

The Marine Observer



A quarterly journal

July 2000



Met.O.1027

The Met. Office

Met. O. 1027

THE MARINE OBSERVER

*A quarterly journal prepared by
The Met. Office Observations–Voluntary (Marine) branch*

VOL. 70

No. 349

JULY 2000

Contents

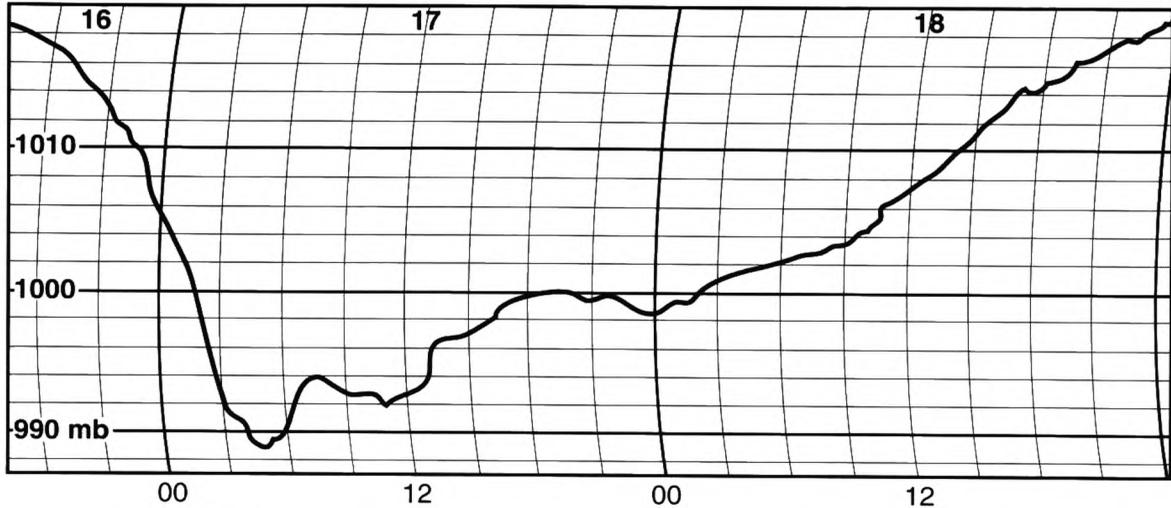
	<i>Page</i>
The Marine Observers' Log	90
ASAP — past, present and future	108
Missing the right whale	114
The <i>Maersk Surrey</i> — a 'booby' trap?	120
Booby gallery	122
Scene at sea	123
The total solar eclipse of 11 August 1999	125
Coding tips	126
Personalities	128
Noticeboard	129
Fleet lists	132

COVER PHOTOGRAPH: Bad weather and the *Maersk Surrey*. Photographed by S. Gallaway.

Views expressed in this journal are those of authors and not necessarily those of the Editor or of The Met. Office. All correspondence regarding the journal should be addressed to: **The Editor The Marine Observer The Met. Office OV(M) Scott Building Eastern Road Bracknell Berkshire RG12 2PW, or e-mailed to: obsmar@meto.gov.uk www.met-office.gov.uk**

LONDON: THE STATIONERY OFFICE

By 0000 on the 18th, the pressure was 1000.1 mb and the temperature had increased slightly to 6.8°, but the wind was starting to increase again too, reaching WSW'ly, force 8 at this time, then SW'ly, force 9 by 0400.



As the wind altered direction throughout the period, so the ship's course was altered to keep the wind either astern or on the port quarter. Often seas were taken on deck, resulting in the destruction of a fibreglass storage box. On occasion the swell waves were observed as being at bridge wing height (14 m) and were described as "awesome" by some of the ship's crew. The strong winds continued until the 23rd.

Editor's note. This depression was also encountered by the *Pacific Pintail* during the 17th when, following a sudden and rapid drop in pressure, half-hourly weather observations were made between 0300 and 0900. The minimum pressure at the ship, 989.4 mb, was recorded at 0600 when the *Pacific Pintail* was in position 41° 15' S, 51° 47.7' E. At this point the wind was W×N'ly, force 11 and the dry-bulb temperature was 12.7°.

The wind then increased to force 11/12, and the maximum strength, W×S'ly, force 12, was experienced at around 0900; after this time, the pressure, which had risen slightly and steadied at 992.7 mb, began to rise again. This indicated an improvement in conditions, and the half-hourly observations were stopped.

In brief: On 17 September 1999 at 1815 UTC a waterspout was spotted from the *Oriana* by Third Officer T. Wingate when the vessel was about 5 n mile west of Jersey (Channel Islands). The spout formed below a cumulonimbus cloud of moderate vertical extent, with a base at 500–700 feet, and persisted for about 20 minutes before disappearing some 8 n mile east of Jersey. The air temperature was 18°, wet bulb 15° and the sea temperature was 17.7°.

In brief: Whilst the *Elke* was departing Le Havre on 19 August 1999, Captain R. Hay, Chief Officer J. Cholewinski, Second Officer J. Mabatan and Chief Engineer C. Mack spotted a waterspout 0.3 n mile to the south, near the 'LHA' buoy. The waterspout formed below a towering cumulus cloud based at 2,000–2,500 feet and was accompanied by slight rain and a wind of W'ly, force 4/5.

Depression

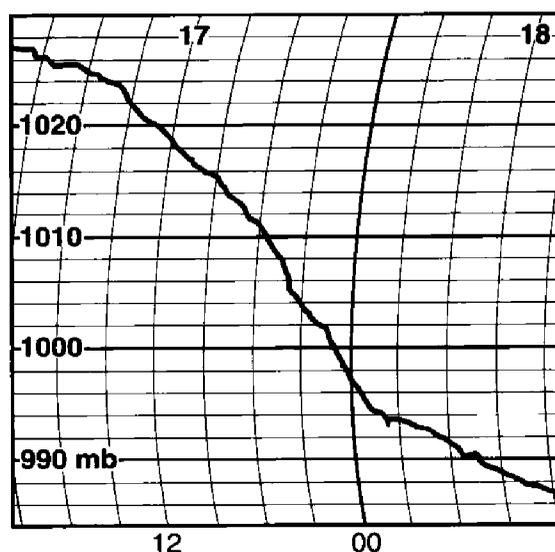
North Atlantic Ocean

17–18 September 1999

m.v. *Pacific Swan*. Captain M.J. Stares. Panama to France. Observers: Captain Stares, A.J. Howlett, Chief Officer, S. Chaplin, 2nd Officer and J.S. Ward, 3rd Officer.

The ship encountered an unavoidable ‘low’ on the 17th, when in position 43° 46.7' N, 26° 19.1' W, the pressure beginning to decrease markedly during the second half of the day, as indicated by the barograph trace. The following observations of wind and pressure were taken during the period.

Date and time	Pressure	Wind	
		Dir'n	Force
17th 0000	1020.8	NW	4
0400	1017.0	WNW	5
0800	1012.9	W×S	6
1200	1006.7	W×W	7/8
1600	999.0	SW×W	8
2000	993.0	SW×W	8/9



By 0000 UTC on the 18th, the pressure had fallen to 990.0 mb while the wind direction and force remained unchanged. Throughout the first half of the day, the pressure continued to fall, although not as fast as before, and the wind moderated.

