



## Detector Support Group

### Weekly Report, 2016-03-16

Glossary: EDC = Estimated Date of Completion.  
MFC = Mass Flow Controller.

### Ongoing Projects

- I. Hall B Magnet Slow Controls (Brian, Peter, Tyler, Amanda)  
Task: Test Power supply PLC to EPICS interface.  
EDC: 3/15/2016  
Work done: **No Activity**  
Comments: Torus service tower being installed.  
**Status: Delayed. Task 1a started of original list started.**
  
- II. Hall B Gas System Slow Controls (Brian, Marc, 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  
Work done: Coding of LTCC PID, MFC.VI, GUI for DC completed.  
Comments: None.  
**Status: Work in Progress.**
  
- III. Hall B Gas System DC Hardware in hall (George, Marc, Mindy, Sahin, Anatoly)  
Task: Install Gas System hardware.  
EDC: N/A (Depends on HallB Engineering)  
Work done: **No Activity**  
Comments: **Four of the existing DC pumps have failed. DCGAS needs 6 new pumps (\$18,000), two are to be spares. DSG recommends phased procurement, starting March 2016 two pumps every four months.**  
**Status: Work in progress.**
  
- IV. Hall B Gas System LTCC Hardware in hall (George, Marc, Mindy, Sahin, Anatoly)  
Task: Install Gas System hardware.  
EDC: N/A (Depends on HallB Engineering)  
Work done: Rack in place.  
Comments: Need power outlet. Need switch from Computer Center  
**Status: Work in progress.**
  
- V. Hall B Gas System MVT Hardware in EEL (George, Marc, Mindy, Sahin, Anatoly)  
Task: Deploy all LabVIEW based slow controls software system.  
EDC: 07/31/2016  
Work done: **No Activity**  
Comments: None.  
**Status: Work in Progress.**



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- VI. Hall B Gas System HTCC in TEDE (Brian, Marc, George, Mindy, Sahin, Anatoly)  
Task: Replace cRIO.  
EDC: N/A.  
Work done: Requested networking connection.  
Comments: None.  
**Status:** Work in Progress.
- VII. Hall B HDICE (Peter, Brian, Mary Ann, Amanda, Tyler, Mindy, Sahin)  
Task: Fabricate RF box.  
EDC: N/A.  
Work done: Testing drivers for current source and amplifier.  
Comments: Received all parts for RF box.  
**Status:** Work in Progress.
- VIII. Hall B HTCC (Mary Ann, Mindy, Anatoly, Sahin)  
Task: Fabricate LV compensation coil cables.  
EDC: 07/31/2016  
Work done: Fabricated one end of the cable.  
Comments: **Waiting for connectors.**  
**Status:** Work in progress.
- IX. Hall B RICH (Tyler, Amanda, Peter, Brian, Mary Ann, George, Mindy, Sahin, Marc, Anatoly)  
Task: Prepare for arrival of components.  
EDC: N/A.  
Work done: Generated parts list.  
Comments: Received component delivery schedule.  
**Status:** Work in progress.
- X. Hall D PLC Systems (Peter, Brian, Tyler, Amanda, Mary Ann, Marc)  
Task: Locate and document (including spares) the eight PLC systems in use.  
EDC: 03/15/2016  
Work done: **No Activity.**  
Comments: Hall D closed due to run. Still need pictures.  
**Status:** Work in progress.
- XI. Hall B SVT Long Term Test (Amanda)  
Task: Monitor long term test of the eight modules.  
EDC: End of July 2016  
Work done: Analyzed module currents. Currents are stabilizing.  
Comments: For details, see Amanda's section in the weekly report.  
**Status:** Analyzing data on a weekly basis.



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#### Antonioli, Mary Ann

##### Hall B

###### HDice

- Writing LabVIEW code for the drivers for the DIO modules of the RF/Attenuation box.
  - \* Seven of nineteen written.

###### HTCC

- For the compensation coils low voltage cables, four of eight are fabricated as far as possible, awaiting second connector.

