



Detector Support Group

Weekly Report, 2017-08-09

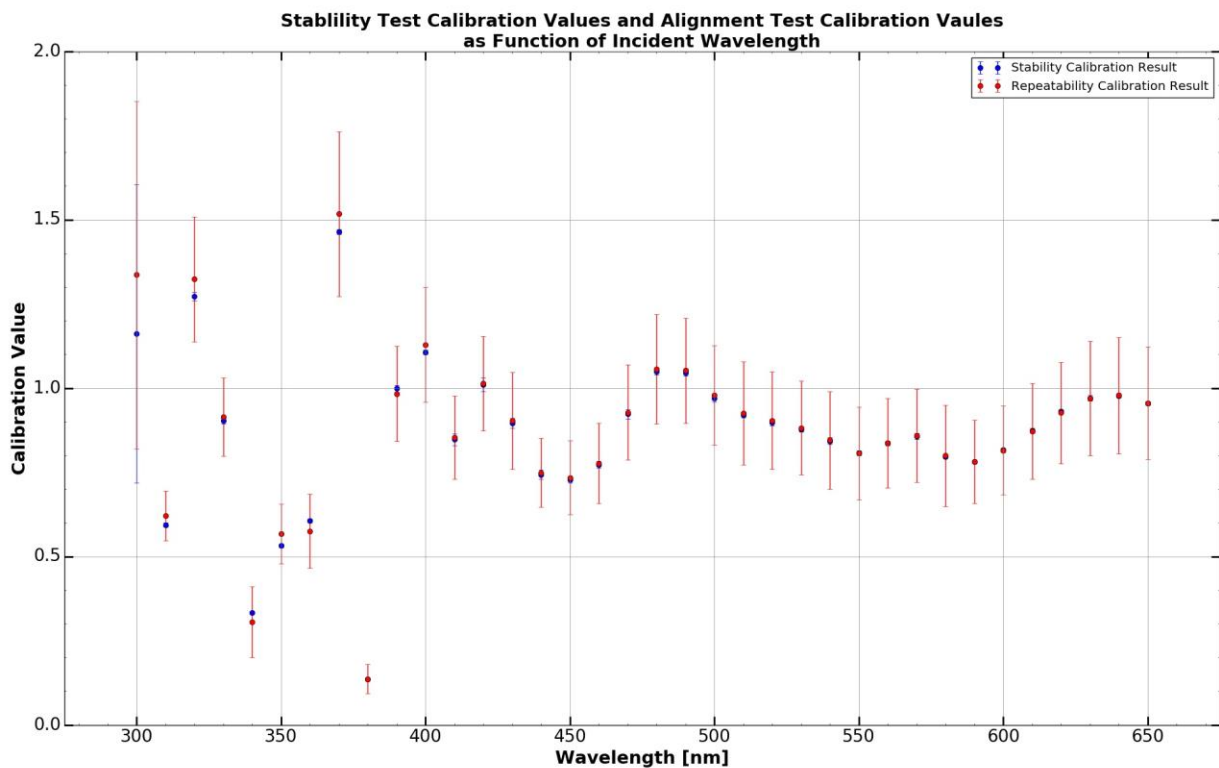
Status

Solenoid

- Configuration re-established for cryocon temperature control units.
 - ★ Configuration for system settings and network for Cryocon 3 were lost.
 - IP address re-assigned to allow remote connection from the web-page and upload the proper system settings and temperature curves for each sensor.
 - Firmware updated from 2.10 to 2.11.
- Switch for valve EV8611JT replaced.
- LVDT for Valve EV8611JT recalibrated.

RICH

- Results from reflectivity test stand's stability test and alignment repeatability test analyzed to calculate confidence interval for test results.
 - ★ Confidence interval for each data point shown as error bars.





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- Temperature and humidity sensor cables in feedthroughs tested for light-tightness.
 - * Photodiode used to measure light in darkbox in two cases:
 - No light on feedthrough from outside of darkbox.
 - Light shining directly on feedthrough outside of darkbox.
 - * Photodiode measured about 4% more light in darkbox when light was shining directly on feedthrough than with no light shining on feedthrough.

	NO LIGHT (CASE 1)	LIGHT (CASE 2)
	<i>Current (pA)</i>	<i>Current (pA)</i>
AVERAGE	5.199	5.403
STD DEV	0.0273	0.0295
95% CONFIDENCE INTERVAL	± 0.0032	± 0.0035

Table containing results from feedthrough light-tightness test.

