Detector Support Group
Weekly Report, 2016-05-25

Ongoing Projects

I. Hall B Magnet Slow Controls (**Brian**, Tyler, Peter, Amanda)

Task: Define/develop EPICS screen(s) for power supply status/control
EDC: 03/15/2016
Activity: None
Comments: Leak checks and repairs are in progress.
Vacuum has improved and turbo pumps can now be used.

Status: Delayed

II. Hall B Gas System: Slow Controls (**Marc**, Brian, George, Mary Ann,)

Task: Deploy LabVIEW based slow controls software system for **DC, LTCC, HTCC, SVT, MicroMegas, Forward Tagger,** and **RICH**.
EDC: 07/31/2016.
Activity: Developing software.
Comments: Present status:

† Waiting on Hall B Engineering. †† Waiting for more information.

#	Location	Detector	Gas	Hardware		Software	Deployed	Tested
				Piping	Instrumentation			
1	Hall B	DC	Ar/CO_2	X†	✓	✓	✓	X
2		HTCC	N_2	X†	X	✓	✓	X
4		LTCC	C_4F_{10}	X†	✓	✓	X	X
5		SVT	N_2	X†	X	✓	✓	X
6		RICH	N_2	X†	X	X	X	X
7		MicroMegas	Ar, C_4H_{10}, C_2H_6, Ne††, CF_4	X††	X††	X††	X††	X††
8		Forward Tagger	N_2	X	X	X	X	
9	EEL	SVT	N_2	✓	✓	✓	✓	✓
10		MicroMegas V.1	Pre-mix Ar/C_4H_{10}	✓	✓	N/A	N/A	N/A

11		Micromegas V.2	Mix Ar/C_4H_{10}	✓	✓	**N/A**	**N/A**	**N/A**
12		Forward Tagger	N_2	✓	✓	**N/A**	**N/A**	**N/A**
13	**TEDF**	HTCC	N_2	✓	✓	✓	✓	✓

Status: **Work in progress.**

II. Hall B Gas System: DC Hardware in hall (**George**, Marc, Mindy, Sahin, Anatoly)

Task: Install Gas System hardware.
EDC: N/A (Depends on Hall B Engineering)
Activity: None.
Comments: George: *"I updated the DCGAS and LTCC gas system critical path documents. In both cases we are waiting for critical path items to be completed by Hall B Engineering before we can continue."*
Status: **No progress.**

III. Hall B Gas System: LTCC Hardware in hall (**George**, Marc, Mindy, Sahin,Anatoly)

Task: Install Gas System hardware.
EDC: N/A (Depends on Hall B Engineering)
Activity: LTCC instrumentation hardware done.
Comments: *George: "I updated the DCGAS and LTCC gas system critical path documents. In both cases we are waiting for critical path items to be completed by Hall B Engineering before we can continue."*
Status: **No progress.**

IV. Hall B HDICE (**Mary Ann**, Peter, Amanda, Tyler, Mindy, Sahin)

Task: Fabricate RF box. Task includes draw fabrication drawing in AutoCAD, write drivers for DIO modules, and develop RF box test program review.
EDC: N/A.
Activity: Developed and tested LabVIEW code for read-back of RF Switching/Attenuation Unit attenuators and remote interlock. Completed RF & interlock cables for test station.
Comments: None
Status: **Work in progress.**

V. Hall B HDICE (**Peter**, Amanda, Mary Ann, Tyler, Pablo.)

Task:	Development and troubleshooting of HDice NMR programming.
EDC:	09/15/2016.
Activity:	Corrected problem in NMR programming to allow negative fields. Completed troubleshooting and repair of NMR field timing errors.
Comments:	None
Status:	**Work in progress.**

VI. Hall B RICH (**Tyler**, Amanda, Peter, Brian, Mary Ann, George, Mindy, Sahin, Marc, Anatoly)

Task:	Development of specifications for RICH interlock system.
EDC:	N/A.
Activity:	Meeting with INFN. Reviewed the cooling system, N2 purge system, and interlocks. Researched VESDA system and airflow sensors for interlocks.
Comments:	None.
Status:	**Work in progress**

