Detector Support Group

Weekly Report, 2017-11-01

Status

RICH

- Reflectivity test station realigned.
  - ✶ Optics fell out of alignment during move to cleanroom.
- Reflectivity of spherical mirror 6 tested.
  - ✶ Results showed reflectivity of ~90% for good spots and ~88% for bad spots.
  - ✶ Bad spots are areas that look smudged.
- RICH rotated from horizontal to vertical for nitrogen test.
- For nitrogen volume, five interlock sensor cables connected to hardware interlock cRIO.
- Interlock airflow values debugged.
  - ✶ Incorrect indexing in loop that monitors airflows caused Airflow #1 to be read twice.
  - ✶ After fixing indexing, both airflows read correctly on cRIO and EPICS.
- Keyed override-switch installed in hardware interlock cRIO chassis.
  - ✶ Override-switch allows cRIO to be restarted without disabling HV or LV.
- Components received for Interlock System:
  - ✶ UPS for NI cRio system.
  - ✶ Humidity sensors.
- For nitrogen volume, six cables for humidity and temperature sensors completed.
- Velocities in manifold orifice used for air cooling system in E-Panel calculated in Python.
  - ✶ Assumed input air flow rate ~ 400 [l/min], diameter of the orifice = 2 mm.
  - ✶ Found that max flow rate that can flow in each orifice output is ~ 66 l/min.
- End plate panels machined to accept humidity/temperature sensors, N_2 supply, and exhaust.
- Valve panel modified to supply compressed air to the detector shell.
  - ✶ Trace gas line added. Multiple leaks detected on both sides of the RICH.
  - ✶ Gasket materials ordered.
- High pressure N_2 bottle circuit installed on gas panel.
- N_2 dewar ordered.
- D-sub connectors soldered to 65’ end of six HTSB cable bundles.

FT

- Digital card for chiller installed for interlock system.
  - ✶ Interlock cable wired to cRIO.
  - ✶ Status readback was not displaying status.
  - ✶ Hodoscope LV showed disabled by interlocks.
  - ✶ Found incorrect wire hook-up to DIO module.
    - ▪ Fixed wires, status readback worked and hodoscope LV was no longer disabled.

SVT

- Moved from EEL/124 to EEL/125.
- Electronics transferred and installed on insertion cart in EEL/127.
- Real-time network variables completed and tested for interlocks.

DC

- TCU flow of standard monitored at 200cc/m.
    - ✶ Mix 1 TCU reading is 2.71V.
    - ✶ Mix 2 TCU reading is 2.61V.

LTCC

- Bubbler moved to forward carriage.
    - ✶ Gas line connected.
- Connections leaked-checked with Snoop.
    - ✶ No leaks found.
- S5 reconnected.
    - ✶ Purging volume (gas flowing out of bubbler) at 0.5 lpm with a pressure of 0.36 inH_2O.

Gas Systems

- Bubblers and pressure regulators assembled for RICH N_2 testing.
- New orifice ordered for MVT/FT pre-mix supply.
- CO_2 ordered for DC.

Antonioli, Mary Ann

- Put heatshrink on seven **RICH** cable bundles.
- Worked with Mindy, Amanda, and Pablo on replacement of **FT** chiller cable.
    - ✶ Updated cRIO AutoCad drawing with new connections.

- Completed debugging of writing to Excel in cRIO **test stand** code.
- Completed first editing and layout of Brian's second Note.
- Edited and formatted Tyler's Note on mirror testing.
- Changed website photo.

Bonneau, Peter

RICH

- Worked with Tyler and Mindy on the instrumentation test and debugging of the RICH Hardware Interlock System hardware.
    - ✶ Tested and debugged temperature / humidity sensor assemblies prior to installation.
    - ✶ Researched cRio hardware needed to implement all dual-board temperature and humidity sensors. (8 boards in electronic panel area & 6 boards in N2 space)
    - ✶ cRio chassis, RTS modules, ADC module, poser supply, mounting chassis & hardware is needed. Approximate cost ~5K.
    - ✶ Troubleshooting procedures for temperature sensor #1 was reviewed with sensor assembly installers.
    - ✶ Successfully debugged airflow sensor readings #1 & #2 in cRio real-time program.
    - ✶ Troubleshooting procedures for temperature sensor #1 was reviewed with sensor assembly installers.
    - ✶ Calibration constants for the newly received humidity sensors was documented.
- Received components for RICH Interlock System.
    - ✶ UPS for NI cRio system.
    - ✶ Humidity sensors.