ET

- Interface between calorimeter chiller and hardware interlock system caused chiller to incorrectly vary temperature.
 - * The fault is internal to the chiller.
 - * A Bi-Ra AC control box can be used as an alternative the analog interface to control the chiller.



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Antonioli, Mary Ann

Absent

Arslan, Sahin

Absent

Bonneau, Peter

HDICE

- Developing programming for data readout synchronization for the CAENels CT-Box and the lock-in amplifier.
 - ★ Due to lack of internal storage memory for the current measurements, data from CT-Box must be read at acquisition rate.

FT

- Conducted FT Hardware Interlock System testing and debugging.
 - ★ Worked with Amrit, Amanda, Tyler, and Pablo on the debugging of the interface between the calorimeter chiller and the hardware interlock system.
 - When the Lauda chiller's analog interface is programed to control the pump, it incorrectly varies the temperature.
 - Interface worked correctly while in the EEL building.
 - Controlling signal (0-20mA) from interlock system is correct.
 - The fault is internal to the chiller.
 - A Bi-Ra AC control box can be used as an alternative the analog interface to control the chiller.
 - ★ Met with Raffaella Devita regarding the addition of another humidity sensor.
 - Humidity sensor can use one of the spare cRio ADC module channels. No additional modules will be needed.

RICH

- Worked with Tyler on RICH Hardware Interlock System.
 - ★ There is a concern regarding light leaks for proposed temperature and humidity wire feed-thrus.
 - Discussed feed-thrus, wire management, and methods for testing for light leaks.
 - ★ Testing of the CAEN LV module interlocks using daisy-chained signal was discussed.
- Setup and software installation for new DSG development and debugging Dell Precision 7710 mobile workstation.



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Campero, Pablo

Solenoid

- Tested valve SV8675BY used in vaporizer.
 - * Valve was changed from solenoid valve to pneumatic valve.
 - * Checked that air was properly connected in supply lines.
 - * Verified wiring for 24 V signal and 120 VAC power source circuit.
 - * Ensured correct relay output PLC module channel assignment.
 - * Opened and closed valve from the PLC controller and inspected valve mechanically.
- Tested Estimated Temperatures in the coils 1 to 5.
 - * Measured inductance across the whole magnet for continuity.
 - * Injected 1A on leads to perform the test at 12V across the whole magnet (VT_20).
 - * Measured voltage values in the Voltage Tap panel at the solenoid controls rack.
 - * Monitored readback voltage values in the EPICS screen and archived readout for the 5 estimated temperatures.
 - * Recorded *FastDAQ* data to log the voltage taps behavior during the test.
 - * Verified PLC logic used to calculate the temperatures based on the VT6, VT14, VT8, VT12, VT10 and current in the coil.
 - * Read estimated temperatures as expected (~ 300 K). Test completed successfully.
- Re-established configuration for cryocon temperature control units with Brian.
 - * Configuration for system settings and network of Cryocon 3 were lost.
 - Re-assigned IP address to allow remote connection from the web-page and upload the proper system settings and temperature curves for each sensor.
 - Assigned the temperature signal names for each channel.
 - Updated firmware version from 2.10 to 2.11.
 - * Set temperature thresholds for Cryocon 1 and 2.
 - Tested relay output activation at any over threshold.
- Recalibrated LVDT for Valve EV8611JT due that valve switch position was damage.
 - * Read-back for valve position at fully open (100%) was 80 %.
 - Replaced switch position and re-calibrated LVDT to solve the issue.
- Tested heaters on Lead A and Lead B.
 - * Test performed in a temperature range of 292 to 310 K.
 - * Verified hardware wiring, PLC logic, and that EPICS indicators works properly.
- Completed *P010- Pre-Cooldown Valve Checkout Procedure* and *P013- Pre-Cooldown Instrument Checkout*.

FT

- Troubleshoot Calorimeter chiller with Amanda and Peter.
 - * Chiller was heating up when its analog input was enabled.
 - Verified thresholds set for temperature output to ensure local control of the output temperature.
 - Configured the analog input to read 0-20 mA signal, which is used to turn on the pump in the chiller and drop the output temperature in the chiller.
 - Problem persists, still under investigation.



