RRS JOHN MURRAY CRUISE

Report on Cruise 5/1976

4 May - 14 May

Report of Proceedings

RRS John Murray Cruise 5/76

May 4 (South Shields) to May 14 (South Shields)

a) Objectives

To test the newly developed Pull-up Shallow water Seismometer (PUSS) System and to gain experience in electrically firing a dispersed charge of 900 lbs geophex. The results for which we hoped were firstly measurement of Seismic background noise versus signal level for shots of appropriate size fired at ranges from 10 to 200 kms and secondly a reversed crustal profile west of the Viking graben.

b) Area

North Sea between 55°49'N 1°51'E and 57°25'N 00°07'E with five PUSSes deployed at 10 km intervals at the southern end for Line 1 and at the northern end for line 2.

c) Weather

Good almost all the time. Operations were handicapped by fog on May 9 and suspended by a force 8 gale on May 13.

d) Proceedings

The five PUSSes were laid for line 1 between 0900 and 1400 on May 5. Immediately after this the sump of the starboard engine cracked and it was necessary to recover the gear and return to Newcastle. PUSSes were laid for line 2 on the 8th May and shots were fired out to 100 km on 9th, working only in daylight hours to facilitate navigation by Decca. On the 10th we attempted to fire the 900 lb dispersed charge at the southern end of the line. Although we had electrical continuity until the moment of firing and I believe that the detonators fired, the charge did not fire. Immediately after passing the firing current the leads were open circuit and half an hour later the meter indicated a short.

and no other long range charges could be fired into the recording windows. These attempts may not have been successful. PUSSes were recovered a. m. 11th: we got three records and two had failed to run tape.

PUSSes were laid for line 1 a. m. 12th and the four smallest close range shots were fired p. m. No firing was possible on 13th as the ship was hove to but the PUSSes were recovered when the wind dropped between 2000 and 0030. This time we got four records and one failed to switch on.

The seismic signal to noise ratio looks reasonably good for shots out to 100 kms but it is highly unfortunate that we were not able to record any distant shots. We did not, of course, obtain a reversed refraction profile.

e) IOS equipment performance

1. The PDR only occasionally recorded an echo in 40 fms. It produced a feeble 'ping', inaudible when standing near the transducer. EHT volts are low to vanishing on both the power packs and the spare power pack. I tried changing the output valves without improvement and subsequently relied on the Bridge for soundings at shot and laying positions. There are spare V19 (thermal delays) on board but I couldn't find rectifiers or latching relays

2. The detonator locker is worn out (hinge failed), not completely wood lined and not waterproof. It should be replaced with something more sturdy.

3. I do not wish to sail again with the roller firing platform. Crumbs of Geophex should never be allowed to come in contact with steel. The platform worked well enough for 200 lbs charges in a flat calm on 9th; I was thoroughly glad that we were prevented from firing a 600 lb charge in a net from it when the ship was pitching on 10th. The platform had to be unbolted from the stern before the dough nut buoys could be laid or recovered, a thoroughly dangerous occupation in a violently pitching ship on 13th. Tilting wooden firing platorms, a drawing of which you were sent before the cruise, have been used by us to fire $\frac{1}{2}$ ton charges in Discovery in 1961, in Discovery in rough weather in 1967 and in Shackleton in 1971: they are a proven design. They are safe.

You should supply John Murray with an 8ft square of tarpaulin to be used to cover the steel deck when making up geophex charges, and ensure that it is scrubbed after each operation and thrown overboard at the end. Fortunately the Bosun was able to make one for us. Crumbs of Geophex become extremely dangerous after a few days weathering.

f. Ship performance

You need a new sump!

The ship needs an efficient inflatable work-boat with permanent storage forward under a Schatt davit. The boat should have a less powerful outboard than the Volva Penta 250 since a slip of the hand on the throttle might well

fitted in Discovery, Shackleton and in all warships. This should be additional to any VHF radio system. After the VHF radio was dunked on May 10th the mate was left communicating the angles of wires and suggested engine movements from the after deck to the Bridge by tick-tack hand signals. His gestures might easily have been misunderstood!

h) Signature and date

I apologise personally for failing to intercept the errors in the data sent to the RVB which were promulgated in the Sailing Instructions.

This has been a particularly pleasant and happy cruise. We have had splendid food and the best possible co-operation from the Master and Officers: I was particularly impressed by the speedy employment of the Paxman generator to give the ship extra speed in order to recover the firing schedule after we had been stopped by fog on May 9.

D. H. Matthews
14 May 1976

Brian Kennett
Professor Jacobs
Tim Owen
five participants
3 R. V. B.
Mr Ramsden, Offshore Operator
Mr Staines, do
6 recording groups
E. Boon, DOE

Lt Cdr D. C. B. Webb, Hydrographic Office
Conoco
Shell
Mobil
BP
Ashland
Mesa
Mr Baxter, Lowestoft