Corposants

North Pacific Ocean

26 September 1999

m.v. *Maersk Humber*. Captain J. Boreman. Rosarito to Salina Cruz. Observers: S. Gillies, 3rd Officer, L. Higson, Cadet and J. Aitken, 2nd Engineer.

Between 1040 and 1130 UTC ‘St Elmo’s fire’ was observed radiating from the MF/VHF aerial, the foremast, antennae and the starboard bridge-wing floodlight. The main charge emitted was about 6 mm long while there was also a further ‘brush’ effect measuring up to 50 mm long. The phenomenon was accompanied by

a static 'hissing' sound, and the observers' hair was felt to stand 'on end'. An intense thunderstorm with precipitation followed, during which the phenomenon seemed to subside. In the course of the storm the ship was struck by lightning, resulting in some GMDSS equipment failure.

The ship's position at the time of the event was 19° 04' N, 105° 08' W.

In brief: On 15 July 1999, the *Peninsular Bay* was in the southern part of the Red Sea when a crackling noise was heard from the starboard bridge wing at 1310 UTC. Upon investigation, Captain S.G. Millar, First Officer M.C.P. Sutcliffe and Cadet S.R. Charniker experienced a tingling sensation on their finger tips, and their hair stood 'on end'. The noise was similar to electrical arcing and was concentrated around aerials and the tips of extended fingers. No blue haze was observed, but large patches of interference were noted on the 3-cm radar. VHF and HF communications were not possible owing to continuous static noise. The effects lasted for about 30 minutes.

In brief: On 12 July 1999, in position 45° 16.2' N, 47° 14.7' W, a bright thin band of orange light extending through 50° on a bearing of 290°–340° was noted at 2340 UTC from the *Queen Elizabeth 2*. Captain R.W. Warwick, First Officer I. Hall, Second Officer R. Hone and Cadet L. George watched as the line continually changed in length. The vessel had just experienced fog, and the air temperature was 14.5° while the wet bulb was 14° and the sea temperature was 11°. The sun had set at 2258, and civil twilight ended at 2334. The light disappeared at 0030 on the 13th, eight minutes after the end of nautical twilight.

Waterspout

North Atlantic Ocean

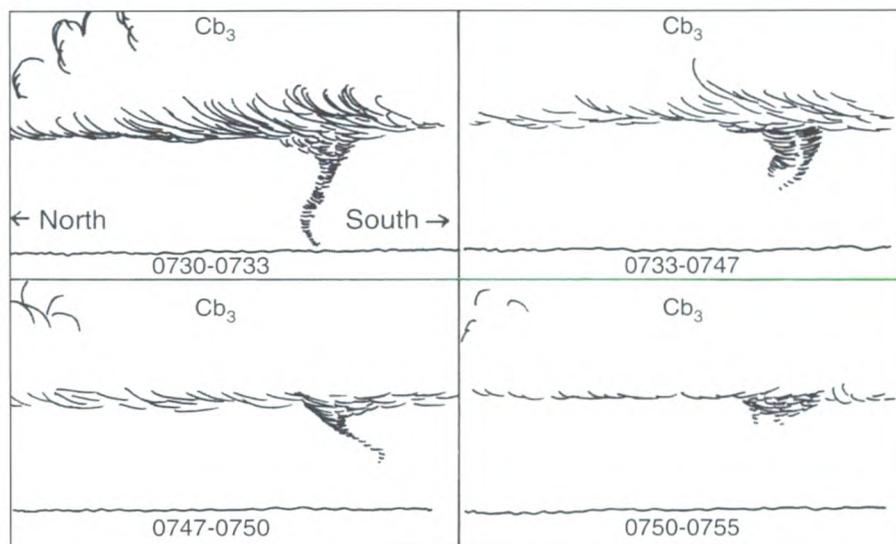
20 September 1999

m.v. *Esplanade*. Captain J.M. Bullard. Vitoria to Ijmuiden. Observers: Captain Bullard, R.G. Cauilan, Quartermaster, and Mrs Bullard.

The vessel was clearing the ITCZ on a heading of 020° at 12.4 knots; to the north there were mainly clear skies with small cumulus clouds, whereas running on an east/west axis was a chaotic sky with large cumulus clouds and a mixture of altostratus with other 'cumulus type' clouds. To the south of the ship's position (08° 53' N, 38° 20' W) the sky was dark, with rain showers and lightning coming from cumulonimbus clouds.

A waterspout was observed, initially, at 0730 UTC (at the end of morning twilight) extending from the base of a large cumulonimbus cloud, estimated to be about 1,000 feet. It reached the sea in a wavy 'S' form, lasting roughly three minutes before rapidly withdrawing upwards to about one-third of the distance between cloud and sea. However, as indicated in the sketches, the upper diameter of the spout increased at this time, becoming double its original size.

The waterspout was visible on radar, as cross-checked with visual bearings, and was found to be on a bearing of 125° at a radar distance of 7.2 n mile. It remained in its stubby form, varying very little in depth or diameter, until about 0747 when it reduced to a thin wispy tail extending to roughly half-way between the cloud base and the sea.



By 0750 there was only a slight converse bulge below the cloud, and it disappeared completely after a further five minutes, no reappearance being noted. At the time of the sighting, the air temperature was 27.0° , wet bulb 25.0° , and sea 28.3° ; the pressure was 1011.7 mb and the wind was WNW'ly, force 3.

Waterspout

Arabian Sea

22 July 1999

m.v. *British Skill*. Captain H. Mansbridge. Sydney to Das Island. Observers: P. Anderson, 3rd Officer, R. Wade and J. Cunliffe, Cadets.

At 0940 UTC the vessel was on a course of 340° at approximately 13.5 knots, and was within an area of heavy rain showers; the squalls were clearly visible on the radar as they approached from the west. The cloud type was cumulonimbus with a base of about 500 feet. At 0955 there was an onset of heavy rain while the wind speed increased to approximately force 6 at this point, and the visibility reduced to approximately 0.8 n mile. The rain began to ease off about 15 minutes later and the visibility improved.

Further observation at the extremity of the squall revealed a waterspout forming about 3 points off the port bow at a distance of about 2 n mile, and it continued to develop to the point where it extended from the base of the cloud down to the water surface. It was moving in an easterly direction until it reached the point where it was directly ahead at a distance of 5 cables and, at the base of the waterspout, there appeared to be rotation in an anticlockwise direction. At 1017 the waterspout retreated back into the cloud; by this time the rain had stopped and the wind had eased.

Weather conditions at the time of the sighting were: air temperature 26.2°, wet bulb 24.5°, pressure 1008.9 mb, wind W'ly, force 4 increasing to force 6. The ship's position was 11° 57.8' N, 74° 30.1' E.

Waterspouts

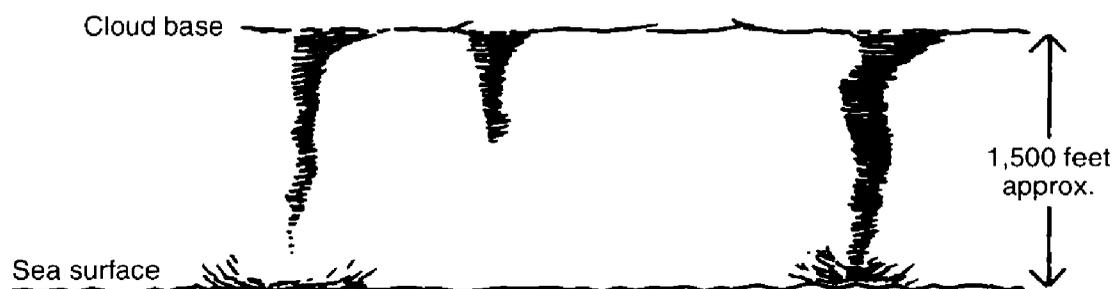
Bay of Bengal

13 September 1999

m.t. *Eagle*. Captain P.J. Chambers. Shimotsu to Khawr Fakkan. Observer: D. Grundy, 3rd Officer.