VII. Hall D Solenoid (**Pablo**, Peter, Brian, Tyler, Amanda, Mary Ann, Marc)

Task:	Repair and maintenance of Hall D solenoid magnet.
EDC:	N/A
Activity:	Troubleshooting and repair Coil 3 He return temperature sensor. Troubleshooting of Solenoid coil 1 strain gauge.
Comments:	None
Status:	**Completed**

VIII. Hall D PLC Systems (**Pablo**, Peter, Brian, Tyler, Amanda, Mary Ann, Marc)

Task:	Generate Allen Bradley report for the Start Counter/Hall Environment/HV Reset Controls PLC system.
EDC:	06/24/2016
Activity:	Generated report and revised the sequence for this system. Compared documentation layouts for PLC.
Comments:	None
Status:	**Work in progress**

Antonioli, Mary Ann

Hall B

HDice

- Tested LabVIEW code for RF Switching/Attenuation Unit on test stand, with Pete.
  - "Read Attenuator A", "Read Attenuator B", "Read remote interlock".
  - Troubleshot problems. Two causes: reverse logic in one module type and not enough bits to display dB.
  - Changes made, re-tested, and now OK.

DSG

- Imported into InDesign and formatted Pablo's note on Hall D PLC system.
  - Began editing.
  - Re-formatted and edited four of six tables.
- Compiled, formatted, and edited weekly report.
- Changed website photo and archived old photo.

Arslan, Sahin

Vacation

Bonneau, Peter

Hall B

HDice

- Troubleshooting NMR program errors.
  - Fixed NMR negative center field problem (in LabVIEW 2015). Program now allows user to use both positive and negative fields during NMR runs.
  - Fixed NMR problem (In LabVIEW 2015) "where it's only understandable for range =300 and Tup / Tdown =31 sec". Program was not calculating ramp rates correctly for Oxford power supply.
  - Tested Tup=Tdown range from 15−300 s.
  - Documented procedure for code fixes.
- Met with Xiangdong Wei regarding HDice NMR work.
  - Reviewed and demonstrated fixes on NMR test station for negative center field problem and ramp rate issues.
  - Xiangdong requested for range to be expanded from 15 to 10 s for minimum Tup=Tdown value.
- Worked with MaryAnn on the software development for ICP-CON DIO modules.
  - Testing and troubleshooting of VIs for readback of "A" and "B" attenuators.
  - Tested remote interlock read-back VI.

SVT

- Monitored SVT Hardware Interlock System on a daily basis.

RICH

- Researched slow controls sensors for interlock system.

- Reviewed specifications for VESDA smoke detection systems.
- Researched possible CRio interfaces for smoke detection systems.
- A daily meeting was held on instrumentation and tasks.

Hall D

- Due to a facilities-chilled water trip overnight, the chillers for the BCAL and FDC tripped.
  - Chillers were reset in the morning.
  - Alarms will be set up to send text messages when this occurs.
- Monitored Hall D slow control systems on a daily basis.

Campero, Pablo

Hall B

HDICE

- Solved problems with Mercury iPS power supply with Peter.
  - Entered in Engineering Mode and added new values for the LRMF Lead Rate, Magnet Field. The default value (0.1 A/min) was changed.
  - Monitored the new speed ramp rate (A/min) for current on home page screen of power supply; it was corrected.
- Began to read/write to Mercury iPS power supply assisted by Tyler and Amanda.
  - Set up USB interface connection between HdicePC1 and iPS power supply.
  - Downloaded and installed driver for USB communication.
  - Wrote LabVIEW code to test communication.
  - Generated sub-Vis for main SCPI commands.

RICH

- Visually inspected aerogel with Tyler and Amanda.
  - Verified amount and state of the aerogel.
  - Took pictures of each side, checked for imperfections, documented information, and stored in gowning room dry box.
  - Sent inspection information to Valery and all concerned.
- Received mirrors and moved to small clean room.

Hall D

Slow Controls

- Met with Nick concerning task list for solenoid controls.
  - Worked with Tyler and Amanda on Coil 3 He return temperature sporadic signal. The leads were changed from the redundant sensor location to the main sensor location; all located in terminal TS-LCP2 C3-6 at control rack.
  - Checked the connections for the cable that was swapped. The problem seems to be solved, but needs monitoring.
  - Entered logbook # 3406170, explaining solution.
- Assisted with problem with Strain Gauge Coil 1, which had loose connection.
  - Sent e-mail to Scot requesting wiring diagram since label on cable was not clear.
  - Checked signal on MYA viewer.