SVT

- SVT Hardware Interlock System
    - ✶ Completed and tested library of real-time network variable interface VI's to EPICS.
    - ✶ Hall B EPICS signal names were assigned to SVT network variables for softIOC development.

Forward Tagger

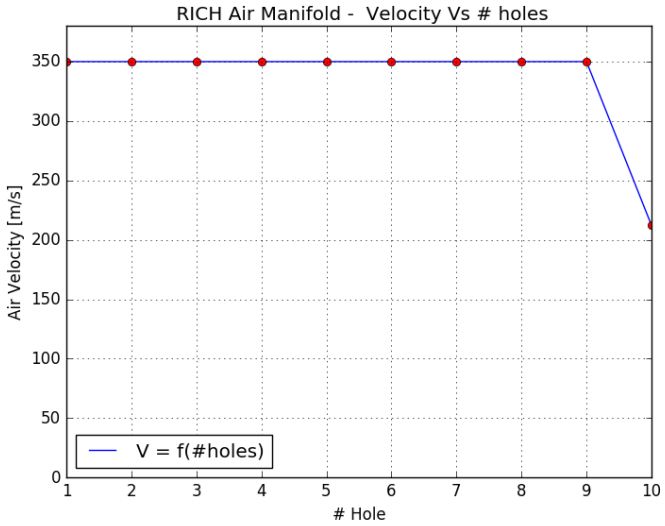
- Worked with Amanda and Pablo on FT Hardware Interlock System debugging.
    - ▪ Developed chiller hardware test procedure for pump stand-by using Lauda LRZ915 contact module.

- Setup and software installation for new DSG development and debugging Dell Precision 7720 mobile workstation.

Campero, Pablo

RICH

- Contributed with Mindy to complete six cables for humidity and temperature sensors that will be use in the RICH nitrogen volume.
  - ✶ Striped wires and connected ferrules at the end of the 65' cables.
  - ✶ Labeled cables with the proper tags for temperature, humidity sense and outputs.
  - ✶ Tested each cable and connector
    - Verified continuity between humidity sensor and end of each cable.
    - Verified continuity between D Sub connectors and ferrules.
- Calculated velocities in the manifold orifice used for the air cooling system in the RICH E-Panel.
  - ✶ Wrote python code to calculate the velocity in each manifold orifice.
  - ✶ Assumed input air flow rate ~ 400 [l/min], diameter of the orifice = 2 [mm]
  - ✶ Found that max flow rate that can flow in each orifice output is ~ 66 [l/min] when the velocity in the orifice is limited to the speed of sound (~350 [m/s]).



FT

- With Amanda and Peter worked on setting up the Contact digital card for FT chiller used as part of the FT interlock system.
  - ✶ Installed Contact digital card in the chiller.
    - Configured inputs and outputs interface settings to enable standby external control of the chiller.
  - ✶ Tested card by switching 0 to 5 [V] signals
    - Run three test to verify that chiller reacts as expected, which involves turn the pump on/off.

- Verified that output temperature in the chiller did not increased rapidly after the interlock signal (contact signal 5 V) in the card was activated.
- Test with contactor run as expected.

✶ Wired signal cables from the cRIO to the Contact digital card on the chiller.
- Debugged with the analog input signal from the Contact card to the cRIO ADC module, signal is not being read.

Eng, Brian

SVT

- Moved SVT from EEL/124 to EEL/125.
- Transferred and installed electronics on insertion cart in EEL/127.
- Reconnecting SC patch panel after SVT moved to SFL1.

LTCC

- S5 reconnected, currently purging the volume (gas flowing out the bubbler).

RICH

- Setup to flow with N2 bottles with MFC.
- Leak check with R134a, found leaks basically everywhere.

Hoebel, Amanda

RICH

- Calculated velocity of air through manifold.
  - ✶ Velocity of air through first hole is about 2120 m/s for a flow rate of 400 L/min.
- Calculated pressure differential in manifold.
  - ✶ Pressure differential calculated to be -0.24 times the energy, which was calculated to be about 1.32 kPa.
- Inspected aerogel tiles with Tyler.

FT

- Tested digital module card in chiller with Pablo.
  - ✶ Card works.
- Investigated calorimeter temperature sensor problem.
  - ✶ All calorimeter temperature sensors stopped working.
  - ✶ Found OL ohm value on cRIO end of sensor cables.
  - ✶ Problem must be on detector end.

