



Detector Support Group

Weekly Report, 2017-03-22

State of Play

Solenoid

- Documentation for Cryogenic Control Systems completed.

Gas System

- **LTCC** and **HTCC** portions of stand-alone GUI completed.
- Program to datalog **LTCC** MFC total-flows and times to determine leak rate of sectors (to identify one that leaks least) completed.
- **DC**: Solenoid valve panel rebuild completed and installed on L3 space frame.
 - ★ Completed initial testing on relief valves; tested set points.

HDice

- Flowchart of Rotation of Target Polarization program completed.
- Lock-in amplifier data buffer handling routines tested and debugged.
- cRIO-based clock-edge counter/scaler (in FPGA mode) to verify CT-box acquisition clock trigger output developed.

SVT

- R4 M23 U2 bad gain scans due to damaged data cable connector on crate side.
 - ★ Connector on VSCM had bent pin (which was replaced) and cable itself had some damaged plastic (which was removed).
 - ★ Scans look normal now.
- IOCs moved to Hall B network.
 - ★ CSS launchable from clon machines (need to SSH through hlb100 from ACC machine).
 - ★ CSS still not staying open though, continuing to troubleshoot.

RICH

- Detector shell rotated to vertical position
- B-List for installation of electronics-support panel using gantry, generated.

FT

- Watchdog handling routines developed.
- Operation modes of main real-time program tested and debugged.
- Interlock bypass code for HV/LV supplies maintenance-mode operation completed.



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Antonioli, Mary Ann

- Continued working on **RICH** interlock code (interlock control loop).
- Finished Visio flowchart of **HDice** Rotation of Target Polarization software. Began flowchart of NMR code.

Arslan, Sahin

- Continued working on **RICH** detector assembly, fabricating, assembling, and modifying.
 - ★ Transferred Box 3 to CMS area.

Bonneau, Peter

- Continued **Forward Tagger** Interlock System code.
 - ★ Developed watchdog handling routines.
 - ★ Tested and debugged operation modes of main real-time program.
 - ★ Completed interlock bypass code for HV/LV supply maintenance mode operation.
- Discussed **RICH** code development of Interlock Control - Real Time loop and integration of its sub-vi's with Mary Ann.
 - ★ Testing and debugging of RT routine is underway.
 - ★ Reviewed maintenance mode operation (with interlock override) in FT interlock system, which can be added to RICH system.
- Continued development of **HDice** lock-in amplifier/current-shunt integration and synchronization test program.
 - ★ Tested and debugged lock-in amplifier data buffer handling routines.
 - ★ Developed cRIO-based clock-edge counter/scaler (in FPGA mode) to verify CT-box acquisition clock trigger output.
- Worked with Amanda on **HDice** current shunt noise measurements, done at 1, 5, 10, and 20 A.
 - ★ Results were consistent with zero voltage base-line measurements. Noise does not exceed 1 mA (~1/2 gauss on PD-I/PD-II).
- Held daily meeting on Hall D status and EPICS controls monitoring.
 - ★ Ground fault in Solenoid power supply investigated. Several areas of transistor pass-bank discolored and charred. On board #32, rusted mounting screw on LCW cooling bus bar was found, indicative of cooling leak in that area.
- Showed Pablo how to set up and begin initialization command sequence necessary to read Highland V450 RTD sensor inputs on VME Test Station.

Campero, Pablo

- Contributed to assembly of **RICH** electronic panel for the PMTs.

Solenoid

- Wrote Hall B Magnet and Cryogenic Control Systems.
 - ★ Described cRIO low voltage and Fast-DAQ control operations.
 - ★ Described EPICS functionality and generated EPICS screen status list.
 - ★ Completed draft version.



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- Generated status report Power Point presentation for DSG.
- Monitored and analyzed logbook entries and EPICs screens daily for Hall D.
 - * Noticed high temperature (~ 90-130 K) on 3/20 at TP2, coil 2 and coil 3 in Solenoid.
- Began writing LabVIEW program for VME Test Station to read out RTD signals from V450 ADC board.
- With Amanda, set up PLC station
 - * Created communication Ethernet driver between Compact-Logix L35E AB PLC and Amanda's PC.
 - * Connected analog source to AB- 1769-IF8 ADC module.

Eng. Brian

SVT

- R4 M23 U2 bad gain scans due to damaged data cable connector on crate side. Connector on VSCM had bent pin (which was replaced) and cable itself had some damaged plastic (which was removed). Scans look normal now.
- IOCs moved to Hall B network; CSS can be launched from clon machines (need to SSH through hlb100 from ACC machine). CSS still not staying open though, continuing to troubleshoot with Nathan.

RICH

- With Marc, found five 5000 lb hoist rings that have 3/4" bolt for lifting structure.
- Working on having 3D-printed panel templates in next few days.

Gas System

- Completed LTCC and HTCC portions of stand-alone GUI; found issue with LabVIEW (KeyFocus property doesn't work on Ring type controls).
- Made VI to datalog LTCC MFC total flows and times to possibly determine leak rate for sectors (to identify one that leaks least).

Hoebel, Amanda

- Took pictures of RICH electronics panel attachment to frame for DSG website.

HDice

- Presented status report in DSG weekly meeting.
- Met with Pete on status of lock-in triggering.
 - * Need to switch lock-in amplifier Pete has for amplifier on Rack 2.
- Created PLC ADC voltage readback in RSLogix 5000 with Pablo.

Jacobs, George

GAS Systems

- MVT: Discussed mixing system with Dave Kashy; completed cost estimates.



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- DC: Solenoid valve panel rebuild now complete and installed on L3 space frame; completed initial testing on relief valves; tested set points.
- Discussed pressure testing requirements with Dave Kashy.
- Created gas supply diagram and components spreadsheet for testing MVT and FT in EEL using pre-mixed gas.
- Created N₂ gas supply RV installation sketch for braze work.
- Ordered: Number tags, blanks, and ties for DC system components; liquid Ar and CO₂ dewars for DC, and HP CO₂ due to apparent liquid CO₂ dewar shortage.
- Conversations with procurement on when Ar dewar hot fill can proceed.
- Discussions with gas cylinder vendor and procurement about late orders and long delivery delays that exceed contract requirements.

Leffel, Mindy

RICH

- Continued working on HTSBs.
- Contributed to assembly.
 - ★ Reattached upper beam and removed lower to attach gasket.
 - ★ Assembled support structure for electronic panels.
 - ★ Attached panels to cart.
 - ★ Performed test insertion of panels on shell

Lemon, Tyler

- For RICH assembly, contributed to:
 - ★ Rotation of detector shell to vertical.
 - ★ Assembly of electronic panel support structure.
 - ★ Test run of electronic panel installation procedure.
- Monitored Hall D logbook and EPICS.
 - ★ Noted Spring 2017 experimental run ended 2017-03-16.
 - ★ On 2017-03-16, cause of ground faults in Solenoid MPS could be LCW leak.

McMullen, Marc

- Continued modifying gas system code to remove gas mixing logic from GUI and placing it as sub VI of main. Started modifying current gas system GUI to work with new gas mixing VI through networked variables.

RICH

- Met with vendor Precise Machine to discuss fabrication of stiffening frame. We expect a quote by 3/22. Sent RFQs to two more vendors.
- Wrote a B-List for installation of electronics support panel using gantry.
- Contacted industrial hygiene concerning carbon fiber modification and set up respirator training for DSG staff that will perform modification.
- Located five swiveling hoist rings in Hall B for use with stiffening frame. Hoist rings have 3/4" mounting bolts.
- Assisted with RICH panel installation; some holes not aligned.