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FRV *Scotia*

Cruise 1699S

REPORT

6-28 October 1999

Personnel

R D Galbraith (in charge)
P J Copland
N S Collie

A Macdonald (6-16 October)
S J McKay (6-16 October)

P J Barkel (16-28 October)

*O A Misund (20-26 October)
*A Engaas (18-26 October)
*E Hals (18-26 October)
**S Oldeide (18-26 October)

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Objectives

1. To undertake pelagic fishing trials using both upper and lower net drum winches.
2. To carry out fully instrumented engineering performance measurements on PT 168.
3. To conduct joint trials with the Institute of Marine Research (IMR) on the efficiency of a size selective mackerel grid installed in a pelagic trawl.
4. To measure water flow in front of, below and behind the grid at typical towing speeds.
5. To obtain video film of mackerel behaviour while selection is taking place.

Out-turn cost per project: 23 days MF060

Narrative

Scotia left Aberdeen on 6 October and commenced gear trials in deep water west of Shetland the following day. Trials continued until 10 October when work was halted by bad weather. *Scotia* steamed overnight to shelter off Balta where 11 October was spent repairing underwater instrumentation and making minor modifications to fishing gear. On 12 October deep water

trials were resumed NW of Muckle Flugga and continued until the evening of 15 October. *Scotia* set course for Lerwick where a staff changeover was carried out by boat transfer the following morning. Passage was then made to Bergen where *Scotia* docked on the morning of 17 October.

Norwegian staff were embarked on 18 October together with the Selstatral selective grid net and additional scientific equipment. *Scotia* left Bergen that afternoon for the mackerel fishing grounds due west of Bergen where both trawl gear and underwater instrumentation were tested on 19 October in preparation for the fishing trials which commenced the following day. On the morning of 20 October the Norwegian pelagic trawler *Gunnar Langva* joined *Scotia* and Dr Misund and the vessel's fishing master came aboard by boat. Discussions were held on how codend transfers would be carried out and, having established an agreed procedure, the fishing master returned to his vessel. Both vessels then worked in partnership searching for marks and fishing until later that evening when, in the process of retrieving an emptied codend from *Gunnar Langva*, a loose rope codend strengthening hoop fouled *Scotia's* stationary propeller. After several unsuccessful attempts to clear this diving assistance was sought from a Norwegian coastguard vessel patrolling in the area. Having insufficient diving capability on board to attempt such a task in darkness on the open sea K/V *Nornen* then took *Scotia* in tow. The vessels reached the sheltered waters of Korsfjorden on the afternoon of 21 October where a naval diving team quickly cleared the fouled gear and inspected both propeller and rudder to confirm that no damage had been received. The Norwegian authorities offered every courtesy and assistance in ensuring that *Scotia* was able to resume work as quickly as possible.

Scotia then rejoined *Gunnar Langva* on the fishing grounds that evening and the vessels worked together until the afternoon of 22 October when, while *Scotia* prepared to shoot on marks spotted by the Norwegian vessel, a serious malfunction of the starboard lower net drum winch necessitated that an engineer from the company which supplied the equipment be taken on board as soon as possible. *Gunnar Langva* then sailed to Aalesund to land the catch and *Scotia* steamed back to Korsfjorden to meet the replacement partner vessel *Ligrunn*, who had taken the engineer on board. The engineer joined *Scotia* by boat transfer early on 23 October and both vessels put to sea later that morning. After net drum trials had been completed both vessels worked together till evening when *Ligrunn* left to land her catch in Bergen. On 24 October *Scotia* worked alone on the fringes of the purse seine fleet, deliberately targeting the smaller shoals. *Ligrunn* rejoined *Scotia* early on 25 October and both vessels operated together until late afternoon when *Ligrunn* left to land the catch transhipped from *Scotia*. On the morning of 26 October *Scotia* entered Bergen where Norwegian scientific staff and equipment were disembarked, together with the visiting engineer and all Selstatral gear. The vessel left Bergen that evening to return to Aberdeen. On 27 October a stop was made on passage to carry out trials with both plankton and hydro winches which had been modified by the winch manufacturer's engineer when on board. *Scotia* docked in Aberdeen on the morning of 28 October when all scientific staff, equipment and fishing gear left the vessel.

Results

1. PT 168 was shot and hauled from the upper net drum winch but immediately switched to the lower winch for instrumentation work. If large pelagic trawls are deployed from the upper net winch it is recommended that a removable roller be installed above the ramp roller to restrict the vertical movement of bridles and trawl wings.

2. Twelve hauls with PT 168 resulted in 77 data blocks at various towing speeds and warp lengths. The 8 sq metre Kvit Topp otterboards were tested in near-surface and mid-water mode but problems with the netzonde system precluded any deep water work with 1,700 kg weights. Using maximum permitted towing power (85% of available horsepower) PT 168 with a 100 tonne mackerel codend attained a net water speed of

5.5 knots. In comparison the Selstatral gear with a 6 sq metre grid, 50 tonne grid cover codend and 450 tonne main codend achieved a speed over the ground of just over 5 knots during fishing operations using similar engine RPM. Gear engineering data for PT 168 will be analysed in the Laboratory.

3. Three experimental hauls and five fishing hauls targeting mackerel marks were carried out with the selective grid trawl, although in one of the latter a fouled lower starboard selvedge resulted in no catch. For the remainder of the fishing hauls catches ranged from around half a tonne (15 baskets) to over 38 tonnes (1,270 baskets) of mackerel. A statistical analysis of the grid selectivity data will be conducted by the Institute of Marine Research.

4. Due to time lost for various reasons it was not possible to investigate water flow in and around the selection grid.

5. Twenty-one hours video film of grid performance and mackerel behaviour were obtained. The tapes will be analysed by IMR fish behaviour personnel.

R D Galbraith
15 November 1999