During the 8–12 morning watch, three medium-sized waterspouts were observed to develop approximately 2 n mile north of the vessel at 0130 UTC. Initially, the two larger spouts only were visible, but as a thin veil of rain cleared, a third was quite clear. Of the three, the largest one was estimated to have a diameter of 50–60 m.

The larger ones grew quite rapidly in the space of 10–15 minutes, from cumulonimbus clouds with bases at about 1,600 feet, and reached the sea surface where they caused a noticeable and violent agitation of the water, as indicated in the sketch. The effect was much akin to a shoal of fish being hunted from below. The third, and smallest, of the three did not appear to touch the sea surface.



From this point, the waterspouts persisted for a further 30 minutes (45–50 minutes in all); they revolved in an anticlockwise direction and were accompanied by a thin mist or drizzle. The speed at which they revolved was not possible to determine. All three disappeared or 'blew out' quite quickly, seeming to retreat back into the cloud base.

The ship's position was 06° 17' N, 87° 15' E, and the weather conditions at the time were as follows: air temperature 29°, wet bulb 26°, sea 27°, the pressure was 1011.7 mb, wind SW'ly, force 5.

Fogbank

Southern North Sea

6 July 1999

m.v. *Resolution Bay*. Captain A.M. Tweedie. Lisbon to Zeebrugge. Observers: D. J. Harkness, 3rd Officer and other bridge personnel.

The vessel was proceeding in thick fog about 2.5 n mile south of the West Hinder racon in the north-east bound lane of the TSS. On the bridge were the Master, two Third Officers, the Zeebrugge pilot, one deck Cadet and two ABs.

At about 1800 UTC the Master was informed by Port Control at Zeebrugge that it was “crystal clear” at the destination, so those concerned were wondering when the fog was going to come to an end. Visibility in the fog was never more than 300 m, the wind was W×N’y, force 1 or 2, the pressure was 1018.5 mb and had been steady at that reading for a considerable period. The air and wet-bulb temperatures were 15.3° and 15°, respectively.

At approximately 1830, when Mr Harkness looked up from the chart table where he was working out the tides, he was amazed that he could see a good 10 or 12 n mile ahead of the vessel. Looking astern, the fogbank through which the vessel had passed was clearly visible, as shown in the photograph.



Minutes after clearing the fog, the pressure rose by 1 mb and stayed steady, while the air and wet-bulb temperatures increased to 17.1° and 16.3°, respectively. Twenty minutes later, the fogbank was still obvious around approximately 150° of the horizon.

Dust echoes

North Atlantic Ocean

3 July 1999

m.v. Taunton. Captain J.E. Sinnott. Sines to Las Palmas. Observers: A.M. Joshi, Extra 2nd Officer, Captain Sinnott and K. Meher-Homji, Cadet.

Between 0930 UTC and 1100, an echo was detected on both the 3-cm and 10-cm radars; a watch for the target was kept, but nothing was seen visually. The echo was about 22 n mile away, being about 3 n mile long and a mile wide, and was therefore a difficult target to acquire.

The vessel was on a heading of 208°, and the echo was observed fine on the starboard bow, the nearest land being Alegranza Island (north of Arrecife Island in the Canaries), about 45 n mile away. After referring to the *Marine Observer's Handbook*, it was found that dust from the Sahara is carried by the trade wind, and that it is experienced over a large area of the eastern North Atlantic adjacent to the coast of Africa.

The distance between the target and the ship decreased and, finally, the ship passed through the area of the echo although nothing was seen. At the time of the observation the ship's position was 29° 50' N, 14° 00' W, and the wind was N'ly, force 5 or 6.

Current

Indian Ocean

26 July 1999

m.v. *Waterford*. Captain S.B. Tudor. Newcastle, N.S.W., to Taranto. Observers: R. Bhatia, Chief Officer and A. Banerjee, 3rd Officer.

Whilst following a course of 251° in position 28° 55' S, 48° 41' E, the vessel started to experience a strong set to the north at 1200 UTC, although the current streams indicated in the routing charts and sailing directions were southerly. However, a small note in the sailing directions stated, "Less than about 500 miles from the coast of Madagascar and SE of the south point of the island, currents setting between E and N are often experienced".

At the time, the vessel was about 250 n mile south-east of Madagascar and, evidently, had found this north-setting current. The main axis of the current seemed to run along a line from 170° to 350°, and it was flowing at a rate of about 1.5 knots. No significant change in the sea temperature was observed, and an allowance of 8° of set was made on the autopilot in order to keep the vessel on the desired course line.

In position 29° 37' S, 46° 50' E, after covering roughly 100 n mile since first encountering the current, the vessel swung noticeably to port as it exited the current stream. The effect of the current had been strongest in a 55-n mile width between 29° 12' S, 48° 01' E (at 1300), and 29° 33' S, 47° 02' E (at 1800).

In brief: On 15 August 1999 at 0325 UTC, when the *Maersk Somerset* was off Yanbu, Second Officer I.R. Blair noted a layer of sand or dust at a distance of about 15 n mile; it appeared to lie at a height of approximately 150 m above the sea, and was easily picked up on radar

In brief: A marked rise in sea temperature was noted from the *Resolution Bay* at about 2100 UTC on 31 July 1999 when the vessel was heading 090° in position 35° 10' S, 22° 59' E, and a sharp drop of 4 or 5 knots in the ship's speed was then noted. Second Officer J. Fowler, Cadet S. Maple and Captain J.N. Kelleher realised the cause was the Agulhas current sweeping down the east coast of Africa, bringing with it warm equatorial water.

A number of fishing boats were also spotted, no doubt taking advantage of the associated abundant sea life. Later, the sea temperature fell and the ship's speed started to increase again, indicating that the influence of the current had passed.

Dolphins

Indian Ocean

27 September 1999

m.v. *Zetland*. Captain J.H. Brierley. Port Hedland to Iskenderun. Observers: Shenai Ul, Extra 2nd Officer and E. Mariano, GP1.

A school of dolphins was observed at about 1750 UTC. There were about 50 of them and they were estimated to be about 1.5 m long; they swam along the length of the ship and could be heard making a peculiar noise. This noise had attracted the observer's attention to them; it was as if the dolphins were 'calling' to the observers to wish "bon voyage" for the passage to Iskenderun.

The dolphins stayed with the ship for a distance of some 14 n mile, the ship's position being 16° 20' S, 110° 50' E at the time of their departure. The ship's course was 296° and the sea-water temperature was 25.2°.

