

IN CONFIDENCE: Not to be quoted without reference to the laboratory.

CRUISE REPORT

FRV "CLUPEA"

23 September - 2 October 1970

The aims of this cruise were to test the launch and recovery system for the projected towed underwater vehicle on "Clupea", and to make any necessary engineering modifications to improve the reliability and safety of the technique.

RESULT

A mock-up vehicle of the correct overall size, weight, and centre of gravity was used in the trials. During the first three days of the cruise modification to the position of rollers on the gantry frame and other minor structural modifications were carried out and a temporary wooden cradle was built on to the stern platform of the ship. During the second week the complete engineering system was tested first of all in Buckie Harbour and then out at sea in progressively more open water conditions.

One test was carried out with the fishing gear deployed prior to launch and recovery of the vehicle but the steadying effect on the ship of having the fishing gear under tow tended to ease the handling problem and further tests were carried out without this advantage.

During part of the launch and recovery the use of divers is required; this aspect was also tested and, apart from showing up the need for some minor engineering modification (e.g. the position and direction of the lifting and release mechanisms on the T.U.V.), was also shown to be satisfactory.

Even with the various modifications still outstanding the system worked satisfactorily in sea states of 3+ and a best time for the complete launch, disconnection, reconnection and recovery, of 6 minutes was achieved. A summary of the launch and recovery system developed follows, but it is anticipated that when this is operated with the actual T.U.V., with pilot and observer, some additional stages will need to be inserted to tie in with the needs of communication on board and between the vehicle and the ship.

LAUNCH

1. The T.U.V. is lifted hard against the "A" frame.
2. The "A" frame plungers are inserted and the tension taken off of the lifting wires.
3. The drogue is deployed.
4. The gantry is put outboard.
5. The tension is taken on the two lifting wires and the "A" frame plungers retracted.
6. The T.U.V. is lowered into the water.

7. The T.U.V. is streamed aft using the towing cable to take the tension.
8. The lifting attachments have floats attached by divers.
9. The divers release the lifting attachments.
10. The drogue is pulled in till there is no tension on the drogue - T.U.V. rope; this rope is released by a diver.
11. The drogue is taken on board "Clupea".

RECOVERY

1. The drogue and lifting wires are deployed from the stern to a position about 30' aft.
2. The T.U.V. is brought to this position using the towing cable.
3. The drogue is attached to the T.U.V.
4. The drogue is then allowed to stream aft till it is acting as an anchor to the T.U.V.
5. The divers attach the lifting attachments and disconnect the floats.
6. The T.U.V. is brought just under the stern by the towing cable.
7. The T.U.V. is lifted hard against the "A" frame.
8. The "A" frame plungers are actuated and the tension released from the lifting wires.
9. The gantry is brought inboard.
10. The tension is taken on the lifting wires and the "A" frame plungers retracted.
11. The vehicle is lowered to the deck.
12. The drogue is pulled in and disconnected from the T.U.V.

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