



# Detector Support Group

## Weekly Report, 2016-11-16

### Ongoing Projects

#### Magnet Control System

##### Solenoid

- PLC programming for vacuum valves continuing.
- LabVIEW programming started.
- cRIOs' base system software upgraded to 2016.
- GitHub repositories for cRIO created.
- New software on Solenoid cRIO installed.

##### Torus

- Mapping voltage taps completed.
- cRIOs' base system software upgraded to 2016.
- Created GitHub repositories for cRIO.

#### Gas System

- Dave Meekins assigned as design authority for the **RICH**.
- Dave Kashy assigned as design authority for **DC** and **LTCC**.

#### HDice

- IBC LabVIEW VI for Picowatt AVS-47B and Cryomagnetics LM-500s flow-charted.

#### FT

- Hardware Interlock System's power supplies (+24V and +5V) installed and tested in NI chassis

#### SVT

- Cables for regions 1, 2, and 3 secured.

#### RICH

- INFN requested Hall B engineering's help with installing anchors in large clean room for assembly fixture; Bob Miller suggested making arrangements with Doug Tilles or Denny Insley when fixture base arrives early next year (January 2017).



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### Antonioli, Mary Ann

#### HDice

- Changed RF Attenuation/Switching Unit software to display LCD screen at start of test, and made notations in program.
  - \* Software tested by Amanda, made a few changes, and done.
  - \* Updated wiring diagrams (RF, power, and control) of Unit.
- Began making flowcharts in Visio, completing overall program and display of LCD screen.

### Arslan, Sahin

#### SVT

- Worked on cable management and cable-lacing regions 1, 2, and 3, with Mindy.
- Replaced N<sub>2</sub> bottles, with Mindy.
- Pulled faraday cage from R4.
- Debugged modules installed on R4.
  - \* R4M1-P20 replaced with P1.
  - \* R4M9-P21 replaced with P60.
  - \* R4M15-P40 replaced with P64.
- Attached another HTSB on R3 for ambient temperature.

#### DSG

- Helped with reconfiguration of control room.
- Helped with DC movement in clean room and reorganized clean room.

### Bonneau, Peter

#### Magnet Systems

- Evaluating methods of creating time-averaged Solenoid PLC data for interlocks, with Pablo.
- Updating PLC module and channel assignments documentation to include new vacuum system signals, with Pablo.
- Determined PLC calculations for vacuum ADC signals, with Pablo.
- Reviewed PLC code implementation for value control and position readback, with Pablo.
- Monitored and analyzed data from Torus instrumentation and cryogenic system status via EPICS, during testing.
  - \* Warm-up and parking Torus at 80 K.

#### FT

- The power supplies (+24V and +5V) have been tested in the NI chassis.

#### HDice

- Worked with Amanda on debugging and testing of NMR instrumentation and program for rack #2 in HDice lab.
  - \* LCD on RF box shows intermittent incorrect characters.
  - \* Working on memory issues related to running of multiple NMR scans.
  - \* Set up and programming replacement cRIO processor on IBC pump cart.
- Meeting with Xiangdong Wei and Mike Lowry regarding DSG work for HDice.



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### Campero, Pablo

#### Solenoid

- Modified Vacuum\_Calcs PLC program to define vacuum levels read back in [torr], and vacuum pump speed in [%] units.
  - \* Model needed to be defined for two vacuum gauges used.
- Working on Vacuum\_Rate PLC program to calculate rates measured by vacuum gauges levels every hour and 10 hours.
- Added two signals for vacuum level, one signal for turbo pump speed, and one signal for open/close gate vacuum valve to Solenoid Master Instrumentation List.
- Worked on PLC programming and instrumentation for cryogenics.
  - \* The CLAS 12 Solenoid Cooldown and Cryogenic Operational Procedure V0\_5 and Solenoid DBX PID were updated with needed control process variables.
  - \* Modified FastDaq\_Processing program.
    - Modified Cernox\_Stats Routine structure.
    - Wrote code to calculate Max, Min, Average and Differential temperatures in coils.
  - \* Modified Cryo program to calculate Max, Min, and differential for Cold Mass temperatures.
- Worked with Tyler and Brian on “LV Solenoid cRIO” and PLC communication.
  - \* Modified interpolation algorithm for Cernox and PT-100 sensors in LabVIEW.
  - \* Monitored corrected reading in PLC side after adding look-up table in LV Solenoid cRIO.