Whales

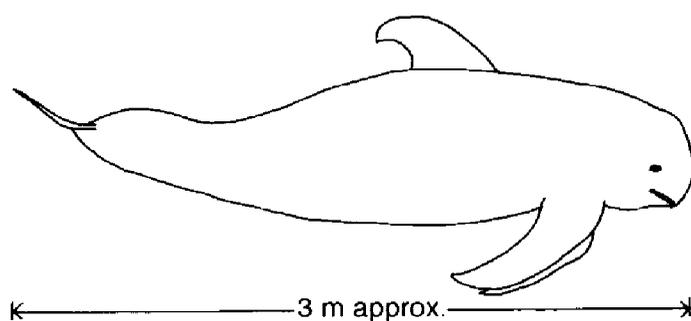
North Atlantic Ocean

7 July 1999

m.v. *British Harrier*. Captain C. Gaukroger. Trinidad to Gamba (Angola). Observers: T. Radford, Chief Officer, P. Haswell, Cadet and F. Dinas, AB.

At 0945 UTC some splashes were noticed at a distance of one cable on the starboard bow when the ship was in position 08° 14' N, 57° 43' W. Upon closer inspection it was noticed that there were a number of what appeared to be dolphins present, all about 3 m long.

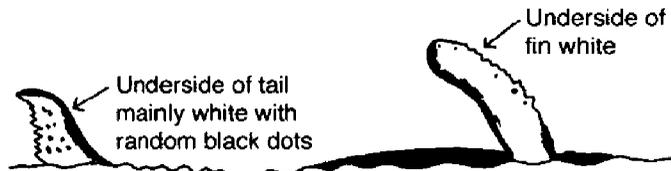
However, observation through binoculars revealed that they were not dolphins on account of their poorly-defined beaks and their hooked dorsal fins. The speed at which they were travelling also indicated that they were not dolphins because dolphins move at a faster pace than the creatures observed, and are generally more 'playful'. The sketch indicates what was seen.



It was determined, after consulting a handbook on cetaceans, that the group of about 20 individuals observed were Short-finned Pilot Whales. They were all heading in a north-easterly direction and, after being watched for approximately five minutes, they dived and disappeared behind the ship.

The ship's course and speed was 100° at 17 knots, the sea was calm and there was little wind.

Later in the month, on the 19th, after the vessel had departed Gamba for St Croix, more whales were sighted in pairs. As the distance between them and the vessel decreased, a closer observation was made. Whales breached on a number of occasions after which they took to flipper-slapping. One pectoral fin and approximately half of the tail could be seen as they carried on this activity which lasted for a considerable period.



As indicated in the sketch, the pectoral fin on view was black on the upper side and white on the underside, and approximately 3 m in length. The tail was coloured likewise but there were also random black dots on the underside.

After consulting an 'Eye Witness' handbook, the observers (S. Moss, Second Officer and M. Foden, Cadet) agreed that these were very energetic Humpback Whales. More of them were observed as the vessel continued on her course of 270° at 15 knots; some were flipper-slapping while others just surfaced and dived, but they were always in pairs. On this occasion the ship's position was 02° 51' S, 09° 51.5' E, the sea temperature was 23° and the wind was S'yly, force 3.

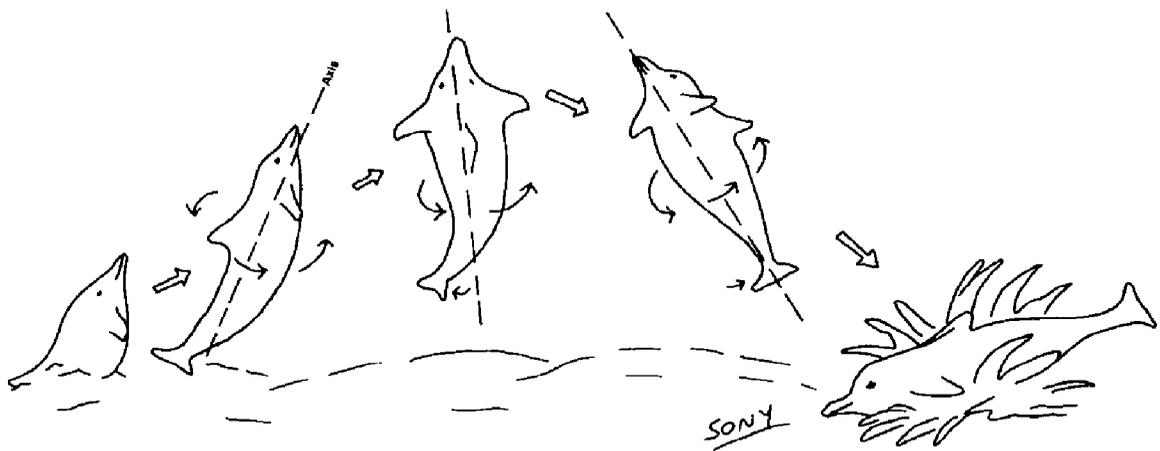
Dolphins

North Atlantic Ocean

16 July 1999

m.v. *Vine*. Captain R.M. Ellsmoor. Sines to Saldanha Bay. Observer: S. Mathews, Extra 2nd Officer.

A very big school of dolphins was observed on the port side of the vessel at 0800 UTC, when the vessel's position was 15° 03.1' N, 18° 16.6' W. The dolphins were about a cable away and, on average, were about 1.2 m long; they were greyish in colour with a lighter belly. There were at least 200, all jumping and continuously moving towards the vessel at a good speed. When they closed in on the vessel, most of them performed an unmistakable act of showmanship by jumping almost vertically, coming fully out of the water and, in the process, turning between 180° to 270° along the axis of their bodies before landing in the water with a large splash. The sequence of movement is shown in the sketches.



They all then turned back and moved away from the ship at a good speed but with no more jumping. At the time of the sighting, the ship's course and speed was 178° at 12.5 knots, and there was a slight sea with a low swell. During the first week in July, similar activity had been seen by other crew members when the ship was passing through 18° W in the same area.

In brief: When 3 n mile east of Fairway Buoy, Durban, observers on the *City of Cape Town* sighted two large whales at 0445 UTC on 6 September 1999. The whales loitered in the area of the pilot station, and one reared vertically out of the water to show black and white speckled fins. They were thought to be Humpback Whales. On 16 September, a large whale about 21 m long was observed breaching, the ship's position being 24° 05.2' S, 09° 43.5' E. Cadet S. Booth watched as it leapt at least 6 m into the air, and twisted before landing on its back. It was thought to be a Fin Whale.

Whales

South Atlantic Ocean

29 August 1999

m.v. Mairangi Bay. Captain D.S. Hughan. Port Chalmers to Santos. Observers: Captain Hughan, B. Griffiths, 3rd Officer, J. Weber, 2nd Officer and R. Mounsey, Chief Engineer.

In calm conditions with light airs, a group of three whales was sighted on the port bow at 1830 UTC, heading north-north-east from the ship's position of 36° 35' S, 52° 48' W. As the ship approached, all three dived showing their tails. With reference to the *Sea guide to whales of the world*, these whales were later identified as possible Shortfin Pilot Whales. The sea-water temperature was 13°.

Shortly after these had vanished, four separate groups of two or three whales were sighted, again on the port bow. Of a different species to those first observed, they were sighted slightly further away from the vessel, and a definite identification could not be made. However, from their shape and the angle of the blow, they were thought to be Sperm Whales. The ship's course and speed at the time was 025° at 20 knots.

In brief: The tail of a large whale was spotted from the *P&O Nedlloyd Lyttelton* in position 21° 48.7' S, 150° 56.3' E. The tail was about 300 m away and was repeatedly raised to a height of 3–4 m before being slapped on the sea surface; a smaller tail accompanying it also did the same thing. The vessel took avoiding action and the whales sounded but the observers could just make out the shapes of a large mother whale and a smaller one beneath the surface.

