PROJECT SITUATION REPORT
IDD Test, Greenland 2014

Project:	8314				
Project Principal Investigator:		Don Lebar			
Report No:	1	**for period**	4-20-14	**through**	4-26-14
Prepared by:	Jay Johnson			**Date:**	5-4-14

IDDO Personnel on Site:	Jay Johnson Don Kirkpatrick Elizabeth Morton Grant Boeckmann Tanner Kuhl Terry Jordan

ACTIVITIES DURING PERIOD

- Everyone arrived in Albany, NY on Monday as scheduled
- On Tuesday at 5 AM we transported to the ANG base and checked in
- Four missions were scheduled to Kangerlussuaq
- A problem was found with the bleed air system on one of the aircraft, which resulted in a 24 hour mechanical delay for all aircraft.
- The 24 hour delay turned into a 48 hour delay and then a cancellation of flights until further notice
- On Wednesday, after staying for two additional nights in the hotel, CPS recommended everyone return home and wait for further updates
- We were all able to change our return flights and returned to our airports of departure on Thursday

SAFETY

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COMMENTS
(Problems, Concerns, Recommendations, Etc.)

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PROJECT SITUATION REPORT
IDD Test, Greenland 2014

Project:	8314				
Project Principal Investigator:		Don Lebar			
Report No:	2	**for period**	4-27-14	**through**	5-3-14
Prepared by:	Jay Johnson			**Date:**	5-4-14

IDDO Personnel on Site:	Jay Johnson Don Kirkpatrick Elizabeth Morton Grant Boeckmann Tanner Kuhl Terry Jordan

ACTIVITIES DURING PERIOD

- On Wednesday IDDO received the word from CPS that inspections and repairs had been made on all aircraft and that flights to Kangerlussuaq are now scheduled for Friday.
- We were all able to rebook commercial flights for Thursday back to Albany, NY
- On Friday at 5 AM we transported to the 109th ANG base and checked in
- Four missions were again scheduled to Kanger
- Due to the amount of cargo, passengers were split up between two flights
- Elisabeth and I were put on the second mission along with two CPS personnel, and Tanner, Grant, Terry, and Don were put on the third mission. Missions one and four were for cargo only.
- Our flights took off on schedule at 8:30 AM and 9:00 AM respectively
- Both flights stopped in Goose bay for fuel before continuing on to Kangerlussuaq
- Total flying time including the fuel stop was about 6.5 hours
- On Saturday we had a meet and greet with Jaime, our camp manager and cook, and Jiame (pronounced “Hi may”) from IT and also went over cargo, communications equipment, and general camp operations.
- All IDD cargo is in Kangerlussuaq and has been re palletized for transport to Summit.
- All equipment requested from CPS has been pulled and packed by Jaime
- Saturday was a beautiful sunny day in Kanger, so we all got out and did some outdoor recreation
- Our flight to Summit is scheduled for Monday April 5

SAFETY

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COMMENTS
(Problems, Concerns, Recommendations, Etc.)

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PROJECT SITUATION REPORT
IDD Test, Greenland 2014

Project:	8314				
Project Principal Investigator:		Don Lebar			
Report No:	3	**for period**	5-4-14	**through**	5-10-14
Prepared by:	Jay Johnson			**Date:**	

IDDO Personnel on Site:	Jay Johnson Don Kirkpatrick Elizabeth Morton Grant Boeckmann Tanner Kuhl Terry Jordan

ACTIVITIES DURING PERIOD

- We were originally scheduled to fly to Summit on Monday; however the visibility at Summit was below the minimums for flying most of the day.
- We flew to Summit on Tuesday. We were on the second of two flights. The first flight was for cargo only.
- Upon arrival, we had orientation with Ken, the Summit station manager, and Dave the medic.
- Three flights were scheduled for Wednesday, however only one flight made it to Summit. The remainder of our cargo arrived on this flight.
- Installed the Sorensen power supply in the control box
- Don and Terry completed the startup and inspection of the 70kW generators and snow melter. They also helped with the startup of the 30kW generator.
- Don and Terry spent Thursday and Friday helping John, the camp mechanic, repair the Case tractor.
- On Wednesday the carpenters set up the Weatherport for the 30kW generator and installed the camp power distribution system components and placed the Bally building.
- On Thursday Tanner, Grant, Elisabeth, and I hauled all of our smaller cargo pieces out to the drill site using snowmobiles and sleds. Two trips were made using four snowmobiles. A total of about 8,000 lbs of cargo was moved.
- We set up our tents at the drill site on Thursday
- On Friday the D6 bulldozer was used to pull the cargo sled out to the drill site. It delivered our large crates and the 30kW generator
- On Friday Geoblock for the tent footers was installed and the trench was cut using the D6. The carpenters installed the end walls and the back filling was completed. The tower base, winch drum, centrifuge, and transformer were placed in the trench before the end walls were built. All other equipment can be

moved in after the tent is in place.

