Answers/clarifications for questions in SoLID Magnet Controls System Meeting Minutes of April 7, 2021

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**2. Electrical drawings in progress**

3. Checking the total number of 2-amp breakers in drawing A00000-16-03-0350, 24 VDC and 5 VDC Power Distribution. Answers needed to the following:

 Is it right to connect two CCS boards to a single breaker? **Yes, the current draw due to two boards should be low enough for this. In addition, the breakers act as disconnect to allow for component replacement on the boards while the rest of the control system is operating.**

 Can two valve drive motors be connected to a single breaker? **No, more than one valve will be operating at a given time. The valves can draw upwards to 2A each. Putting more than one drive motor on a 2A breaker runs the risk of unnecessary trips. Also having a single breaker per valve makes finding a faulty motor quicker, helps in trouble shooting.**

 Is there any reason to use 24 VDC power supply only for the valve drive motors? **Yes, due to the large current draws of the motors and frequent switching on/off. A separate, cleaner 24V power supply is recommend for I/O and other sensors.**

 Will a single breaker protect all macro sensors? **Yes, this should be ok. The single breaker can still be used as a disconnect switch for the bank of macro sensors if one goes bad and needs to be replaced. One would then just place the valve controls in local mode so that the auto mode does not try to open/close other critical valves while the breaker is turned off and the LVDT readbacks go to zero.**

**4. Researching temperature and voltage taps cable**

*2.* Discussed specifications required for voltage taps cable

 Reviewed drawing *A00000-16-03-0401 Voltage Tap Cable Diagram* and information given in *Control CLEO* spreadsheet **I have not checked this drawing yet.**

Three 10-pin vacuum feedthroughs are used to wire the internal voltage taps. **NO, only one 15 pin cable is need for the voltage taps and the FL taps.**

Cables will connect with a 10-pin vacuum feedthrough at the magnet end and to the terminal strip at the instrumentation rack. **NO, the single 15 pin cable will connect to the voltage tap protective resistor box located close to the Current lead turret vacuum feed thru. This connection will be a terminal strip inside a protective box housing 200K ohms resistors in series with each tap. See the excel spreadsheet Controls-CLEO, under the tab Voltage taps.**

Two wires will be needed for VT6 and VT7 voltage taps, located at warm end of current leads; will not connect with any of the three 10-pin vacuum feedthroughs. **Correct, but these will be short lengths wires that go from the warm end of the current leads to the protective resistor box. Then they will be part of the single 15 pin cable going to the I/O rack.**

 Need to determine cable lengths. **~70 foot cable length is all that is needed for the test lab configuration. At the ends of the magnet ,the 5G field zone is ~10m away from the magnet at 100A. Along the sides it is only 7m away. If a larger reel of cable (1500ft vs 1000ft) and the quantity of cables allow for longer length, say 75 feet, that is okay. A 1,000 foot reel will provide about 15 cables of 65 feet which is also okay or 14 cables of 70 feet. We can make any of these options work.**