

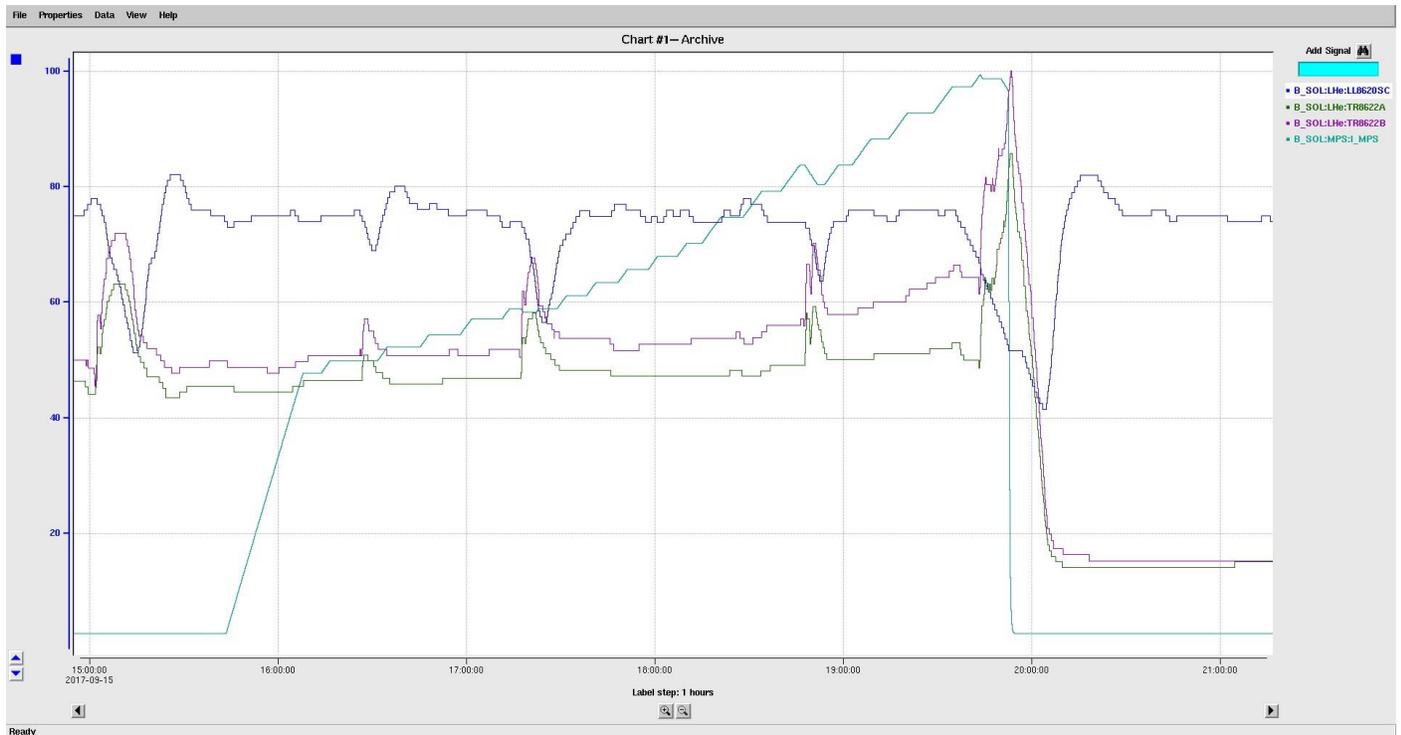


Detector Support Group Weekly Report, 2017-09-20

Status

Solenoid

- Data analysis performed with VT analyzer and MYA archiver following quenches.
- Analysis performed of real-time PV's during ramping and steady state running of Solenoid.
- Of the five quenches, four quench events noticed during ramp up of the solenoid (~1014-1060 A) were due to voltage taps spikes for coils 3 and 4.
 - ★ Thresholds for QD #1 for channel 1 and 2 raised from 60 to 100 mV.
 - ★ Thresholds for QD #2 for channels 3 to 8 raised from 100 mV, 60 mV to 750 mV.
 - ★ Fifth quench due to low liquid level because cold helium supply from cryo was unstable and helium to torus reservoir was shut off.



Liquid helium level and VCL temperatures recorded during trip on 9/15.

- Control systems re-covered after power outage due to faults in UPS which was supplying power for the Solenoid and DBX control systems.
- PLC code modified to re-link Min input PID parameter for EV8612 valve.

Solenoid ramped up to full current 2416 [A] on 9/18/17.



