

Detector Support Group

We choose to do these things "not because they are easy, but because they are hard". Weekly Report, 2022-04-06

Summary

<u>Hall A – ECal</u>

George Jacobs, Mindy Leffel, and Marc McMullen

- Assembling supermodules 45 of 59 complete
- Measured and sorted 27 lead-glass assemblies

<u>Hall A – GEM</u>

Brian Eng, George Jacobs, and Marc McMullen

• Modifying gas flow and pressure monitoring system software to supply flow values to the Hall A plotting utility

<u>Hall A – SoLID</u>

Mary Ann Antonioli, Pablo Campero, Mindy Leffel, and Marc McMullen

• Completed Solenoid Interlock Setup HMI screen and Phoebus screen

Solenoid Interlock Setup		2022-04-05 06:07:30 SoLID Solenoid Interlock Setup			Setup
4/1/2022 SoLID - Solenoid Interlock Setup		Magnet Temp	eratures [K]	Current leads mass flow and	i temperature
Magnet Temperature Max. Rd_Fe Temp 10.0, K Max. PT102 Temp 175.0, K Max. PT102 Cemp 175.0, K Max. TD Temp. 1300, K Max. TD Temp. 1320, K Max. TD Temp. 1320, K	Current Leads Mass Flow & Temperature Integration Time Flow Max. [55000] L / min [99999] Ims Flow Min. [10.00] L / min Flow Allowance [10.00] L / min CL Max Temp. [18.00] K	Max. Rd Fe Max. PT102 Min. PT102 Max. PT102 colo Max. temp. diode Min. temp. diode	<ha_solt <ha_solp <ha_solp <ha_soll <ha_soll <ha_solt <ha_solt< td=""><td>Integration time Max. flow Min. flow Flow allowance Current leads max. temp.</td><td>a sol:Mms sol:ML/min a sol:TLL/min a sol:TLL/min a sol:mL/min</td></ha_solt<></ha_solt </ha_soll </ha_soll </ha_solp </ha_solp </ha_solt 	Integration time Max. flow Min. flow Flow allowance Current leads max. temp.	a sol:M ms sol:ML/min a sol:TLL/min a sol:TLL/min a sol:mL/min
Magnet Neck Temperature Max. Temp He Supply Helium Pressure Max. Temp He Supply Helium Leve 4.60 K Max. Temp He Supply 4.60 K Max. Pressure 1.0000 Atm Level Max. [0. 10.000 Atm Level Max. [0. 10.000 Atm Level Min. [0. 10.000 Atm Level Min. [0.		Magnet Neck Temperatures [K] Max. temp. He supply <ha_sol.t, Max. temp. He return <ha_sol.t< td=""><td colspan="2">Helium pressure [atm] Helium level [95] Max. pressure <ha_solp_max. <ha_solh_<br="" level="">Min. pressure <ha_solp_min. <ha_solh_<="" level="" td=""></ha_solp_min.></ha_solp_max.></td></ha_sol.t<></ha_sol.t, 		Helium pressure [atm] Helium level [95] Max. pressure <ha_solp_max. <ha_solh_<br="" level="">Min. pressure <ha_solp_min. <ha_solh_<="" level="" td=""></ha_solp_min.></ha_solp_max.>	
Vacuum Pressure Vacuum Limit (0.0100) Torr Vacuum delay (3000) ms	Nitrogen Pressure Nitrogen Level Max. Pressure 25000 Atm Level Max 430.00 % Min. Pressure 0.9500 Atm Level Min. 100.00 %	Vacuum F Vacuum limit Vacuum delay	<pre>cha_sol:VETorr <ha_sol:vetorr< pre=""></ha_sol:vetorr<></pre>	Nitrogen pressure [atm] Nitr Max. pressure <ha_sol:p_max. Min. pressure <ha_sol:p_min. i<="" td=""><td>rogen level [%] level <ha_sol.h_ evel <ha_sol.h_< td=""></ha_sol.h_<></ha_sol.h_ </td></ha_sol:p_min.></ha_sol:p_max. 	rogen level [%] level <ha_sol.h_ evel <ha_sol.h_< td=""></ha_sol.h_<></ha_sol.h_
Quench Max 5000 V CL Voltage Max. 0000 V Quench Min. 5000 V CL Voltage Max. 0000 V Quench Level2 Max. 0000 V Integration Time 200 ms Quench Level2 Min. 0000 V Up Software Limit 0.060 V		Software quench detector [V] Max, quench cha_sol/Q Max. current leads cha_sol/Q Min, quench cha_sol/Q Min. current leads cha_sol/Q Max, quench level 2 cha_sol/Q Quench detector software limit cha_sol/Q Min, quench level 2 cha_sol/Q Integration time cha_sol/Q			