#### Arslan, Sahin

##### Hall B

###### LTCC/DC

- Installed and labeled, with George, 90° fittings on valve panel supply and return lines.
- Assembled, with Anatoly, new control rack for LTCC in hall on forward carriage.
- Disconnected and removed from old control rack all electronic equipment, and installed them in the new control rack, labeled connections.
- Rearranged control racks in gas shed and provided UPS for control system.

###### HDICE

- AutoCad drawing for rack layout and cable connection.

###### HTCC

- Fabricated and installed network cable for HTCC cRIO.

#### Bonneau, Peter

##### Hall B

###### Magnet

- Convened DSG – Hall B Magnet Controls Meeting on 3/15/2016.
  - \* No progress since last meeting on testing of the EPICS controls for the MPS due to the closing of level 2 and 3 of the Space Frame for the installation of the Torus Service Module.
  - \* Distribution Box was shipped yesterday (3/14).
  - \* After the Distribution Box is installed and cabled in the hall, PLC testing can begin approximately the first week in April.
  - \* Josh will provide a checkout list for the testing of the Distribution Box.
  - \* Josh is working on the Torus Service Tower PLC testing. Will ask DSG for help if needed.

###### HDICE

###### RF Switching/Attenuation Unit

- Debugging issues with internal RS-485 DAq bus.
  - \* Unit failed initialization sequence intermittently.
    - The ends of the internal RS-485 bus were found to be unterminated.
    - 120 ohm termination will be added to both bus ends.



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- ★ Received all components for 3<sup>rd</sup> RF box.
- Working with Tyler & Amanda on development of NI-VISA device drivers for the CT-Box calibration program.

#### SVT

- Monitored SVT Hardware Interlock System on a daily basis.
  - ★ Coolant temperature stable at ~ 6C.

#### **Hall D**

- Monitored Hall D slow control systems on a daily basis.
  - ★ The Solenoid magnet is running without problems at 1200 Amps. A small ice ball has formed on the DS vapor cooled lead.

#### **Eng. Brian**

##### **Hall B**

#### Gas System

- Swapped 8-slot cRIO chassis being used on HTCC test stand with 4-slot one.
- Added shared variables to EPICS PVs using NI's EPICS Client (SVT flow, DC R1-3 flow and pressure, HTCC flow & pressure) to test CSS GUIs.

#### Magnets

- Initial testing of Torus CSS EPICS screen with Tyler using Solenoid MPS.
  - ★ Found issues (some indicators were backwards, controls not working as expected).
  - ★ Reported to Wesley and Josh to fix the issues.

#### SVT

- Adjusted R4 valve to try and balance the flow between regions better.

#### **Hoebel, Amanda**

##### **Hall B**

#### HDICE

- Tested 31 drivers for Fluke Transconductance Amplifier 52120A.
  - ★ Driver to toggle between High and Low current terminals did not work.
  - ★ **Found error in manual and fixed driver.**

