

July 19, 2004

IODP EXPEDITION 301: JUAN DE FUCA HYDROGEOLOGY WEEK 3 REPORT

OPERATIONS

HOLE 1301B: 47° 45.2286' N, 127° 45.8262' W (final); Water depth: 2666.5 mbrf

Installation of 16-inch casing: We started this week by finishing the installation of the 267.5 m-long, 16-inch casing string in Hole 1301B. We reentered the hole at 1620 hours on 11 July, landed the casing at 1800 hours and cemented it in place.

Installation of 10-3/4-inch casing: Our next step was to drill a 14-3/4 inch hole into basement for the 10-3/4 inch casing. We reentered Hole 1301B with a 14-3/4 inch tricone bit at 0700 hours on 12 July. After drilling out the cement at the base of the 16-inch casing, we began drilling the new 14-inch hole from 2944.0 mbrf (277.5 mbsf) at 1030 hours on 12 July. Penetration rates varied substantially (<1 to 6 m/hr) over the first 50 m of basement and we encountered no significant hole problems. At 328.5 mbsf, we started fighting hole problems (loss of rotation, loss of circulation, overpull, and elevated pump pressure). After ~11 hours (~1130 hours on 13 July) the hole conditions stabilized and we were then able to drill to the target depth of 3018.0 mbrf (351.5 mbsf) or 85.0 m into basement by 1530 hours on 13 July. We then conditioned the hole (mud sweeps, wash/ream) until we were comfortable that hole stability was adequate for casing deployment. By 0215 hours on 14 July had been retrieved and we began preparations for running 10-3/4 inch casing.

We assembled a 342.50 meter-long 10-3/4 inch casing string and reentered Hole 1301B at 1140 hours on 14 July. We were able to easily lower the casing into the hole to 3002.0 mbrf (335.5 mbsf) when we had to attach the cementing manifold at the rig floor. After this, we tried for ~7 hours but could not get the casing past 3002.0 mbrf. When the casing was raised above 3000.0 mbrf it was completely free. At 1930 hours on 14 July, we decided to retrieve and disassemble the casing. As this hole's objective is to drill deeply into basement below the 10-3/4 inch casing, we decided to clean out the hole again so we might be able to install the full length of casing. By 0530 hours on 15 July the casing string had been disassembled and stored away in the riser hold.

We reentered Hole 1301B with the 14-3/4 inch tricone bit and washed to 2998.0 mbrf (331.5 mbsf) before encountering any significant resistance. The next 6 hours were spent washing, reaming, and pumping multiple mud sweeps to clean and condition the hole to 3018.0 mbrf. At 2000 hours on 15 July we started raising the bit up into the 16-inch casing. After waiting 1 hour, we lowered the pipe back to TD with only minimal circulation and no rotation. No significant resistance was encountered, so we circulated mud and retrieved the drill string. At 0500 hours on 16 July the bit was on-deck and we began reassembling the same 342.50 meter-long, 10-3/4 inch casing string.

We reentered Hole 1301B at 1425 hours on 16 July. The casing was lowered to ~3005 mbrf where it encountered minor resistance, but we were able to land the casing at 1615 hours on 16 July. After cementing it in place, we released the casing running tool and retrieved the drill string. While the string was being recovered, we offset the ship ~1 km to Hole 1026B in dynamic positioning mode.

HOLE 1026B: 47° 45.759' N, 127° 45.552' W; Water depth: 2666.1 mbrf

Removal of min-cone previously installed to assist non-drill ship wireline reentry: During Expedition 301, we are planning to replace the existing Hole 1026B CORK that was installed

during ODP Leg 168. After Leg 168, a mini-cone was placed in the top of the CORK to facilitate wireline reentry during non-drillship reentries. We had to remove it so it would not interfere with engagement of the cork-pulling tool. This mini-cone (~1.0 m diameter) could not be removed by submersible. We fabricated a special fork-shaped, jetted, fishing tool to remove the mini-cone. We could maneuver the tool by rotating the drill string and pumping seawater to move the bottom of the drill string. We slid the fork-shaped fishing tool around the CORK, raised it, and broke the mini-cone off. The mini-cone fell and landed on the ROV platform and we used the fishing tool to kick it off onto the seafloor beside the reentry cone. This entire removal process only required ~15 minutes and then we retrieved the drill string.

HOLE 1301A: 47° 45.2095' N, 127° 45.8329' W, Seafloor depth 2667.5 mbrf:
We have now returned to Hole 1301A to drill out the cement at base of 10-3/4 inch casing, conduct hydrologic packer tests of upper basement, and install our first CORK.

SCIENTIFIC RESULTS

No new results, only drilling operations.

EDUCATION

The third weekly installment of the Teacher-at-Sea's daily journal (text and photo) has been sent to shore. The first lab brief (microbiology lab) has been transmitted to shore. Working on lab brief for the paleomagnetism lab. Experienced a short helicopter tour around the ship (very lucky!).

TECHNICAL SUPPORT AND HSE ACTIVITIES

Lab activities: The labs remain mostly on stand-by while calibration and testing of equipment continues. Several activities include (1) refined the method for determining total organic carbon analyses, (2) reviewed status and documented thermal conductivity needles used for hard rock conductivity, (3) found an oxygen bottle used for the CNS station contaminated with air, (4) refurbished one of the drill presses for taking minicores, (5) constructed a new rock saw drain, (6) prepared XRD standards for semi-quantitative analyses, (7) obtained and installed the lab notes ("Tech Volume") for staff use over the shipboard network. The Curator has finalized the working basement-sampling plan and nearly finished with the working sediment-sampling plan. We took advantage of the helicopter transfer required for operational hardware to obtain required and desired lab supplies. Once the helicopter landed, the photographer and Teacher-at-Sea took a short trip around the ship in the helicopter for public relations pictures. Computer System Managers and Programmer have been continuously busy with a multitude of trouble-shooting, upgrades, and repairs for lab equipment, systems, communications, and scientists needs. The science database is ready and digital imaging workflow has been addressed. The Electronics Technicians have used parts obtained by helicopter to install/repair the rig's drilling depth encoder, the weight-on-bit filter, and repair the autoclave in the microbiology lab.

Core recovery: None
Samples collected: None

HSE: A fire drill was conducted 13 July fire drill conducted and those not involved in the simulated emergency response mustered at the lifeboats. For each lifeboat, six participants (limited by safety rules) were introduced to the features, equipment, and operation of the lifeboats. This included procedures for deploying and operating the boats, reviewing the array of communications equipment, food, water, first aid kits, and survival gear. Safety video library is being evaluated to determine how to expand, improve, and update.

