

Hall A SoLID Magnet Control Systems Meeting Minutes

Date: August 5, 2020

Time: 10:30 – 12:00

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

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

- 1.1. Marc McMullen is reviewing design of MCR board.
 - 1.1.1. Verifying dimensions and thickness of traces and bus to make sure that they can handle the load when 12 relays are energized at same time.
- 1.2. CCS boards and components are located at Marc's house.
 - 1.2.1. One of eight boards has been assembled.
 - 1.2.2. Planning assembly of remaining boards.

2. PLC programming status

- 2.1. Steven Lassiter confirmed Flex I/O communication system to be used between Danfysik PSU and PLC.
 - 2.1.1. Controlnet adapter, 24 V power supply, and ASCII module will be same models and brands as those used for SHMS control systems.
- 2.2. PLC code for LHe and LN₂ sensors readout was modified and checked by Pablo Campero.
 - 2.2.1. Verified channel configurations to read 4–20 mA analog signals.
 - 2.2.2. Steven Lassiter confirmed there will not be an interlock based on LN₂ level; only warning and alarm are required.
 - 2.2.3. Interlock's logic for LHe level is same as HMS PLC logic.
 - 2.2.4. Interlock and alarm thresholds for LN₂ and LHe levels will be entered by user from expert HMI screen.
- 2.3. Whit Seay will look into details of heaters that are part of sorption system on magnet's coil shell.
 - 2.3.1. PLC code and necessary hardware will be added to control and monitor heaters.
- 2.4. PLC code to control and monitor heaters on current leads (left and right) will be added.

3. HMI programming status

- 3.1. *JT Valve Page* HMI screen in progress.
 - 3.1.1. Pablo Campero checked "Automatic" and "Manual" mode operations performed by the HMI screen.

4. Instrumentation status

- 4.1. Steven Lassiter confirmed liquid level probes and controller have been ordered.
 - 4.1.1. Spreadsheet with updated PO numbers will be shared with DSG.
- 4.2. PLC rack layout drawing is under development.
 - 4.2.1. Timing and relay devices used to monitor PLC heartbeat must be moved from PLC rack to instrumentation rack.
 - 4.2.2. Assigned location for PLC chassis.
 - 4.2.3. Decided on location of 24 V and 5 VDC power supplies in rack.
 - 4.2.4. Steven Lassiter suggested an increase in vertical space between PLC remote 1 and PLC remote 2 to facilitate access for wiring to and from modules.
 - 4.2.5. All modifications of rack layout will be done by Pablo Campero.

- 4.2.6. Flex I/O modules must be relocated to instrumentation rack.
- 4.3. Instrumentation Rack drawing status.
 - 4.3.1. Since it is unknown how many wires (two, three, or four) that temperature sensors AST1a, AST2, AST4, CU1, and CU2 have, decision was made to allow four connection points for each sensor (V+, V-, I+ and I-) in determining number and type of terminal blocks to be used for them.
 - 4.3.2. Confirmed that PT-100 and diode temperature sensors located at CCR are four-wire sensors.
 - 4.3.3. Decided on labeling for terminal strips in rack.
 - 4.3.4. Added terminal strips for axial and radial support sensors. Terminal strips are not shown in instrumentation and controls (I&C) spreadsheet provided by Steven Lassiter.
 - 4.3.5. Confirmed addition of terminal strips for miscellaneous sensors (mass flow, vacuum, and pressure sensors) that are not part of I&C spreadsheet.
- 4.4. Parts list is progressing along with rack layouts.
 - 4.4.1. Most of required instrumentation will be shown in the instrumentation and PLC rack drawings being developed.
- 4.5. Updated I&C spreadsheet will be shared with DSG by Steven Lassiter.

5. Electrical drawings status

- 5.1. Steven Lassiter suggested changes on drawing numbers used for each group.
 - 5.1.1. For example, keep all PLC I/O modules wire diagrams in the same group of hundreds (301, 302, 303...).
 - 5.1.2. Changing drawing numbers would involve changes on completed drawings.
- 5.2. Drawing A00000-16-03-1250 needs to be modified.
 - 5.2.1. Add heat exchanger JT valve's motors control wiring.
 - 5.2.2. Decided to populate first 20 relay channels and keep last four relay channels as spares.
- 5.3. Reviewed completed drawings.
 - 5.3.1. A00000-16-03-1950
 - 5.3.2. A00000-16-03-1750
 - 5.3.3. A00000-16-03-2800