

## PROJECT SITUATION REPORT DISC Drill 2011-12 Season

**Project:** T-350-M

**Project Principal Investigator:** Dr. Charles Bentley

**Report No.** 9      **for period:** 1-8-12      **through:** 1-14-12

**Prepared by:** Jay Johnson      **Date:** 1-15-12

### **IDDO Personnel Onsite:**

Kristina Dahnert (departed WSD on 1/9/12)

Josh Goetz

Mike Jayred

Elizabeth Morton

Paul Sendelbach (departed WSD on 1/9/12)

Chuck Zander

Chris Gibson

Jay Johnson

Nicolai Mortensen (arrived at WSD on 1/9/12)

Steffen Bo Hansen (arrived at WSD on 1/10/12)

### **ACTIVITIES DURING PERIOD**

- Krissy and Paul departed WAIS on Monday. They were scheduled to fly to CHC on Wednesday. However, due to flight cancellations they are still in MCM.
- Nicolai arrived at WAIS on Monday.
- Steff arrived at WAIS on Tuesday.
- The power up issue with the I<sup>2</sup>C buss has been resolved with a hardware and software delay. The fix has been implemented on both instrument sections and the engineering model.
- The entire replicate drill was assembled on the bench.
- On the initial run down the hole, the pump quit working after just a few minutes of operation. Instrument section (section K) was removed and section L was swapped in. The screws retaining the heat sink bracket for the pump MDPU were found loose which resulted in a component burning out. This section has since been repaired and is fully operational.
- The replicate drill was configured with six screens and the broaching head and then lowered to 2500m (the highest borehole inclination is at ~1900m) to test the function of the spring loaded bumper. The screens came back empty. This means we have the bumper springs set high enough to keep the head from scraping the bore wall on the way down.
- A broken hall sensor wire for the cutter motor was found in the compensator piston of motor section Z. We were able to repair it without taking the motor section apart.
- We have been busy testing the actuators and making modifications to the firmware and LabView code. Through testing we have found the need to implement correction factors for each of the actuator arms so they each provide equal force for a given setting. Each actuator arm also requires a slightly different

amount of current to initiate movement. An offset has been implemented so all arms start moving at the same setting on the control.

- A software feature has been added that allows the actuators to keep the drill on a set compass heading even if the upper sonde rotates while doing a deviation.
- I gave several arch tours this week. The groups included an Air Guard flight crew, Deborah Roth, Dawn Needham, and several camp staff.
- The fluid tanks were filled and the hoses going between the tanks and arch were dug out.
- Tested the ability of the drill to find the high side of the hole. This was done using one and two actuator sections. Both methods work well. We also tested the repeatability of the system by raising or lowering the drill and then bringing it back to its original position and then repeating the test. We are confident we can find the high side of a hole within  $\pm 25^\circ$ .
- The fail-safe mechanism on three of the six actuator arms was tripped during testing. This happened prior to implementing the force correction factors. All arms have been fitted with tighter springs to increase their capacity by 20%. This configuration was tested in Madison and is still within our safe working limits.
- Mike and Elizabeth started Eclipse drill training and testing. The drill is set up and they are currently at 15m. Steff helped get the drill dialed in and cutting properly.
- The Glassman would not power up on Saturday morning. After some troubleshooting we found one of the arms on the three pole breaker switch had broken off. We were able to make a repair and get it running again. Our back up unit is being shipped in from MCM in case it is needed.
- New transceivers for the borehole camera system are in transit and should arrive at WAIS next week. The current units were found to have been ordered incorrectly. As a backup, a digital video recorder that writes to a SD memory card has also been ordered and is in transit. With this unit we would not be able to see the video real time because the recorder would be in the down hole pressure vessel.
- Josh started testing the prototype hand auger.

## SAFETY

- The weekly PM check list was completed.
- I did a thorough inspection of the winch system and tower hydraulics. Two hydraulic hoses that move with the tower are starting to rub on one of the drip pans. This is due to settling of the firm. We adjusted the drip pan to prevent further abrasion.
- Adjusted the pressure relief valve for tilting the tower vertical. Due to the shorter replicate drill and one meter of truss removed from the tower, the balance of the hydraulic system was off and it could not move the tower off of horizontal.
- A test of the winch E-stop system was conducted.
- The handrail between the control room and winch pit was attached to the control room to make it more secure. When making and breaking barrel connections operators lean on the rail so we wanted to make sure it wouldn't fail.

## COMMENTS

### (Problems, Concerns, Recommendations, Etc.)

- The Piston Bully has been repaired.
- We have been asked by Julie Palais to reduce the amount of Comm Air allowance we have requested due to the delays with the Vessel this season.
- Yesterday Nicolai and I noticed a new sound coming from the large winch motor. We don't have a diagnosis yet, but we are concerned it may be a bearing. We will be watching it closely this coming week.