HAWAII UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT MISSION NO. P5-330

MISSION STATUS

Location: Loihi

Mission Date: Aug.30, 97

Maximum Depth: ~1280 m.

Project Title: HUGO

Principal Investigator: Duennebier / malahoff

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University of Hawaii
Honolulu, HI 96822

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Observer 1: Duennebier **Observer 2:**

Address: as above **Address:**

Scientific Data Acquired : Prepare an abstract outlining your objectives, techniques, findings, etc.

Abstract: The main objective of this dive was to survey the proposed HUGO Junction Box site on the southern Thousand Fingers Field on the SE side of the Loihi summit. A secondary objective was to search the north end of the East Pit crater looking for evidence of last year's eruption in that area heard on sonobuoys during the rapid response cruise. The major data acquired would be still photos and video. Samples of any fresh rocks or sediment would also be collected. A third objective was to observe the area on the NE side of east pit to "ground truth" deep tow bathymetric data taken in June of 1997 that showed very rough topography in that area.

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

I spent some time in the Operations Center during earlier dives, and was surprised to see how poorly known the location of the submersible was. The short-baseline acoustic system used is inadequate for navigating the sub. This lack in accuracy in location could cause serious problems. On Dive 330, we expected to land at about 1203 m near the center of the Thousand Fingers Field. At about 1150 m, the sonar was activated and clutter was observed. Terry Kerby looked out the window and noticed a near-vertical wall going by about 12' away. He immediately stopped the sub and turned, noting visible walls in every direction. From the maps, the nearest peak that could be at that depth should have been more than 300 m away. We climbed to the highest point and asked for a location, and were told that we were off to the east. According to the map, we should have been able to transit directly west and come down to the landing site, but as we moved west, the depths increased to more than 1220 m and finally ended in a cliff going down. We again stopped and requested a location, and were told we were still off to the east. This time, we continued west and did end up in the correct area. We could easily have broken a thruster and ended the dive season quickly if we hadn't been so lucky.

Recommendations for corrective action or improvement:

1) Purchase the equipment necessary for the submersible to locate itself in real-time, rather than wait several minutes for estimates of location from the surface. The acoustic hardware for this purpose is available, but it will take money, and it will certainly be cheaper than a serious accident. While such a system may not work in some areas because of acoustic shadows or side echoes, it will operate in most areas and in mid-water.
2) Obstacle avoidance sonar: A relatively simple sonar to warn the pilot of nearby bottom in any direction would be extremely useful.
3) Until such systems are available, it would probably be a good procedure to begin searching for bottom at least 100 m above the target depth.

In your opinion, did the mission essentially achieve its purpose? Compare actual work accomplished with the work that was expected to be accomplished.

The dive certainly achieved its objectives, although we could have done a more detailed survey of the HUGO landing site if we knew better where we were, and didn't have to spend a considerable amount of time waiting for and correcting navigation. Surveys aren't very useful if you don't know where you are.

List specimens or samples collected on the mission.

One sediment sample was collected (P5-330-1) at the summit of the crater in which we landed east of the Thousand Fingers Field. The sediment is a poorly sorted fresh-looking black sand. Water samples were obtained in a near bottom series as we ascended at the end of the dive. An octopod, roughly 6' in diameter, was observed and documented at the end of the dive. Excellent video.

DATA RELEASE

Data may be retained by the project leader for up to 2 years after the mission date with the following exception. NOAA may request to use photos for publication or publicity purposes at any time.

Fill in the appropriate statement below and sign this form.

I hereby release the data archived by HURL for public consumption following mission

HUGO (project title)

held on Aug.30, 1997 (date) in the following way:

a. CTD data by immediately (date)

b. voice transcripts, video, and still camera film by immediately (date)

c. other immediately (date)

d. I will give my written consent to individuals wishing to use these data prior to the above dates depending on the nature of the request(s).

_____ Principal Investigator