



# Detector Support Group

## Weekly Report, 2016-10-05

### Ongoing Projects

#### Magnet Control System

##### Torus

- Working on Pre-Power-Up Interlocks Checkout Procedure.
  - ★ 16/51 checklist tasks completed
- Troubleshooting LV cRIO issues.
  - ★ Found incorrect initial excitation current for Cernox temperature sensors.
- Resolved problems with temperature monitors for Torus controls.
- Resolved lead heater turn off /on issues for leads A and B.
- Updating project to work with LabVIEW 2016.
  - ★ Editing and making subVIs for ease of maintenance.
  - ★ Current code has lots of duplicated functionality – very poorly written; hence, causes many problems.
- Ordered two LabVIEW Ethernet/IP licenses for DSG to support magnets.

##### HDice

- CAEN engineers investigating CT-Box firmware to allow triggering using oscilloscope mode, up to 100 KHz.
- Submitted PR for IBC pump cart cRIO processor replacement.
  - ★ Awaiting final signature from finance.

##### Gas System

- Made Gas System VI to change gas type without using web browser.
  - ★ Unfortunately, this isn't possible to do via Modbus.
  - ★ MKS claims this is only possible via web browser, which is what the VI mimics.

##### DC

- DC wire test stand set up.

##### SVT

- De-cabled R1—R3 to replace three modules in these regions.
- Troubleshooting R4 modules with gain scan issues.
- Noticed alarm handler wasn't saving log files.
  - ★ Due to file permission problems.
  - ★ Ensured accelerator EPICS group fixed the problem.

##### ET

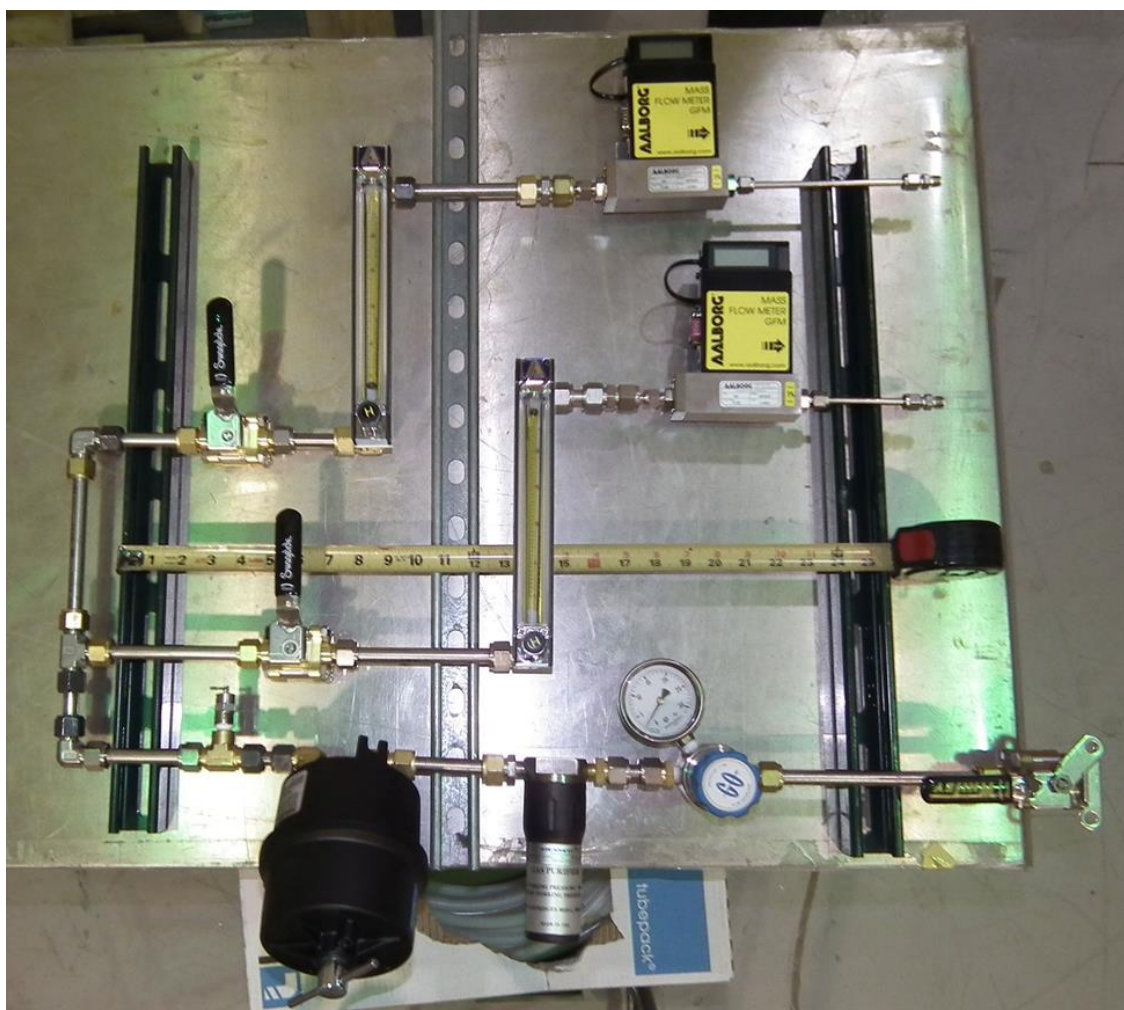
- Defined Hardware Interlock System signal levels and module assignments for calorimeter temperatures, humidity, and gas flow, and hodoscope temperatures.

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## RICH

- Assigning signal and channels assignments for Interlock System's cRIO module.
- Nitrogen purge valve panel fabricated.