Detector

- Review in progress of Environment/HV Reset/ Start Counter Control PLC system.
  - Added information extracted from generated Allen Bradley report and revised programs and sequence for system.
  - Compared with spreadsheet layouts that already exist.

DSG

- Troubleshooting FT-View 7.0 on DSGPLC1 computer.
  - Sent request for technical support concerning error (SQL server 2008).
- Tested cRIO test station in 121C with Tyler and Amanda.
  - Became familiar with hardware and software components of NI control systems.
  - Tested temperature and humidity sensor connections on cRIO modules.
- Updated photos folder on M Drive with pictures taken in Hall D.

Eng, Brian

Hall B

SVT

- Performed software updates on SVTINTERLOCKS computer while SVT was powered down.
  - Tried to get cRIO to communicate directly to Mpod to record current in sub-zero test.
  - The net-snmp package from NI was too old (doesn't support extended precision output option, so can't read HV current); nightly releases didn't compile.
  - Solution was to use SSH to run snmpget command on svtsystem1 to get HV current.
- Added HTSB and HV currents to SQLite logging on cRIO.
- Altered logic on temporary cRIO for SVT MFC to only write set point when less than value MFC can flow.
  - Done to work around a limitation with cRIO-9075 vs cRIO-9035; the 9075 can't run embedded UIs so have to use shared variables as controls.
- Made plots for sensor data for sub-zero test.

Gas System

- Testing using HTSB without a separate power supply, using AO + AI module.
  - Working.

Hoebel, Amanda

Hall B

RICH

- Assisted Tyler and Pablo with transporting mirrors to clean room.
- Checked 10 aerogel blocks for impurities, with Tyler and Pablo.
  - Most had small chips and cracks. Two had significant chips.

HDice

- Troubleshot LabVIEW driver “*IDN?” command for Mercury iPS.

- IDN command gave no response; solution was selecting "'\' Codes Display" on string menu.

Hall D

Magnet

- Assisted Pablo in swapping leads from redundant sensor location to main sensor location in terminal TS-LCP2 C3-6 at control rack.
- Assisted Pablo and Tyler in locating source of noise possibly not fixed by relocating redundant sensor leads.
  - Checked MYA viewer for spikes in signal.
  - Problem seemed to be fixed until noticed a new problem. Strain gauge signal on Coil 1 had heavy noise, a possible result from attempting to locate noise in sensor leads.
- Assisted Pablo, Tyler, and Nick in locating source of Coil 1 strain gauge issue.
  - Monitored MYA viewer for spikes in signal.
  - Strain gauge connection was found to be loose at coil.
- Wrote paper on voltage taps insert and query program.

DSG

Safety

- Studied for and took ODH 1 training.
- Studied for and took Rad Worker 1 training.

Jacobs, George

Hall B

DC

- Set up test stand gas supply with MKS 647 to mix 10% CO_2 in Ar.
- Discussions with Saptarshi about ASME storage tank relief valves and other pressure system considerations.

MVT

- Set up test stand gas supply with MKS 647 to mix 10% Isobutane in Argon.

HTCC

- Discussions with Youri S. on changing gas to CO_2.
  - Need to purchase CO_2 press regulator and CO_2 dewars.
  - Youri S. will clear purchases with Volker B.

RICH

- Created spreadsheet with components, part numbers, costs, for cooling circuit electronics.
  - Updated with higher flow meters and transducers.
- Created spreadsheet with components, part numbers, costs, for N_2 purge circuit.
  - Updated with higher flow meters and transducers.
- Created AutoCAD drawing of cooling circuit electronics.
  - Updated with new flow specifications.
- Created AutoCAD drawing of aerogel N_2 purge circuit.
  - Updated with new flow spcifications.
- Discussions with Saptarshi on cooling circuit pressure systems electronics.

- Participated in telephone meeting (new higher flow specs for both the N2 purge and air cooling circuits).

Misc

- Searched for missing Helmholtz coils to use for testing PMTs ends.
  - ✶ Coils were recycled some time in 2015.

DSG

Safety

- Quarterly safety walk-through of bldg. 96B.

