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CRUISE REPORT

Ship Name: VEMA **Cruise No:** 36-07

Departure: January 9, 1980 (Date) **from** Hong Kong (Port)

Arrival: February 6, 1980 (Date) **at** Hong Kong (Port)

Days at Sea: 28
(Count day of departure but not day of arrival in port)

Days Foreign Port: 3
(number of days in arrival port before next leg)

Area of Operation: South China Sea

Program Description: 1500 N. Mi. MCS coverage was completed across the northern continental margin of the South China Sea. This was the first part of a cooperative MCS program with the Peoples' Republic of China.

Program supported by what contract: 439-5097-5973

Participants: (All L-DGO unless otherwise specified)

Name	Title	
C. Windisch	Chief Scientist	L-DGO
B. Taylor	Co-chief Scientist	"
W. Robinson	E. Eng.	"
P. Woodroffe	E.T.	"
C. Salcedo	E.T.	"
S. Hudson	Res. Asst.	"
D. Medlicott	Computer Prog.	"
P. Belknap	Computer Op.	"
A. Hazelman	Mech. Tech.	"
H. Smith	Mech. Tech.	"
M. Iltzsche	Mech. Tech.	"
A. Montez	Field Eng.	SECo
Li Zhen Wu	Geophysicist	PRC
Feng Wen Ki	Geologist	PRC
Qian Yi Peng	Geophysicist	PRC

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

Discussion

Some 1500 N.Mi. of 12-Ch. X 1200 meter MCS coverage was completed during this second leg of the L-DGO/PRC cooperative program. All tracks covered were in the western part of the study area as shown in the attached drawing.

It is premature to discuss the unprocessed data except in very general terms. Crude interpretation indicates a relatively large sub-shelf basin exists immediately south of Hong Kong containing some 5.0+ seconds of sediments in the deepest area recorded. Much of the structural control within and around the basin appears to be due to block faulting. The Chinese have a drilling platform located on the crest of a basement rise near the northern edge of the basin. Some five holes have been drilled at this location. Granitic (?) basement was reached at 3100 m which probably corresponds with depth of the deepest coherent reflector observed in our monitor records. We were told that oil had been recovered at this test site. There appear to be other narrow E-W trending faulted basins along the outer shelf and upper slope. Some of the faulting has very clear topographic expression. Offsets in the youngest reflectors indicate relatively recent structural activity in the vicinity of the shelf-slope break. Basement reflections are easily followed from the shelf to the deep ocean basin.

In general the scale of many major geological features on the shelf seems smaller than the spacing of ship's tracks. This may necessitate some additional MCS or high-quality, single-channel lines to fill in between the initial MCS tracks before the shapes and trends of the basins can be drawn accurately.

To a great extent this first month of MCS on VEMA was a shakedown for the recently installed seismic gear--a fact which limited overall data recovery to 1500 N.Mi. instead of the 2000 N.Mi. or more we had hoped for.

The DFS IV worked quite reliably once some difficulty with connectors had been found and corrected. There were other challenging problems of an intermittant nature both in the DFS IV and the block box header unit. The latter is still a source of trouble and must either be replaced by a more reliable design or, better yet, substituted by a mini-computer. Little or no down time resulted from the overall recording system, however..

The new SECo streamer proved to be a disappointment. All but four of the quick-disconnect couplings between the various sections leaked sea water causing a succession of noise problems and inoperative depth transducers. The SECo field engineer and the E.T.s spent some three days sorting this out. The problems were caused by poorly designed connectors--poor in the sense that their watertight integrity depends upon very fragile "O" ring seals. The situation reached a final solution with vigorous applications of vinyl mastic pads and yards of tape (what else?). Exit field engineer!

D.C. leakage continued to be an intermittent difficulty giving rise to a certain amount of A.C. pickup on one streamer channel. Since the electrical leakage could have been anywhere in the streamer, we proceeded to make track rather than waste more time in the hope that notch filtering during data processing would provide a cure. Thereafter, the streamer worked quite well.

The new A.C.D.C. automatic depth control system for the streamer worked quite well. On several occasions one or more of the depth control "birds" at the head of the streamer would forget where they were supposed to be and move toward the surface. It was a simple matter to recommand them to the desired working depth--usually 40-60 ft. or more depending upon sea state and traffic.

The air compressor failed completely after two days of operation necessitating a return to port for repairs. The crosshead piston in the fourth stage had cracked through around the oil ring. The piston eventually separated into smaller chunks which lodged between various reciprocating parts destroying the entire fourth stage including the booster block. A spare block was on hand, but a guide cylinder assembly had to be flown in from Houston. This breakdown and subsequent repairs cost a week of working time.

Additional compressor failure resulted when the fourth stage H.P. discharge line blew out due to overheating. The source of this difficulty was a sheared impeller in a water pump. This type of accident is not new and has considerable potential for injury to persons working in the compressor room without eye and ear protection. Installation of an overheat alarm on the fourth stage aftercooler would be a good safety feature.

And finally for want of some lockwashers an exhaust flange coupling on the compressor diesel engine parted setting the overhead of the compressor room afire. Damage was negligible except to Martin's ego. In fact, it was a shipyard error.

The ship's computer system seems to be working well, but it is not yet able to acquire data automatically--the magnetics, depth, fixes, etc. having to be punched in. D. Medlicott is working tirelessly on various programs for data logging and playback. A version of a navigation program allows plotting MCS shot points along the ships tracks. One suspects that within a few short months the necessary programs for acquisition ans plotting will be complete. Some technical problems occurred in the disk drives. Presumably these are due to equipment damage during shipping.

