



Detector Support Group

Weekly Report, 2017-09-13

Status

Solenoid

- Problem with immersion heaters HTR8620 and HTR8672 unable to power on fixed.
- Hall B Solenoid Pre-Power-Up *Interlock Checkout Procedure* B000000400-P005 completed.
- Hall B Solenoid Pre-Power-Up *Instrument Checkout Procedure* B000000400-P003 completed.
- New PLC code written to add differential pressure signals between magnet reservoir and DBX output.
 - * Cascade PID logic implemented to control the Min input parameter of the PID control for electric valve.
- FastDAQ cRIO modified to scale IDCCT by 1e5 instead of 1e6.

RICH

- Frontal panel assembly cart assembled.



Mindy Leffel and Tyler Lemon assembling RICH frontal panel assembly cart.

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- Lower frontal panel with planar mirror test-installed on assembly cart.



Lower RICH frontal panel with a planar mirror anchored to panel.

- SQLite database created of RICH parts in EEL 125 and DSG cabinet.
- Hardware Interlock EPICS screen updated, at request of INFN collaborators.
 - ★ Rearranged limit controls and enable controls.
- Darkbox assembled for cosmic tests of fully assembled RICH electronic panel.
- Hardware Interlock cRIO's start-up app problem of disabling deployment of interlock program debugged.
- Flow meter and pressure transducer cables fabricated for interlock system.

HDIce

- Troubleshooting NMR program losing communication of power supply.
 - ★ Revised program to run with GPIB drivers for power supply.

FT

- Digital module LRZ 915 purchased by Raffaella DeVita, INFN.

Gas Systems

- Two solenoid valves ordered and received to replace leaking valves for LTCC.
- New three-way valves installed for LTCC.
- New solenoid valve installed for LTCC Sector 5.
 - ★ S5 piping gas usage is 3.5% of gas leakage with the sector installed.
 - ★ Leakage measured of the piping and valves is ~1L/day.
- CO₂ dewar ordered for DC gas.



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Antonioli, Mary Ann

- Worked on cRIO test stand code.
 - * Wrote and debugged subVI that writes and reads one channel of NI9264 module through values -10–10 V.
 - * Using subVI, wrote and debugged code to test eight channels of NI9264.
 - * Debugged manual mode of NI9264 test.
- Completed editing of George's Note on MVT gas system and posted to website (2017-09).
- Attended Worker's Safety Committee meeting.

Bonneau, Peter

Vacation

Campero, Pablo

Solenoid

- Debugged immersion heaters (HTR8620 and HTR8672) used for Magnet and lead reservoirs.
 - * Unable to power on heaters due to output voltage and current on heater power supplies displaying 0.0 V and 0.0 A.
 - Measured voltage and current input voltage and current in the power supply heater, these indicated 0 A and 0 V.
 - Verified wiring for PLC relay output (24 VDC) used to control the enabling of the heaters.
 - * Verified scale factors and calculations used in the analog input/output PLC module to read out and send (4-20 mA) signals to the heaters' power supplies.
 - Changed default limits on the analog output module.
 - * Changed configuration for the deep switch used to enable the external programming voltage and current source for the heaters.
 - 'Ext_OFF' switch changed from 'active-low' logic position (ON) to 'active-high' logic position (OFF).
 - * Power on heaters in Normal (PID control) mode and Manual (Set values) mode, both heaters controlled by the voltage and current signals assigned in PLC logic, control issue was fixed.
- Completed B000000400-P005 Hall B Solenoid Pre-Power-Up Interlock Checkout Procedure.
 - * System cable interlock tested.
 - * Liquid helium level interlock checked.
- Completed B000000400-P003 Hall B Solenoid Pre-Power-Up Instrument Checkouts.
 - * Recorded temperature, load cells, and hall sensor values at cryogenic conditions (~4.6 K).
 - * Noticed offset for the hall sensor values (~30 G), modified PLC code to zero them prior to the magnet ramp up/down.



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- Wrote PLC code to add new signals.
 - * Added signal to measure the differential pressure between magnet reservoir and DBX output.
 - * Implemented Cascade PID logic to control the Min input parameter of the PID control for electric valve EV8670BY.

RICH

- Cleaned and sorted curtain room in the EEL building to store delivered RICH components, with Mindy, Tyler, and Amanda.

HDice

- Tested GPIB drivers implemented for the 120-IPS power supply in the NMR program with Amanda and Peter.
 - * Replaced GPIB card on the PC.
 - Debugged LabVIEW code.
 - Noticed issues with communication of NMR program (GPIB drivers) with the Lock-in Amplifier device.
 - GPIB card removed.
 - * Implemented USB/GPIB adaptor to connect the PC with the 120-IPS power supply.

Eng, Brian

Solenoid

- Modified FastDAQ cRIO to scale IDCCT by 1e5 instead of 1e6.
- Remotely monitored I&C during step 1 power up to 100 A.
- Monitoring I&C during full current power up.
 - * Had fast dumps at 937 & 1014, most likely due to QD, initial guess is VT18 causing it.