- Tent construction was started Friday afternoon and completed on Saturday. The building was erected off one end of the drill trench and then pulled in place using the winch on the tucker. The carpenter crew worked with us to build and place the tent. The whole process went smoothly and took about 10 hours to complete.
- The GrIT travers arrived at Summit on Friday
- Smobile was pulled out to the drill site on Saturday
- The camp electrician finished hooking up the drill site power system
- The drilling fluid and casing was delivered to the drill site by the GrIT travers team. 24 drums of drilling fluid were brought out to the drill site. The remaining 26 drums were left at Summit.

SAFETY

- All of us read and signed the Summit Accident Prevention plan, Clean air protocol, and summer travel plan.

COMMENTS
(Problems, Concerns, Recommendations, Etc.)

- The control box looks to have been dropped in shipping. I suspect this happed by UPS when it was shipped from Madison to Scotia. All eight fasteners that mount the faceplate to the box were torn out of the mounting brackets. The drive for the tower actuator was torn from its mount and was hanging loose in the box. The winch motor drive was still in place, however the back plate it attaches to is bent. The 24 V power supply was torn from its din rail mount. We were able to fix everything. It has been powered up the box and everything is functioning accept the heater. We have yet to see if this is repairable.
- The cargo sled, slot hand rails, and control room floor are missing. After conversations with Earl and Dino in Scotia, it sounds like these items never arrived in Scotia. We are in the process of contacting the commercial shipper that transported the cargo from Madison to Scotia to try and locate these items. These items were strapped to the top of a crate and must have been removed at some point during shipping. All items are non-critical and will not delay the test.

PROJECT SITUATION REPORT
IDD Test, Greenland 2014

Project:	8314				
Project Principal Investigator:		Don Lebar			
Report No:	4	**for period**	5-11-14	**through**	5-17-14
Prepared by:	Jay Johnson			**Date:**	

IDDO Personnel on Site:	Jay Johnson Don Kirkpatrick Elizabeth Morton Grant Boeckmann Tanner Kuhl Terry Jordan

ACTIVITIES DURING PERIOD

- On Sunday the 70kW generator was powered up at the drill site
- We organized our living quarter in the Smobile and moved out to the drill site on Sunday afternoon
- Installed the man doors and stairs in the drill tent
- On Monday the control room was assembled
- Winch and tower were installed on Monday and Tuesday
- The fuel tank for the generators was brought out on Monday
- Slot excavation was started Monday and completed on Tuesday. The slot ventilation system was also installed.
- The drill was assembled on the tower on Tuesday. The wide cutters normally used for wet drilling were put on. The idea was to see if we could skip the reaming phase normally required before starting wet drilling.
- The core pull out table was assembled on Wednesday
- Installed the centrifuge and ventilation system
- The FIRST CORE WAS DRILLED on Wednesday afternoon! A full two meters were drilled on the first run. However, only 1.25 meters were recovered due to the core dogs sliding in the soft firn.
- Mark, Leah, TJ, Murat, Steff, and Trevor arrived at Summit on Wednesday morning and came out to the drill site in the late afternoon.
- Assembly of the core processing table was started on Thursday and completed on Friday. Grant led the work and the assembly was done with the help of our visitors.
- Steff and Trevor bought their new 2 meter core barrel and a selection of heads along to test. Their barrel had been designed to fit our outer tube and fit perfectly. Several cores were drilled using this barrel and it transported chips and times so their different barrel and flight design could be compared with ours. The Danish

barrel drilled good quality core.

