Detector Support Group
Weekly Report, 2016-12-14

Status of Projects

Magnet Control System
Solenoid:
- *PLC programming assigned to Pablo completed (1st version).*
- LabView shared variables to LV cRIO tested and deployed.
- LabView shared variables added to Fast-Daq cRIO.
- Documentation for Hall B Magnet GitHub Repositories written.

Torus:
- Torus Fast-Daq cRIO firmware and base software updated.
- Shared variables added to Torus Fast-Daq cRIO.

Gas System
- To bring DC gas system incompliance with pressure system requirements, modifying **DC** gas piping in gas shed
- To comply with design authority requirements, replacing **RICH** valve panel components.
- For pressure systems compliance, redrawing **DCGAS** P&I diagram in progress.
- Ordered relief valves and flow orifices for EEL N$_2$ purge and **wire test stand** gas mixing system.
- Leak-checking of **LTCC** gas system valve panel and detector connections now complete.

HDice
- Upgraded Fast Resonance Scanner program.
- Fixed errors in NMR program.
- Worked on pump cart wiring diagram with Mindy and Sahin.

RICH
- Packaged spherical mirrors in boxes to ship for final coating.

Antonioli, Mary Ann

- Continued upgrading code of **HDice** NMR program, using subVIs written for RF Switching/Attenuation Unit.
  - ★ Changed LCD display code to include indicators on front panel of NMR code.
- Boxed up **RICH** mirrors with Tyler Lemon.
- Compiled, formatted, and edited weekly report.

Arslan, Sahin

- Continued working with Mindy Leffel on modification of **DC** gas system piping and components for pressure system compliance.
  - ★ Did pre-job walkthrough for attaching lines from valve panel to manifolds with George Jacobs and Mindy Leffel.

Confirmed valve specification on buffer tanks.

- Continued to figure out cable routing in **HDice** pump cart with Mindy Leffel, and transferring this info into wiring diagram in AutoCAD.
- Attended worker safety meeting.
- Transferred two optical tables from big clean room to small clean room.

Bonneau, Peter

No report – Medical leave.

Campero, Pablo

Magnet- Solenoid

- Wrote Cryo PLC programs to add control logic required during cryogenics operations.
  - ★ Programed following routines:
    - *Temperature _Deltas*, allowsoperator to enter process variables tag and calculate its differential (high-low).
    - *Vacuum_Rate*, calculates rate that is read from CG8606 gauge in torr/hr after 1 min, 1 hr. and 10 hrs.
    - *Vapor_Cool_Lead_Flow* and *VCL_Heater_Control*.
    - *Cool_Down_Rate*, routine was modified to monitor differential in temperatures (i.e. solenoid shield out and coils) every 30 min, 1 hr and 10 hrs. Units implemented for rate are in K/hr. Used average values of each temperature differential to read every second and calculate rates respectively.

- ✱ Calculated flow rate in [SLPM] by using linear equation that makes relationship between flow and current read from Solenoid MPS.
- ✱ Confirmed equation: flow = 0.0023605 * I + 35.403
- ✱ Set up condition to turn off/on heaters, depending on temperature of VCL (~301-303 K).
- ✱ Configured digital output modules to set heaters on/off.
- Modified *PLC_Communication* program to populate process variable array with variables required for cooldown.
  - Wrote code to add variables into process variables arrays. Configured this routine to share these process variables with Torus PLC and D.Box PLC.
- Modified Cryo Distribution Box PLC program.
  - ✱ Added S*ol_Valve_Interlock* routine into *cPID control* program. Routine was programed to close valves required by Solenoid cryogenics operations.
  - ✱ Modified *PV_Array* routine, adding new tags needed for Solenoid cryogenics calculations.
- Updated PLC programming schedule.
  - ✱ Programming (except Magnet Interlock program assigned to Nick Sandoval) is completed; two remaining routines are in progress.
- Updated GitHub with latest production version programs under development.
- Monitored and used EPICs screen for Solenoid.
  - ✱ Verified tags implemented in new screens with PLC tag assigned.

Eng, Brian
No report − Vacation

Hoebel, Amanda
HDice
- Upgraded Fast Resonance Scanner program.
  - ✱ Inserted DI/O modules' subVIs written by Mary Ann Antonioli.
- Fixed errors in NMR program.
  - ✱ Removed 1 s delay in graphs.
  - ✱ Rewrote program to adjust graphs for Tdown, Tup, and Tbottom times.
- Worked on pump cart wiring diagram with Mindy Leffel and Sahin Arslan.
  - ✱ Documented instrumentation connected to four power distribution strips.

Jacobs, George
GAS Systems
- Continued **DC** gas piping modifications in gas shed to bring system into compliance with pressure system requirements
- Continued replacing **RICH** valve panel components to comply with design authority's requirements
- Discussions and meetings with Dave Kashy on pressure system requirements for Wire Test Stand (WTS) gas mixing system and N_2 purge systems.
- Performed pressure vs. flow test on GE250 MFC for C_v calculation.

- DCGAS P&I diagram in progress for pressure systems compliance.
- Ordered relief valves and flow orifices for EEL N_2 purge and WTS gas mixing system.
- Created spreadsheet with DCGAS components, pressure ratings, and component diagram names.

