Detector Support Group

Weekly Report, 2018-02-07

Summary

Hall B Magnets

- Torus and Solenoid monitored on a daily basis via EPICS screens, Mya Archiver and posted logbooks.
  - On 02/01/18, Torus strain gauges major alarm for the vertical supports noticed.
  - Some of the recent magnets ramp downs are coming from the buffer dewar and Saclay target.
  - Analyzed the cryogenics controls upgrades made for the Buffer Dewar, Distribution Box, Torus and Solenoid.
    - Modification performed to avoid LHe level drops in the solenoid and Torus.
    - PID inputs values used to control main valves and heater in the Solenoid/Torus has been changed. Re-tuning of the PID buffer dewar controls has reduced this effect.

SVT

- SVT Hardware Interlock System upgrades performed.
  - Liquid detection in Hardware Interlock Control sub-routine debugged. The dual detection sensor read-backs were combined into a single action during an interlock trip.
  - Off-line programming for the hardware interlock system upgrade is completed.
  - For system level installation, hardware configuration, debugging, and testing, the SVT Hardware Interlock System has to be taken off-line for a period of one to two weeks.
    - During this time, the SVT will not be protected by the SVT Hardware Interlock System.
- Gain Scan plots had missing axis labels and tiles at the time to be posted to logbook.
  - Plots got fixed, titles and axis label assigned and posted correctly.
- Eight modules re-setup for the long term test stand that was taken off network.

RICH

- LabVIEW remote monitoring program for N2 cRIO sensors improved.
  - Ability to record calculated averages and standard deviations to text files added.
  - Monitoring and recording of raw voltages for humidity sensors added.
- Bash script to simplify user-inputs required to get MYA data for RICH interlock sensors added.
- Improved Python program that uses archived data to calculate statistics for RICH interlock sensors.
  - Code to split sensor data by day and to calculate statistics for each sensor or each day added.

RTPC

- RTPC meeting attended.
  - RTPC group still working with George to finalize gas supply system.
  - No Design Authority (DA) for gas system assigned.

- There is not an official request for gas system procurement.

MVT

- 20 bottles of premix to be delivered on 02/12/18 by local Praxair vendors scheduled.

HDice

- Power supply issues with the NMR program debugged
  - Oxford power supply would not ramp at the pre-programmed rate. Supply would fast run-down independent of the set rate.
  - Switch heater control was found to be enabled in the supply firmware.
  - To enable operation in the test station without changing the firmware settings, a power resistor was added to the supply heater terminals to simulate the heater switch.
  - As requested by the HDice group, the heater override control by the NMR program was not implemented.
- RF fabricated cables connected in the HDice RF box.
- For the second NMR rack upgrades:
  - Adapters on connectors soldered
  - Three SMS – N and four SMA- SMA cables fabricated.
  - Eighteen isolation brackets cutting finished.
  - Broken ground wire on programmable NMR attenuator repaired.

LTCC

- Mya dead-band for S5 flow lowered from 100[sccm] to 50 [sccm] and then to 5[sccm] due to flow for C_4F_{10} were not being captured in MYA Archiver.
- LTCC S5 fill status and gas usage rate analyzed.

DC

- DC MFCs used in Mix1 and Mix 2 were zeroed.
  - Prior to zeroed the MFC, when upstream and downstream valves were closed MFC readings were:
    - Mix 1 : Argon ~-1.86 [slpm], CO2 ~ 0.282 [slpm]
    - Mix 2 : Argon ~ -1.085 [slpm], CO2 ~ 0.10[slpm]
- Differential pressure transducer MKS-223 moved from DC valve panel on space frame level 3 to the manifolds.
  - Pressure readings for R1/2 ~0.07 [iwc], and R3 ~ 0.14[iwc].
  - R3 flow decreased from 32 [slpm] to 16 [slpm] as per Hall B request.
    - With the flow decrement pressure decreased to 0.07[iwc] and later to 0.02[iwc].

FT

- Developmental cRIO system to simulate FT Hardware Interlock system set up.
  - Ethernet connection between NI-cRIO 9082 and Amanda's computer established.
  - Communication issues between Real Time and User Interface into the FT Interlock Hardware LabVIEW project debugged.
    - FT Hardware Interlocks LabVIEW program did not deploy to cRIO.
    - Error message showed shared library missing from cRIO controller.
    - Error fixed by installing Scan Engine on cRIO controller.

cRIO Test Station

- Development in progress for the communication between User Interface (UI) and Real-Time (RT) for the cRIO test station
  - ✶ Implementation of messaging feature to the cRIO test station project completed.
    - Main Real Time LabVIEW program to implement messaging logic into the cRIO controller generated.
    - Modifications in RT and UI tested by sending random commands and data from the UI to the RT and vice versa.