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Eng, Brian

- Tested DC TCUs using 10% gas standard with Marc and Pablo.
 - * Zero'ed and spanned the TCUs again.
 - * Also zero'd the MFCs.

Solenoid

- Updated firmware on Cryo-con units, 490NBX and both 435NBX units (Torus and Solenoid).
- Started I&C check prior to cool-down beginning.

SVT

- Rearranged chiller and panel with Marc in preparation for gantry move.

RICH

- Moved EEL/124 gantry (with help from RICH and MVT collaborators) in order to remove exit window, and removed it with George and Marc.

Hoebel, Amanda

- Performed light-tightness test of **RICH** cable feedthroughs with Tyler.
 - * Photodiode was used to measure light in darkbox when light source was shining on feedthroughs on outside of box, and when light source was turned off.
 - * Program measured higher light when light source was shining on feedthroughs.

FT

- Debugged chiller temperature problem with Tyler, Pablo, Pete, and Amrit.
 - * When “analog input 1” is enabled, the temperature in the chiller increases or decreases rapidly.
 - Whether the temperature increases or decreases depends on “maximum value” setting.
 - Max value is in percent. Different percent values cause chiller to heat or cool.
 - * Analog output 1, which is used to tell if pump is on or off by hardware interlocks, gives correct reading only from 1-60%.
 - Should work at 100%.
 - * Power-cycled chiller and swapped analog card ports.
 - Did not solve problem.
 - * Chiller should be replaced.

- Created and edited weekly report.

Jacobs, George

- Contacted AIRGAS about delivery times, route, training requirements, and escort requirements for site access.

GAS Systems

- Meeting with DA, Matt M, about MVT gas mixing system
- Discussions concerning DC Gas mix ratio specification with respect to the calibration standard with Mac M.



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Leffel, Mindy

Absent

Lemon, Tyler

- Troubleshoot **FT** chiller issues with Amanda.
 - ★ Chiller cannot be enabled or disabled using the cRIO-based Hardware Interlock System.
 - ★ Power-cycled chiller; did not fix issue.
 - ★ Removed analog control module from one slot and placed it in second slot; did not fix issue.
 - ★ Chiller currently running with hardware interlocks input disabled.

RICH

- Debugged EPICS status indicators for Hardware Interlock System as an EPICS client.
 - ★ Low limit statuses for Temperatures 14 – 16 were not updating.
 - ★ Noted path that binds EPICS PV to LabVIEW shared variable was incorrect.
 - Was missing VAL field for PVs.
 - ★ Correcting path to include VAL field for PV fixed error where statuses were not updating.
- Tested temperature and humidity sensor cables in feedthroughs for light-tightness.
 - ★ Installed one plastic feedthrough into wall of reflectivity test station's darkbox.
 - ★ Used photodiode to measure light in darkbox in two cases:
 - No light on feedthrough from outside of darkbox.
 - Light shining directly on feedthrough outside of darkbox.
 - ★ Noted that photodiode measured about 4% more light in darkbox when light was shining directly on feedthrough than with no light shining on feedthrough.

