Detector Support Group

Weekly Report, 2018-02-28

Summary

Hall B Magnets

- Solenoid fast dump of February 19, 2018 investigated.
  - ✶ Found VT18 increasing prior to the fast dump.
    - ▪ Voltage value of combination VT15+VT16+VT17+VT18+VT19 is used for QD1:Ch3; the SUM of the voltage values was compare to the threshold.
    - ▪ SUM measured ~ 155 [mV], VT18 showed ~70 [mV], set threshold in QD1:Ch3 is 1500 [mV].
    - ▪ VT18 voltage spike shouldn't have caused the trip since the threshold on the hardware QD is well above the spike.

RICH

- Completed preliminary leak check at 10 [psi] for the new N2 RICH gas panel.
- Tested monochromator-integrated reflectivity test station LabVIEW code with *Keithley 6517* electrometer.
  - ✶ Fastest measurement rate ~117 ms for program determined while using electrometer.
  - ✶ Program works as expected.
- Data files from runs to use *richmon* program accessed.
  - ✶ *Richmon* program generates occupancy, TDC, and multiplicity plots from EVIO or HIPO files.
- PMT scalers monitored and debugged
  - ✶ Incorrect readings on scaler maps EPICS screen.
    - ▪ Most likely cause is an error during initialization of DAQ where tile 66's ASIC board could not be read correctly or determined to be a 2 or 3 ASIC tile.
  - ✶ On February 22, 2018, tile 66's PMT scalers all read zero and did not update.
  - ✶ Fix for issue it to power cycle LV and restart DAQ.
    - ▪ PMT scalers for tile 66 began reading again when DAQ was restarted later that day.

SVT

- Initial routing for both PCBs to be used in the interlocks patch panel completed.
- *SVT Hardware* Interlock program tested.
  - ✶ Debugged leak sensor control logic, interlock did not work; unable to set thresholds in *SVT Hardware Interlocks* LabVIEW program.
    - ▪ Solved leak sensor interlock problem by modifying LabVIEW program.

HDice

- Communication and timing between NMR Instrumentation tested.
  - ✶ During debugging process found:
    - ▪ CT-Box does not have an internal buffer memory.
    - ▪ Computer must accept CT-box serial communication stream at data acquisition.

Gas System

- Pressure sensors for **DC** CO2 ordered
  - Sensor ordered with more applicable range (previous were 0-300 [psia], ordered 0-400 [psig]).
- LabVIEW program written to zero multiple MFCs at the same time.
- Omega process controller being tested to be implemented in any of the gas system in Hall B.

MVT

- C_4H_{10} MFC sent to MKS to be repaired.
- Five mass flow controllers zeroed to set up gas mixing system.
- Flows set to test gas mixing system for Mix #2.

Hall D Magnets

- Failed PXIe-1078 chassis used for the Solenoid debugged.
  - Determined chassis need new power supply.

cRIO Test Station

- In cRIO test stand, researched methods to write test result data to Excel.
  - Successful wrote 9207 accuracy results into Excel using Report Generation

Antonioli, Mary Ann

- Redrew **Hall B magnets** cryo system in Visio.

- In **cRIO test stand**, researched methods to write test result data to Excel.
  - ✶ Successful wrote 9207 accuracy results into Excel using Report Generation.
- Formatted Amanda's TCU **note** in InDesign and edited.

Bonneau, Peter

HDice

- Programming, testing, and debugging NMR Development test program.
  - ✶ Tested the communication and timing between NMR Instrumentation.
  - ✶ CT-Box does not have an internal buffer memory.
  - ✶ Computer must accept CT-box serial communication stream at data acquisition.
  - ✶ The NMR program must communicate with all instrumentation without dropping CT-box events.
  - ✶ Debugging queued acquisition subroutines to handle the current shunt measurements during a NMR scan.
- Wrote HDice synchronization status report talk.

SVT

- Worked with Pablo on the SVT Hardware Interlock System upgrades.
  - ✶ Debug and test of leak sensor controls logic in the SVT Hardware Interlock System program.

- Started having a daily meeting on **Hall D** status and EPICS controls monitoring.

Campero, Pablo

Magnets

- Monitored Solenoid and Torus magnet on a daily bases through EPICS screens, Mya Archiver and posted logbooks.
  - ✶ Investigated causes for the last Solenoid fast dump event occurred on 2/19/2018.
    - ▪ Added combinations of voltage values measured for voltage taps in QD#1 channel 3, which comprises the VTs with notable increments.
    - ▪ Noticed that VT18 show increments of voltage ~ 175 [mV], but it did not went over the set threshold (~1500 [mV]).
- Generated spreadsheet with all the fast dump occurred for the solenoid due to the voltage tap spikes since the commissioning period to present.
  - ✶ Data showed that a total of 12 fast dump occurred since Sep 2017 to February 2018.
  - ✶ 11 fast dumps resulted as a consequence of trips in the QD1 and QD2.

SVT

- Tested SVT Hardware interlock upgraded program.
  - ✶ Debugged leak sensor control logic, interlock did not work, unable to set point thresholds from UI to RT.
    - ▪ Solved leak sensor interlock problem by modifying LabVIEW program.

- Changed data type for the variables used to assign leak detection which is the set voltage threshold.

MVT

- With Brian and Marc worked in the MVT gas mixing system.
  - Zeroed five mass flow controllers by using LabVIEW control programs.
  - Set mix#1 to 200 [sccm] (argon~180 [sccm] and C4F10 ~20 [sccm]).
    - Monitored at this flow rate over the night on 2/26, and noticed flat flow signal without droop
    - MFC for mix #1 worked as expected without issues.