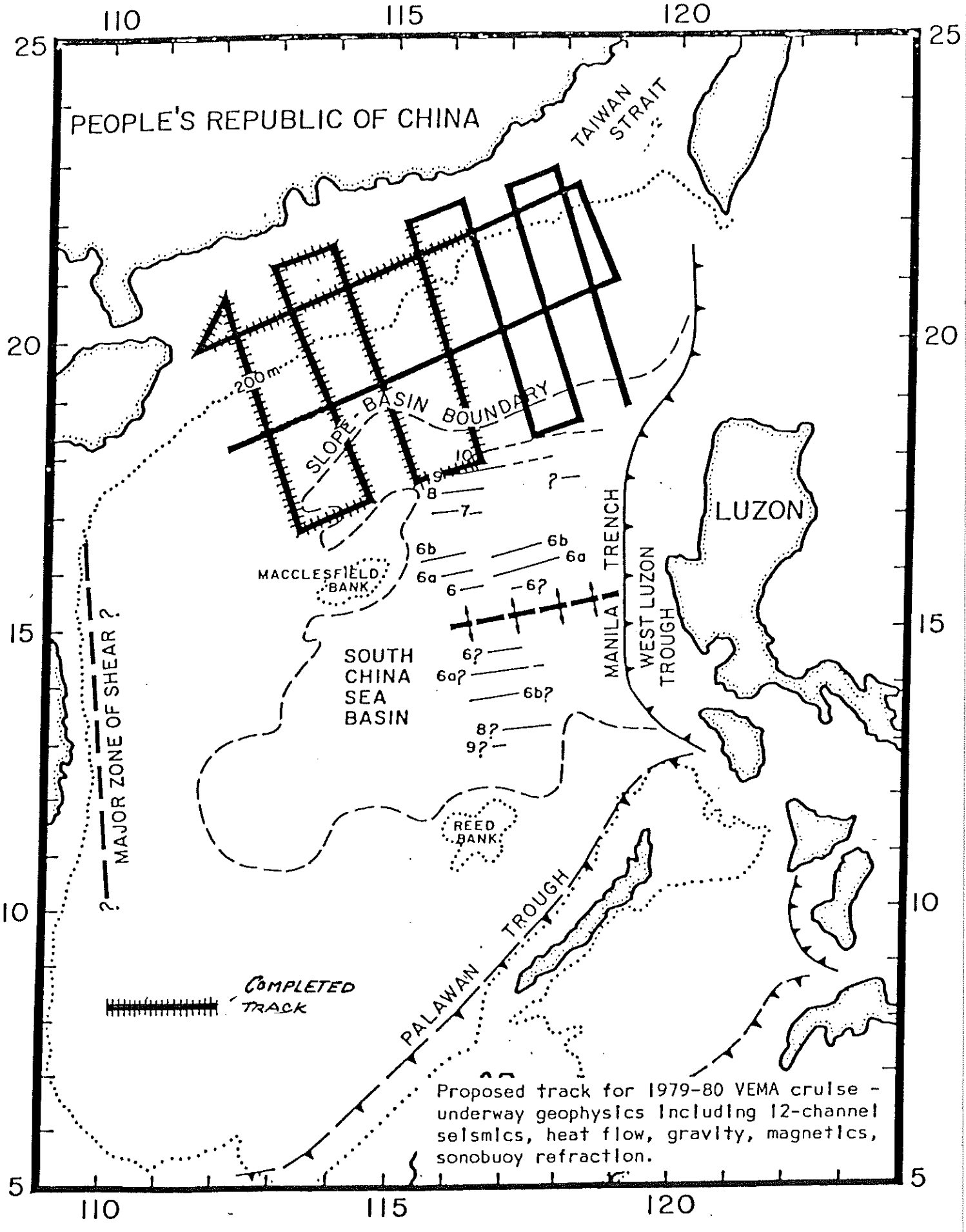
Some 50 sonobuoys were recorded on the drum profilers and on an auxiliary channel of the DFS IV. The results were generally quite good.

Gravity data suffered as usual in the heavier weather. VEMA had exhausted her spare gyros and accelerometers shortly before our departure. Additional gyros were later pirated from R/V CONRAD's inoperative system and shipped out. Spare accelerometers are on order.

Magnetics data was reasonably good, though the signal-to-noise ratio was sensitive to ship's heading. A variation of a few degrees in course on some N-S lines meant the difference between acceptable and illegible data--at least on the shelf.

Scientific personnel were a mixed bag. One E.T., C. Salcedo, retired. There were no serious competency problems. P. Woodroffe will pick up the gravity work temporarily until R. Rossler can be brought up to speed on record keeping, etc. The Chinese geophysicists were capable watch standers in both labs and participated enthusiastically in streamer hauling exercises plus related tasks.

V36-07 was a good leg for all the other things that could have happened but didn't.


110
115
120
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PEOPLE'S REPUBLIC OF CHINA
TAIWAN STRAIT
200m
SLOPE-BASIN BOUNDARY
10
9
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7
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6b
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6?
MACCLESFIELD BANK
LUZON
MANILA TRENCH
WEST LUZON TROUGH
SOUTH CHINA SEA BASIN
6?
6a?
6b?
8?
9?
MAJOR ZONE OF SHEAR ?
REED BANK
PALAWAN TROUGH
COMPLETED TRACK
Proposed track for 1979-80 VEMA cruise - underway geophysics including 12-channel seismics, heat flow, gravity, magnetics, sonobuoy refraction.