

## Hall A - SoLID Magnet Control Systems – Meeting Minutes

**Date:** July 8, 2020

**Time:** 10:30 – 11:30

Attendees: Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng, Marc McMullen, Tyler Lemon, Steven Lassiter, Whit Seay

### 1. Motor Controller Relay (MCR) board and Constant Current Source (CCS) board status

- 1.1. Marc McMullen mentioned that CCS bare boards and components were picked up from the Lab and will be sent to Mindy Leffel to be assembled.
  - 1.1.1. Seven boards will be assembled.
- 1.2. Marc McMullen placed a purchase order (PO) for the MCR parts.
  - 1.2.1. PO signed by Stephen Wood and waiting to be signed by Purchase department.
- 1.3. Once the parts have arrived, the assembly of the MCR boards will be scheduled.

### 2. PLC programming status

- 2.1. Power supply (PSU) communication, control, and monitoring PLC routines will be re-used.
- 2.2. Steven Lassiter mentioned that PSU to be used for SoLID magnet during first stage of testing in the lab will be Hall C-HMS Quadrupole's PSU.
  - 2.2.1. Steve Lassiter will provide the specifications for the PSU.
- 2.3. Liquid levels and controller device for LHe and LN<sub>2</sub> were defined.
  - 2.3.1. Selected LM-510 liquid level monitor with dual sensor, which has the option of 4-20 mA and 0-10 V analog outputs for each channel.
  - 2.3.2. Pablo Campero will be changing the existing PLC code in CLEO II PLC to monitor and control both liquid levels probes.
  - 2.3.3. Liquid level probes and controller will be ordered by Steven Lassiter.
- 2.4. JT Valve control status
  - 2.4.1. Spreadsheet containing PID parameters and conditions to control the JT valves is being developed by Brian Eng.
    - 2.4.1.1. Spreadsheet will be used as a reference document to ensure proper controls for each JT valve and EV in the Cryo Control Reservoir (CCR).
- 2.5. Heat Exchanger instrumentation controls and monitoring status
  - 2.5.1. Pablo Campero added temperature sensors readout and error handler.
  - 2.5.2. Steve Lassiter mentioned that PLC code to control JT valves has been added in PLC.

### 3. HMI programming status

- 3.1. Pablo Campero modified *Axial and Radial Supports Expert* HMI screen.
  - 3.1.1. Added feature to make the support's fault indicators invisible when faults are not present.
- 3.2. Reviewed first version of the *CCR HMI – Expert* HMI screen.
  - 3.2.1. Added HX instrumentation to base *CCR* HMI screen.
- 3.3. Reviewed *JT Valve Page* HMI screens status.
  - 3.3.1. First version of screen completed for seven JT valves.
  - 3.3.2. HMI screen to control Helium Warm Return valve is in progress.
  - 3.3.3. Pablo Campero will check “Automatic” and “Manual” mode operations performed by the screens.
- 3.4. Agreed to develop HMI screen to monitor and control instrumentation in the current leads.

- 3.4.1. Instrumentation: temperature sensors, mass flow sensors, and voltage taps.
- 3.4.2. Potentially, developed *Solenoid Neck Temperature Sensors* HMI screen could be modified to be used to monitor and control current lead instrumentation.
- 3.5. Agreed to add current readout to all developed HMI screens.

#### 4. CSS-BOY screens

- 4.1. First version of *CCR CSS-BOY* screen completed by Mary Ann Antonioli.
  - 4.1.1. Tyler Lemon mentioned that screen was tested.

#### 5. Instrumentation status

- 5.1. Reviewed pictures of the instrumentation in place at JLab.
  - 5.1.1. Vacuum feedthroughs and D-25 connectors located at the end and inside the magnet's turret.
  - 5.1.2. Whit Seay will share pictures with DSG.
- 5.2. Signal conditioners will be used for the voltage tap readouts.
  - 5.2.1. PLC will be secondary protection system when voltage tap readouts are out of the set thresholds.
- 5.3. Cooldown procedure status
  - 5.3.1. Whit Seay sent differential temperature parameters during cooldown.
  - 5.3.2. Cooldown procedure will be very similar to Hall C HMS procedure, except for the consideration of Oxford (magnet manufacturer) manual's recommended parameters.
  - 5.3.3. Steven Lassiter suggested becoming familiar with the Hall C HMS cooldown procedure since it is similar to the planned SoLID magnet cooldown operations.

#### 6. Electrical drawings status

- 6.1. Completed most requested modifications for the already developed drawings.
  - 6.1.1. Modified drawings were posted on DSG website.
- 6.2. Need to consider the best way to handle the internal wiring bundle in the magnet.
  - 6.2.1. Wiring for a few sensors are connected to different feedthrough connectors and this makes a messy cable split coming from the magnet to the local instrumentation rack.
    - 6.2.1.1. Some temperature sensor wires between the first internal connector and the vacuum feedthrough go to different connectors.
- 6.3. Agreed that the *Sensors Wiring Diagram* drawings should be put on hold until we can find a way to improve wiring in the vacuum feedthroughs so all cables and connections are not messy in the terminal strips. Need to review drawings:
  - 6.3.1. A00000-16-03-0450
  - 6.3.2. A00000-16-03-2350
- 6.4. Completed drawing A00000-16-03-1250 – Linear Motor Actuator for JT valves.
  - 6.4.1. Steven Lassiter will check the drawing and make any necessary comments.
- 6.5. Agreed to work on *Parts List* and *Rack layout* drawings.