Leffel, Mindy

Hall B

HDICE

- RF Switching/Attenuation Unit
  - ✶ Completed termination of replacement cables: one BNC – N and two N – N.
  - ✶ Started prepping the nine internal cables for second unit.
  - ✶ Terminated one end of two eight foot cables with SMA plugs.
  - ✶ Terminated remote interlock test cable with a circular plug connector.

FT-Cal (Forward Tagger- Calorimeter)

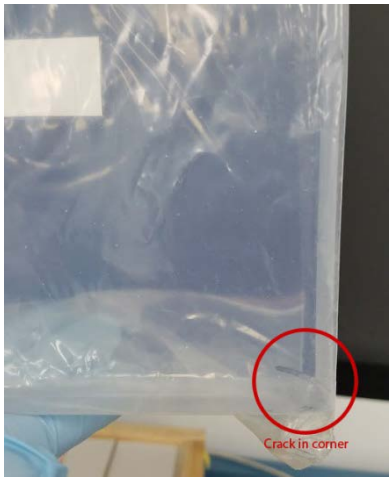
- Worked with members of INFN.
  - ✶ Removed and replaced surface mount connector on preamplifier motherboard.
  - ✶ Removed one capacitor and one resistor from 40 preamplifiers, to reduce gain.

Lemon, Tyler

Hall B

RICH

- Visually inspected aerogel tiles with Amanda and Pablo.
  - ✶ Received shipment of 10 tiles on 5/19.
  - ✶ Photographed and checked each tile for cracks, air bubbles, and chips.
  - ✶ See photo below of tile 3 with crack.



- Attended INFN-DSG phone meeting.
  - Discussed information about the cooling system, N_2 purge system, and interlocks for the review and the plan of action for upcoming tasks.
- Created and updated overall task list for detector.
- Stored mirrors in EEL 121b cleanroom with Pablo and Amanda.
  - Wrapped box with plastic wrap to make cleanroom-safe.
- Researched scales for aerogel testing.
  - Sent specs and quote for scale that meets requested specs to INFN group.
- Researched VESDA system and airflow sensors for interlocks.

Hall D

Magnet

- Troubleshooting of sporadic signal for Coil 3 He return with Pablo and Amanda.
  - Moved He return temperature sensor wires from redundant spare terminal block to main sensor terminal block.
  - Checked connections on Coil 3 to see if bad connections caused sporadic signal.
  - Traced sensor cabling from Coil 3 connection to Lakeshore to see if bad cables caused sporadic signal.
- Troubleshooting of Coil 1 strain gauge signal error.
  - Noted jump in Coil 1 strain gauge at the time we were checking the He return connection on Coil 3.
  - Traced error to loose connection for strain gauge on Coil 1.
  - Made logbook entry to note strain gauge signal error; contacted Scot Spiegel for more information.

DSG

MPOD Test Station

- Guided Anatoly's work in performing voltage test for MPOD LV card 3.

McMullen, Marc

Hall B

Gas System

- DC Gas
  - Updated the mix gas system to be controlled via the total flow and CO_2 percentage of the mix. The CPU usage of the Gas Shed cRIO is ~30%, which is much improved.
  - Continued writing code to display and control the MKS 647. The method of setting up mass flow controllers using the current VI differs from setting up control at the 647; the current VI sets flow by using a percentage of the full scale versus entering a set point.
- HTCC
  - Updated GUI, which now has separate graphic displays for temperature/humidity and ambient/differential pressure.
  - Monitored gas flow.

- RICH
  - ✶ Participated in conference call.
    - ▪ Forwarded Jlab laser safety guidelines. For testing, a class 2 laser may be used without further laser safety considerations or documentation, however this should be noted in the B-List.
    - ▪ Measuring humidity in the electronics below 0.002% would need a sensor on the order of the Easidew online hygrometer (the same used by the HTCC and DC gas system), with an approximate cost of $2K per sensor/readout.

DSG

Safety

- Accompanied EH&S Safety Warden manager to identify areas of the building which had not been upgraded to the VIOP phones.

Sitnikov, Anatoly

Hall B

SVT

- Completed calibration of Mpod LV card #3 voltage test. Began current test.
  - ✶ Voltage test−1296 measurements.
  - ✶ Current test–168 measurements.