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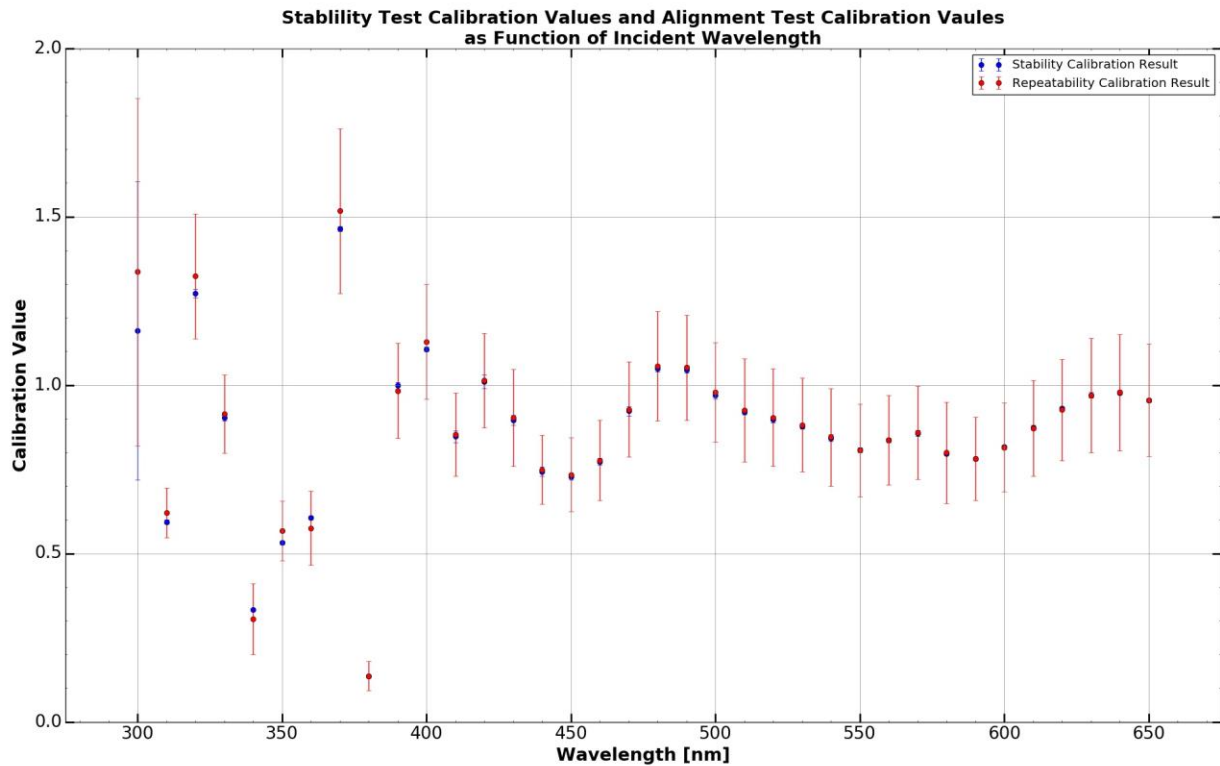
Table containing results from feedthrough light-tightness test.

- Analyzed results from reflectivity test stand's calibration stability test and alignment repeatability test to calculate confidence interval for test results.
 - ★ Confidence interval for each data point shown as error bars.



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McMullen, Marc

Gas System

- Worked with Brian and Pablo on DC gas TCU calibration.
 - ★ The TCU measures Ar/CO₂ gas mix. TCU 1 outputs ~8mA from the standard while TCU 2 outputs ~5mA.
 - We checked the extremes of the range (0% and 100% CO₂) and measured the following:

	Initial measurement	Re-Calibrating the TCU			Post calibration measurements		Re-Zeroing MFCs
TCU#	TCU value from Mix at 14:40 (cRIO value)	TCU value using 0% CO ₂ (cRIO value)	TCU value using 0% CO ₂ , after adjustment of TCU (cRIO value)	TCU value using 100% CO ₂ , after 0% CO ₂ adjustment (cRIO value) No further adjustment needed	measure the standard post TCU adjustment (cRIO value)	measure the mix post TCU adjustment (cRIO value)	zeroed the MFCs and measure the mix (cRIO value)
TCU1	8.7mA (2.6V)	4.4mA (0.375V)	4mA (0.03V)	20mA (10.0V)	8.42mA (2.77V)	7.69mA (2.31V)	8.22mA (2.64V)
TCU2	5.1mA (0.57V)	0.6mA (-0.21V)	4mA (0.03V)	20mA (10.0V)	8.28mA (2.68V)	8.19mA (2.62V)	7.98mA (2.49V)

- After adjustment the TCU standard measures were both in the mid 8mAs.



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- * We also zeroed the MFCs, as the slight offset of flow contributed to the difference in TCU measurement.
- * Assisted Argon supplier while he filled the Argon tank.

RICH

- Worked with Brian and George to remove exit panel using gantry crane.
- Met with INFN to discuss additional parts for Stiffener to adapt to DC cart.
- Researched tooling to modify 3D printed threaded components.
 - * Verified the thread pitch for the nitrogen manifold piece $\frac{3}{4}$ straight pipe thread with 14 threads per inch, and 1/8 NTP with 27 threads per inch.
 - * We will try to retool the components with a tap and die.

MVT

- Started assembly of the MVT gas controls interface chassis.

LTCC

- Contacted F2 Chemicals to get pricing/delivery information on C₄F₁₀.
 - * They have the gas on hand.
 - * They have to refurbish the gas tanks they have on hand, or we need to send them empty tanks.
 - * Still waiting on pricing/delivery information.