

# DSG-SoLID Magnet Controls Meeting Minutes

**Date:** July 21, 2021

**Time:** 11:00 – 12:00

*Attendees:* Aaron Brown, Peter Bonneau, Pablo Campero, Brian Eng, George Jacobs, Tyler Lemon, Marc McMullen, and Whit Seay

## **1. Completed modification of electrical drawings**

*Mary Ann Antonioli and Pablo Campero*

1. A000000-16-03-0260 *CCR Valves LVDT Wiring Diagram*
  - Changed cable colors to match selected cable
  - Combined seven 2-conductor cables into one 20-conductor cable
2. A000000-16-03-0313 *PLC IO, Remote B, Slot 3, Wiring Diagram*
  - Combined seven 2-conductor cables into one 20-conductor cable

## **2. Completed two new electrical drawings**

*Mary Ann Antonioli and Pablo Campero*

1. A000000-16-03-0314 *PLC IO, Remote B, Slot 4, Wiring Diagram*
2. A000000-16-03-0504 *HX Valves LVDT Wiring Diagram*

## **3. Drawings in progress**

*Pablo Campero*

1. A000000-16-03-0350 *Power Supply Terminal Strips*
  - Determining number and ampacity of circuit breakers required to protect 24 VDC and 5 VDC power supply circuits
2. A000000-16-03-0100 *Instrumentation Control Panel - Rear Layout*

## **4. Power Requirements for instrumentation**

*Pablo Campero*

1. Reviewed generated tables with power requirements for 5 VDC and 24 VDC circuits
  - Two basic functions of the circuit breakers should be considered
    - Control for turning a device on and off
    - Protect an electrical circuit from damage caused by overcurrent/overload or short circuit
  - Based on calculations, some devices should use a circuit breaker other than 2 A, such as a 0.5 A circuit breaker to protect Dataforth signal conditioning modules required for voltage tap sensors
2. Need to define current excitation for radial and axial supports' load sensors
  - Dataforth modules require 170 mA (full excitation load) or 70 mA (no excitation load) from 5 VDC power supply. For calculations, assumed 170 mA for all load sensors
3. Evaluated required components to read out the mass flow controller signals in the PLC
  - From the specifications, mass flow controllers allow 0-5 VDC analog output for mass flow rate readout
  - Need to confirm if Dataforth signal conditioning modules will be used between the mass flow controllers and the PLC ADC input
4. Need specifications for motor drives
  - Is 2 A the maximum current that can be considered for the relay contacts to control motor drive valves? If yes, then based on assumed safety factor (1.25), a standardized 3 A circuit breaker should be used

## 5. Cables for SoLID magnet instrumentation

*Pablo Campero, Brian Eng, and Marc McMullen*

1. Reviewed cables selected to connect voltage taps, macro sensors, and valve motor drivers
  - Updated *Cable List* spreadsheet; added total length required for each cable type
2. Ordered cable (rated for 600 V) required to connect voltage tap signal readouts from the terminal strip to the Dataforth signal conditioning module
3. Discussed voltage input specifications of Dataforth signal conditioning modules
  - Need ensure that modules can handle voltages produced by the magnet during a quench
  - Verified specifications for Dataforth modules that will be used for voltage tap readout
    - Reviewed transient rating code ANSI/IEEE C37.90.1. in ANSI-IEEE issued on 2002; waiting to check the same code specification on the most current issued ANSI-IEEE manual
4. Added cable 261-01 and 261-02 to *Cable List*
  - Cable 261-01 connects macro sensors output or transmitter (EBV8) to 12-position switch (for local readout of valve position)
  - Cable 261-02 connects macro sensor output voltage to 12-position switch

## 6. Milestone dates

1. SoLID low current test (100 A) at the Test Lab is planned for the end of 2021
  - All instrumentation checkout should be done prior to the test
2. Cooldown review date is to be determined