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CRUISE REPORT

Ship Name: VEMA Cruise No: 33-08

Departure: June 15, 1976 (Date) from Columbo (Port)

Arrival: July 19, 1976 (Date) at Singapore (Port)

Days at Sea: 34 Days Foreign Port: 5
No. of days in arrival port

Area of Operation:
Wharton Basin

Program Description: Magnetic and seismic survey in the Wharton Basin and onto the northwestern Australian continental margin. Heat flow measurements in the Wharton Basin and in the inner trough between Java and the Java trench. Coring, camera, and nephelometer stations in the Wharton Basin.

Participants: (All L-DGO unless otherwise specified)

Herron, Thomas	Chief Scientist
Giddy, Howard	Coring O. S.
Holland, David	E. T.
Holland, Michael	Camera/nephelometer
Leiser, Nick	Computer Tech.
Morrow, Mark	E. T.
Paisley-Smith, Van	Gravity/Heat Flow
Quick, Dennis	E. T.
Rock, Anthony	Computer Tech.
Steeves, Herb	Airgun
Sundvik, Michael	Core describer

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

VEMA left Columbo on the afternoon of June 15 and arrived at Singapore on the morning of July 19, completing a 34-day leg (Figure 1). The objectives of the leg were to: 1) conduct a magnetic and seismic survey of a part of the Wharton Basin in which Roger Larson had tentatively identified magnetic anomalies M0 to M4 on the tracks of Conrad 14-03 and Vema 33-05; 2) to obtain sets of closely-spaced T-grad stations in the Wharton Basin and in the inner trough between Java and the Java trench; 3) to take about 15 camera nephelometer and piston core stations along the track; and 4) to dredge on the Ninety-East Ridge. All objectives were accomplished except the dredging. Twenty stations, many of them two-wire, were taken.

VEMA left Columbo without receiving two cartons of important supplies. About 36 hours was spent cruising west of Ceylon in anticipation of returning to collect them, if found. During this interval two stations were taken and the magnetometer "problem" which had existed for several legs was solved. The "bad" output existed because the magnetometer amplifier had inadvertantly been tuned to a rather strong noise "signal", instead of the precession signal, at the same time during Leg 5 that the ET's changed water in the coil. They subsequently blamed "dirty" water for the noisy output. They were apparently unaware that the electronic counter reading could give them the amplifier output frequency for comparison with the theoretical value of the precession frequency for the ship's location, as given on a world chart in their magnetometer manual. The noise frequency as it turned out, was nearly

twice the proper precession frequency. The ET's failed to consider non-electronic problems and were surprised that their noisy "signal" was unchanged (on the oscilloscope) when the cable and coil were disconnected from the amplifier. With the help of the Captain and Chief Engineer, the ship was stopped in the water and all non-essential electrical circuits (main refrigeration, lights, etc.) were shut down one at a time until it was determined that the ship's d-c blower system was responsible for about 70% of the electrical noise induced in the magnetometer amplifier. The noise energy peaked at about 3200 hz, far from the 1700 hz precession frequency. The induced noise was stronger than the precession signal and may well be degrading the performance of other scientific equipment. Once properly tuned, the magnetometer output was extremely stable and almost noise-free to the degree of resolution on the strip-chart record.

Receiving no word of the missing supplies we set a course toward Australia. A track of 2000 miles straight into the Southeast Trade Winds and corresponding swell reduced the planned 9 knot speed to about 7-7 1/2 knots. As it was apparent we would be several days behind when the Wharton Basin was reached, no dredging was done on the Ninetyeast Ridge and only one station was taken (on the Cocos Ridge), where the T-grad, camera, and nephelometer cases were put down empty for pressure testing at the request of the scientific crew members responsible for these instruments.

The satellite navigation system failed (and was unrepairable) just as the ship crossed the equator a few days from Ceylon. Two celestial

fixes a day were provided by the ship's officers for the remainder of the cruise. Fouled-up fixpit output was subsequently blamed by the computer technicians on the relatively inaccurate celestial fixes. After much prodding the replacement computer technician realized he had failed to change sign of the latitudes of the input data when crossing the equator.

Two high quality sonobuoys were recorded over the Ceylon Abyssal Plain just west of the Ninetyeast Ridge. East of the Ridge the ship was turned to the south, parallel to the Ridge, and another sonobuoy recorded.

In the Wharton Basin, four traverses were run across the strike of the magnetic anomalies providing data sufficient for positive identification of the anomalies. One two-wire station was taken in 1000 fathoms on the Australian slope of the Cuvier Basin. Eight other stations (some two-wire) were taken in the Wharton Basin for attempted T-grad measurements. Lacking proper batteries for the T-grad, because of the missing supplies; the heat-flow technician improvised several battery packs which failed on the early stations. He then used an empty T-grad case to contain a large battery pack and ran power over to the other T-grad using one of the probe connectors for power input. This worked, but all subsequent measurements had only four probes on two pipes. Four apparently good T-grad stations were obtained.

