PROJECT SITUATION REPORT

Project:	DISC Drill Test-Summit Greenland				
Project Manager:		Alex Shturmakov			
Report No:	9	**For period:**	6-19-06	**through**	6-24-06
Prepared by:	Jay Johnson			**Date:**	6-25-06

Weather Conditions: Temperature range –21°C to -8°C, wind 3 to 30 knots.

ICDS Personnel on Site:
Jay Johnson
Kristina Dahnert
Michael Jayred
Bill Mason
Nicolai Mortensen
Paul Sendelbach
Scott Haman
John Fowler

Other Personnel on Site:

ACTIVITIES DURING PERIOD

- Drilling – This week we drilled a total of 160.311 meter. The bore hole depth is 618.85 meters. The average core length was 2.42 meters. The longest core drilled in one trip was 2.67 meters. Three cores were drilled with an average length of 4.155 meters from a depth of 458.54 to 470.91 meters. They were drilled by removing the core dogs for first 2 meter run and then replacing them for the second run. All three cores were pushed from the core barrel in one piece. Drilling cores with this method is more difficult and risky than drilling a single 4 meter core because the drill must be rethreaded over the first 2 meter core. The drilling of these three cores has proved the DISC drill is capable of retrieving high quality 4 meter cores in one piece. These cores went to NICL for the ductile ice acceptance test. All cores drilled this week have been made available to NICL for setup and testing of their equipment.

- Cutter head and core barrel – I modified one of the cutter heads by opening up the cutter windows. We wanted to see what effects changing the fluid flow around the cutters would have on drilling. After several drill runs it was concluded that we saw no change in core length, quality, or chip collection. Up until now we have been drilling without the first core sleeve in the core barrel. The core sleeves started about 31 cm up from the cutters. We tried adding the first sleeve which extends down to the face of the cutter and found it caused the cutter head to plug with chips within the first .4 meters of coring. With the latest configuration we have core sleeves down to with in 6.3 cm of the cutters and this is working well. Another modification I did was to add more relief to the inside edge of the cutters (the edge of the cutter that is closest to the core). The added relief eliminated a white colored 45° helix pattern we were seeing on the

outside of the cores and also reduced the quantity of small surface fractures. Over the past week we also tested the three different height shoes (.6 °, .8°, and 1.2°) we have for the cutter head. All cores drilled during the shoe tests were of very similar quality. The only visible difference was the change in pitch. Our preferred drilling parameters are the cutter set at 80 rpm with a starting feed rate of 9.5 mm/s and the pump running at 2100-2300 rpm. This sets a good balance between motor current draws and drilling speed.

- Winch tests – As I have written over the past weeks, when we run the winch at .7 m/s the level wind drive faults out sporadically. With technical support from Madison Paul confirmed controller parameters and running feed back data. Everything looked to be set and operating as it should, yet every now and then the system would fault. On Friday we ran tests with the winch running at higher speeds to monitor how the level wind was tracking the winch drum. We ran the winch tripping down at speeds up to 1.4 m/s and tripping up at speeds up to 2.0 m/s. No faults were incurred. Depending on which way the level wind is being loaded the carriage bounces around a bit upon winch start up. The lead screw also makes creaking noises (ie. Stick-slip between the screw and nut) when the level wind changes direction despite the screw having proper lubrication. This is due to the pore design of the level wind section. These symptoms will most likely get worse with time. Other than these observations the winch ran smoothly.

- Instrument section K – We have been running instrument section K all week with out any problems until we did the winch tests. After concluding the winch tests we went to do a drill run and found the pump motor controller wouldn't talk to the computer. The cutter motor was working fine. After several attempts to establish communication the drill was pulled up and the instrument section was removed. Upon removal of the bulk heads we found four out of five of the Glenair electrical feed thoroughs were leaking internally. The inside of the instrument section was completely wet with Isopar-K. I would guess an ounce or two of fluid had gotten in. Worse yet there was visible signs and smells of burnt electrical components. Nicolai removed the electronics and did a full diagnosis. He found the OVP circuit of the MPS and the filter capacitors on the cutter motor driver board had destructively failed. He determined that the electronic failures were not due to the Isopar-K leak but rather the drilling fluid back driving the pump during the during the winch tests. The pump motor effectively turned into a generator back feeding power into and overloading its control circuits. Nicolai is currently trying to salvage, clean, and repair this instrument section.

- Instrument section J – Nicolai found a similar problem with this instrument section as we had with K. The P3 connector on the pump motor driver board had bad solder joints. Upon putting it back in service we found one of the micro controllers doesn't always like to boot up. We have only done two drill runs with it so far and both times it took a few attempts to get the controller to come up. So far once running the micro controller has stayed on line.

- Shift work – This was the last week of working two shifts. Given our current

drilling depth, current goal of 730 meters, and quantity of drilling fluid left, I decided to drop second shift so we don't run out of work before the DV visit during the week of July9th.

COMMENTS
(Problems, Concerns, Recommendations, Etc.)