- Created and edited weekly report.

Jacobs, George

- Assembled bubblers and pressure regulators for RICH N_2 testing.
- Connected MVT pre-mix cylinder regulators and hall gas line on target gas pad.
- Connected N_2 purge gas to RICH.
- Connected bubbler and Magnahelic pressure gauge to RICH.
- Relocated S5 LTCC bubbler to top of forward carriage.

- Leaked-checked LTCC connections with Snoop.
  - ✶ All OK.
- Ordered new orifice for Hall B MVT/FT pre-mix supply.

HALLB

- Ordered CO_2 for DC.
- Crane ops for RICH.
- Completed slides for TCB meeting.
- Participated in pre-run TCB meeting.
- Ordered correct length slings for RICH rotation.

Leffel, Mindy

RICH

- Soldered D-sub connectors to 65' end of six HTSB cable bundles.

LTCC

- Moved bubbler to forward carriage and ran gas line with George.

FT

- Wired control for testing chiller contact module.
- Worked with Mary Ann, Pablo, and Amanda to replace FT chiller analog connector with digital.

- Annual standards of conduct training, GEN101.

Lemon, Tyler

RICH

- Realigned reflectivity test station's optics.
  - ✶ Optics fell out of alignment during move to cleanroom.
  - ✶ Debugged issues with monochromator and collimators.
  - ✶ Tested calibration runs and reference mirror after alignment attempts until results were similar to before test station's move to cleanroom.
- Tested reflectivity of spherical mirror 6.
  - ✶ Results showed reflectivity of ~90% for good spots and ~88% for bad spots.
  - ✶ Bad spots are areas that look smudged.
- Rotated RICH from horizontal to vertical for nitrogen test with George, Marc, and Brian.
  - ✶ Nitrogen test performed to determine gas-tightness of detector shell and to test how low humidity can be made inside the detector shell.
- Installed cables for five nitrogen volume interlock sensors in hardware interlock cRIO.
  - ✶ Sensors for nitrogen volume:
    - ▪ Temperature 9 to Temperature 13
    - ▪ Humidity 9 to Humidity 13
- Debugged interlock airflow values with Peter.
  - ✶ As noted by Brian, Airflow #2 was not reading on EPICS for the hardware interlock system.

- Verified that correct voltage is read by cRIO module.
- Noted that incorrect indexing in loop that monitors airflows caused Airflow #1 to be read twice, once correctly for Airflow #1 and once incorrectly for Airflow #2.
- After fixing indexing, both airflows read correctly on cRIO and EPICS.

- Assembled frontal panel installation support on assembly structure.
  - Support consists of extruded aluminum pieces form base that frontal panel sits on to aid in its installation on detector shell.
- Installed keyed override switch in hardware interlock cRIO chassis.
  - Override switch allows cRIO to be restarted without disabling HV or LV.
  - Override switch also shows override status by sending or disconnecting +5V signal to an ADC channel.
    - Allows for monitoring of override status on EPICS and LabVIEW UI.

- Completed training that would soon expire:
  - Rad Worker I
  - Oxygen Deficiency Hazard
  - Standards of Conduct
- Attended Hall C safety walkthrough.
  - Walkthrough needed to access Hall C for overhead crane training next week.

McMullen, Marc

DC

- Continued TCU flow of standard at 200cc/m.
  - Mix 1 TCU reading is 2.71V.
  - Mix 2 TCU reading is 2.61V.

RICH

- Completed rotation of the detector to 65 degrees.
- Machined end plate panels to accept Humidity/Temperature, N2 supply and exhaust.
- Returned DC strongback to ESB.
- Modified valve panel to supply compressed air to the detector shell.
  - Added trace gas line. Detected multiple leaks on both sides of the RICH.
  - Ordered gasket materials.
- Submitted lower panel tool parts for quote, order should be received by 11/10.
- Installed high pressure N2 bottle circuit to gas panel.
- Ordered LN_2 dewar.

MVT

- Met with the installation engineer to discuss cable routing.
  - Hall b technical staff will run the MFC and pressure transducer cables, DSG will terminate and install the gas controls interface.
- Network cable received and delivered to Hall B mechanical.

LTCC

- Installed cap on S5. S5 is purging at 0.5lpm with a pressure of 0.36iwc.