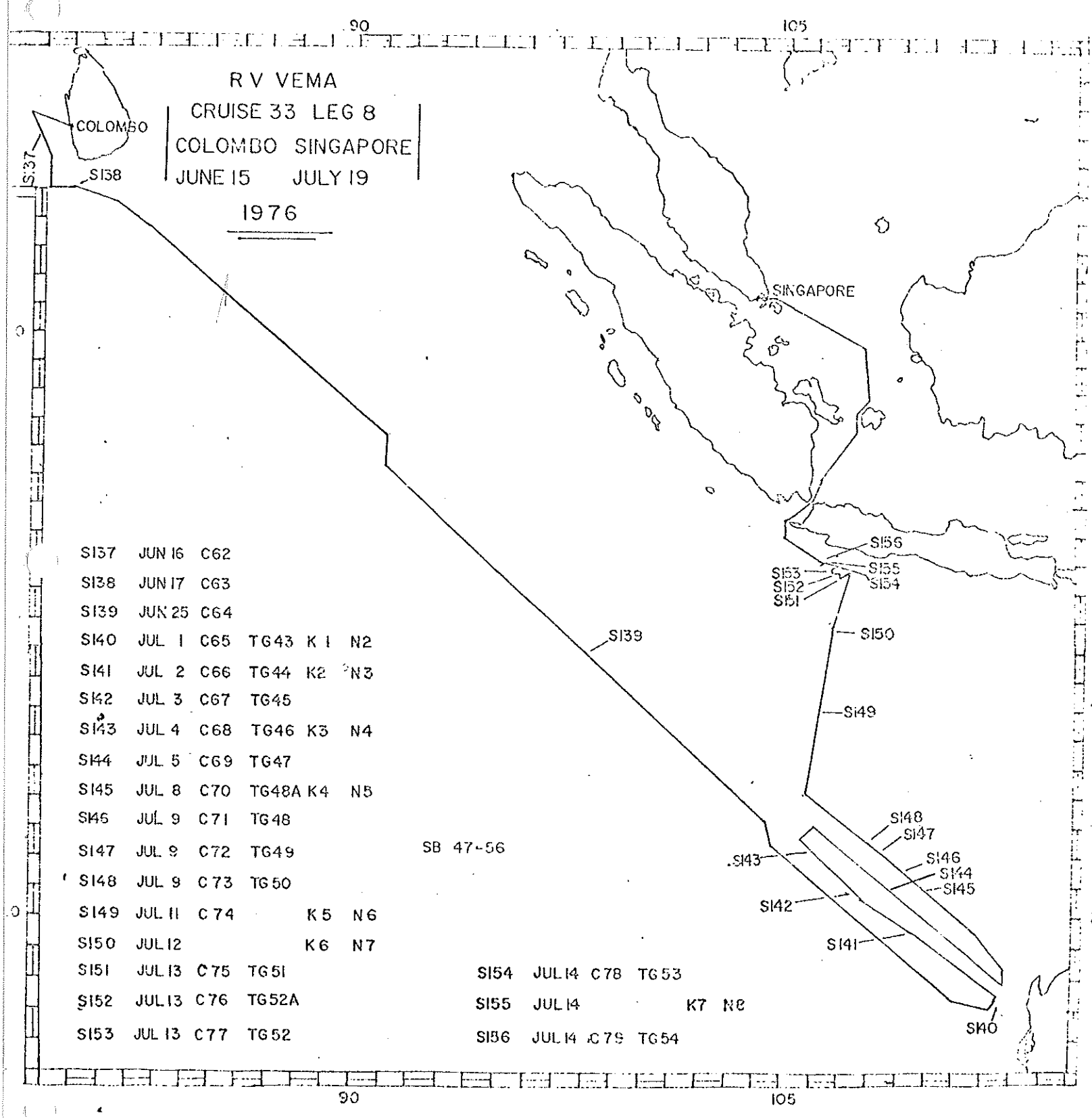
The camera and nephelometer, both inoperative initially, were repaired by the camera man and functioned well thereafter. A cracked strobe dome was glued and served well.

Upon completing the magnetometer survey in the Wharton basin, VEMA sailed northward toward Java. One core and one camera nephelometer station were taken in the northern part of the Wharton Basin. After crossing the Java trench and passing over the inner trough between the trench and Java, the first of a set of T-grad stations was taken. Five stations were taken with apparently good T-grad measurements at three of them. One camera station was taken here.

VEMA then proceeded to the Sunda Straight where the geophysics gear was pulled aboard for the passage through the shallow waters of the South China Sea to Singapore.

Because of the lost supplies in Columbo there was not enough paper to run the 12 kHz PDR except for a few days at the end of the leg.

My general impression is that VEMA is very well operated by the ship's officers and crew. Similarly, the scientific crew worked well. However, because most of them are quite young and inexperienced they tend to jump to the most obvious conclusion regarding the source of trouble("dirty" water, poor celestial fixes, etc.) without considering alternative explanations.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RV VEMA
CRUISE 33 LEG 8
COLOMBO SINGAPORE
JUNE 15 JULY 19
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SI38 JUN 17 C63
SI39 JUN 25 C64
SI40 JUL 1 C65 TG43 K1 N2
SI41 JUL 2 C66 TG44 K2 N3
SI42 JUL 3 C67 TG45
SI43 JUL 4 C68 TG46 K3 N4
SI44 JUL 5 C69 TG47
SI45 JUL 8 C70 TG48A K4 N5
SI46 JUL 9 C71 TG48
SI47 JUL 9 C72 TG49
SI48 JUL 9 C73 TG50
SI49 JUL 11 C74 K5 N6
SI50 JUL 12 K6 N7
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