Whales

South Atlantic Ocean

2 August 1999

m.v. Palliser Bay. Captain D.K. MacCorquodale. Port Chalmers to Santos. Observers: Captain MacCorquodale, O. Ridyard, 3rd Officer and members of ship's company.

At 2010 UTC the Third Officer had just taken over the watch when he spotted three 'waterspouts' within 3 n mile of one another on the starboard bow. They passed within 2 n mile of the ship and were identified as Sperm Whales by the

45-degree angle at which the blow was sprayed. At 2022 two more were sighted on the port bow; then, three minutes later, numerous blows were sighted right ahead and on both port and starboard bows.

Initially, 20–30 whales were estimated some 2–3 n mile ahead; the vessel altered course 15° to starboard to avoid several whales sighted fine on the starboard bow, moving west-south-westerly at about 6 knots. At 2033, against the backdrop of the setting sun, approximately 20 blows could be counted at any one time between 300° and 230°. More than 50 individuals were estimated, and at least four of them came within 2 cables of the vessel. At this time the ship's position was 33° 56' S, 51° 16' W, and the course was 025° at 19.5 knots.

They were easily identified as Sperm Whales by a large square (or blunt round) nose, a relatively small tail, a distinct colour and, as stated, the forward-pointing blow. The length of the closest specimens was estimated at 15 m. The whales were visible until 2045.

Weather conditions at the time were: air temperature 15.1°, wet-bulb 14°, sea 15.6°, pressure 1023.2 mb, wind WSW'y, force 3. There was also a current estimated at north-by-east, 0.5–1.0 knot. Despite the generally favourable weather conditions, no definite targets were acquired on radar.

Whales

North Atlantic Ocean

20 August 1999

m.v. *British Valour*. Captain M. Philips. Observers: S. Magalotti, 3rd Officer and members of ship's company.

At about 1145 UTC two whales were seen off the starboard bow. They were both swimming slowly on the surface, occasionally diving briefly before resurfacing to produce blows which were high and narrow.

Upon closer inspection, their bodies were noted to be a greyish-black colour with white markings on their fins; when one of them dived, the undersides of the flukes showed white, and the lower right jaw of both whales also had white markings. Neither seemed to be too bothered by the vessel, and swam peacefully away. Approximately five minutes later, three more whales of the same description passed the vessel, again unfazed by it.

After referring to *The Seafarer's Guide to Marine Life* by Paul Horsman, the whales were identified as possible Fin Whales by their general markings. However, one puzzle was that the guide mentioned that the flukes are not raised in the dive, but the observed whales showed theirs.

The ship's position was 43° 02' N, 50° 14.4' W, and the weather was humid with low cloud and a calm sea. The sea temperature was 20.6°.

Editor's note. From the reference books available to us, it seems that Fin Whales do not show their flukes when at the surface, but will occasionally do so, briefly, just before diving.

Turtles

North Pacific Ocean

2 September 1999

m.v. Maersk Humber. Captain N.A. Vause. Salina Cruz to Topolobampo. Observer: K.G. Fiske, 2nd Officer.

Whilst following a course of 326° at 16.4 knots, with Isla Maria at a distance 14.8 n mile on the starboard side, a number of floating objects were observed a point off the starboard bow at a distance of about 13 n mile.

At first it was believed that the objects were partly submerged fishing markers, but upon closer inspection, they were found to be turtles. There were five in total, comprising one particularly large one in the centre of the group, flanked by four smaller ones. The large one was more than 1 m long and 60 cm wide whereas the smaller ones were less than half its size and were a lighter shade of green than that of the large one.

Because the observation was short-lived, an accurate observation of their markings could not be made. The water depth at the time was 690 fathoms and the sea was calm with a westerly swell of 1 m, and the ship was in position $21^\circ 23' N$, $106^\circ 45' W$.

Fish

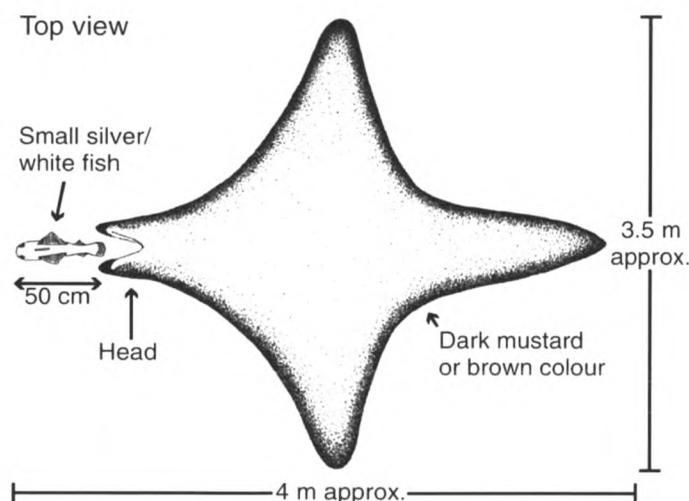
North Atlantic Ocean

21 July 1999

m.v. Royal Star. Captain S.K. Chandra. Drifting off Morocco. Observers: A. Ravikant, 3rd Officer and members of ship's company.

At 0830 UTC, whilst the vessel was drifting in position $35^\circ 40.4' N$, $06^\circ 49.8' W$, a large bird-like creature was spotted in the water on the port side, gliding towards the vessel. It was a fish approximately 4 m long from head to tail, and had a 'wing-span' of 3.5–4 m; it glided smoothly just below the surface of the water.

The fish, a giant ray, was a dark-mustard or brownish colour on the upper side with a velvet-like skin appearance, and was light-grey or off-white on the underside. It also had a 'double' head as shown in the sketch. It glided around the stern of the ship and then came to the starboard side; thereafter, it swam repeatedly back and forth between the port and starboard sides via the stern. All this while it was barely 30 m away.



Upon closer inspection with binoculars, a small fish (resembling a small or baby shark about 50 cm long) was seen swimming 10–15 cm from its head. This fish was completely white or silver in colour and was initially thought to be a part of the ray because the two swam in such unison that the distance between them was unchanged, the white fish appearing to be attached somehow.

The ray seemed to be chasing the white fish all the time, either playfully or as a predator unable to catch its prey by a small margin. It was extremely agile and was able to glide most effortlessly and gracefully. No long pointed tail, as seen on smaller rays, was observed, and this giant ray did not break the surface at any time. After about 20 minutes the two fish swam away.

At the time of the sighting the conditions were calm, there being light airs, partly cloudy skies and very good visibility, and the sea was rippled.

Editor's note. This report was forwarded to Dr Frank Evans, of the Dove Marine Laboratory, who said:

“This fish, 3.5–4m across was correctly identified as a giant ray. The description, size and location in fact fit only the Atlantic manta ray (*Manta birostris*). The cephalic fins (the ‘double head’ in the description), the colour and the relatively small tail are also indicative. This huge fish, one of the cartilaginous group that includes sharks as well as skates and rays, is in fact a harmless plankton eater and it is improbable that it was hunting the smaller fish for food. The smaller fish was almost certainly a pilot fish. These pilot fish are light coloured with darker hoops around the body but these hoops may not have been noticeable. The ray would not have been pursuing the pilot fish, rather the pilot fish was keeping station on the ray, as they habitually do on sharks and other fish and even on small boats. They are looking for fragments of food discarded by the bigger organism. I have underwater film of a pilot fish keeping company with a small yacht in the tropical Atlantic.