#### Torus

- Worked on mapping Voltage Taps for Torus Magnet.
  - \* Plotted and marked every voltage tap in drawing B00000-09-00-0180.
  - \* Sketched and supplied information for diagram with locations for VT1 to VT22.
- Monitored EPICs screen for MPS, Cryo system, Strain Gauges, and Load cell for Torus magnet on daily basis.
  - \* Not all process variables are available in Archive mode in MYA Viewer.

### Eng, Brian

#### Hall B

##### Magnets

- Upgraded Torus and Solenoid cRIOs’ base system software to 2016.
- Created GitHub repositories for both cRIOs.
- Installed new software on Solenoid cRIO. Initially planned to do on Torus first, but found some issues due to code, which has since been changed.

#### Hall D

- Found part number for burned IC on microscope motor driver board.
- NBX firmware updates postponed until next shutdown.

### Hoebel, Amanda

#### HDice

- Debugged NMR program.
  - \* Field chart did not clear and caused memory leak.
  - \* Added sequence frame to clear field chart.



## Detector Support Group

### Weekly Report, 2016-11-16

- Troubleshoot RF Attenuator screen problem.
  - \* Screen becomes blank at random times.
  - \* Used Hyperterminal program to display screen, indicating a hardware issue.
- Added IBC-axial and IBC-transverse magnet selection to NMR program.
- Made flow chart of IBC LabVIEW VI for Picowatt AVS-47B and Cryomagnetics LM-500s.
- Met with Xiangdong, Mike, Marc, and Pete to make HBlisT for pump cart.

### Jacobs, George

#### DC

- Discussions with Mac Mestayer about DC gas relief valves and timeline for start of DC gas operations.
- PO for DC gas pumps has been sent to vendor.

#### RICH

- Meeting with Dave Meekins about RICH N<sub>2</sub> purge and air cooling systems pressure system compliance

#### Gas Systems

- Provided information on DC gas and RICH ASME relief valves to Dave Meekins.
- Discussions with Hall B engineering staff and multiple system owners about ODH assessments for individual gas volumes in Hall B
- Provided information on DC gas ASME relief valves to Dave Kashy.
- Discussions with Dave K on Hall B pressure systems

#### DSG

- Discussions with Procurement about LAr contract and purchases.
- Completed bulk LN<sub>2</sub> and LAr gas usage estimates, and updated specifications, for new gas contract bid package (SOTR).
- Placed PR367120 to cover late invoice for bulk LN<sub>2</sub> contract (SOTR).

### Leffel, Mindy

#### SVT

- Finished cable lacing R1 – R3, with Sahin.
- Replaced two N<sub>2</sub> bottles, with Sahin.

#### Forward Tagger

- Installed power supplies (+24V and +5V) in the NI chassis.
- Completed fabrication of the CAEN HV cable interlock interface.
- Interlock chassis.
  - \* Modified front panel for selector switch.
  - \* Fabricated and tested 6-LEMO-connector, HV patch panel.

#### DSG

- Assisted with reorganization of control room.

### Lemon, Tyler

No report - absent.



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### McMullen, Marc

#### HDice

- Met with Xiadong Wei and Mike Lowry and assisted them with Task Hazard Analysis and B-List for DSG-assigned work.
  - ★ B-list approved.

#### Gas System

- Worked with George Jacobs and Brian Eng on improving gas supply for HTCC, which should mitigate issues associated with power outages.

#### RICH

- Met with George Jacobs and Dave Meekins (design authority) for RICH air tank and valve panel.
  - ★ Dave Meekins mentioned that pressure systems should have design authority assigned prior to any assembly, modification, or repair.
  - ★ Dave Meekins will contact Patrizia directly regarding schedule and workload.
- Assisted Valery Kubarovsky with RICH safety documentation.
  - ★ Added gas system items to THA and did ODH calculation.
- Attended meeting with Sandro Tomassino, Dario Oerchini (INFN collaborators) and Bob Miller to discuss transportation of detector from EEL to Hall and installation of the detector in the Hall.
  - INFN requested Hall B mechanical help with installing anchors in large clean room for assembly fixture.
  - Bob Miller suggested making arrangements with Doug Tilles or Denny Insley when fixture base arrives early next year (January 2016).

#### DSG

- Prepared an OSP guide for Physics Staff.