LTCC

- Leak-tested Asco solenoid valves that were removed.
 - * No leaks found via pressure calibrator or measuring flow with MFC.
- Replaced solenoid valve using new Parker valve on S5 with Marc.

Hoebel, Amanda

- Used Myget to retrieve TCU1 and TCU2 values from MYA.
 - * Only 5-7 values retrieved due to deadband recording. Asked to bring deadband down to 0.001V.

HDICE

- Troubleshooting NMR program losing control of power supply.
 - * Added Clear VISA to program.
 - Program still lost control of PS.
 - * Changed VISA drivers for PS back to GPIB.
 - * PS conflicted with lock-in amplifier when run from GPIB card.



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- ★ PS would not run with GPIB drivers when using USB converter if card was still inserted.
- ★ Removed card and ran program using GPIB PS drivers.
- Created and edited weekly report.
- Sent in service request for key to EEL 124.

Jacobs, George

GAS Systems

- Ordered two solenoid valves to replace the leaking ones.
- Received two solenoid valves and coils.
- Contacted GSS about damaged solenoid coil replacement.
- Ordered CO₂ dewar for Hall B DC gas.
- Returned bad solenoid coil via GSS RMA.
- Attended meeting with Tim Minga for Hall b MVT install.

HALL B

- Produced Hall B gas system status PPT.
- Participated in Hall B Engineering Meeting.

Leffel, Mindy

RICH

- Cleaned and reorganized shower curtain room to make work area easily accessible.
- Assembled front panel support with Tyler and Marco.
- Started fabricating transducer flow and transducer pressure cables.
- Modified corner brackets for dark box assembly with both Marcos and Tyler.
- Completed electrical safety training SAF603N2.

Lemon, Tyler

RICH

- Assembled frontal panel assembly cart in EEL 125 with Mindy.
 - ★ Cart used to support frontal panels during installation onto RICH detector shell.

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Mindy Leffel and Tyler Lemon assembling RICH frontal panel assembly cart.

- Test-installed lower frontal panel with planar mirror on assembly cart.
 - ★ Panel and mirror test-fit to check mirror anchors.



Lower RICH frontal panel with a planar mirror anchored to panel.

- Arranged EEL 125 with Mindy, Amanda, Pablo, and Amrit to clear space for RICH assembly tasks and storage of RICH parts.
- Created SQLite database of RICH parts in EEL 125 and DSG cabinet.
- Updated Hardware Interlock EPICS screen to rearrange limit and enable controls at request of INFN collaborators.
 - ★ Updated screen needs to be given to Nathan Baltzell to post to clasess.
- Assembled darkbox for cosmic tests of fully assembled RICH electronic panel.
 - ★ Components received from Argonne.
 - ★ 3D-printed brackets required filing to fit in aluminum pieces.



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- ★ Had to glue three 3D-printed brackets together because they broke during shipping.
- Debugged Hardware Interlock cRIO start-up app issues.
 - ★ Hardware Interlock program does not deploy on if start-up app is enabled.
 - Deployment freezes and states “Waiting for target (RICHCRIO) to respond”
 - ★ Able to run program without issues if start-up app is disabled.

McMullen, Marc

DC

- Monitored TCU value of mix with Amanda.
 - ★ The TCUs have been measuring the Ar/CO₂ standard since 9/5.
 - Mix 1 measurement is ~2.8V.
 - Mix 2 measurement is ~2.3V.

RICH

- All lift plans for detector assembly have been approved.
- Additional hardware for assembly have been received.
 - ★ INFN is still investigating foam needed to assemble Front panels and lacing wire.
- Updates to Trolley Parts drawing set have been approved by Hall B Engineering.

MVT

- Continued wiring controls interface chassis.
- Met with DA to discuss the location of the gas panel.
 - ★ The Hall B gas shed is still under consideration. The DA is working to get approval to use the gas shed, although it is not rated for the use of flammable gas.
 - ★ Gas pad behind counting house is outside, would resolve any fire safety concerns.

LTCC

- Worked with Amanda and George to install new 3 way valves, and reconfigured the valve panel for flowing C₄F₁₀ in sector 5.
- Installed a new solenoid on Sector 5 with Brian.
 - ★ S5 piping gas usage is 3.5% of gas leakage with the detector installed. Flow with the piping is 1L/day. Flow will be monitored for several days to verify leak rates. Pressure holds for multiple days without additional gas supplied to the system.

	S3	S4	S5
Average Daily Leak Rate	131.561	70.066	58.076
Average Daily Leak Rate Since Dead Band Change	102.661	41.518	38.209
S3 S4 S5 Leak Thru Pipes (Liters per day)	11.138	2.244	1.345
Piping % of total detector leak	10.849	5.406	3.519