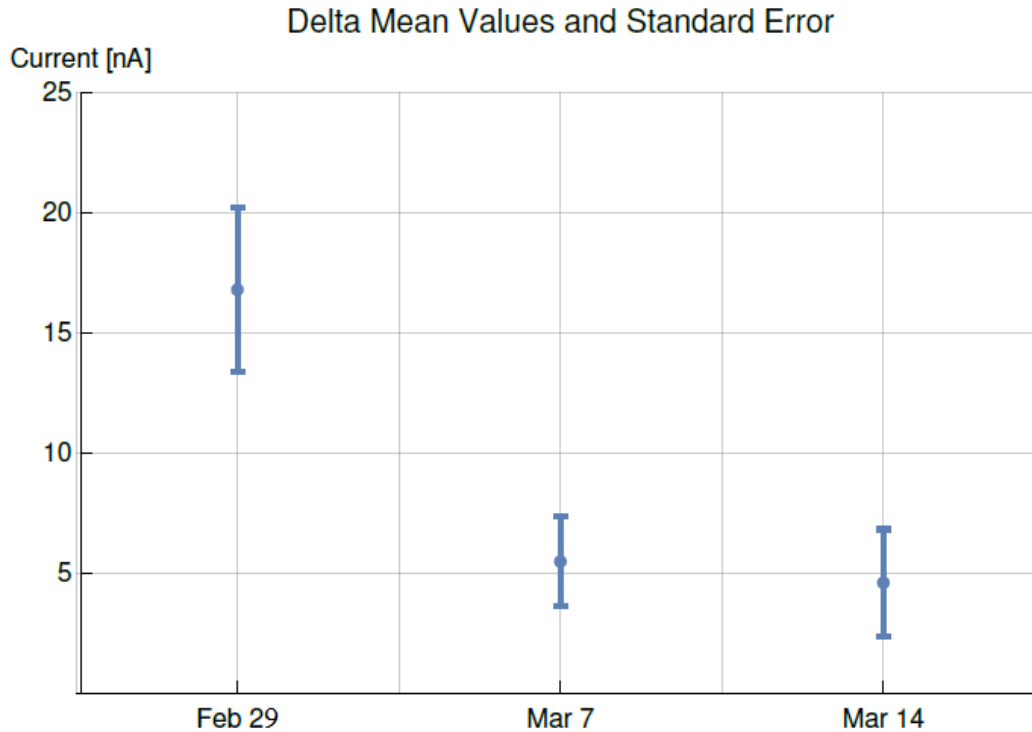
#### SVT

- Attended SVT meeting.
  - ★ Discussed issues: Software status of Forward Micromegas Tracker track reconstruction, Monte Carlo tuning, and development of SVT monitoring.
- Monitored change in current for spare modules.
  - ★ Calculated average mean and standard error for change in currents ( $\langle \Delta I \rangle$ ) for week of Mar 7 minus week of Feb 29 (Mar 14), week of Feb 29 minus week of Feb 22 (Mar 7), week of Feb 22 minus week of Feb 15 (Feb 29).



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$\langle \Delta I \rangle$  vs. time

### Hall D

#### Detector

- Monitored logbook.
  - EPICS glitch- all EPICS channels from all hall systems shown as disconnected.

### DSG

- \* Updated computer spreadsheet with IP and MAC addresses.
- \* Created color-coordinated chart for network cables.

### Jacobs, George

#### Hall B

##### Gas Systems

- Supervised LTCC exhaust gas line and bubbler installation for S4, S5, and S6.
  - \* Supply lines for S4, S5, and S6 have not been done as yet.
- Requested and received quotes for MVT 5 gas mixing system MFCs, cylinder scales, and other components for system cost estimate.
- Requested quote and ordered pressure regulator for isobutane gas.
- Updated HTCC controls and piping diagram.
- Updated HTCC gas system scope of work.



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#### Other Detectors

- Modified the DC test stand scintillator setup in EEL Rm 125 in order to test wire efficiency at the endplate region.
- Contacted Ingersol Rand and Kaeser for class 0 high flow air compressor for cooling RICH electronics.
- Supported PRAD GEM detector with additional gas cyl, regulator, lines, and fittings.

#### **DSG**

- Updated and added files to latest directory on M drive. The folder currently contains the following files.
  1. DCGAS-clas12-Mixing-2-25-2016.pdf
  2. DCGAS-clas12-Block-Diagram-2-23-2016.pdf
  3. DCGAS-CLAS12-Layout(1).pdf
  4. DCGAS-CriticalPath-11-17-2015-h.pdf
  5. DCGAS-EPICS-Monitoring-CLAS12-7-30-2015.pdf
  6. DCGAS-Hall-location-11-06-2015.pdf
  7. DCGAS-PID-connections.pdf
  8. dcgas-PID-Devel-29Jan2016.pdf
  9. dcgas-PID-Devel-Basic.pdf
  10. DCGAS-pressure-controls-2-19-2016.pdf
  11. DCGAS-Scope-11-05-2015.pdf
  12. Gas-System-Parameters-EPICS.pdf
  13. HTCC-gas-sys-controls-2-25-2016.pdf
  14. HTCC Gas-Scope-3-15-2016 .pdf
  15. HTCC-EPICS-Monitoring-30July2015.pdf
  16. LTCC-GAS-controls-piping-2-26-2016.pdf
  17. LTCC-gas-CriticalPath-11-20-2015.pdf
  18. LTCC-GAS-EPICS-Monitoring-7-29-2015.pdf
  19. LTCC-GAS-Scope-11-10-2015.pdf
  20. micromegas-MIXING-8March2016.pdf
  21. micromegas-EEL-March2016.pdf
  22. RICHGAScontrols-3-1-2016.pdf
  23. Space-Frame-gas-lines-1-16-2015.pdf
  24. SVT-N2-purge-3-15-2016.pdf
  25. SVT N2 Purge - Scope of Work.pdf

