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R.V. CLIONE

Report for Cruise 2/1968

Staff

J. W. Ramster
G. C. Baxter
A. Jeffery (The Plessey Co. Ltd.)
R. Adams (Aberdeen)
M. Vince
J. Twilley (The Plessey Co. Ltd.) (until 12 February)
C. E. Purdom - 12-16 February

Diving Team

Duration

2000 hours, 27 January-
1000 hours, 16 February
All times are G.M.T.

Aims

As part of the programme of acceptance tests of the Plessey current meter agreed between the laboratory and Marine Systems Division, The Plessey Co. Ltd., it is proposed:

1. To salvage the current meter station at 54°00' 03°55'W from which the surface buoy disappeared during Cruise 1.

2. To trawl for meter 385 which disappeared from the rig at 54°05' 04°25'.

3. To lay 11 new current meters at stations 53°46' 04°37', 54°05' 04°25' and 54°32' 04°20'.

4. To continue examining the performances of the current meters while in the sea with the aid of the Plessey hydrophone equipment and the diving team.

5. To measure currents by means of the Kelvin Hughes current meter and the towed electrode system.

6. To release Woodhead seabed drifters between Anglesey and the Isle of Man and in the region between St. Bee's Head and Walney Island.

Narrative

The crew travelled to Liverpool on Thursday, 25 January, provisioned the ship and made ready for sea. Messrs. Ramster, Baxter and Vince left Lowestoft at 0900 hours, 27 January and reached the vessel at 2000 hours the same day; the other members of the Scientific Staff arriving at about the same time. Sunday, 28 January was spent preparing the moored buoy stations and the current meters themselves for launching. The ship sailed at 2100 hours, and during the night inspected the stations that had been left at sea between cruises. At the Orme station the surface buoy was found to have turned over, at Midway all was well and at St. Bee's there was no sign at all of the surface marker. The ship lay in the area until daylight and then resumed a visual search, but no trace of the station could be seen. Furthermore, it was not possible to pick up signals from the meters on the Plessey hydrophone. A systematic visual search for the pellet marking the meter end of the rig, which began at 0930 hours and ended at 1200 hours, was unsuccessful.

The ship then returned to the Orme station and in a heavy south-westerly swell the surface buoy was hauled aboard and replaced by another toroid. By 1820 hours the ship was steaming towards the Solway station (54°32' 04°20'), and at 0630 hours, 29 January a rig was laid there. The sea and swell had increased considerably and further deterioration occurred

as passage to the area of 54°05' 04°25' (the Douglas buoy) was made. Since conditions had been marginal at the Solway buoy, it was not possible to launch this station and the ship took to the lee of Douglas Bay, moving later in the afternoon to Ramsey Bay.

At 0500 hours, 31 January another attempt was made to lay the Douglas buoy, but again there was too much swell once the lee of the shore had been left. The same situation prevailed at 0900 hours the next day. By 1100 hours that day the ship lay in Ramsey Bay yet again, and preparations were made to lay two stations close to each other off Douglas as soon as possible, rather than risk further delay in finding good conditions at the exposed Hughes station (53°46' 04°37') between the Isle of Man and Anglesey. Both these stations, the Douglas buoy (54°05' 04°25') and the East Douglas buoy (54°05' 04°18'), were laid by 0900 hours, 2 February, and during the afternoon slack water the divers examined the two sets of meters. They found that all the instruments were hanging free and had not been damaged during launching. However, the line to the pellet marking the meter end of the rig at the East Douglas station had caught in the bridle of the sub-surface buoy. This was cleared at the time of observation.

Since there was little wind or swell, the ship steamed to the Midway station from which the surface marker disappeared during Cruise 1, and a hydrophone search began in order to try to determine whether or not the instruments were in fact in the area. Only one instrument could be heard. At the Orme buoy, however, which was reached at 1920 hours, signals from each meter were received. By this time sea state 4 had been reached and it was not easy to decode the hydrophone signals. A detailed hydrophone check was therefore impracticable. Since the light on the surface buoy was not working, the ship lay near the buoy all night and throughout the morning of 3 February, waiting for conditions to improve so that the light could be changed. This was done by 1400 hours and the ship then steamed to Douglas, arriving at 1730 hours.

Storm Force 10 was forecast for the Irish Sea later that night, and by 0640 hours the next morning conditions in Douglas harbour were such that the ship had to leave for the more satisfactory lee of Ramsey Bay. Coasters, fishing vessels and the Preston-Belfast ferry came into the bay during the day and all remained at anchor long after 1400 hours, when the wind had dropped to 10 knots, because renewed storm warnings were being issued. By 0640 hours the next morning there was no sign of the gales still being forecast, and, after rigging the G.E.K. system, the ship moved to the Solway buoy and the divers checked the meters there at 0920 hours. All were in good order.

