

# **Detector Support Group**

We choose to do these things "not because they are easy, but because they are hard".

Weekly Report, 2020-08-05

# **Summary**

#### <u>Hall A – SoLID Magnet Controls</u>

Mary Ann Antonioli, Aaron Brown, Pablo Campero, Brian Eng, Tyler Lemon, Marc McMullen

- Verified the PLC code for the LN<sub>2</sub> and LHe liquid level sensors
  - Channels in the PLC program match the physical channel assignment for each sensor
- Developing *PLC Rack Layout* drawing A00000-16-03-0150
  - \* Added 24 VDC and 5 VDC power supplies, breakers, and terminal strips
  - \* Added and grouped terminal blocks for all PLC I/O modules
- Developing Instrumentation Rack Layout drawing A00000-16-03-0200
  - \* Added terminal strip groups for all sensors and instrumentation from the magnet and cryo control reservoir
  - \* Added terminal strips for the heat exchanger instrumentation
- Completed wiring diagram for sheet named "PLC I/O Remote 2, Slot 3 Wiring Diagram" drawing A00000-16-03-2800
  - Drawing shows the wiring connection for the analog input PLC module used to monitor the position of the JT valves through the LVDTs
- Completed all design checks for the 24 channel motor controller board
  - Component pad dimensions and locations have been verified, as well as connections

### Hall A – GEM Detector Gas System

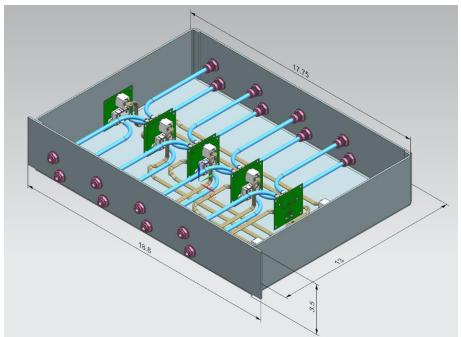
Peter Bonneau, Brian Eng, George Jacobs, Mindy Leffel, Tyler Lemon, Marc McMullen

- Populated five 400 sccm gas flow sensor boards (40 completed)
- Completed design of the I<sup>2</sup>C multiplexer PCB; ready for manufacturing
- Continued development of gas flow sensor chassis using NX12
  - \* Chassis design was adjusted to force all Tygon tubing lengths to be  $\sim 6$ "
  - \* Multiplexer board changed to vertical orientation
  - \* Added flat telephone cable for multiplexer-flow sensor connections



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Latest design of the gas flow sensor chassis for the GEM Detector Gas Distribution System.

#### <u>HDice – fsNMR Program</u>

Peter Bonneau, Tyler Lemon, Marc McMullen

- Developed a data review program
  - \* Used to review all cycles' data to exclude anomalous results from a cycle
  - \* Includes controls to select which cycles to include and average and then saves that result as a new averaged data file
- Debugged phase's averaged data plot color reverting to white instead of intended red color
  - ★ Found that plot color was being changed by a feature previously added to the program that makes all plots blink in inverse colors to signify the end of a run
  - \* Removing this feature resolved the issue

### <u>Hall C - NPS</u>

Peter Bonneau, Aaron Brown, George Jacobs, Mindy Leffel, Tyler Lemon

- Environmental Monitoring System
  - \* Researching resistive coolant leak sensors that can hold up under high radiation
  - \* Determined the need for chiller and HV interlocks to protect the detector
- High Voltage Distribution
  - Researching connectors and cables to be used in HV distribution system that are consistent with the planned detector operating voltage of ~1100 V
- CAEN Testing
  - \* Continued voltage stability testing (with load) using EPICS on CAEN crate and modules



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- Analyzing HV stability test (with load) current data for modules #0256 and #0262
- Five hundred and forty of 1100 high voltage divider cables fabricated
  - \* Cut 240 RG-174 cables

#### Hall C- HMS/SHMS Magnets CSS Screen Development

Mary Ann Antonioli, Aaron Brown, Pablo Campero, Brian Eng, Tyler Lemon

• Completed SHMS Dipole Interlock screen

			No Interlock
Keep Alive Timer		Reset	Fast Discharge
		Interlock	
Reset QD			Slow Discharge
	Fast Disc	tharge	Slow Discharge
	Fast Disch	arge by Operator	Slow Discharge by Operato
Hardware	Quench Detector	Sof	tware Quench Detector
Coil 1	Coil 2	Pancake	e 1 🛛 🕘 Pancake 4
U2 U2 Fault	🕘 L2 🛛 🕘 L2 F		
Coil 3	Coil 4	Pancake CH 2 H	
U3 U3 Fault	●L3 ●L3 F		Voltage Right CL Voltage
Left Current Lead	Right Current Lea	ad	
●U1 ●L1	● U4 ● L4	Liqu	uid Helium Level
U1 Fault U1 Fault	U4 Fault	ault 🔹 🕘 Out of I	Range 🏾 🔵 Alarm 🖉 Faul
OD Sum OD Sum I	ault	Heli	ium Pressure
		Liqu	uid Nitrogen Level
Current Lead Mass Flows		Out of	Range 🥥 Alarm 🌑 Faul
Flow Left Too Low	Flow Right Too Lo	Nitr	ogen Pressure
Out of Range	Out of Range		
Flow Fault	Flow Fault	Vacu	ium Pressure
CL Tempera	ture	Pirani Fa	
CL Temperature First		Contam	
			Filament Over Voltage
Magnet T	emperature	HighAla	
T1 Too High			
T3 Too High	T4 Too High	For	ce Interlock
CC Error		Vert	
		Axia	al 🌒 Max 🌒 Min
Power Su	oply Interlock		

Screenshot of the SHMS Dipole Interlock CSS-BOY screen.

### EIC

<u>Brian Eng</u>

• Attended risk training provided by BNL along with meetings to update the risk registry

#### <u> DSG – Website Design</u>

Mary Ann Antonioli, Peter Bonneau, Aaron Brown

• Updating and standardizing all DSG Technical Documentation sections