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In Confidence - Not to be quoted without prior reference to the Laboratory

CRUISE REPORT

FRV CLUPEA

14-22 August 1975

Personnel		
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	G M Cameron	SSO
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	G I Sangster	SO
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Objectives

The objectives of the initial manned tests with the Towed Underwater Vehicle (TUV) were as follows:

(1) Familiarisation of staff with the vehicle and operational procedures.
(2) Test (a) handling system with vehicle manned.
(b) life support (including diving back-up) systems
(c) communications systems
(d) static stability when manned using weight adjustment etc.
(e) control of vehicle in a tideway with the Clupea anchored.

Procedure

Loading of TUV, decompression chamber, life support (compressors etc). A frame and associated equipment was completed on the 13th August and Clupea sailed 2300 hours the following day after having the compass adjustments.

One day (15th) was spent at Cullen Bay testing the handling system with the TUV unmanned and manned.

Heavy swell prevented work the following day and Clupea returned to Buckie for the weekend. The ship then proceeded through heavy weather on the 18th to Invergordon, this being the only suitably sheltered area within easy reach. Two manned dives, one to the sea bed (55 ft) were completed. The following day a further test designed to achieve the correct ballasting of the vehicle was carried out. This was not satisfactory as the vehicle was still too buoyant and the ship tied up at Invergordon to get metal ballast weights to replace the wooden skids. While this engineering work was carried out two staff spent 3 hours in the vehicle to further check the internal life support system. Further testings continued in the evening and following day. The latter part of this period and all of the last working day (21st) attention was given to the dynamic characteristics of the vehicle when streamed from the ship at anchor in a tide way. These tests had to be timed to coincide with the maximum flow rates.

The ship set away for home at 1800 hours arriving early on Friday 22nd.

Results

All 6 scientific staff spent some time in the TUV and experience showed that while it seems a little cramped this was not a difficulty and contrary to expectation in fact had advantages. No-one suffered any 'claustrophobic' problems. No really important snags occurred with the operational procedures and internal conditions of temperature, humidity etc were acceptable.

The handling system worked well although one of the rollers which guide the towing cable had to be removed in order to ease recovery of the vehicle. Modifications to the roller system and other minor adjustments are necessary.

Life support systems were particularly satisfactory - small improvements are needed but these do not involve changes in concept.

Communication systems gave some trouble at times (eg the tape recording of all messages failed to operate properly) but the principles were obviously satisfactory and merely require adjustment for ease of working and improved reliability.

The static stability of the TUV in water proved to be considerably less than expected. Means of stiffening are needed but with the excess buoyancy of the vehicle after the larger pads were added gives some flexibility for this.

Visibility underwater was poor (up to 15 ft) and would certainly not have been suitable for initial towing trials. However during the trials 11 manned dives (duration up to 1 hr 40 mins) were completed with an overall total duration of 10 hr 7 mins. Also, several hours were spent with the vehicle manned with hatches closed on deck to test life support during the trip.

Seen in draft - G Geddes.

J J Foster
26 August 1975