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RICH

- Deformation and max stress on the RICH electronics panel simulated in ANSYS 18.2.
 - ★ Considered a uniform load of 800 [N] over an effective area (holes considered) of 0.8064 [m²].
 - ★ Found total deflection to be equal to 4.17 [mm] and Max stress (Von-Mises) to be equal to $\sim 2.47 \cdot 10^7$ [Pa].
 - ★ The Young's Modulus for the carbon fiber is $2.3 \cdot 10^9$ [Pa], two orders of magnitude larger than the calculated stress.
- All lift plans for detector assembly approved.
- Darkbox parts refabricated with lumber.
- Larger holes drilled in aluminum support bracket.

HDIce

- Power supply stability issues in the NMR program debugged.
 - ★ Power supply drivers revised from VISA to GPIB.
 - ★ Test run of 1500 sweeps completed successfully. All known issues with Rack #2 NRM system has been resolved.

FT

- FT Interlock System's hardware interface developed for adding water detection device to chiller coolant tubes.

SVT

- Hardware interlocks' EPICS interface for signal monitoring created for RTD temperatures, coolant flow, and coolant leak.
- Hardware interlocks' EPICS interface for threshold control variables created for humidity, RTD temperatures, HFCB temperatures, dew point, coolant flow, and coolant leak.

MVT

- Wiring for controls interface chassis completed.
- Gas mixing LabView code generated.

LTCC

- Leak study completed for sector 5.
 - ★ Sector 5 leak rate for the piping is less than 3% of the sector gas leakage.

Gas Systems

- Replacement solenoid coil received for LTCC panel.
- Two CO₂ dewars ordered for Hall B DC gas.



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Antonioli, Mary Ann

- On cRIO test stand, began code to read NI-9207 module.
 - * Reads all channels; working on array of data.
 - * Readback incorrect; debugged with Peter.
- Formatted and began editing Peter's Note on VME test stand.
- Wrote Note concerning cRIO test stand and posted to website (2017-10).

Bonneau, Peter

Forward Tagger

- Developed FT Hardware Interlock System interface for adding water detection device to chiller coolant tubes.
 - * The Greystone WD-100 water detector must be mounted near detector.
 - * The hardware interface between water detector electronics and hardware interlock cRio would use one of the spare ADC channels.
 - * The water detector electronics will be powered by the 24V cRio chassis power supply

HDice

- Debugged power supply stability issues in the NMR program with Amanda.
 - * The power supply drivers were revised from VISA to GPIB.
 - * A DSG test run of 1500 sweeps has been completed successfully. All known issues with the Rack #2 NRM system has been resolved.
- Completed status summary report of NMR hardware and software work by DSG.

RICH

- Worked on installation debugging of the RICH Hardware Interlock System with Tyler.
 - * Timing for the threshold configuration file library sub-VI's was discussed.
 - * Developed debugging procedures for the reported issues with humidity sensors.

Solenoid

- Performed analysis of data with VT analyzer and MYA archiver following quenches and the successful full current operation of the Solenoid.
- Performed analysis of real-time PV's during ramping and steady state running of Solenoid.

SVT

- Worked with Amanda on the development of the EPICS interface for the SVT Hardware Interlock System.
 - * Development of the EPICS signal monitoring and threshold controls sub-VI's were discussed.



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- Worked with Mary Ann on development of the National Instruments Compact-Rio test station.
 - ★ The test program design architecture for ADC modules was assessed.
 - ★ Debugging the automatic mode of the test program.
- Completed DSG note on The VME Test Stand Proposal
 - ★ Paper details the hardware and software plans for the test station.

Campero, Pablo

Solenoid

- Monitored and analyzed temperature, voltage taps, load cells and hall sensors with Brian during the ramp up of the solenoid.
 - ★ Opened root files to analyze voltage tap signals and verified first signals to generate quench events.
 - ★ Powered Solenoid magnet to full current 2416 A.
- Noticed four quench events during ramp up of the solenoid (~1014-1060 A) due to voltage taps spikes for coils 3 and 4.
 - ★ Measured IDCCT MPS current to check noise level.
 - Found ~ 30 [mV] after ramp of the magnet to 5 [A].
 - ★ Raised thresholds in QD #1 for channel 1 and 2 from 60 to 100 mV.
 - ★ Raised thresholds in QD #2 for channels 3 to 8 from 100 mV, 60 mV to 750 mV.
 - ★ Re-tuned QD#1 and QD #2 after changing thresholds.
- Re-covered control systems after power outage due to faulty UPS used to supply power for the Solenoid and DBX control systems.
 - ★ Reset communications for all hardware controllers.
 - ★ Reset Sol-LV-cRIO controller to recover all temperature, load cells and halls sensors readouts.
 - ★ Solved issues with the Sol - FastDAQ cRIO operating system with Brian.
 - Noticed that cRIO did not recover after power cycle and put the system on safe mode.
 - Attempted to communicate with the controller via Ethernet and RS-232, not response found.
 - Found error to re-install the LabVIEW in safe mode.
 - Swapped Sol - FastDAQ Crio by spare available (the one that was recover after the 2nd outage power issue back on 06/28/17).
 - Re-assigned IP and Host Name for the implemented cRIO controller.
 - Configured LabVIEW project.
 - Deployed LabVIEW program FPGA version on the cRIO.
- Modified PLC code to re-link Min input PID parameter for EV8612 valve.

