Hall A – Magnet Controls System for SoLID – Meeting Minutes

Date: November 5, 2019
Time: 14:00 – 15:00

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

1. Steven Lassiter shared the Gantt chart to describe planning and schedule of the SoLID project
    - 1.1. Project comprises two main stages:
        - 1.1.1. First: Testing of the SoLID magnet in the test lab at low current ~ 100 A.
        - 1.1.2. Second: Final commissioning in Hall A.
    - 1.2. Project is expected to be completed between 18 to 24 months.
    - 1.3. Provided a detailed breakdown of the software and hardware tasks assigned to DSG

2. Development of electrical and controls drawings requested to DSG for the SoLID magnet control systems.
    - 2.1. Currently, there is not any SoLID electrical and controls drawing.
    - 2.2. Drawings will be developed based on the Hall C-SHMS controls system drawings.
    - 2.3. Format, labels and nomenclature for the drawings will be based on JLab convection.
    - 2.4. Copy of the SHMS AutoCAD files will be shared with DSG.

3. SoLID magnet hardware task information.
    - 3.1. Temperature, strain gauges and voltage taps sensors have been already installed in the magnet.
    - 3.2. Whit Seay will provide a drawing with the location of the strain gauges sensors.
    - 3.3. Re-calibration for the axial strain gauge/load cell will be required.
        - 3.3.1. Axial load cell will be installed outside the magnet.
        - 3.3.2. Radial load cell are already connected inside the magnet.
    - 3.4. SoLID cryogenics service tower will be built off-side of JLab, and will required additional temperature sensor readouts (x8) in the proposed PLC control systems.
        - 3.4.1. Current proposed PLC control system has one local PLC chassis (controller and communication modules) and one remote PLC chassis (I/O modules).
        - 3.4.2. To add temperature sensors, it will be required the addition of an extra PLC remote chassis. Flexible controls design based on the needs along its implementation.
    - 3.5. Agreed that DSG will developed Layout of PLC rack controls and instrumentation rack.
        - 3.5.1. Spare rack from Hall A/Hall C will be used for SoLID magnet control systems.
            - 3.5.1.1. Control system will be deviated in two racks: PLC controls rack and instrumentation rack.
        - 3.5.2. Suggested to contact Jack Segal/ Joe Beaufait to procure more information about available racks and side panel racks to be used.
        - 3.5.3. CAD drawings for the controls rack will be generated based on actual specs of the available rack.
    - 3.6. There is not redundant temperature sensors installed in the magnet.
    - 3.7. Feedthroughs connectors, terminal blocks, terminal strips and wires for the sensors and instrumentation will be re-used/bought as needed.
    - 3.8. Custom/fabricated cable for any instrument and sensor would be avoid based on optimization of the time/effort.

3.9. Final labels/names for the sensor sensors and instrumentation cables are showed in the spreadsheet provided by Steven Lassiter.
3.10. Steven Lassiter requested the assembly and soldering for *Constant Current Source* boards and *Motor Driver control* boards.

4. Steven Lassiter mentioned that most of the hardware components to be used during the testing of the SoLID magnet in the test lab (first stage of the project) will be reused and adapted.
    4.1. Spares available from Hall C controls will be use to perform initial test of the SoLID control system.
    4.2. Agreed to generate part list reflecting hardware components status.
        4.2.1. Parts list will contain information of the instrumentation, sensors availability/in hand or order, estimated time to be received at the Lab, and location.

5. Software tasks assigned to DSG; PLC and HMI programing.
    5.1. Steven Lassiter will contact EECO technical support to fix firmware upgrade issues for the I/O high speed module, which could be used for the SoLID magnet voltage tap readouts
        5.1.1. Found issues with high speed I/O PLC module during firmware upgrade from rev. 1.4 to 3.5. Firmware version 1.4 allows a max RTS of 400 µs, compared with the firmware 3.5 version with a max RTS of 300 µs.
        5.1.2. PLC code to read voltage tap measurement will be developed by DSG.
        5.1.3. Functional high speed I/O PLC module from SHSM/HMS test station will be use to continue with the developing/testing of the PLC code.
    5.2. DSG will start with PLC routines for the sensor readout and instrument controls.
        5.2.1. Instrumentation/sensor spares in hand/available will be used to test developed PLC code.
    5.3. PLC-HMI screens development requested to DSG.
        5.3.1. License's availability will be checked by Whit Seay, so then DSG will be able to use Factory Talk View (HMI software).
    5.4. Researching of faster and reliable communication options between PLC and magnet power supply requested (e.g. Ethernet TCP/IP).

6. Other topics
    6.1. Pdf version of Gantt chart with details on the schedule and work weight will be shared with DSG.
    6.2. Pablo Campero will create a common folder to be placed in the M: Drive.
        6.2.1. Shared folder will be protected and allow access only to assigned DSG members and Hall A staff involved.