The vessel then set course for 54°05' 03°35', the Walney buoy of the previous cruise, where meter 385 had been lost during the recovery operation. En route for this region, however, the news was received from Lowestoft that an Ulster trawler had trawled up the St. Bee's station in the period 17-29 January, taken it into Whitehaven, then taken it back to sea and dumped it some three miles north of its original position. On arriving at the Decca coordinates provided by the skipper of the trawler, the surface buoy and the pellet were found. The divers examined the rig and found that although the buoy tow and the meter wire were closer than they should have been there was a good chance they were not tangled. They could not see any of the meters. At 1500 hours the rig was recovered without difficulty. There was a length of trawl warp near the meter weight and all the frames were buckled and empty. The Plessey hydrophone was put over the side and almost immediately clear signals from two meters were heard. The trawl was shot at 1630 hours and hauled two hours later during a heavy snow shower, but the meters were not recovered. Because the heavy snow showers seriously restricted visibility, the ship lay for the better part of the night and then dodged to the Midway station.

By 0630 hours, 6 February preparations were being made to "grope" with the warp anchor for the ground-wire of the station laid on 7 January, and from which the surface marker disappeared at some time between 8 and 12 January. Six unsuccessful tows of the anchor between the Decca

coordinates of the two anchors were made during the morning, but at the seventh, post-prandial, attempt the anchor came up with the top meter wedged between the flukes and the stock, the weight of the whole system being taken at this point. A wire was made fast via port side leads to the sub-surface float, which surfaced with the meter and the "weight" transferred to it. The top meter was then unclipped from its frame and brought inboard and the leader wire from the winch to the meter-wire slackened off so that the rig was brought to the port side, the ship's working side.

It was then necessary to recover a wire held taut by an anchor weighing 900 lb. This was done by taking the "weight" beneath each frame in turn on a chain stopper, removing the frame and slowly heaving the wire on to the winch after clearing the stopper. All the meters, wires and anchors were recovered. It was found that the 50-fathom buoy tow had parted some 16 fathoms from the bottom.

After recovering the surface buoy put down to mark the station's position, the ship moved off on a tour of inspection of the other stations. The Orme and Douglas buoys were in good order but the East Douglas buoy was found to have overturned. It was righted at midnight and the ship then moved to St. Bee's, where trawling began at 0700 hours and lasted until 2030 hours. By this time the Decca coordinates provided by the Ulster skipper had been trawled through 15 times without any trace of the instruments being found, and yet within minutes of the trawl being hauled for the last time signals from two meters were picked up on the hydrophone.

Throughout the night a hydrophone survey of the region around what had been the buoy position was made in an attempt to find the "critical" zone for trawling. Unfortunately, the range of the Plessey hydrophone turned out to be about 1½ miles rather than the estimated range of 500 yards, and because it is "buffered" there is no way of noting varying degrees of signal intensity. The only course of action was to find the area within which clear signals could be received. Nearly 12 hours of hydrophone work simply showed the range of the Plessey equipment and confirmed that the meters lay close to the buoy position. Further trawling took place throughout the morning of 8 February without success, and the ship then made for Fleetwood where the surface buoy that had broken away from the Midway station and other items of gear were taken aboard from the Fleetwood Pilot Boat.

At 1630 hours course was set for the Solway buoy and, since there were signs that the calm of the previous five days was beginning to break up, this station was recovered at the midnight slack water. Passage to the area of Walney Island was made during the night and the morning was spent trawling for the fourth lost meter. Nothing was found, but signals from the instrument were picked up on the hydrophone. By late that afternoon the ship had anchored within ½ mile of the Orme buoy and a DRCM station was occupied in ideal conditions during the maximum flow of both tidal streams. This station was recovered intact at 0200 hours, 10 February, and the ship then made for Douglas in order to top-up its water tanks and collect mail.

By 1130 hours, 10 February the ship had left Douglas and was heading for the Douglas buoy. This was found to have turned over and the pellet marking the meter end could not be seen. Conditions were more normal at the East Douglas buoy. The divers inspected it at 1305 hours and reported that all was well. The station was brought inboard and by 1600 hours the Douglas buoy had also been brought in intact, although the key-ring at the middle meter was beginning to open up.

After several hours of clearing up, it was decided to move to the beginning of the Walney-St. Bee's drifter grid and 25 Woodhead drifters were thrown out at each of thirteen points during the night. The G.E.K. was then streamed and towed around the St. Bee's station during the following morning. In rapidly deteriorating conditions the ship then steamed to the vicinity of the Calf of Man and, heading into a

south-easterly swell, moved towards Anglesey. Seabed drifters were put out at six points along this line.