“The position of the observation was far from the main tropical locations of mantas and close to their extreme northerly range in the eastern Atlantic.”

In brief: A bat was observed on the starboard bridge wing of the *British Tamar* by Third Officers Glynn Stone and M. Pratt, and Cadet M. Newton on 10 September 1999 when the vessel was in position 54° 21' N, 00° 40.8' E. It was brown in colour and had an approximate wing-span of 16 cm while its body was about 6 cm long.

Bioluminescence

Arabian Sea

10 August 1999

m.v. Repulse Bay. Captain K.P. Byrne. Suez to Singapore. Observers: M.K. Hill, 3rd Officer and P. Labis, AB.

At 1820 UTC, whilst in position 08° 50.2' N, 69° 19.7' E and on a heading of 106° at 21.8 knots, spectacular bioluminescence was observed on the starboard side of the ship.

Its appearance was of small columns of light-blue or turquoise coloured light, approximately 10 m from the starboard beam, rising up from beneath the sea and

then bursting as they reached the surface to radiate outwards in small clusters of cloudy luminescence. These ‘bubbles’ of luminescence occurred in a band about 10 m wide, and left the water looking very cloudy as it passed away astern.

The observers went onto the starboard bridge wing, taking the Aldis lamp with them to try and get a better look at the water as it passed by. When shining the lamp on the sea beside the vessel, the water could be seen to be cloudy. The phenomenon faded after about 15 minutes. During the observation the sky was clear, there was a slight sea with moderate swell and the visibility was excellent; the sea temperature was 28.6°.

The Third Officer recalled very similar luminescence in a similar area some 12 months earlier. On that occasion he had investigated the event and had come to the conclusion, after referring to the *Marine Observer's Handbook*, that the phenomenon was one of the “more remarkable manifestations” of luminescence caused by “Upwelling of subsurface water or organisms breaking into vivid luminosity at the surface”.

The luminescence that was seen on 10 August was felt to be of the same variety although on a smaller scale.

Refraction

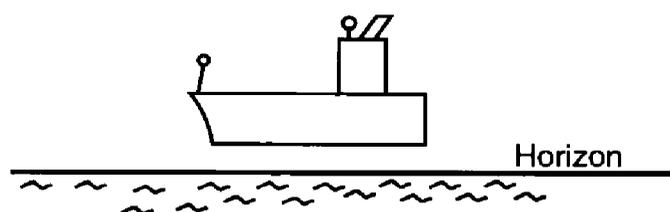
Indian Ocean

10 September 1999

m.v. *Jervis Bay*. Captain C. Woodward. Suez to Singapore. Observers: G. Mathias, 3rd Officer, F. Bernas, Watchman, and A.H. Abid, 1st Officer.

Whilst on watch in darkness, the horizon was visible although there were frequent rain showers. At 1420 UTC, vessel's course was 089° at 22 knots, and its position was 05° 55.9' N, 91° 23.4' E; the watchman reported a light on the port bow, and asked whether it was a planet because it seemed to be a few degrees above the horizon.

About 10 minutes later, however, ‘it’ was clearly apparent to be the lights of a ship on a reciprocal course. When this ship passed by only a few miles away it appeared to be above the horizon, as indicated in the sketch, as though travelling through the air about 500 feet above the surface.

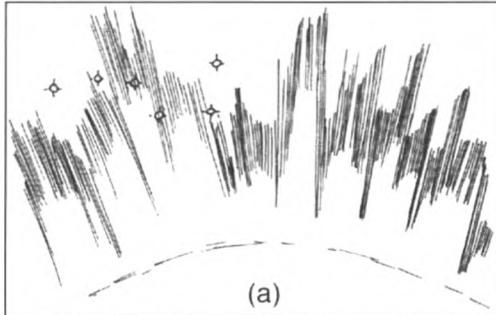


Later on, other ships on the horizon appeared to share the same strange phenomenon. At the time of the observation, the air temperature was 25°, wet bulb 23.4°, sea 27.6°, and the wind was SSW'ly, force 3.

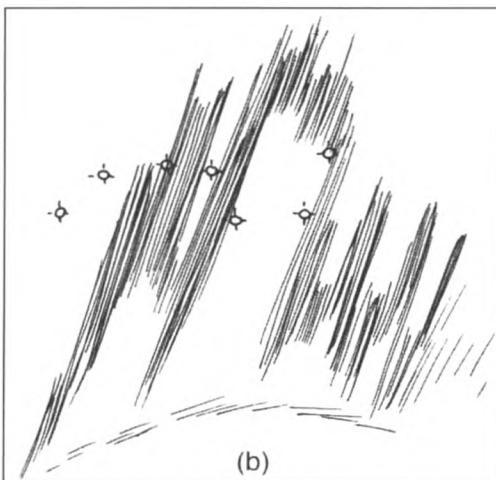
Aurora Borealis Western North Atlantic 29/30 September 1999

m.v. *Queen Elizabeth 2*. Captain R.W. Warwick. Observers: R. Hone, 1st Officer, R. Firth, 3rd Officer and A. Yuson, Quartermaster.

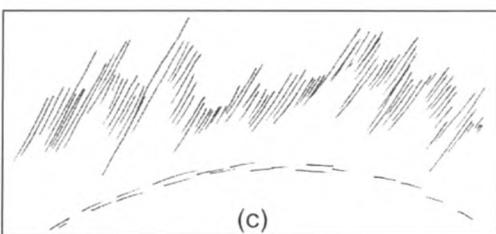
The 'Northern Lights' were sighted in a display that commenced at 2345 UTC on the 29th. The sky was clear and the visibility was good when the aurora was first sighted extending between bearings of 290° and 040°. Initially, a quiet homogeneous glow was seen, this reaching the approximate elevation of Ursa Major; sketches (a), (b) and (c) show the sequence of activity that followed the glow.



Form: arc.
Structure: striated with fine filaments of arcs or bands.
Condition: active, the lower border changing rapidly.
Brightness: comparable with moonlit cirrus.
Colour: white.



Form: rays like searchlight beams, display breaking up.
Structure: long rays.
Condition: active, with rapid horizontal movement.
Brightness: comparable with brightly lit moonlit cirrus.
Colour: white.



Form: arc, fragmentary.
Structure: medium length rays.
Condition: active, with movement of folds or irregularities.
Brightness: comparable with the Milky Way.
Colour: white.

The ship's position was 49° 20' N, 64° 09' W (Honguedo Passage) on a heading of 296° at 24.5 knots.

Editor's note. The details of this observation were given in the International Aurora Code. For the purposes of reproduction here the elements as decoded have been used.

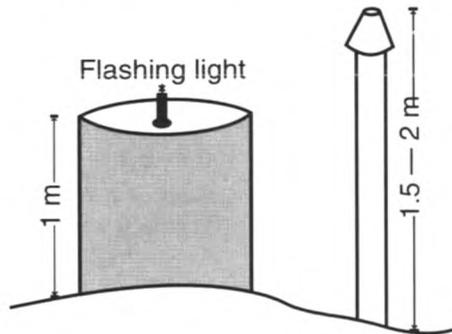
Buoy

North Atlantic Ocean

15 September 1999

m.v. Ullswater. Captain F. Pereira. Bristol to Hampton Roads. Observers: Captain Pereira, R. Doshi, 2nd Officer and R. Delacruz, GP.