Solenoid

- With Brian and Tyler attempt to debugged Solenoid NI PXI system
  - Unable to run PXI controller used to read voltage taps values in the solenoid. System was rebooting constantly.
  - Attempted to debug PXI-e 1078 chassis that was swapped for the available spare and removed from Hall D on 2/27/18.
  - Tested chassis with old controller PXIe-8101.
    - Powered on chassis with the controller and noticed loud noise from the fans.
    - Connected screen to the controller and it showed starting a boot process, which was unable to complete due to lost connection with I/O modules and network.
  - Tried to power the chassis PXI-e 1078 with the new PXIe-8840 controller (acquired by Brian)
    - With the 8840 controller installed, the chassis' fans did not turn on, the power button's LED stayed off and also LED indicators on controller were off.
    - .Contacted NI support and they suggested test controller 8840 on a different chassis
    - Problem not solve, deep debugging needed, possible failure at the power supply located in PXI chassis.

- Edited **DSG weekly report** for the week of 2/21//2018.

Eng, Brian

MVT

- Zeroed mixing MFCs with Amanda, Marc, and Pablo
- Setup to test mixing system on Mix 2
- After Mix 2 performed well overnight, Mix 1 was added

Magnets

- More analysis of 2018-02-19 Solenoid fast dump,
  - Only finding VT18 doing anything prior to the dump (which in theory shouldn't cause one since the thresholds on the hardware QD are set way above the spikes).

Gas System

- Ordered pressure sensors for DC CO2 with more applicable range (previous were 0-300 [psia], ordered 0-400 [psig]).

- Wrote a small VI to zero multiple MFCs at the same time, previously used the Example.vi to zero one at a time
- Testing new Omega process controller (has MODBUS over TCP/IP).

Hall D Magnets

- PXI died again, Nick who was already down dealing with the PLC issues swapped the chassis out as it was constantly rebooting.
  - Troubleshooting PXI with Pablo and Tyler: https://logbooks.jlab.org/entry/3539714

Hoebel, Amanda

Absent

Jacobs, George

RICH

- Completed leak check at 10 [psi] for the new N2 RICH panel assembled.
- Assembled Differential Pressure Transducers
  - N2 volume to atmosphere
  - N2 volume to E-panel volume.

Gas Systems

- Discussed about Omega DP41/42 process controller dead band operation.
- Met with Zhiwen Zhao and Chao Gu on **Hall A** Cerenkov to discuss about the gas system conceptual design and cost estimate for **SoLID** detector.
- Generated **LTCC** Single Sector Test Status Feb 26, 2018 presentation.
- Ordered snoop for leak checking.

Leffel, Mindy

Absent

Lemon, Tyler

RICH

- Tested monochromator-integrated reflectivity test station LabVIEW code with Keithley 6517 electrometer.
  - Determined fastest measurement rate for program while using electrometer.
    - Fastest acquisition rate possible is ~117 ms between measurements.
    - At 117 ms, loop timing is not consistant; time required for measurement fluctuates between ~117 ms and ~148 ms.
    - Program will use a rate of 150 ms between measurements to ensure consistent timing.
  - Program works as expected; still need to test with monochromator.
- Accessed data files from runs to use “richmon” program.
  - richmon program generates occupancy, TDC, and multiplicity plots from EVIO or HIPO files.

- Monitored and debugged PMT scalers not reading correctly on scaler maps EPICS screen.
  - On February 22, 2018, tile 66's PMT scalers all read zero and did not update.
    - Could still see voltage and temperatures for tile change over time.
  - Most likely cause is an error during initialization of DAQ where tile 66's ASIC board could not be read correctly or determined to be a 2 or 3 ASIC tile.
    - Fault causes scalers to not be read, but voltages and temperatures will still update.
  - Fix for issue it to power cycle LV and restart DAQ.
    - PMT scalers for tile 66 began reading again when DAQ was restarted later that day.
  - Permanent solution will be determined after spring run.

Hall D

- Debugged failed PXIe-1078 chassis.
  - Chassis powers fine on its own with no controller installed.
    - Only issue is one fan seems to be going bad.
  - Chassis powers fine with old PXIe-8101 controller.
    - Does not power cycle and shows no error messages.
  - Chassis does not power at all with brand new PXIe-8840 controller.
  - Called NI support line for further troubleshooting advice.
    - Support call given service request #3121514.
    - NI only able to advise to test 8840 controller in different chassis.
    - Only other chassis is in use by Hall D.
    - Will wait until after run to test chassis.
  - Attempted to swap chassis' power supply to check whether problem is in its power supply, but could not find appropriate power supply.
    - All spare PC power supplies on hand are too big in dimension or does not supply enough power.

McMullen, Marc

MVT

- Sent C4H10 MFC for repair.
- Set up mixing system to ensure proper operation as Hall B rerouted part of the piping.
  - Started testing the mixing system over night to see if the new set up has issues with the C4H10 condensing.

SVT

- Completed initial routing of both PCB patch panels.
- Started revisions to the Temperature patch panel board by adding duplicate 3 pin headers for the temperature connectors.

HALL A

- Attended a preliminary meeting to discuss the cost of a C4F10 supply and distillation recovery set up for the **SoLID** detector.

LTCC

- Changed the pressure set point for sector 5 from 1.92 [iwc] to 1.82 [iwc].
  - Discussed process controller logic with George and Brian.