Passage was then made, via the Liverpool Bar, to Liverpool, where Mr. Twilley left the ship and Dr. Purdom came on board. R.V. ERNEST HOLT arrived at 1245 hours and various items of gear and information that might help in the recovery of the lost meters were passed over to her before R.V. CLIONE set off at 1400 hours for the Orme spawning area. Some three dozen ripe plaice and flounders were caught, and then at 2350 hours the ship set course for Lowestoft. Unfortunately, most of the fish died in the next 24 hours as a consequence of the heavy seas and swell that were encountered.

During this period it also became apparent that the oil lubricating the tail shaft bearing was escaping via a faulty stern tube seal at the rate of about 1½ gallons an hour, and it was thought best to reduce speed in order to lessen this seepage. By the early hours of 15 February it was clear that more oil would have to be bought in order to maintain the required degree of lubrication, and the ship put into Boulogne for this purpose. Because of the damaged seal, it was felt unreasonable to fish as had been planned on the Brown Ridges, so course was set for Sizewell Bank. Two tows between 1900 hours and 2230 hours added two flounders to the surviving Irish Sea fish. The ship lay off Sizewell for the night and then docked at Lowestoft at 1000 hours, 16 February.

Results

Aims 1, 3, 4, 5 and 6 were achieved. Aim 2, the recovery of meter 385, was not accomplished and the three current meters belonging to the Plessey Co. Ltd. could not be found after the station had been disturbed by a trawler. The detailed results of Aims 3, 4 and 5 are as follows:

(a) Of the instruments laid during Cruise 2, three (686, 153, 332) have a potential running time of 10 days and six (409, 417, 429; 069, 313 and 412) of 8 days. Of those carried over from Cruise 1, three (217, 172, 065) were in the sea for 32 days and three (249, 277, 281) for 31 days.

(b) The nine instruments laid during this cruise were examined by the divers and found to be free of obstructions. In no instances were key-rings seen to be opening, but at the Solway and Douglas buoys, where opening rings were found on recovery, it was not possible to dive just before the rig was brought inboard.

(c) It was not possible during this cruise to monitor the performance of the meters via the Plessey hydrophone, but there is a set of DRCM measurements at the Orme buoy for comparison with the speeds and directions of flow given by the Plessey meters. The DRCM station was about ½ mile from the moored instruments. The G.E.K. was towed around the position of the St. Bee's station to give some idea of the magnitude of the currents to be expected there.

(d) The following items relate to the performance of various parts of the gear:

(i) Plessey meters:

065	Both batteries decomposing. No record.
417	Slight leakage. Partial record.
153	Reed switch shorted before launching.
277	Transducer not working.
249	Propeller broken off and guard broken at recovery. Long-term leakage at transducer probable - instrument body had water inside - take-up spool full.

(ii) Four Stone-Chance Gull lights will have to be written off, two are probably in working order but their battery-life did not approach the specified fifteen weeks. The two "on loan" continuous flash lights are in working order but give a relatively poor performance and should only be used when there is no alternative.

(iii) The recovery hoops on buoys 4, 3 and 5 have been damaged and one of the lower struts on buoy 2 has been slightly bent. Buoy 2 (Orme station) turned over, but this was probably because the eye pulled out of the base weight and left the buoy linked via a safety chain acting some way up the lower strut and not at the base.
Buoy 2 (East Douglas station) turned over after Storm 10 winds. This could be because two $\frac{1}{2}$ cwt sinkers had to be used as a base-weight instead of a single 1 cwt cylinder, and the efficiency of the system was diminished accordingly.
Buoy 7 (Douglas) turned over after a week of calm weather and after surviving Storm 10 winds and seas. A similar inexplicable performance occurred at this station last year.

(iv) The 50-fathom tow beneath the Midway buoy parted 16 fathoms from the bottom. At slack water this point in the wire would be lying on the bottom, at full tide it would be, at most, 8 fathoms up, i.e. at 15 fathoms from the surface.

(v) Six of the snap-shackle pins bent during use.

(e) A dozen live plaice and flounders were landed at Lowestoft by Dr. Purdom.

It is not perhaps generally realized that the laying and recovery of moored buoy stations is dangerous and exacting work for the Ship's Crew, the more so because it is work of which they have had little experience hitherto and do now only two or three times a year. During Cruises 1 and 2 twenty-three stations were laid and recovered, one successfully salvaged and nine rigs changed in one or other detail whilst moored; all without mishap or undue damage to valuable instruments. Thirty-one current meters were tested, twenty-seven recovered and four lost, because other vessels tampered with the rigs. These details speak for themselves, but nevertheless the Scientific Staff would like to thank the Ship's Officers and Crew for the way in which they overcame all the technical problems that arose, and for their continued cheerfulness and enthusiasm throughout five long and, at times, very uncomfortable weeks.

J. W. Ramster

20 February 1968

Seen in draft: MRS

Initialled: HWH

Distribution

Basic list, plus the following:

Scientific staff on cruise

Mr. Ramster
Mr. Baxter
Mr. Jeffery
Mr. Adams
Mr. Vince
Mr. Twilley
Dr. Purdom