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CRUISE REPORT

FRS "EXPLORER"

5 - 29 January 1976

Personnel

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Objectives

1. To conduct instrumented engineering trials on a 1000 HP Delagic trawl to determine the effect of changes in warp length, flotation and weighting on trawl configuration when in contact with the seabed.
2. To conduct instrumented engineering trials on a 600 HP version of the Delagic trawl to determine the most appropriate rigging and in particular otterboard size for this trawl.
3. To conduct limited instrumented trials on a pelagic trawl in deep water to establish the optimum techniques for controlling warp length and towing speed to obtain given vertical displacements of the net. Consideration will be given to the known behaviour during the catching process of deep water species such as Blue Whiting.
4. To test the deployment and recovery of a rig for the measurement of sedimentation rates at various points in the water column.

Narrative

After the port side gallows were installed, "Explorer" sailed from Aberdeen at 2100 hours on 7 January. Next morning, in the Moray Firth, the sedimentation rig was shot and recovered after which the ship made several runs over the Buckie measured mile to calibrate the electro-magnetic log. "Explorer" then made for Fraserburgh where Dr Davies and Mr Payne went ashore by pilot boat, and from there the ship made overnight passage to Shetland. Gear testing commenced on 9 January, for the most part in 80 fms of water off Fetlar and when weather permitted in deep water north of the Shetlands. This work continued until 17 January when "Explorer" put in at Lerwick to change personnel.

"Explorer" sailed for the fishing grounds off Fetlar on the morning of 21 January having been delayed by the late arrival of spare instrumentation from Aberdeen and by storm force winds. The weather moderated on 22 January and the trials continued until the evening of 23 January when the starboard towing block broke necessitating rerigging the gear on the port side. Bad weather prevented fishing the next day and it was decided to sail for the Moray Firth which was reached on 26 January. The electro-magnetic log was again calibrated off Buckie and the engineering trials continued until "Explorer" sailed for Aberdeen arriving on 28 January.

Results

The settlement rigs, which were being tested prior to their use in the FLEX programme, were successfully deployed and recovered in wind conditions of force 6-7.

Comprehensive measurements of engineering performance were obtained for the 1000 HP and 600 HP versions of the Delagic trawl gear, and provisional information on the towing loads and net geometry is summarised in the following table.

PERFORMANCE OF DELAGIC TRAWLS AT 3 KNOTS AND 150 FATHOMS WARP

	600 HP Version	1000 HP Version
Net depth - metres	88	95
Net mouth spread - metres	14	19
Net mouth height - metres	18	16.5
Net drag - tonnes	4.1	5.7
Gear horse power	98	150
Gear drag - tonnes	4.6	7.1

In the course of 11 tows with the Delagic gears, severe otterboard damage occurred on 3 occasions due partly to poor manufacture and partly to sudden shock loads originating when the winch brakes slipped and were reapplied.

The 1000 HP gear was also tested using a pair of specially strong pelagic boards of Norwegian design. While the mechanical strength of these boards was more than adequate, they did not produce the required performance in net spread or in the rate at which gear depth varied with changes in ship speed. Based on these results, a new design of otterboard is being developed with improved strength but maintaining the hydrodynamic performance of Suberkrubs.

The Delagic gears were used for sustained periods in contact with the seabed, and even when the groundrope and the chain on the lower sweeps were hard on the seabed (as evidenced by polish on the chain and wing-end weights) no significant net damage occurred due to bottom contact. Although fish were scarce on the grounds being worked, the catches obtained correlated reasonably with fish traces detected on a netsonde attached to the headline and there were no indications of fish escaping beneath the footrope or through the large meshes in the forward part of the net.

D. N. MacLennan
R. S. T. Ferro
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Seen in draft - F. Orr.