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CRUISE REPORT

Ship Name: R/V VEMA

Cruise No: 33-12

Departure: November 27, 1976 from Hakodate, Japan
Date Port

Arrival: December 17, 1976 at Guam, Mariana Islands
Date Port

Days at Sea: 20

Days Foreign Port: 3
No. of days in arrival port

Area of Operation: Western Pacific, specifically Bonin Trough and Trench,
Magellan Seamounts and northwestern Mariana Basin.

Program Description:

Participants: (All L-DGO unless otherwise specified)

James Cochran
Van Paisley-Smith
Nicholas Leiser
Dennis Quick
James Cranston
Herbert Steeves
Michael Sundvig

Chief Scientist
Gravity
Computer
E. T.
E. T.
Airgun
Core Describer

All inquiries regarding cruise should be made to the chief scientist.

One of the main objectives of Vema cruise 33-12 was to obtain gravity and magnetic data over seamounts located on Jurassic aged seafloor. We thus surveyed Seamount Z4/3 located at $27^{\circ} 06'N$, $148^{\circ} 40'E$, Golden Dragon Seamount located near $21^{\circ} 20'N$, $153^{\circ} 10'E$ and an unnamed seamount near $21^{\circ} 30'N$, $151^{\circ} 40'E$. The first two seamounts have been mapped previously, but those surveys did not extend far enough from the seamount to be useful in lithospheric loading studies. We thus ran two long lines across each of them which along with the existing data makes them ideal for such studies. Both Z4/3 and Golden Dragon seamounts were also successfully dredged. Seamount Z4/3 was dredged from about 2000 fms to 1200 fms depth, the steepest part of the seamount. The top of the mountain is at a depth of near 600 fms. The dredge haul included a large amount of coral along with basalt and chert. Golden Dragon Seamount was dredged from 2000 fms to about 1500 fms. The main rock type recovered was welded tuffs, but there were also several very large pieces of basalt and some chert. The third seamount was somewhat smaller than the first two and is mainly notable for not having any distinctive magnetic signature associated with it.

A second project was to run a line of sonobuoy refraction experiments along the axis of the Bonin trough to attempt to determine the sediment thickness. This experiment was not successful in that we did not obtain basement refractions although the buoys functioned properly and the seas were calm. I believe that the sediments were just too thick to penetrate with the small airgun on Vema .

A magnetics line was run parallel to one run last year on V32-14 to look for lineated anomalies in the Jurassic Quiet Zone. Anomalies of small to moderate amplitude were observed in the Quiet Zone, but preliminary examination did not show any obvious correlation with those observed on

V32-14. A magnetics run was also made into the Mariana trench north of the location where recent H.I.G./I.P.O.D. data appears to show lineated anomalies. We observed a similar pattern of anomalies and, since we started much farther to the east, were definitely in the Quiet Zone at the eastern end of our run. An attempt was made to run another line back to the east. However, we could not make any headway against the combination of very strong trade winds and high seas and the ship was forced to take a southeasterly course at a high angle to the apparent trend of the anomalies.

The cruise was plagued by a series of equipment problems. The most frustrating were with the seismic reflection equipment and we were not able to obtain profiler records for the first four days of the cruise. This was due to the fact that neither eel gave a recordable signal. By building a new eel section, the E.T.s were able to put together a servicable, although noisy eel. An autopsy of the other eel revealed that something over half of the hydrophones were dead. A new eel was obtained from Conrad in Guam and may have improved the situation.

We also reencountered the problem of noise from D.C. motors on the ship interfering with the magnetometer readings. The problem was compounded by the fact that the ship was near the magnetic equator and the signal from the Earth's field was thus weak and difficult to lock onto. We initially attempted to fight the interference by running the signal through an additional filter to increase the roll off, but it was really only solved when the guilty motor burned out.

The third problem was with the computer. As it is now functioning, the computer can be used to run satellite alerts, the FIXPIT navigation program, and satellite fixes. The parameters for the fixes must be entered by hand rather than on paper tape. It is not possible to use the plotter. I am not

certain whether I would spend any great sums of money to rush in repairing the computer since it can now perform most of the operations which are routinely done. When I asked the computer operator about plotting navigation and magnetics data, he said that I was the first Chief Scientist who had made such a request since he had been on the ship and the data stored on the disk was from V32-15 indicating that cruise was the last time any systematic effort was made to use the plotter and data reduction programs.

