

Expedition 321T: Juan de Fuca Cementing Week 1 Report (23-27 June 2009)

29 June 2009

Operations

Expedition 321T began at 1715 hr 22 June 2009 in San Diego, California with the first line ashore at the 10th Avenue Marine Facility. The Expedition 321 scientists disembarked on 23 June and Expedition 321T scientists, School of Rock participants, and other technical support personnel came aboard. Two vendor representatives from Hadco came aboard for the transit to inspect and certify all Transocean lifting gear. Core samples from Expedition 321 were offloaded. One empty core liner box was removed and limited other freight including a Schlumberger transmission/gear box were offloaded. Four P-trucks (1391 sacks/65.4 short tons) of “blended” bulk cement with Cello-Flake lost circulation material were loaded into P-Tank #8 and 225 sacks/9.7 short tons of neat cement were loaded to top off P-Tank #6. In addition, six 45 gallon drums of sodium silicate “cement extender” were loaded. Fresh fruit and vegetables for catering were also brought aboard. The day was busy in the afternoon with ship tours taking place. The ship departed San Diego on schedule with the last line away from the dock at 0700 hr 24 June 2009. The San Diego pilot departed the ship at 0800 hr, however, the US Navy diverted the ship on a southerly and then westerly course before being allowed to transit northward on our desired route. Average speed for the remainder of the first day exceeded 11 kts. By afternoon of the second day a weather system began moving in and slowed the speed to an average of 8.7 kts. For the third and fourth day of the transit, the full effect of an opposing current and a force 8 gale with heavy seas and large swells slowed the ship to an average of less than 7 kts. By the morning of the fifth day (Sunday) conditions began improving. Although wind speed remains brisk at 25 to 30 kts, it is anticipated that the effects of the storm will continue to diminish. Estimated time of arrival at Site U1301 remains late on the 29th or early on the 30th of June.

Science Update

Juan de Fuca Cementing

Expedition 321T is a continuation of a program initiated on IODP Expedition 301, working on 3.5 Ma seafloor on the eastern flank of the Juan de Fuca Ridge. Borehole observatories installed during IODP Expedition 301 were designed to seal open holes so that thermal, pressure, chemical conditions could equilibrate following the dissipation of the drilling disturbance; to facilitate collection of fluid and microbiological samples and temperature and pressure data using autonomous samplers and data logging systems; and to serve as long-term monitoring points for large-scale crustal testing. The CORKs installed in Holes U1301A and U1301B were not sealed as intended and data and samples collected during subsequent ROV and submersible servicing operations have shown that both observatory systems are leaking. Expedition 321T will seal these observatories by putting cement into the re-entry cones surrounding the CORK wellheads, allowing the remaining components of the full experimental program to be completed during subsequent drilling and submersible expeditions. Expedition 321T will consist of cementing operations only. Sampling, measurement, or other scientific operations will not be conducted.

School of Rock

Apart from cementing operations, a research and education workshop, School of Rock (SOR), has been planned during Expedition 321T. This year's program is the fourth SOR and is primarily focused on the science of Juan de Fuca hydrogeology, borehole observatories, as well as legacy cores and data from past expeditions in the eastern Equatorial Pacific. A total of 15 participants are participating in this SOR program.

Expedition 321T Juan de Fuca scientists, SOR participants boarded the ship on June 23 at 1045 h and began shipboard orientation. The following day began with Captain's introduction and initial safety meeting. The SOR participants began their activities with an introduction to core flow and ship's laboratories. The rest of the week continued with activities including visual examination and analyses of physical properties and chemistry data from ODP Legs 189, 192, 198 and 199 focusing on the Eocene/Oligocene boundary, introduction to ocean crust and heat flow, measuring thermal conductivity on Hole U1338D (Expedition 321) instructional cores, learning hydrothermal circulation and an introduction to Expedition 301 operations and science results. SOR participants also received rig floor tours during the week.

Technical Support Activities

The technical staff started palletizing cores on the Bridge deck prior to arrival in San Diego, but the process was interrupted due to elevator malfunction. The elevator was repaired overnight by ship electricians. The core offloading resumed the morning of June 23.

During the initial transit to Juan de Fuca operational area, two redundant fan coils were removed from the core reefer storage, the emergency shower/eye wash station was relocated from the Microscope laboratory into Paleontology Preparation laboratory, isolation valves were installed in helium and argon gas line throughout the labs, and an inventory of library and reference books was conducted. A center shelf is planned to be built for additional core storage in the core reefer.