SoLID Solenoid Interlock Setup HMI screen (left) and Phoebus screen (right)

- Testing electric ball valve readout
 - ★ Voltage measured at valve terminal is -0.23 V when open and closed fully open valve should show 5 V and closed valve 0 V; debugging in progress
- Fabricated four, 4-conductor cables with CPC connectors
- Completed NX12 rendering of SoLID solenoid magnet



Detector Support Group We choose to do these things "not because they are easy, but because they are hard". Weekly Report, 2022-04-06



VT_1 (inner/outer coil junction at magnet rear)

SoLID magnet and turret rendering with voltage tap locations and flux loops

<u>Hall B – RICH-II</u>

Mary Ann Antonioli, Peter Bonneau, Pablo Campero, Brian Eng, George Jacobs, Tyler Lemon, and Marc McMullen

- Connected EEL air-cooling and nitrogen setups' flow meters and pressure transducers to hardware interlock chassis
- Developed LabVIEW program for new compact CCD spectrometer (CCS) reflectivity test station
 - ★ Program measures mirror reflectivity for light of wavelengths from 450 800 nm
 - ★ When user runs program, it displays CCS data for reference light and light reflected off of mirror
 - ★ When user triggers a data capture, 50 measurements (quantity is user-settable), are recorded and averaged – averaging helps eliminate some of the noise at lower wavelengths
 - ★ Tested program by successfully measuring reflectivity of a mirror sample from ECI from RICH-I to be ~90% (sample has specified reflectivity of at least 90%)



Detector Support Group We choose to do these things "not because they are easy, but because they are hard". Weekly Report, 2022-04-06



LabVIEW front panel of new reflectivity test station program using two CCSs. White waveform is CCS counts from reference light (data uses left y-axis). Red waveform is CCS counts from measurement light (data uses left (y-axis). Green waveform is calculated reflectivity of mirror sample (data uses right y-axis).

• Submitted cooling tube to JLab machine shop for modification

Hall C – NPS

Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng, George Jacobs, Mindy Leffel, Tyler Lemon, and Marc McMullen

- Hardware interlock LabVIEW program development
 - * Developed Python program to generate configuration file
 - ★ Wrote LabVIEW code to initialize high and low limits for all temperature, humidity, pressure, and flow variables
 - ★ Added Keysight scanning and averaging code
- Generated histogram of front crystal face temperatures using temperature probe data exported from Ansys steady-state thermal analysis



Histogram of front crystal face temperatures

3 DSG Weekly Report, 2022-04-06



Detector Support Group We choose to do these things "not because they are easy, but because they are hard". Weekly Report, 2022-04-06

<u>Hall D – JEF</u>

Mary Ann Antonioli, Aaron Brown, George Jacobs, and Mindy Leffel

- FCAL foil pre-shaping (total of 608 foils)
- Wrapped 29 crystals with foil and Tedlar

EIC

Pablo Campero, Brian Eng

- Conducting simulations in Ansys *Fluid Flow Fluent* to get the maximum temperature at the Si sensor layer 1
 - ★ Assumed air temperature in the annulus space and enclosed (ambient) of 20, 18, 16, 14°C
 - ★ For each temperature, air velocities of 0, 1,5, 8, 10 m/s were used for the ambient and annulus space



• Continued comparing Reference (CD1) and ECCE cost spreadsheets, with ATHENA as a sanity check – total costs are similar, but material/labor are far apart

DSG R&D – EPICS Alarm System

<u>Peter Bonneau</u>

- Debugging the Kafka message stream for alarm system PV configuration settings
 - ★ Some of the configuration settings are not being accepted by the alarm server
 - Wrote a Kafka message stream spy program to aid in the debug of the configuration message stream – found errors in the format of the message stream
 - * Successfully debugged PV configuration message stream
- Developing an Input/Output Controller (IOC) using EPICS base 3.14 to be used for the development and testing of the alarm system