LTCC
- Leak-checking of LTCC gas system valve panel and detector connections now complete.
  - ✶ Pressure control system components still not installed.
- Discussions with Maurizio Ungaro about leak rate estimate determinations.

Leffel, Mindy

DC
- Worked with Sahin Arslan modifying and installing components on gas supply panels.
- Continued working with Mark Taylor in Hall, identifying and hooking up signal cables.

HDICE
- Pump cart.
  - ✶ Attended several meetings to discuss wiring diagram, photos, and work schedule.
  - ✶ Worked with Amanda Hoebel and Sahin Arslan identifying onboard rack components connected to power strips.
  - ✶ Took photos of onboard rack components and posted on M drive.
- Worked with Sahin Arslan moving two optical tables to small clean room.

Lemon, Tyler

Torus
- Updated Torus Fast-Daq cRIO firmware and base software.
  - ✶ Firmware upgraded from 2.1.0f0 to 4.0.0f0.
  - ✶ Base software upgraded from 14.0-August 2014 to 16.0-August 2016.
- Added shared variables to Torus Fast-Daq cRIO.
  - ✶ Used to monitor cRIO CPU Usage, cRIO Uptime, cRIO Heartbeat,
  - ✶ Enables monitoring without connection to cRIO via NI Distribution Manager.
  - ✶ VI tested and deployed to cRIO.

Solenoid
- Tested and deployed shared variables to Solenoid LV cRIO.
- Added shared variables to Solenoid Fast-Daq cRIO.
  - ✶ Used to monitor cRIO CPU Usage, cRIO Uptime, cRIO Heartbeat
  - ✶ Enables monitoring without connection to cRIO via NI Distribution Manager.
  - ✶ VI tested and deployed to cRIO.
- Wrote documentation for Hall B Magnet GitHub Repositories.

RICH
- Packaged spherical mirrors in boxes to ship for final coating, with Mary Ann Antonioli.
  - ✶ Waiting on INFN collaborators to provide shipping information for Shipping Authorization Form.
  - ✶ JLab Shipping & Receiving will help to ensure proper packaging after form completed.

McMullen, Marc

Gas System

LTCC

- Completed leak operations.
- Added mass flow controller valve position to forward carriage GUI.
- Monitored gas flow.
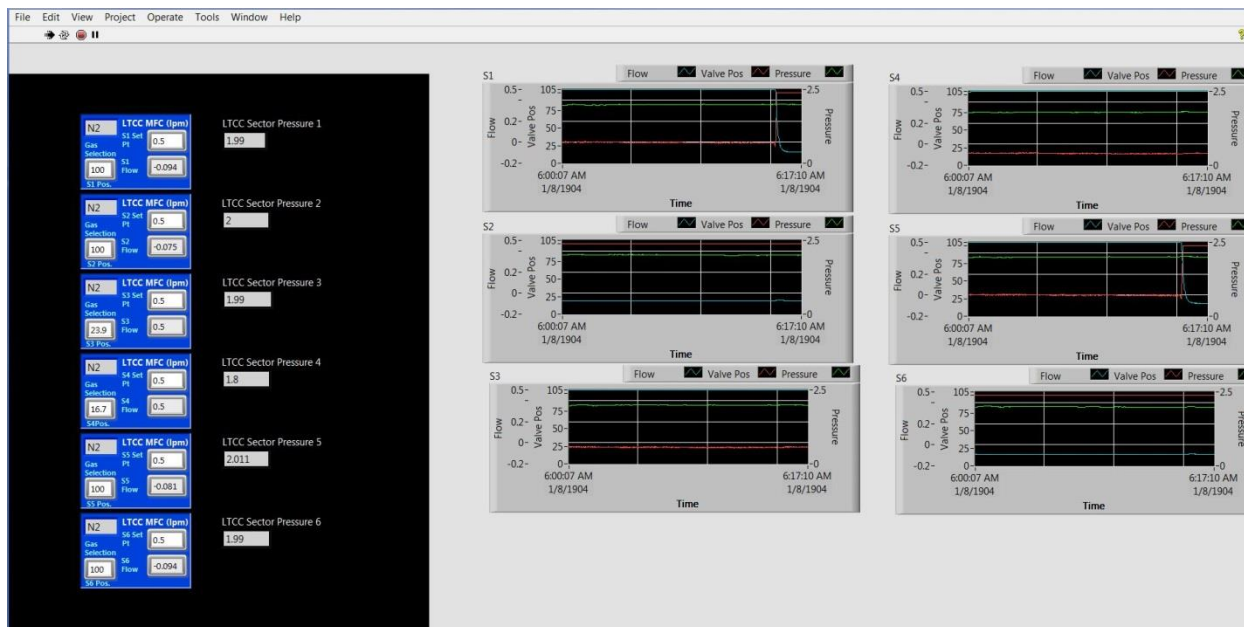
LTCC Gas GUI during leak test.

- Continued work on **RICH** TOSP for detector assembly.
- Removed flexible line from **DC** region 1's mix panel and replaced it with stainless steel ½ " pipe.
- Submitted first set of technical documents concerning the Gas Controls Interface Chassis to be reviewed by Physics division's electronics documentation archiving staff.