MPOD Test Station

- Issues with MPOD crate debugged.
  - ✶ Firmware reverted to previous version, allowing control board to work again.
    - Newest firmware available from WIENER is incompatible with control board SVT uses.
  - ✶ Reason for "bad" MPOD crate determined. MPOD was not being able to be powered was because of a problem in its power supply unit.
    - Hall B will submit RMA request to WIENER for repair of power supply

DSG cRio Development

- Upgrades performed in the DSG cRIO Development chassis.
  - ✶ The cRIO controller installed and tested in the completed crate.

Antonioli, Mary Ann

- Connected RF cables made by Mindy in the **HDice** RF box.

- Discussed **cRIO test stand** messaging code with Pablo.

Bonneau, Peter

HDice

- Debugging power supply issues with the NMR program.
  - Oxford power supply would not ramp at the pre-programmed rate. Supply would fast run-down independent of the set rate.
  - The switch heater control was found to be enabled in the supply firmware.
  - To enable operation in the test station without changing the firmware settings, a power resistor was added to the supply heater terminals to simulate the heater switch.
  - As requested by the HDice group, the heater override control by the NMR program was not implemented.
- Worked with Mindy on the upgrade to the RF attenuation box.
  - A ground pin that broke off on the programmable attenuator was repaired by a direct connection to the attenuator's metal case.

SVT

- Worked with Pablo on the SVT Hardware Interlock System upgrades.
  - Debugged liquid detection hardware interlock control sub-routine. The dual detection sensor read-backs were combined into a single action during an interlock trip.
  - The off-line programming for the hardware interlock system upgrade is complete. For system level installation, hardware configuration, debugging, and testing, the SVT Hardware Interlock System has to be taken off-line for a period of one to two weeks. During this time, the SVT will not be protected by the SVT Hardware Interlock System.

Magnets

- Met with Amanda, Pablo, and Tyler regarding issues encountered with the Torus and Solenoid magnets during the engineering run.
  - Some of the recent magnets ramp downs are coming from the buffer dewar and Saclay target. Warm gas return pulses can warm up supplies to both magnets. Retuning of the PID buffer dewar controls has reduced this effect.

- Worked with Mindy on the **DSG cRio Development** System chassis.
  - The cRio was installed and tested in the completed crate.

Campero, Pablo

Magnets

- Monitored Solenoid and Torus magnet on a daily bases through EPICS screens, Mya Archiver and posted logbooks.
  - On 02/01/18, Torus strain gauges major alarm for the vertical supports.
  - Torus went into controlled ramp down on 02/04/18.

- Analyzed the cryogenics controls upgrades made for the Buffer Dewar, Distribution Box, Torus and Solenoid.
  - Modification performed to avoid LHe level drops in the solenoid and Torus.
  - PID inputs values used to control main valves and heater in the Solenoid/Torus has been changed.

FT

- Collaborated with Peter and Amanda to set up developmental cRIO system to simulate FT Hardware Interlock system.
  - Set up Ethernet connection between NI-Crio 9082 and Amanda's computer.
  - Debugged communication issues between Real Time and User Interface into the FT Interlock Hardware LabVIEW project.

- Worked on development of communication between User Interface (UI) and Real-Time (RT) for the **cRIO test station**.
  - Completed implementation of messaging feature to the cRIO test station project.
    - Generated Main Real Time LabVIEW program to implement messaging logic into the cRIO controller.
    - Tested modification in RT and UI by sending random commands and data from the UI to the RT and vice versa.
  - Showed to MaryAnn LabVIEW logic implemented to send and receive data between Real Time and User Interface into the cRIO test Station project.
- Edited DSG weekly report.

Eng, Brian

SVT

- Fixed plots (namely missing axis labels and titles) being posted to logbook
  - Old https://logbooks.jlab.org/entry/3523285
  - New: https://logbooks.jlab.org/entry/3524576
- Re-setup 8 module long term test stand previously had been taken off network and LV/HV was off.

