ALOHA Cabled Observatory

Phase 1 Wet Test

Makai Pier, Oahu

January 11, 2007

Test Team:
Fred Duennebier (PI)
James Jolly (ESF)
James Babinec (ESF)
Zensho Heshiki (ESF)
Mike Cole (ESF)
Terry Kerby (HURL)

Purpose: The goals of this test were to insure that the Proof Module and Cable Termination for the ALOHA Cabled Observatory operate correctly in the ocean. Tests included use of the mission power supply, the sealed proof module, the sea-ground, pressure sensor, hydrophone, SL pigtail, termination frame, and float package. We were also interested in obtaining data on thermal dissipation.

Summary of results: All tests were performed with nominal results. The proof module performed well, with data transmitted through the cable termination and recorded without error. The completed Proof module and float package were determined to have a buoyancy of 75 lbs.

Test Narrative:

January 10, 2007. AT SOEST:

A. The Proof Module O-ring seals were checked, cleaned and greased, and new O-rings were checked, greased, and installed.

B. The Proof Module was closed, pumped to vacuum, and back-filled to 1 ATM with helium, pumped back to vacuum, and refilled with helium to 0.t ATM. Internal pressure was checked and found to vary within limits expected from thermal expansion. This procedure insures tight end caps, allows detection of small (low-pressure) leaks, greatly reduces humidity in the package, and provides a high heat capacity gas for heat dissipation.

C. The Proof Module was connected to the termination frame as in the mission configuration and tested.

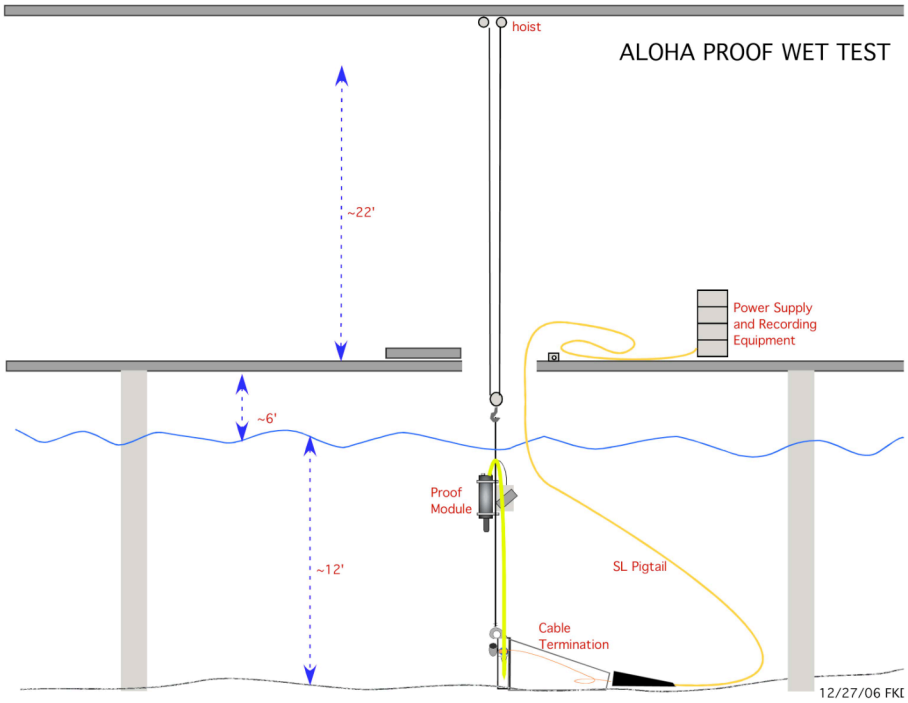
January 11, 2007.

0700: Equipment was loaded on a rented flat-bed truck and into a van for transit to the Makai Pier.