The vessel was in position $46^{\circ} 07.5' N$, $34^{\circ} 55.1' W$, rolling and pitching heavily in the effects of a W'ly wind of force 6 and a 5-m swell from the west-north-west. At 2140 UTC a white flashing light was observed fine on the port bow, and the ship's course was altered from 225° to 230° in order to investigate. As the light cleared the ship's bow, the vessel was brought to 227° for a closer look at it. The sketch shows what was seen.



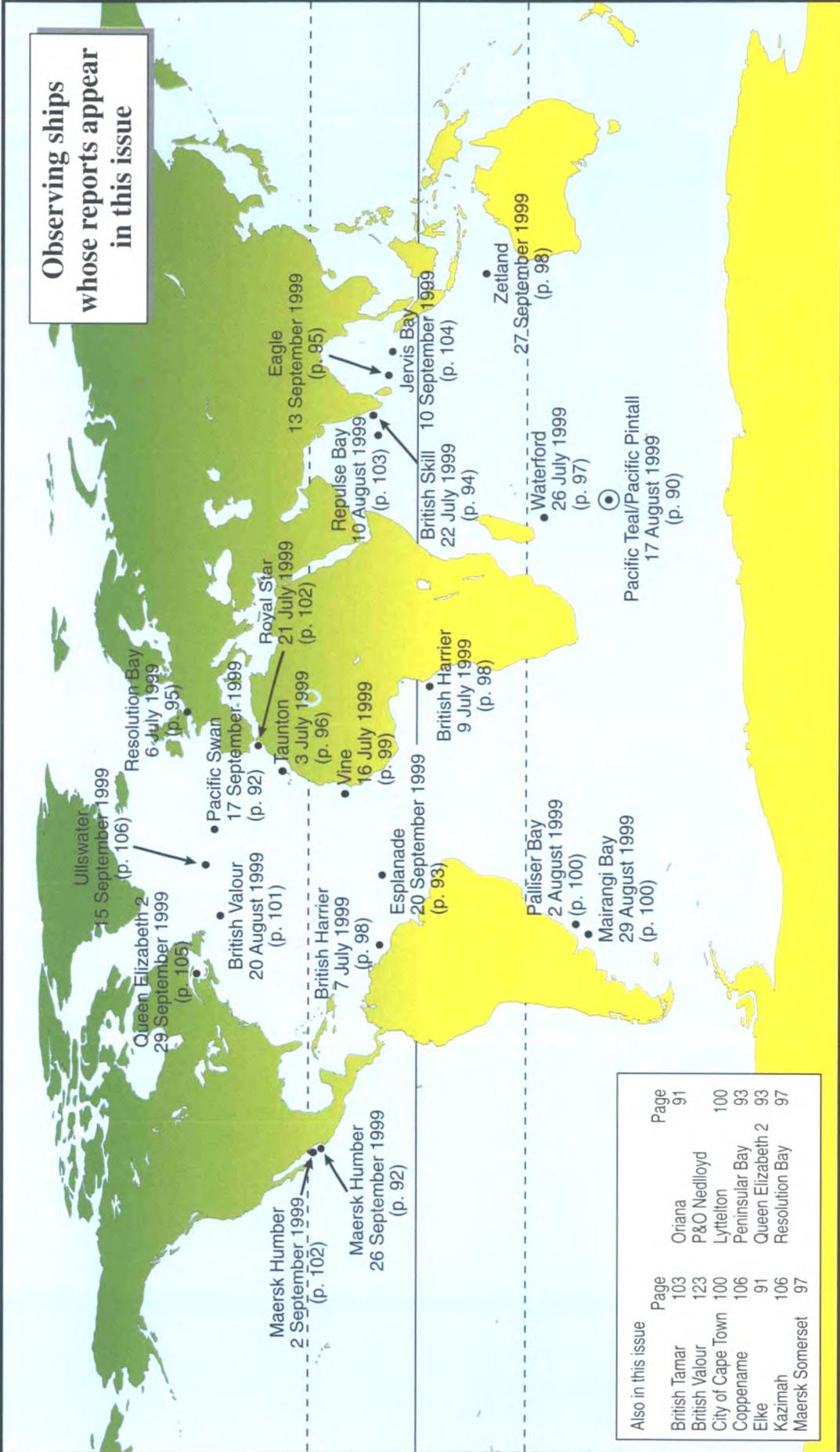
The observers watched the light while it passed about 25 m off the port beam; it was found to be attached to a yellow cylindrical buoy measuring approximately $1\text{ m} \times 1\text{ m}$, and flashed at intervals of four seconds. Also attached to the buoy was a white rod, presumably the antenna, measuring 1.5–2 m high.

The ship's heading was 225° at 25 knots, and no echo of the buoy was observed owing to the heavy swell. A report of the buoy was sent to Camslant Radio.

In brief: A flock of seabirds with black backs and wings was sighted at about 1415 UTC on 18 September 1999 by Second Officer S. Fraser on board the *Coppename*. A school of approximately 10 dolphins was noticed below them. After the vessel passed the dolphins, they seemed to be playing in the bow wave, leaping into the air but not spinning. Another school of about 20 dolphins appeared after a further five minutes; they had grey backs with a lighter grey underside, and all were leaping as one. More black seabirds were seen above these dolphins, and also above a grey-coloured whale sighted further off the port beam. The ship's position was $09^{\circ} 25' N$, $52^{\circ} 11.4' W$.

In brief: On 6 September 1999, when the *Kazimah* was 180 n mile off Conakry, a heron landed on board and was noted by Captain G.M. Abbott and Chief Officer R.A. Latsh to remain for the next 24 hours. It eventually flew off in the direction of local fishing boats.

**Observing ships
whose reports appear
in this issue**



Also in this issue	Page	Page	
British Tamar	103	Oriana	91
British Valour	123	P&O Nedlloyd	100
City of Cape Town	100	Lyttelton	93
Coppename	106	Peninsular Bay	93
Elke	91	Queen Elizabeth 2	93
Kazimah	106	Resolution Bay	97
Maersk Somerset	97		

ASAP — past, present and future

Introduction

Ongoing advances in observing, data processing and communications technology have made it possible for volunteer observers to carry out complex observational programmes which previously required the specialist skills of meteorological and oceanographic scientists and technicians. This has substantially increased the scope of voluntary observation programmes, dramatically changing the economics of meteorological and oceanographic observing at sea. As a result of such changes the Voluntary Observing Ships Programme has, in recent years, expanded to include observations of the structure of the upper atmosphere.

The Automated Shipboard Aerological Programme (ASAP) in its present form was conceived in the mid 1980s and organised by the ASAP Coordinating Committee established by the World Meteorological Organisation Executive Council. It was, and still is, considered a cost effective means of obtaining upper-air data from ocean areas. With the gradual demise of dedicated weather ships, the in situ profile data from 'data sparse' ocean areas provided by ASAP systems is of crucial importance to the World Weather Watch. It is also a vital and economical source of baseline upper-air data from ocean areas as part of a global ocean-observing system in support of many applications, including global climate studies. Furthermore, it is generally recognised that profile data plays a key role in forecasting on both global and national scales and is a reliable reference for calibrating data from other sources, e.g. satellites.

It has now become routine for specially trained officers to launch radiosondes from volunteer ships at sea. These instrumented balloons are tracked electronically to obtain vertical profiles of wind speed and direction, temperature and humidity through the lower and middle layers of the atmosphere. Like other shipboard meteorological observations, ASAP soundings are immediately transmitted to shore by satellite communication and relayed internationally on the Global Telecommunication System (GTS).

