

## **Detector Support Group**

We choose to do these things "not because they are easy, but because they are hard". Weekly Report, 2022-09-21

# <u>Summary</u>

### <u>Hall A – ECal</u>

Brian Eng, Mindy Leffel, Marc McMullen

- Started developing single supermodule heating test
- Working on Visio drawing of supermodules

### <u>Hall A – GEM</u>

Brian Eng, Marc McMullen

- Replaced I2C extender node in the hall and restarted full system
  - ★ Binary gas analyzer on-line for SBS
  - \* 73% argon measured over the weekend
- Updated DSG I<sup>2</sup>C extender circuit to include additional filtering on circuit output

#### Hall A - Gen-II

Mindy Leffel

• Replaced broken sensor on RTD cable

#### <u>Hall A – Moller</u>

<u> Aaron Brown, Brian Eng</u>

- Coil 3 prototype test
  - Unable to locate any of Nick's previous work (code—except copy of the coil test PLC code—documentation, hardware) Assisted with testing of prototype magnet coil #3
  - ★ The plan is to ramp the magnet coil to 700 A and monitor the temperature, pressure, and flow
- Debugged readout of pressure and flow transmitters
  - ★ Connected wiring of two pressure sensors and one flow meter to PLC
  - ★ The pressure sensors needed an additional wire (input) connected to the PLC channels
  - ★ Need to fix scaling formulas; all channels are configured to read as raw instead of engineering units
- Researched specifications for Automation Direct flow transmitter (fsa75-42-6h) and pressure transmitter (spt25-20-150D)

### <u>Hall A – SoLID</u>

Mary Ann Antonioli, Pablo Campero

- Completed modifications to *Solenoid Valve Setup* HMI screen
  - \* Added input controls for integral and proportional gain set points
  - \* Added input control and indicator for set temperature in heat exchanger
  - \* Added buttons to access Position Proportional screen



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SoLID_Solenoid_Valve Setup	
9/20/2022 4:19:40 PM Solenoid Valve Setup	
Valve Settings           Valve Timeout Time:         5         s         LVDT Max.         101.0           Deadband Max         300.0         %         LVDT Min:         6.2           Deadband Max         3.0         %         Max. Setting:         101.0           Min:         5.2         %         Max. Setting:         101.0	Hall A 4 K         Flow Limit Control           56         EPICS 4 K         Flow Limit: 60.00 g/s           56         PIC 4 K         Flow Limit: 60.00 g/s           56         Override Flow Limit: 60.00 g/s         4 K           56         Override Flow Limit: 60.00 g/s         4 K
Cryo Control Reservoir Valves	
JTV4 - Liquid Helium Top Fill Ltie Level Level Set Point: 2000 Integral Gain: 2000 Proportional Gain: 2000	JTV2 - Cooldown Supply           He Delta Temp         Posp           Integral Gain:         2000           Proportional Gain:         2000
JTV6 - Liquid Helium Bottom Fill LHe Level Flow POSP Integral Gain: 1000 Proportional Gain: 1000	EBV8 - Helium Warm Return           Open if He Pressure is > 1.90         Atm           Open if Magnet Temp, is > 9.00         K
JTV1 - Liquid Helium Cold Return           Close if Warm Return is > [44:30] % [POSP]           Pressure Set Point(120)           Integral Gain: [1000]           Proportional Gain: [1000]	JTV7 - Liquid Helium Lead Pot Supply           He Pressure         PosP           Integral Gain:         2000         Integral Gain:         2000           Proportional Gain:         2000         Proportional Gain:         2000
JTV5 - Liquid Nitrogen Top Fill LN2 Level POSP Level Set Point: 10000 % Integral Gain: 120001 Proportional Gain: 120001	JTV3 - Liquid Nitrogen Bottom Fill This valve is either open fully or closed. POSP No PID needed
Heat Exchanger Valves	
JTV9 - Heat Exchanger LN2 Supply Posel Temperature Set Point: 2200 K Proportional Gain: 1650	JTV10 - Heat Exchanger GHe Mix Temperature [POSP] Set Point: -2125 K Integral Gain: [0.330] Proportional Gain: [0.440]
He Level Status N2 Level Status Valve Operation Mode : Local	Click to Load to PLC Print

- Modified PLC code to control through PLC automatic mode the aperture of the nitrogen and helium mix heat exchanger valves
  - \* Added code to determine if heat exchanger is enabled
  - \* Configured one PID controller instruction per valve
  - \* Programmed the correct process variable, set point, and limits for PID controller
- Revised, reviewed, and reposted electrical drawings with cabling and connector changes

### <u>Hall B – RICH</u>

<u>Tyler Lemon</u>

• Writing instructions on how to remotely access hardware interlock system for debugging and rebooting

### Hall C – NPS

<u>Mary Ann Antonioli, Aaron Brown, Brian Eng, Tyler Lemon</u>

- Developing LabVIEW code for configuration file management
  - \* Completed code to read in default configuration file
  - ★ Working on code to generate the updated configuration file if input parameters have been changed
- Continued writing manual for Phoebus screens

### <u>Hall D – JEF</u>

<u>Mindy Leffel</u>

• Wrapped ten crystals



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## <u>EIC</u>

### Pablo Campero, Brian Eng, George Jacobs, Marc McMullen

- Beampipe test stand
  - \* Pressure system parts can be ordered
  - ★ Located self-adhesive surface thermocouples
  - ★ Updated heater design using mineral oil as the medium with screw-in immersion heater and thermostat; mineral oil is stable up to 300°C (572°F)

EIC Thermal Test Stand Concept 2



### EIC - DIRC

#### Tyler Lemon, Marc McMullen

- Compiling parts list for laser interlock chassis
- Used Multisim to design a circuit for laser interlock
  - ★ Uses logic gates to monitor for interlock conditions, such as door open or emergency stop button pressed
  - ★ If no interlock conditions exist, relay to laser is closed, allowing laser to be powered
  - \* Relays control a yellow beacon light to indicate that laser is powered
  - \* Contains a set-reset latch that will keep laser interlocked until system is reset via a push button
  - Includes a keyed switch to allow manual, local lock-out of laser with interlock system; prevents interlocks from being reset while one is working in laser controlled area
  - ★ Investigating how to have a 10-second delay between beacon turning on and laser being enabled; possibly use a 555 timer IC to implement delay



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- Started Laser Specific Lesson Plan for the DIRC He-Cd laser
  - Determined minimal optical density value for eye protection to be 5+, on a scale of 1 to 9; value refers to the amount of light transmitted through the optical lens, with less light as the number increases

#### DSG R&D - CS-Studio Phoebus

- Rebuilding Phoebus development system
  - ★ System drive for Phoebus development became corrupted
  - ★ Linux operating system reinstalled
  - \* EPICS, CS-Studio Phoebus, and support programs being reinstalled and compiled
  - ★ Backup of Phoebus configuration files, EPICS SoftIOC, and Kafka configuration files being used in the rebuild