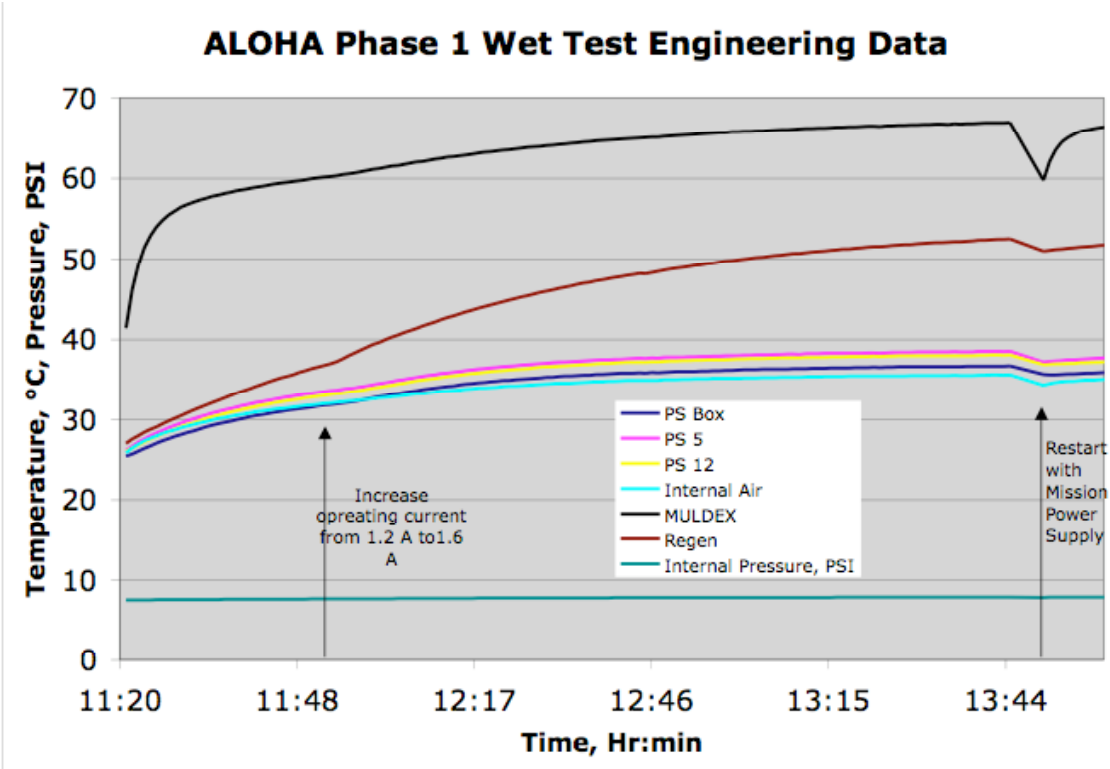
0830: Depart for Makai Pier.

0920: Arrive at Makai Pier. Terry Kerby (HURL submersible chief pilot) had cleared space for the operation behind the PISCES Submersibles. The equipment was lifted past the subs using the overhead hoist and placed next to the slab that would be opened for our entrance to the ocean.
1000: Equipment is set up and tested on the pier with no problems.
1130: Slab moved to side to allow access to water.
1100: The SL pigtail is lowered by hand into the water, with the dry-end tied off to the pier deck.
1110: The termination frame and Proof Module were lowered until the termination frame was on the bottom, and the Proof Module fully submerged. (Water depth ~ 12'). A wire was stripped of insulation and hose-clamped to a shackle, and lowered into the ocean to use as a sea-ground (land-side).
1115: Power was applied to the package, and data began to flow. All data were logged in computer files.
1130: Mike Cole and Zensho Heshiki enter the water to photograph the package.
1140-1155: Swimming noises heard on hydrophone. Occasional overloads of the A/D and hydrophone amplifier noted.
1156: Change supply voltage from 1.2 A to 1.6 A. Expect (and observe) change in slope of internal heating curve.
1206: Switch from hydrophone to ramp data.
1208: Switch from 1-channel to 2-channel recording.
1248: Switch to random noise recording.
1346:30: Shut down to switch to mission (Spellman) power supply.
1350: operating with mission power supply.
1420: Shut-down to begin float test.
1430: System back on deck. Rigging for float package test.
1445: Proof Module and float package lowered into ocean on hoist. Package close to neural buoyancy with 75 lbs of added weight.
1510: System back on deck.
1530: Depart for SOEST.

January 12: Return to Makai Pier to clean up and remove equipment back to SOEST.

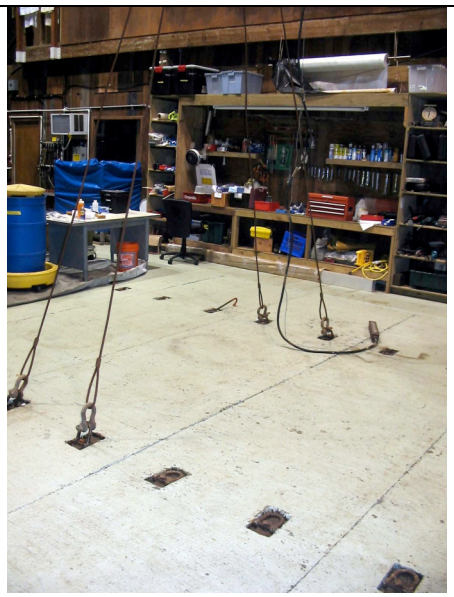


Cross section of Makai Pier showing Phase 1 operational test configuration.

