Whillans Ice Stream Subglacial Access Research Drilling

Project Field Progress Report, 17-23 December, 2012
WISSARD systems testing at MIS site

1. Summary
Testing of the WISSARD drill, science platform, and science instruments was undertaken over a six day period of long days. The physical systems were also inspected by NSF consultants to assess safety and engineering issues. The purpose of the test was to evaluate drill functions, the clean access system, and the integration of science operations and instrument performance, which was successfully accomplished. A summary report of the test will be distributed separately.

2. Environment, Health, and Safety
- A glycol spill was reported underneath one of the generators and is being addressed by ASC.

3. WISSARD Personnel:
- One WISSARD person arrived on station - Science team: Marci Beitch. New arrivals participated in orientations and training as required.
- Drill team on site (10 total): Bolsey, Blythe, Burnett, Carpenter, Duling, Gibson, Lemery, Melby, Rack, Roberts.
- Science observer (RAE, 1 total): Alekhina
- Dave Monk, Andy Fisher, Mike Osment, John Winans, Rudy Schlepp, Frank Rack, Adam Melby, Reed Scherer departed.

4. Field conditions:
- Weather was mostly warm, -5 to +2 C, frequently cloudy with some sun, and mostly calm throughout the week, but windy and snowy one day. No work days were lost. Transit to the site continued to be difficult, with vans, Mattrack, Pisten Bully, and snowmobiles used to supplement shuttles in order to make effective use of borehole time during testing.

5. Activity Progress:
- Science teams prepared instruments and field labs for testing at the field site.
• The science light winch system was finally delivered on site, and assembled for use during the test.
• Work was ongoing to bring IceCube generators and Power Distribution Module online. They were functional for the test, but suffered a few unexpected outages. These were diagnosed and repaired by the end of the week.
• Glycol loop to utilize waste heat for snow melting still had some leaks at junctions to generators which were repaired and system was put on line for snow melting.
• An automated fueling system for the drill day tank was developed. Leaks in the plumbing manifolds were fixed. A new mounting system was devised for the UV collar. The compressed air system for blowing out water lines was improved. The drill system was successfully used to make a 15m mousehole (for borehole instrument assembly). The system was used to make a 56m borehole through the ice shelf in approximately 6 hours. The drill was also used to ream the hole 3 days later. The drill system then was broken down and prepared for traversing. A more complete discussion of drill operations and performance during the test will be included in a separate report detailing and compiling all the test results. Daily drill project reports are available at: [http://www.wissard.org/publications/drill-reports](http://www.wissard.org/publications/drill-reports)
• Samples for clean access performance of the drill water system were collected and analyzed.
• Borehole science tools were deployed using the Launch and Recovery System, and instruments tested over a four day period. Equipment used included: POP/IPSIE, Percussion Corer, Multicorer, CTD, Ekman dredge, Geothermal Probe, Niskin/O-Flo bottles, *in situ* water filtration sampler, MSLED. Results and discussion of the science testing will be included in a separate report detailing and compiling all the test results.
• The NSF contract facilities consultants visited the site and prepared a report on safety and corrective actions, which was reviewed among NSF, ASC, Science PM, and consultants. A punch list was developed in response for final review/approval from NSF.
• Breakdown and packing of science and lab vans for the traverse was begun.

6. Outreach:
• NSF-OPP staff toured the test site.
• Outreach personnel and Russian observer participated in test activities as much as possible.
• Daily email/website reports during test.
• Website updates and blogging continued.
• Video and still photography was collected throughout the test period.

7. Upcoming activities:
• Test data analysis
• Clean up after test, prepare and pack all modules for the traverse.
• PI telecon: Wednesday, 26 December, 1400 MST
• Duling begins drilling the mousehole.

• Drilling a mousehole (instrument assembly hole) in sunny weather.
• Procedures for deploying cleaned instruments are tested.

• Data collection in NIU Command and Control center.
• Percussion corer during assembly

• Geothermal probe prepared for deployment.
- GO-flo bottle deployment during testing.

- McLane in situ water filtration device and CTD prior to test deployment.
• Deck crew standing by multi-purpose winch.

• Discussing deck operations.

The WISSARD project is supported by grants from the National Science Foundation - Office of Polar Programs, Antarctic Integrated System Science