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Not to be cited without prior reference to the Marine Laboratory, Aberdeen

FRV *Scotia*

Cruise 1299S

## REPORT

27-31 July 1999

### Personnel

G G Urquhart (In charge)

P J Barkel

M J Burns

N S Collie

C D Hall

J T M Hunter

C W Shand

M Watson

### Fishing Gear

GOV (BT 137)

### Other equipment

ARIES 3

ARIES 4

New OCEAN sampler

RCTV

U-TOW

### Objectives

1. To conduct engineering performance measurements and trials on towed samplers and a TV vehicle.
2. To conduct development work on a range of electronic packages used with the towed samplers and vehicles.
3. To assess repeatability of the CEDRIC cod-end recorder.
4. To develop the IOS monitor system.

**Out-turn cost to project:** 2.5 days AE11n, 2.5 days MF0661

### Narrative

Equipment and cables were loaded on Monday 26 July and *Scotia* departed Aberdeen at 1000 hours on Tuesday 27 July. The vessel sailed for the Buchan deeps for the initial trials in relatively deep water. The U-TOW sampler, fitted with a heel, pitch and depth metre, was deployed *en route* and tested at speeds ranging from 2 and 14 kt. On reaching waters in excess of 100 m depth, the OCEAN sampler, ARIES 4 and ARIES 3 were deployed in turn and tested at a variety of tow-wire lengths, speeds and tail-fin angle. The samplers were instrumented with load-cells,

heel, pitch and depth metres and flow sensors. A modified IOS depth monitor, incorporating an altimeter under development, was attached to the ARIES towing-yoke during some of the trials.

The RCTV was deployed in its standard configuration to assess its dive/climb performance. The rotors were then exchanged for a shorter, larger-diameter design and the vertical performance was reassessed. Load and attitude sensors were also fitted to the RCTV during these tests.

On the evening of Thursday 29th, *Scotia* sailed for the fishing grounds of Smith's Bank in the Moray Firth for trials of the horizontal (port/starboard) excursions of the RCTV. The vehicle was fitted with Scanmar spread transponders while the GOV trawl (BT 137) was rigged with Scanmar spread sensors at the centre of the headline to act as a reference point. During this trial one of the rotor shaft bearings was damaged beyond repair, and RCTV trials came to an end.

Tests on the towing performance of ARIES were resumed, during which a full set of CEDRIC sensors were attached to the frame for evaluation. U-TOW trials were completed and U-TOW was used as a platform for the calibration of flowmeters.

Scientific work stopped at 0930 hours on Saturday 31 July, when *Scotia* sailed for Aberdeen. Gear was off-loaded on Monday 2 July.

## Results

1. Measurements of towing attitude and drag for various speeds and wire-lengths were recorded for all of the towed bodies. ARIES 4 and OCEAN sampler have stable towing characteristics and tow effectively level. The pitch angle of ARIES 3 varies considerably with towing speed but its characteristics are now well defined.
2. The new control system for the RCTV allowed higher quality video signals than the original system but proved less controllable. A modification to the operator's control console is planned to overcome this problem. The large diameter rotors (230 mm) produced larger deflecting forces than the standard design (150 mm) as predicted. The resultant loading from this and from the relatively high towing speeds may have contributed to the bearing failure.
3. Limited trials on the CEDRIC system suggest that it performs correctly with a full set of three pairs of distance sensors.
4. The IOS depth sensor gave repeatable values over a range of towing speeds and distances. The new altimeter recorded ranges up to 75 m but is sensitive to mounting angle.

Further analysis on the recorded data will be carried out at the Marine Laboratory.

G Urquhart  
15 September 1999

Seen in draft: D Hodge (OIC FRV *Scotia*)