- Both of our dry barrel configurations have been tested. They both drill good quality core, however dry core barrel #1 transports chips a little better due to a less restrictive chip flow path around the bayonet coupling.
- We randomly experience difficulty pushing the core from a barrel. The problem has occurred with both of our barrels and the Danish barrel. Cuttings getting between the core and barrel is the source of the problem.
- A few drill runs were completed with the Danish step cutters. The cutter motor draws .1-.2 amps less early in the coring run, but the runs ended the same as those done with standard cutters.
- The Casing cuffs are welded to the main tube section. These weld seams stick up ~1/8" on both the inside and outside of the tubes. Terry and Don made a set of curved chisels for removing the welds. On Saturday we removed the weld beads from the casing sections and they are now ready to install.
- Mark, TJ, and Murat test ran cores through the core processing line and worked out the core processing plan.
- We found the winch speed control unstable at coring speeds. Grant and I adjusted a few parameters on the motor controller to lessen the problem.
- Connected the laptop with LabVIEW software to the drill console. The added graphing capability has been useful for drilling and diagnosing the low speed stability of the winch.
- Final drilling depth for the week was 84.4 meters

SAFETY

- Completed a walkthrough of the camp and drill power systems
- Completed the seasonal and weekly checklists

COMMENTS
(Problems, Concerns, Recommendations, Etc.)

- The Iridium modem connection is not stable and when it does connect the data transfer rate is 8kbps. Therefore I am unable to check emails or send reports from the drill site.

PROJECT SITUATION REPORT
IDD Test, Greenland 2014

Project:	8314				
Project Principal Investigator:		Don Lebar			
Report No:	5	**for period**	5-18-14	**through**	5-24-14
Prepared by:	Jay Johnson			**Date:**	

IDDO Personnel on Site:	Jay Johnson Don Kirkpatrick Elizabeth Morton Grant Boeckmann Tanner Kuhl Terry Jordan

ACTIVITIES DURING PERIOD

- Mark, Murat, TJ, and Leah departed Summit on Sunday the 18th
- Completed a few drill runs using the 126mm diameter cutters. The narrower kerf leaves fewer chips in the hole between runs.
- Tested the conical reamer head. It worked well and was efficient at enlarging the borehole from 126mm to 129.6mm.
- The level wind has been working well and other than setting the end of travel limit switches has not required any adjustments. It moves with a start-stop motion rather than with a smooth fluid motion, however the cable has still been spooling properly.
- Finished drilling the pilot hole on Monday morning
- Started reaming the pilot hole with the 7” reamer on Monday and finished on Tuesday at a depth of 89.8 meters. Total reaming time was 14 hours. Chip loss was 5.2% at the start and decreased to 0.4%.
- Started reaming the pilot hole with the 9” reamer on Tuesday and finish on Thursday at depth of 84.5 meters. Total reaming time was 12 hours. Chip loss was 1.7% at the start and decreased to 0.4%.
- Installed the casing on Thursday. A total of 18 sections were placed in 5.5 hours. The casing end cuffs were not weld on the sections straight, so the casing was a snug fit in the reamed hole. The first three sections would not slide done the hole without some assistance. The remaining sections went down the hole more smoothly. The threads on the one of the U-bolts that holds the casing clamp shut began to strip out partway through the installation. Terry and I went to Summit and fabricated a new U-bolt. Overall the casing installation process went very smooth. Using the drill winch to set the casing worked very well and made the process go much quicker than if we had used a chain fall.
- Installed the fluid hoses for the centrifuge and fluid handling system

- Installed the slot end wall and floor liner along with the casing drip pan and hole cover
- Added the first three drums of drilling fluid to the borehole on Friday
- Started wet drilling on Friday. The drill was configured with a wet chips chamber (chips chamber with 7,200 1.5 mm holes for filtering the fluid from the chips) matted to the same core barrel and hollow shaft used for dry drilling. The first drill runs went smoothly recovering 2m long cores. As we continued drilling on Saturday, the drill runs would go smooth for the first meter or so, and then the Weight on bit (WOB) would quickly climb along with the curter current. A second booster was added to the hollow shaft 96 cm above the lower valve. Only one run has been done with this configuration; however the WOB and cutter current remained low for the entire run.
- A total of 27.4 meters of core were drilled with drilling fluid.
- The final depth for the week is 127.9 meters.
- The drill tent requires good ventilation to keep the drilling fluid smell to a tolerable level. The drill tent temp has been running between -18° C and -12° C. We are currently running ventilators in the slot, centrifuge, and in two of the roof vents.
- The fumes from drilling fluid evaporating off drillers clothing in the heated control room gets strong quickly. A fan was added in the wall to get some circulation.
- Starting Wednesday we began sending one person each day to help Josh run the Blue Ice drill (BID) for Vas Patrenko's C 14 project. Grant, Don, Elisabeth, and Terry each spent one day working with Josh.

