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FRV *Clupea*

Cruise 0603C

REPORT

1-10 April 2003

Ports

Loading: Fraserburgh
Unloading: Fraserburgh
Port call to exchange equipment: Fraserburgh

Personnel

R J Kynoch (In charge)
E Jones
CD Hall
P Barkel
I Penny
M Burns

Out-turn days: 10 days – MF06q

Objectives

1. To conduct engineering performance measurements on the RCTV to determine the towing characteristics of a 25 mm and 27 mm umbilical cables.

2. To assess the effect on RCTV towing performance by attaching depressor weights at various points along the umbilical cable.

3. To monitor the effect on RCTV towing depth of variable-angle depressors fitted to the upper and lower vehicle frame.

4. To test new methods of mounting self-recording video systems onto the trawl, including a new video gen-locking system.

5. To carry out underwater observations on different cod-end, extension and square mesh panel rigging configurations.

6. To provide RCTV operator training to manoeuvre the RCTV in and around the trawl.

7. To test new survival cover auto-winch.

Narrative

All fishing gear and RCTV equipment was loaded aboard *Clupea* at Fraserburgh on 31 March. Staff joined the vessel on the 1 April and thereafter completed the rigging of the fishing gear and RCTV equipment. However, the vessel was unable to leave Fraserburgh until 3 April due to modifications to the guiding on gear and distance counter on the RCTV winch and a Northerly gale. After departing on 3 April the vessel sailed to the Southern Trench ~10 miles north of Fraserburgh and commenced RCTV towing trials. These trials continued until the afternoon of 5 April when the vessel made a port call into Fraserburgh to exchange RCTV cables. RCTV trials continued at the Southern Trench until 7 April. Thereafter, fishing gear observations were made on two rigging configurations on Moray Firth grounds. Case 1 was an 80 mm (knotted) square mesh cod-end attached to an 80mm diamond mesh extension, which had a 90 mm (knotless) square mesh panel (SMP) inserted at the 8-11 m position. All the material used for case 1 was constructed from 4mm single twine. The joining ration for the cod-end and panel was 1:1 and 2:1 respectively. Case 2 was a 110 mm diamond mesh cod-end constructed from 5 mm double high tenacity twine rigged to a 110 mm extension constructed from 5 mm single high tenacity twine. A 90 mm SMP was inserted into the extension at the 9-12 m position with a joining ratio of 2:1 and the gear was fished with/without a 42 m long dogrope. Between the evenings of 7-9 April whilst the vessel was at anchor the auto-winch was deployed and tested. The cruise ended at Fraserburgh on the 10 April with all staff and equipment returning to Aberdeen.

Results

RCTV towing trials were carried out for a range of ballast weights; 0, 22.5 kg, 45 kg and 77.5 kg and variable angle depressor settings of 0 and 10 degrees for both 27 mm and 25 mm diameter umbilical cables. The RCTV was deployed to three different cable lengths; 225 m, 325 m and 350 m, which are typical of lengths used during gear observations. At each length the maximum RCTV running depth was recorded with the rotors stationary and driving down. The towing speed was maintained at 4 knots ground speed and the reciprocal tow method as recommended by ICES was used. One run was made with the 25 mm diameter umbilical cable with lead weights attached at 50 m intervals out to a maximum cable length of 350 m. For this run no ballast weights were added to the RCTV and the variable angle depressor was set at 0 degrees. Due to the time lost at the start of the cruise Objective 3 was unable to be completed.

Observations on rigging configuration case 1 found that there was some slack netting in the panel due to the larger mesh size of the panel compared to the surrounding diamond mesh extension. However, the slack netting did not appear to hinder fish escapes through the panel. Footage of the 80 mm square mesh cod-end showed that some of the knotted meshes had suffered knot slippage. It was also noted that the netting was tapered outwards from the last ~0.3 m of the extension back towards the strengthening bag joining round. There was a considerable amount of slack netting from the front edge of the cod-end running back towards the strengthening bag, which could reduce the area for fish escapes. At the rear end of the cod-end the meshes were fully open and no slack netting was observed. However, there was considerable slack netting in the strengthening bag ahead of the lifting becket and also many meshes were noted lying across the cod-end meshes beneath, and therefore likely to cause an obstruction.

For the first haul of case 2 the dogrope was tied to the starboard quarter of the headline with enough length to allow it to stream back past the codline and therefore not restrict the cod-end. It was connected to the lifting becket using two shackles, a swivel and an O connector, which weighed a total of 4.4 kg in air. The becket was rigged so that the two tails passed out through two metal cod-end rings rigged in the centre of the cod-end top panel. When observed it was found that the dogrope was floating some metres above the starboard side of the gear until alongside the codline at which point it curved down into the sand cloud. The lifting becket was lying over to starboard and streaming back passed the codline. The last 2 m of the cod-end had a slight twist to starboard but this did not appear to be causing a restriction. For haul two the dogrope was shortened by 7 m and reattached to the headline. The cod-end was now found to have a full quarter twist to starboard, which formed at the leading edge of the square mesh panel. On closer inspection it became apparent that the metal work used to connect the dogrope to the lifting becket was possibly causing the twist. For the last haul the dogrope was removed and the lifting becket was attached to the starboard selvedge at the cod-end/extension joining round. The only metal work retained was the O connector, which weighed 0.5 kg in air. When observed there was a starboard twist in the cod-end, which formed half way down the panel. However, it should be note that the lifting becket had enough slack to allow it to stream back passed the codline. During these observations operator training was given to manoeuvre the RCTV around the trawl.

The camera frame for the new video gen-locking system was successfully deployed and observed during three hauls. The frame was not causing any distortion to the trawl nor handling problems when deployed and retrieved. The new auto-winch was tested on 5 runs. Some minor modification will be required before it is used on experimental field trials in July 2003.

Engineering performance data will be analysed in the Laboratory and cable profiles plotted.

R J Kynoch
11 August 2003

Seen in draft: A Simpson, OIC *Clupea*