DC

- Zeroed DC MFCs with Marc and corrected bug with PV alias
  - https://logbooks.jlab.org/entry/3524614
- Moved MKS 223 DPT with Marc & Dave Anderson to read manifold pressure
  - https://logbooks.jlab.org/entry/3527578

LTCC

- Lowered MYA dead-band for S5 flow from 100 [sccm] to 50 [sccm]
  - As current flow rates for C4F10 weren't being captured; lowered again to 5 [sccm] after archive didn't capture stop/start flows well.

- Updated display and controller firmware on **MPODs** in EEL
- With Tyler debugged failed **MPOD**, it was narrowed down to faulty power supply.
- Worked on replacing of 3 TB drives with 8 TB drives for storage array on hblin4 (mostly used for SVT data storage).

- With the drives in-hand, working on rebuilding array with larger drives one at a time to keep the data from previous array.

Hoebel, Amanda

FT

- Connected cRIO to PC and Hardware Interlocks LabVIEW program.
- FT Hardware Interlocks LabVIEW program did not deploy to cRIO.
  - Error message showed shared library missing from cRIO.
  - Fixed error by installing Scan Engine on cRIO.
- Troubleshoot program problems with Tyler and Pablo.
  - User Interface did not connect to cRIO.
    - Problem found to be missing shared variables from cRIO.
    - Needed to allow for autodeploy variables on startup.
  - "Autodeploy variables" caused Real Time Main to crash on startup.
    - Problem may be related to missing module in Slot 5.

Jacobs, George

DC

- Discussed with Mac about increasing DC Gas flow rate.
- Ordered CO2 for DC
- Discussed with Mac M about DC detector pressure.

Gas Systems

- Analyzed LTCC S5 fill status and gas usage rate.
- Received Ashcroft Differential Pressure Transducers.
- Attended RTPC meeting.
- Ordered two dewars for HTCC.
- Attended Hall B Engineering meeting.

Leffel, Mindy

HDICE

- For the second NMR rack upgrades:
  - Soldered adapters on connectors, eight SMA and one N panel mount.
  - Fabricated three SMS - N and four SMA - SMA cables, all nine cables complete.
  - Finished cutting all 18 isolation brackets.
  - Repaired broken ground wire on programmable attenuator.

- Worked with Angelis, locating, identifying, and tagging DOE property in room 124, in preparation for DOE inspection.

Lemon, Tyler

RICH

- Improved LabVIEW remote monitoring program for N2 cRIO sensors.
  - Added ability to record calculated averages and standard deviations to text files.
  - Added monitoring and recording of raw voltages for humidity sensors.

- Wrote bash script to simplify user-inputs required to get MYA data for RICH interlock sensors.
  - ✶ Script uses mySampler command read archived data in one minute intervals from one week ago to current day.
  - ✶ Script also writes data to a text file and copies the text file to O: Drive.
- Improved Python program that uses archived data to calculate statistics for RICH interlock sensors.
  - ✶ Added code to split sensor data by day and to calculate statistics for each sensor or each day.
  - ✶ Script outputs a formatted CSV file with overall statistics for each sensor on the first tab and statistics for each sensor on each day on the second tab.
    - ▪ Formatting of tab with results by day still needs to be debugged.
    - ▪ Bug in Python package used to write to Excel causes empty rows to be inserted into sheet after each table's header.

MPOD Test Station

- Debugged MPOD issues with Brian.
  - ✶ Reverted firmware to previous version, allowing control board to work again.
    - ▪ Newest firmware available from WIENER is incompatible with control board SVT uses.
  - ✶ Determined reason "bad" MPOD crate was not being able to be powered was because of a problem in its power supply unit.
    - ▪ Tested non-working power supply in different crate; different crate did not work.
    - ▪ Tested working power supply in "bad" crate; "bad" crate works as expected.
    - ▪ Hall B will submit RMA request to WIENER for repair of power supply unit.

McMullen, Marc

RTPC

- Attended RTPC meeting with George and Brian.
  - ✶ RTPC group still working with George to finalize gas supply system.
  - ✶ No Design Authority (DA) for gas system assigned.
  - ✶ There is not an official request for gas system procurement.

MVT

- Scheduled 20 bottles of premix to be delivered on 02/12/18 by local Praxair vendors.

DC

- With Brian installed differential pressure transducers on DC gas manifolds
  - ✶ Pressure readings for R1/2 ~0.07 [iwc] and R3 ~ 0.14[iwc].
  - ✶ R3 flow decreased from 32 [slpm] to 16 [slpm] by Hall B request.
    - ▪ With the flow decrement pressure decreased to 0.07[iwc] and later to 0.02[iwc].