Brian, Peter, and Amanda to discuss **Hall C** PLC licensing and location of PLC code.
  - ✴ Mike and Steven borrow license stored on PC Skylla7; licensing method will not be sufficient for DSG's tasks.
  - ✴ Code sent to DSG via email.
  - ✴ NMR teslameter received to start developing communication between teslameter and PLC via Ethernet.

- Attended LabVIEW Core 2 class.

McMullen, Marc
RICH
- Visually checked the bottom of the air tank with Brian.
  - ✴ The base plug has been epoxied shut; the next lowest port was approximately a foot from the bottom.
  - ✴ We were able to open the port and look inside with a light.
  - ✴ Additionally, we lowered a plastic tube and pushed it along the bottom of the tank.

✶ Verified that in either case there was no visible moisture.

LTCC

- Instrumented sector 1 with Brian.
  - ✶ We connected a mass flow controller, process controller, and differential pressure transducer to monitor the leak rate on Sector 1 as Hall B mechanical adds additional sealing to reduce the leaks.
- Prepped the LTCC gas controls to monitor the evacuation of C4F10.
  - ✶ Hall B engineering will attempt to evacuate the leftover gas from S5 so that it can be reused on the next run.
  - ✶ DSG will provide a reading for the recovered gas weight and the pressure.