SAFETY

- Air quality in the heated control room is a concern when using the drilling fluid. Drilling fluid evaporating off drilling clothing causes strong vapors to the point of making your eyes water. We are currently minimizing the problem by keeping the windows open and by adding a fan in the wall to increase air circulation. We also made aprons that are worn while servicing the drill and taken off before going into the control room. They are working very well and the drill suits now stay nearly dry.

COMMENTS
(Problems, Concerns, Recommendations, Etc.)

- Both types of drilling gloves we have are swelling and failing within two days of continuous use. A better solution will need to be found for SPICE. Gloves with a long cuff should also be supplied to help keep clothing dry.
- Aprons should be supplied for SPICE. The drilling suites are working well, but get wet quickly and are then not good to ware in the control room.

PROJECT SITUATION REPORT
IDD Test, Greenland 2014

Project:	8314				
Project Principal Investigator:		Don Lebar			
Report No:	6	**for period**	5-25-14	**through**	5-31-14
Prepared by:	Jay Johnson			**Date:**	5-31-14

IDDO Personnel on Site:	Jay Johnson Don Kirkpatrick Elizabeth Morton Grant Boeckmann Tanner Kuhl Terry Jordan

ACTIVITIES DURING PERIOD

- Started two shift operations on Sunday. First shift works 6 AM to 5 PM and second shift works 6 PM to 5 AM.
- Continued drill testing with the dry core barrels with wide cutters (129.6 mm diameter hole) in the fluid filled borehole. Core quality has been consistently good. Generally we are able to drill full 2 m cores. Occasionally the run is cut 10 - 20 cm short due to the chips chamber filling or possibly chip transport issues at the cutter head, causing high cutter current and weight on Bit (WOB). The cutter current fluctuates rapidly between .7 A to 2.2 A while coring.
- Tested the pump and wet core barrel combination. We were able to drill 2 m cores, however we don't seem to be collecting as many chips as when running the dry barrel and the chips are not packed as tightly as when running without the pump. The pump is also filled with chips by the end of a run. I contacted Steffen Bo Hansen to discuss their wet drill setup and operation. He had some recommendations on how the pump and hollow shaft valves should be setup. I setup the hollow shaft, pump and valves per his recommendations; however I didn't see much change in operation.
- At 237 m the narrow cutters (126 mm diameter hole) were put on the dry barrel configuration. This was done to compare how the drill performed cutting a narrower kerf. Cutter current is more sable and increases gradually, as expected, as the chips chamber fills. The WOB is also generally lower and more stable with the narrower cutters. The main down side is we have to ascend at a slower speed to keep chips from flushing out of the chips chamber. If the lower booster is not packed at the end of a run the chips are able to be flushed more easily.
- Tested placing the boosters at different locations on the hollow shaft to learn the effects on chips packing. The lower booster needs to be placed below the filter holes in the chips chamber to prevent chips from flushing out during ascent. The

second booster has been working best placed right at the filter holes in the chips chamber.

- Tested the bailer. It works well and has been effective at cleaning chips left in the borehole.
- The conical tool was used on two separate runs to recover screws that have come loose from the anti-torque blades. The conical tool cuts efficiently and works well. The tool has also been tested for reaming the 126 mm hole out to 129.6 mm.
- Tested drilling two 1 m cores in one drill run. It has been working a little better than 50% of the time. On the runs where it didn't work, poor penetration and high WOB has been the reason a second core couldn't be drilled. Sometimes we are only able to drill a short second core. On the runs that have been successful, the cores have fit back together well and with little damage.
- Removed motor section 1 and started running motor section 2 to verify it works properly. Both sections have been working without any issues.
- The new version of the motor power supply (MPS) was installed and tested in motor section 1. One of the two MPS's works fine, the other will only run the motor in one direction. However, the anti-torque slip sensor works properly.
- Packed two core boxes of ice for the NICL. The first box contains six netted cores put in lay flat and placed in core tubes. Three of the cores were packed straight out of the FED and the other three were put into the cardboard tube buffer for 24 hours before being packed. The second box contains nine cores. Three were put in lay flat straight out of the FED. Three were wiped down with cotton towels after coming out of the FED and then put in lay flat. The last three cores were put into the cardboard tube buffer for 24 hours before being put into lay flat.
- Tanner and I meet with Ken, the camp manager, and John in cargo to discuss our takeout plan. Tanner and I decided that it made the most sense to stop drilling and start packing a few days earlier than originally planned to get cargo on a flight of opportunity on June 4th. This plane was going to be returning to Kanger mostly empty. The remainder of our cargo will leave summit on June 10th. CPS felt they could get our cargo out per the original schedule, however it was relying on the Guard being able to take off with at least a 14,000 pound load and had little contingency for weather or mechanical delays. We have completed all of the tests we planned to do and an few more days of drilling weren't going to yield any further results since we don't have enough time to reach brittle ice,
- The last core was drilled on Saturday! The final borehole depth is 285.3 m. 183 drill runs have been completed over the course of testing.
- Packing is now in progress.