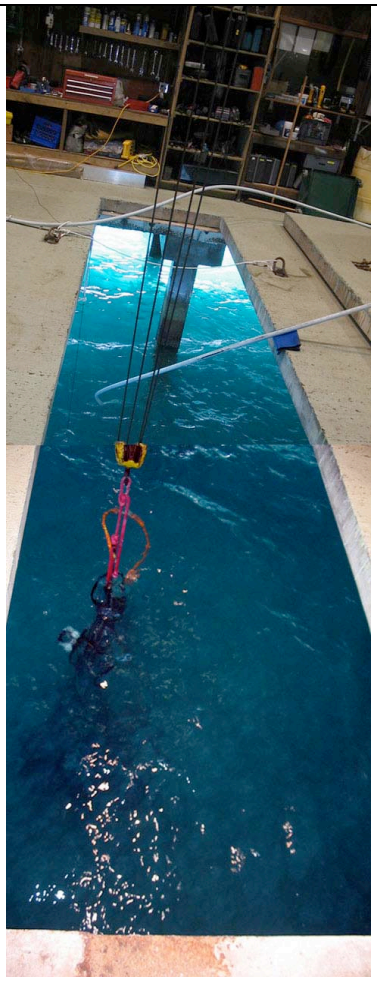


Ocean water temperature ~ 26°C

Makai Pier, Terry Kerby and HURL PISCES submersibles.



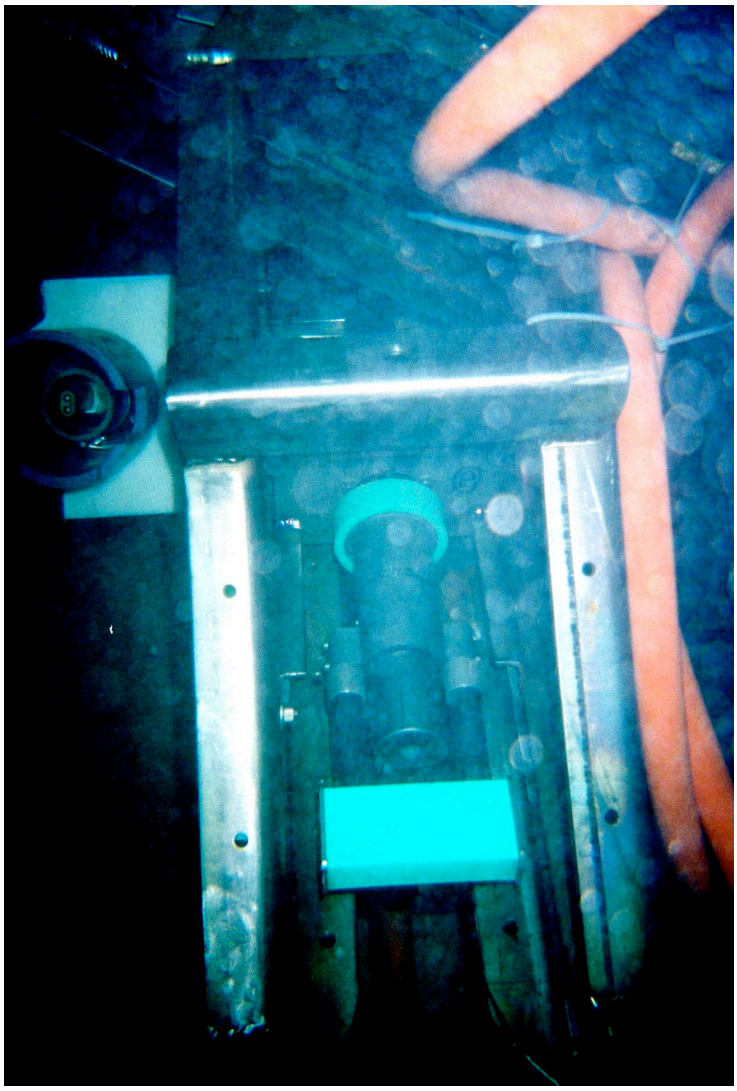
Test Area. Slab is lifted to the side for access to ocean.



Test with Termination Frame on Bottom and Proof Module suspended above.

Recording Wet Test data.

Adding weights in float test.



Proof Module Umbilical wet-mate ODI connector plugged into the ALOHA cable termination during the Makai Pier ALOHA Cabled Observatory Phase 1 Wet Test.