RICH

- Simulated in ANSYS 18.2 deformation and max stress on the RICH electronics panel.
 - ★ Considered a uniform load of 800.7 [N] over an effective area (holes considered) of 0.8064 [m²].



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- ★ Found total deformation = 4.17 [mm] and Max stress (Von-Mises) ~ 2.47×10^7 [Pa].

Eng. Brian

Solenoid

- Raised thresholds on QD 3-8 (splices) to ~750 mV & 999 ms.
 - ★ QD 1-2 left alone, but raised to 20 ms (from 0).
 - ★ Fast dumps at 1035, 1059, 1066.
 - ★ Tried removing FPGA filtering prior to 1059 dump.
 - No effect other than noisier signals when in steady state.
- Raised thresholds on QD 1-2 to 100 mV.
- Ramped magnet to full current.

Torus

- Change FastDAQ cRIO to use similar code as the solenoid (scaling done on FPGA, simplify EPICS array handling, etc).

Hoebel, Amanda

- Increased TCU deadbands to 0.001V.
- Used Myget to retrieve TCU1 and TCU2 values from MYA.
 - ★ Over 200,000 values retrieved.
 - ★ Mean value of TCU1 was 2.85 with standard deviation 0.01.
 - ★ Mean value of TCU2 was 2.32 with standard deviation 0.01.

HDICE

- NMR program successfully ran 1500 sweeps.
 - ★ More testing is being done.

SVT

- Created signal monitoring for RTD temperatures, coolant flow, and coolant leak.
- Created threshold control variables for humidity, RTD temperatures, HFCB temperatures, dew point, coolant flow, and coolant leak.
- Created and edited weekly report.

Jacobs, George

GAS Systems

- Requested quote on $\frac{3}{4}$ " nylon tubing.
- Received replacement solenoid coil for LTCC panel.
- Submitted PR 372612P for RICH cooling line fittings.
- Attended meeting with DA, Matt M. for HTCC pressure system.
- Attended meeting with Yuri S. on HTCC pressure system.

HALLB

- Ordered two CO₂ dewars for Hall B DC gas.



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Leffel, Mindy

RICH

- Assisted with moving dark box into clean room.
- Completed cable fabrication, testing, and labeling.
 - * Two chassis to cRIO analog input, D-sub to ferrule.
 - * Two transducer pressure, D-sub to D-sub.
 - * Four transducer flow, D-sub to D-sub.
- Worked with Tyler and Marco assembling dark box.
 - * Attached gaskets and covered aluminum frame with black tape.
 - * Modified and repaired 3-D printed corner brackets.
- Drilled larger holes in aluminum support bracket.

Lemon, Tyler

Vacation

McMullen, Marc

DC

- Changed standard gas bottle with Amanda.
- Monitored the TCU plots. The TCUs have been measuring the gas standard for two weeks.
 - * Measurements of the standard are more stable than the mix.
 - Possible causes are the size of the mixing volume (250cc), or possibly the action of the mass flow controllers.

RICH

- All lift plans for detector assembly have been approved.
- GandR requested additional dimensions for the Load Test parts and the Strongback/RICH parts.
 - * Requested INFN add the dimensions and resubmit to Hall B Engineering.
- Fabricated darkbox parts with lumber.
- Met with DA and Network Engineers to discuss the mixing system location at the Hydrogen Target gas pad.
 - * Wrote DSG requirements to accommodate the installation of the MVT mixing system at the HT gas pad.

MVT

- Completed wiring controls interface chassis.
- Completed writing the gas mixing LabView code.
- Started adding MVT tab to the GUI.

LTCC

- Completed leak study for sector 5. The sector 5 leak rate for the piping is less than 3% of the sector gas loss.
 - * Suggested that Hall B reconnect the sector. DSG will continue to monitor the flow and leak rate.