SAFETY

- We made aprons from gaffer tape and garbage bags. They have been working well at keeping the front of the driller suites dry.

COMMENTS
(Problems, Concerns, Recommendations, Etc.)

- The screws on the anti-torque blades have been coming loose and must be checked every run. Screws were lost in the borehole on a few occasions.
- The motor on the air compressor quit working and is not reparable. We found it very useful for cleaning the cutter head and other components; however operations can be done without it.
- The air solenoid valves on the centrifuge have been leaking. A heater has been placed on them so they function better. The control system is over complicated and heavy and could be simplified. The air system is not needed with our drilling fluid.

PROJECT SITUATION REPORT
IDD Test, Greenland 2014

Project:	8314				
Project Principal Investigator:		Don Lebar			
Report No:	7	**for period**	6-01-14	**through**	6-07-14
Prepared by:	Jay Johnson			**Date:**	6-07-14

IDDO Personnel on Site:	Jay Johnson Don Kirkpatrick Elizabeth Morton Grant Boeckmann Tanner Kuhl Terry Jordan

ACTIVITIES DURING PERIOD

- We all took the first half of Sunday off to sleep in and rest up after a busy week. In the afternoon we continued working on packing.
- By the end of Monday the only equipment remaining in the drill trench was the control room and tools. All the priority one cargo was packed, which included the sondes, winch/tower, and control system.
- Tested removing crates from the drill trench using a small electric winch we brought along. Crates were pulled up a ramp built at one end of the trench using the winch, which was fixed in place at the surface with dead man anchors. We were successfully able to pull the largest crate, which weighed 1100 lbs, up the ramp and to the surface. A total of four crates were pulled from the trench. The winch quit working on the last pull, which we suspect was due to a switch failure. A snowmobile was then used in place of winch, which also worked well.
- On Tuesday the control room and canvas for the drill tent was packed.
- The casing was extended to ~1.5 meters above the surface.
- Ben and John from Summit came out and pick up three pallets of cargo on Tuesday.
- All of the cargo that was picked up on Tuesday made it on the Wednesday flight from Summit to Kanger.
- On Wednesday we finished packing the drill tent frame, one remaining crate, and the tool cases.
- On Thursday we completed our season debrief.
- On Friday John and LT from Summit came out and picked up the remaining two pallets of cargo along with the 20 empty and 4 full drums of drilling fluid. This cargo is scheduled to fly to Kanger on the 10th.
- The slot and drill trench were back filled on Friday while the 953 loader was out picking up the cargo.

- The borehole fluid level is at 76.5 meters from the surface. Total fluid loss for the season was 26.9%.
- Grant started work with Vas Petrenko at the C14 camp on Friday.

SAFETY

COMMENTS
(Problems, Concerns, Recommendations, Etc.)

PROJECT SITUATION REPORT
IDD Test, Greenland 2014

Project:	8314				
Project Principal Investigator:		Don Lebar			
Report No:	8	**for period**	6-08-14	**through**	6-14-14
Prepared by:	Jay Johnson			**Date:**	6-16-14

IDDO Personnel on Site:	Jay Johnson Don Kirkpatrick Elizabeth Morton Grant Boeckmann (now at C 14 camp) Tanner Kuhl Terry Jordan

ACTIVITIES DURING PERIOD

- Took down tents and dried them in the bally building
- Packed our coms equipment
- Smobile, the Bally building, the generators, and fuel tank are the remaining items at the drill site. They will be taken back to Summit by camp personnel in the coming weeks.
- Flew from Summit to Kangerlussuaq on Wednesday
- All of our priority one cargo, most of the priority two, and some of the priority three cargo is returning to Schenectady during this flight period. This means we will be getting some cargo back to Madison ahead of schedule. The remaining cargo will be returning to NY the end of June.
- Jay, Tanner, Don, and Terry flew from Kangerlussuaq to Schenectady, NY on Friday. Elisabeth is staying in Greenland on vacation and will return on the next flight period.

SAFETY

COMMENTS
(Problems, Concerns, Recommendations, Etc.)