



PROJECT SITUATION REPORT DISC Drill 09-10 Season

Project:	T-350-M				
Project Principal Investigator:	Dr. Charles Bentley				
Report No:	7	for period	12-21-09	through	12-27-09
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ACTIVITIES DURING PERIOD

- The new tool made to remove the screen cleaning valves has worked so well so as to loosen and break off the 'T' portion of the valve handle. Both of the handles have been welded back on and work well.
- Filled bulk fluid tanks twice this week. Three more Air Force pallets (48 drums total) of Isopar K are staged in McMurdo and ready for a flight to WAIS Divide. We will then have enough fluid onsite to finish this season and drill two weeks next season.
- Winch speeds have now reached 1.2m/s on descent and 1.6m/s on ascent. We are still slowing down for the misaligned wraps on the winch drum.
- Our biggest concern this week is inclination of the borehole. While last season saw a dramatic rise up to 3.5°, we are now up to just over 5° and are quickly working to alleviate this increase. Some fixes attempted include:
 - Removing the stabilizers at the top of the core barrel, as these likely only serve to keep our inclination increasing at the current rate, but would not allow us to regain vertical.
 - The core dog cages on the currently in-use J2 cutter head have been taken down .030" from the original .019" clearance that Jay had machined them. Current clearance to the borehole wall is .049". This was done in two separate machinings (.010" and .020").
 - The small collars and screen spacers used during our attempts at using the screen fill tubes have been re-inserted. On the collars, we have re-introduced the stabilizers removed from the top of the core barrel. This collar was then inserted between sections four and five on the top of the screen barrel and above the center of mass of the drill. The thought is that giving the

cutter head more clearance, putting stabilizers above the drill's center of mass and reducing the probable bowing of the drill in the hole will allow the drill to head back towards vertical.

- We have been stopping 15m from the bottom each run, turning the cutter up to 100rpm and reaming down to 0.3m from the bottom.
- We have been running with very low penetration speeds, between 1.3-1.5mm/s.
- All of these efforts seem to have deterred an increase in inclination for now, but the issue is being monitored at all times.
- At the beginning of the week, we had been doing 12 runs per day with total core production of 40m per day. This has been scaled back to 20m per day in light of the inclination problem and subsequent extended run times.
- The crown sheave has again started to make a slight knocking noise after core break. Only a few knocks are heard per run and are not as loud as those heard last season. The noises seem to dissipate after a few hundred meters of travel.
- The drill depth passed that of sea level early Wednesday morning!
- We are still using rear button shoes, but various heights have been tried. We are currently using .186" shoes (includes .010" shim). This limits penetration speeds to between 1.3-1.4mm/s, but allows weight-on-bit (WOB) to remain light.
- All 930m of core drilled last season, including all of the brittle ice, is now in McMurdo. Approximately 500m of ductile ice from this season will also be shipped out. This will max out the amount of core the SafeCore containers can transport this season.
- Christmas was celebrated on Friday night, 12/25/09. The cooks again outdid themselves and a white elephant gift exchange was enjoyed by all. Each shift moved their day off to accommodate the camp's schedule.
- Final driller's depth for the week: -1800.212. Total meters drilled this week: 169.045.

SAFTEY

- The DISC Drill air monitor began registering 'Trouble' early in the week. The sampling lines were unplugged for two days and re-inserted. Residue in the lines may have been the culprit, as they have now dried and the monitor is functioning well.
- The NICL air monitor is still registering 'Trouble'. We will now use one line from the DISC monitor to run samples from the NICL side. We are confident, after 3+ years of data, that vapor levels during operations on both sides of the Arch are permissible and safe.

COMMENTS

(Problems, Concerns, Recommendations, Etc.)