Hall A - SoLID Magnet Control Systems – Meeting Minutes

Date: May 6th, 2020
Time: 10:30 – 11:40

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

1. *Constant Current Source* (CCS) boards status
    1.1. Received and stored board components
    1.2. For now, the assembly of the boards is in hold since components are located in the lab

2. Motor Controller Relay board status
    2.1. Layout and mounting halls design for the board in progress.
    2.2. Understanding JT valve controls and monitoring, DSG developed an overview diagram
    2.3. Steven Lassiter confirmed:
        2.3.1. JT valves to be used for SoLID are the same as used for the Hall C magnets
        2.3.2. Maximum current draw is 2.0A for JT valves. Recommend 24Vrelays be rated at ~2.2A.
    2.4. Steve Lassiter mentioned that some relays required for the board (shown in the on hand board as: RD2N-1U, part obsolete/discontinued) are at the lab and could be hold by Jack Segal or Heidi Fansler.
        2.4.1. If relays are not available, Marc McMullen will find suitable replacement.
    2.5. Marc McMullen will look into the estimated cost for the bare boards and components required.
        2.5.1. The number of boards to be assembled will be based on this cost estimation.
        2.5.2. One board with 24 relay channels allows connection of 12 JTV motors.
        2.5.3. Board will be used to control at least 10 valve motors.

3. PLC programming status
    3.1. Agreed that independent liquid level probes will be used to measure liquid levels for LN2 and LHe levels.
        3.1.1. Liquid level probes and monitors has not been defined yet.
        3.1.2. SoLID magnet will use similar, but improved probes and monitors as Hall C Magnets to allow independent readouts.
            3.1.2.1. Model LM-500 is used for Hall C magnets, this only allows one probe to be monitored at the same time.
            3.1.2.2. Brian Eng suggested to use a liquid level monitors LM-510, which has dual sensor.
    3.2. Implementation of hall probes for SoLID are not defined.
        3.2.1. Just in case, defined PLC channel to read hall sensor.
        3.2.2. Probably, PLC regulation routine will not be needed, so it could be removed.
    3.3. For the JT Valve controls, PLC module and channels assignment for the LVDT readouts signals were changed by Steven Lassiter.
        3.3.1. LVDT readout signals in the IF16 PLC module were changed from its single mode to differential mode.
        3.3.2. Pablo Campero will modified PLC code to match the changes done.
        3.3.3. Based on the modifications, an additional IF16 PLC analog input in Remote 2 PLC chassis will be required.

3.3.4. Brian Eng will add the additional IF16 PLC module (only software addition, faults generated after addition of the module will be inhibit) to the PLC program so PLC programming modification can continue.

4. HMI programming status
    4.1. Reviewed modifications requested by Steven Lassiter for Cryo Control Reservoir (CCR) HMI screen developed by Pablo Campero.
        4.1.1. Agreed that six EPICS process variables will be added to the screen.
        4.1.2. The six PVs from Cryo Plant are used to monitor pressure and consumption rates for 300 K Gas He, LHe Supply and He Warm Return lines.
        4.1.3. Average temperature of the magnet coils and radiation shield needs to be added to the screen.
        4.1.4. Current readout must be added to the screen
        4.1.5. The correct labels for the JT valves will be modified on the screen after confirmation is done by Steven Lassiter.
    4.2. Agreed the following changes to be done in Neck Temperature screen
        4.2.1. Remove statistics box (average, min, and max values) from the screen.
        4.2.2. Add flow readout indicators for the leads.
        4.2.3. Add indicator to show current readout.
    4.3. Information to form the group of trends for Radial/Axial Forces HMI screen is not available.
        4.3.1. Whit Seay informed that documentation/manuals to review are in the lab.
        4.3.2. Revision will be made once the Lab is opened.

5. Instrumentation status
    5.1. Reviewed *Controls-Cleo-Rack-Layout* spreadsheet.
        5.1.1. 1756-IV16D module was added by mistake, this is not needed.
        5.1.2. Rack Termination Cabling sheet contains information from Hall C magnets, which can be used as reference for the SoLID
        5.1.3. Possible addition of signal conditioner for liquid levels.
    5.2. JT valve names/numbering need be checked by Steven Lassiter prior to modification of the drawings, documentation, PLC and HMI programming

6. Electrical drawings status
    6.1. Agreed the following changes:
        6.1.1. Drawing A00000-16-03-0450 – Change labels for signal conditioners model.
        6.1.2. Drawing A00000-16-03-2350 –Wire colors are in the wrong side of the vacuum feedthrough, they need to be moved.
        6.1.3. Drawing A00000-16-03-0600 – Move Mass Flow LCL to sheet # 2.
        6.1.4. Drawing A00000-16-03-2400 –Steven Lassiter will check terminal strip connections.
        6.1.5. Drawing A00000-16-03-2600 – Mass Flow LCL and RLC could change once the mass flow meters are defined.
        6.1.6. Drawing A00000-16-03-2600 – Add Warm Return Motor control wiring.
        6.1.7. Drawing A00000-16-03-1150 – Add Warm Return LVDT/Macro Sensor readout wiring.
        6.1.8. Drawing A00000-16-03-1200 – Add connection node for Warm Return valve, change Grayhill 8 position selector by a 12. DSG will look into the one available and drawing will be modified based on this.
        6.1.9. Drawing A00000-16-03-0450 –Some of the wire bundles from vacuum feedthroughs to terminal strips have one wire as part of the other wire bundle, this is the real connection due to the internal wiring.

6.1.9.1.   With Seay will evaluate the possibility of re-wiring this connections once the access is allowed.