#### Leffel, Mindy

#### **Hall B**

#### HTCC

- LV cables for compensation coils.
  - ★ A total of 8-80' cables required, four complete.
  - ★ One end terminated with a 4 pole, NL4FX connector (other end, TBT).

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Photo of fabrication steps of compensation cable.

### Hall D

- ★ Attended tech. meeting.

### Lemon, Tyler

#### Hall B

##### Software

- Attended meeting.
  - ★ Discussed GEMC developments to view geometric drawings of detectors and Monte Carlos, and using HIPO as better way to compress files.

##### Slow Controls

- Attended bi-weekly meeting.
  - ★ Discussed status of EPICS screens and PRs submitted.

##### Torus

- Tested with Brian MPS EPICS screens.
  - ★ Powered MPS on and off and changed polarity.
  - ★ Setting current output using EPICS worked intermittently.
    - Noted the polarity status indicator was reversed and that MPS power status indicator was reversed.

##### HDICE

- Tested drivers to communicate to the Krohn-Hite Model 523 precision current source through GPIB.
  - ★ Tested each driver as a subVI in LabVIEW to determine number of bytes that would be read back from Model 523 and the time to wait between writing to and reading from the Model 523 through GPIB.





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- ★ Created a single VI containing all query commands as subVIs to test the drivers in a setting with multiple drivers being used in one VI, all subVIs responded as expected.

#### CND

- Met with Amanda and Daria Sokhan in ESB to discuss the CND, the components that are in the ESB, and the tests that they are currently performing with part of the detector.



Six sets of scintillator paddles and PMTs of the CND set up in the ESB. The left-most unit was being tested and was taking cosmic data.

#### Hall D

##### Detector

- Monitored Logbook.
  - ★ Accelerator in a long downtime event in order to repair a cryo module, started 3/10, plan on beam returning to hall on 3/17.

#### DSG

- Installed with Peter new CD drive in PC.
  - ★ Installed PLC software and dongle drivers on PC.
  - ★ Reformatted with Peter the hard drive of a PC that is to be excessed.

#### McMullen, Marc

#### Hall B

##### Gas System

- Wrote Main VI for the Space Frame (SF) and Gas Shed (GS).
  - ★ SF Main contains
    - Drift Chamber PID
    - Pressure Acquisition
    - MFC Control
  - ★ GS Main contains the following Vis:





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- Drift Chamber data logger
- Return flow acquisition
  - ★ Gas System Controls GUI is separate and runs independent of the area Main VIs.
- Tested mains and GUI to ensure functionality.
- Writing code for the LTCC gas control.
  - ★ Made shared variables for signals.
  - ★ Made a new tab in the Gas System Controls GUI.
  - ★ Started coding the GUI controls and indicators.
- Worked with Arslan and Anatoly on arrangements of the LTCC rack and gas shed rack.
- Ordered new connectors for the LTCC solenoid valves.
- Worked with Eng and Arslan on switching out the HTCC gas monitoring cRIO.

#### Safety

- Helped Lab contractor locate and change out some of the extinguishers in the building.

#### Sitnikov, Anatoly

##### **Hall B**

##### Gas System

- Assembled new gas rack inside Hall B with Sahin.
- Assembled gas rack in shed room with Sahin.

##### PRAD

- Completed 2 trigger detectors for Ashot Gasparian (epoxying, wrapping, fixing on the plate, assembling 2 HV and 2 signal connectors)