N<sub>2</sub> purge valve panel



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### Antonioli, Mary Ann

- Working on updates to HDice RF Attenuation/Switching Unit test software.
- Made changes to Magnet PLC Visio drawings.
- Made Visio drawing of large cleanroom containing RICH.

### Arslan, Sahin

- Provided and replaced N<sub>2</sub> gas for FT and SVT.
- De cabled SVT R1-2-3 with Brian and Mindy.
- Wire chamber test set up ready.

### Bonneau, Peter

- Working with Tyler on cRIO module signal and channels assignments for RICH Interlock System.

### Magnet Systems

- Working with Pablo on debugging instrumentation and PLC logic for VCL heaters—resolved.
- Working with Pablo, investigated multiple issues regarding voltage taps/quench protection during interlock checkout procedure.
- Monitored Torus instrumentation and cryogenic system status via EPICS.
- Ordered two LabVIEW Ethernet/IP licenses for DSG support of magnets.

### Forward Tagger

- Defined Hardware Interlock System signal levels and module assignments for calorimeter temperatures, humidity, and gas flow, and hodoscope temperatures.
- Resolved Italian reseller ordering issues regarding calorimeter MKS flow meter.

### HDice

- Received response from CAENels regarding request for modification to CT-Box firmware to allow triggering (using oscilloscope mode). Engineer said it was more complicated than he thought, but hopes to have good news soon.
- PR for IBC pump cart cRIO processor replacement has been submitted and signed by Andy. Awaiting final signature from Allison.
- Working with Amanda, debugging new power supply VISA drivers used in update to Rotation of Polarization Program.
- Working with Mary Ann, debugging test program for the RF Attenuation/Switching Units.

### Campero, Pablo

#### Magnet

- Resolved issues with temperature monitors for Torus controls.
  - ★ Moved four Cernox temperature sensors from Cryocon3 to LV Excitation Readback Chassis 1.
  - ★ Provided PLC tag names to update Torus Instrumentation spreadsheet
  - ★ Added PLC code to read values coming from cRIO systems, using same tag names as before, therefore not causing problems with EPICS.
- Resolved lead heater turn off and on for lead A and B in Torus.
  - ★ Modified PLC program – deleted temporary tag ALWAYS\_OFF
  - ★ Added comparator logic to keep heaters off when readback temperatures are zero.



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- ★ Fixed power on heaters 8221A and 8121B automatically according to readback values (Low\_Limit 301K — Upper\_Limit 303 K) of temperature sensors.
- Continuing testing of Pre-Power-Up Interlocks Checkout Procedure.
  - ★ Troubleshooting noise in voltage taps signals to check interlocks for comparators (0-10).
  - ★ Changed threshold limits in PLC software to force interlocks off (clean state).
  - ★ Solved issues with relays to get magnet power supply breaker to open/close to be able to test hardware interlock.
  - ★ Completed 10 tasks on list.

### Eng. Brian

- Made Gas System VI to change gas type without using web browser. Unfortunately, this isn't possible to do via Modbus and MKS claims this is only possible via web browser, which is what the VI mimics.

### SVT

- Noticed that alarm handler wasn't saving log file, discovered this was due to file permission problems, and had ACE fix.
- Continued troubleshooting R4 modules with gain scan issues: M7 had lower gain (60 s instead of 80 s) possibly due to cabling on HFCB, as reseating pulser and data cable seemed to have fixed gain.

### Magnets

- Continued troubleshooting LV cRIO issues—found incorrect initial excitation current for Cernox sensors.
- Updating project to work with LabVIEW 2016 (making more subVIs for ease of maintenance, lots of duplicated functionality in current code).

### Hoebel, Amanda

- Worked on Magnet Pre-Power-Up Interlocks Checkout Procedure with Pablo.
- Oversaw insertion of FT HV cards into CAEN HV supply.

### HDice

- Fixed Rotation of Target Polarization VI problem.
  - ★ GPIB to VISA switch caused incorrect current reading in Automatic mode.
  - ★ Reordering sequence structure caused current to read correctly.

### Jacobs, George

- Created diagram for proposed DC automation upgrade for TCU calibration.

### RICH

- Aalborg Inst order, flow meters and flow transducers, arrived Tuesday 4 Oct.
- Contacted Atlas Copco about status of compressors; estimated delivery by 10-14.
- Fabricated N<sub>2</sub> purge valve panel.

### Leffel, Mindy

- Worked with Sahin de-cabling SVT R2 and R3.
- Fabricated two of three jack-plug, D-sub, 37-contact cables for RICH interlock chassis.

### HDICE

- Terminated, ran, and labeled Hall B subnet network cable in HDice lab.
- Started cutting rubber insulation material for rack components.
- Reported to facilities EEL roof leak onto transformer, during heavy rains.



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### Lemon, Tyler

#### Magnet

- Debugged hardware wiring and PLC code to clear magnet power supply (MPS) interlocks.
  - \* Determined wiring for quench detection interlocks was incorrect.
    - Showed clear interlock when system was in unsafe state.
    - Rewiring of relays corrected logic for interlock and corrected issue.
  - \* Determined MPS control board was not communicating to MPS.
    - Hardware interlocks when tripped would not open internal dump breaker in power supply.
    - Communication cable between control board and MPS had been unplugged.
    - Reconnecting cable to control board resolved issue.
- Performed 10 of 51 tasks on Interlock Checkout Procedure.
  - \* All tasks require all interlocks to be cleared from EPICS and PLC code before procedure.

### McMullen, Marc

No report - vacation