UK historical involvement

The Met. Office instigated a programme of upper-air soundings from merchant ships in the mid 1960s. The vessels used were bulk carriers, generally trading between the UK and West Indies and/or Australasia. This was a manually operated system. A radiosonde of German design transmitted pressure, temperature and humidity data to a radio receiver using a modified form of Morse code. No 'wind-finding' system was employed. Using calibration graphs, the incoming raw data were converted into usable parameters and plotted on standard graphical charts from which profile data were selected. The selected data were then coded into a standard message format and transmitted by the Radio Officer to a shore radio station. After six years, the programme was terminated in 1971.

The earlier manual method was superseded in the mid 1980s by the UK-ASAP system. The new system was given a six-month trial run in 1984 using a 20-foot container loaned by the Canadian meteorological service and fitted on the container ship *CP Ambassador*, a vessel of the Canada Maritime fleet. The voyage was between Felixstowe and Montreal, calling at two continental ports on the outward-bound leg.

The container was fitted with a balloon launcher, a computer for receiving and processing the raw data from the radiosonde, and a Data Collection Platform for storing the coded messages. The latter were transmitted at fixed times, via geostationary satellites, to a collection centre at Darmstadt in Germany for onward delivery to Bracknell and thence to the GTS. Aerials for reception of radiosonde data and transmission of messages were situated on the monkey island. The sondes used in this automated system were made by Vaisala of Finland and used the world-wide Omega navigation stations and Russian Sigma network for wind-finding.

The 1984 trial proved the viability of the system in the North Atlantic and, in 1987, the container used in the trial was fitted to the container ship *Manchester Challenge*, shortly thereafter to be renamed *OOCL Challenge*, managed by Orient Overseas Container Line Ltd.

Essentially, this system was a 'modular' unit with all system components and consumables housed in a standard 20-foot shipping container, which could be quickly installed on a commercial vessel. Such systems therefore continue to offer advantages in today's flexible shipping environment, since abrupt changes in routes or schedules can be readily accommodated by moving the container to another ship. However, they also require substantial, non-obstructed, deck space and extra costs result from the need to maintain the container and its ancillary equipment. To address these constraints an alternative configuration was subsequently developed, with system electronics installed in existing ship's spaces, and consumables either stored in onboard space or in a small 10-foot container.

With these considerations in mind, a fully fitted 10-foot container, which had previously been operated by the Finnish meteorological service on the *CanMar Ambassador*, was transferred to the UK observing ship *CanMar Europe* towards the end of 1987. This ship operated on the same route as the *OOCL Challenge* (between the UK, Europe and the east coast of Canada as part of the St Lawrence coordinated service). The ASAP units on both ships were operated by staff of The Met. Office, all of whom had served on ocean weather ships and so were used to the rigours of the North Atlantic.

Apart from a few technical problems, some due to inexperience, the programme ran smoothly. The main problem was the siting of the ASAP containers, which were fixed in the only possible location, aft of the bridge but forward of the funnel and the ship's crane. Generally, balloons were found to bounce off the funnel unscathed but the crane was not so forgiving. This problem was eventually solved by the use of portable balloon launchers situated aft of the funnel and crane and, in most cases — even in extreme conditions and sometimes to the astonishment of the operator — the balloon ascended with its valuable package.

Due to financial constraints, the 10-foot container was removed from *CanMar Europe* in March 1990, and the programme continued with just the one remaining ASAP unit on *OOCL Challenge*. About a year later, The Met. Office staff were replaced by contract operators, employed by J. Marr & Son Ltd. At the beginning of 1993, *OOCL Challenge* was re-routed to the far east and the 20-foot container was transferred to *CanMar Europe*.

In April 1994, owing once again to financial constraints, the programme was terminated and the ASAP unit removed from the *CanMar Europe*. This situation was compounded in May 1996 when the last remaining UK Ocean Weather Ship, *Cumulus*, was withdrawn from service, leaving no routine UK upper-air soundings from the North Atlantic. However, although The Met. Office's direct participation in ASAP operations had effectively ceased at that time, some indirect involvement was retained through the UK observing ships R.R.S. *Bransfield* and R.R.S. *James Clark Ross*, both of which continued to undertake routine sonde launches as part of their British Antarctic Survey work, and through our association with the ASAP project for radiosonde observations on the *Ekofisk* platform in the North Sea.

The present level of ASAP operations

A large part of the present global ASAP activity takes place in the North Atlantic. Figure 1 shows the distribution of the total number of upper-air soundings taken in 1998 in the North Atlantic, including data from Ocean Weather Station 'MIKE'. (In 1998 approximately 3,400 ASAP soundings were taken in the North Atlantic.) The ASAP tracks in Figure 1 are covered by around six units for the track to the West Indies, two units on the track between Denmark and Greenland, while the track from Iceland to North America is covered by only one unit.

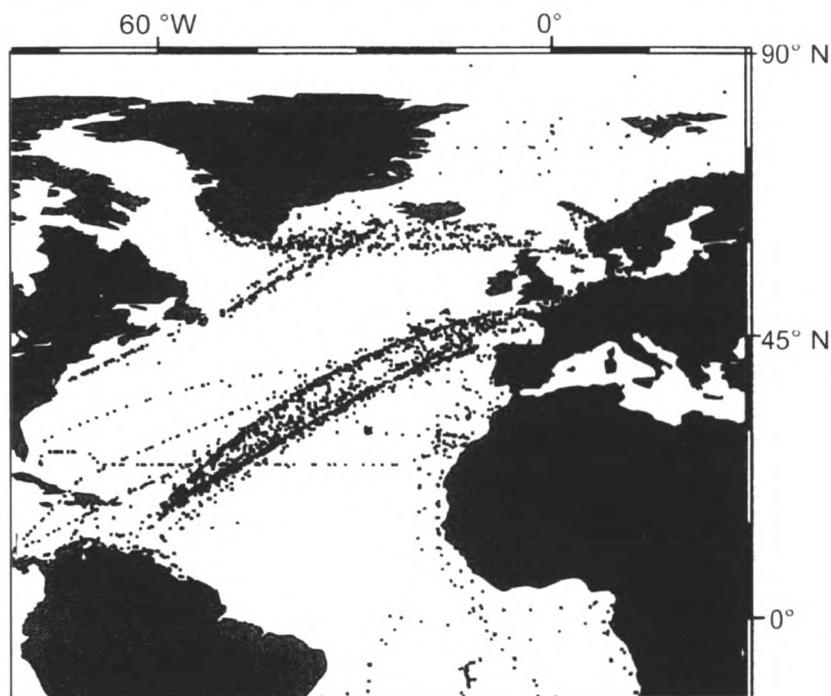


Figure 1. Distribution of the total number of ASAP observations taken in the North Atlantic in 1998. (Courtesy of Météo-France).

On a single day, either at 00 or 12 UTC, the average number of ASAP soundings in the North Atlantic is 4.8 soundings based on 1998 statistics. As an example, Figure 2 shows the total sounding coverage in the North Atlantic on 13 October 1999 at 00 UTC, at which observation hour there were six ASAP soundings, being a little above the 1998 average. The dark-blue squares represent ASAP soundings while the light-blue square in the Norwegian Sea is the

Norwegian ocean weather ship on station ‘MIKE’. The red markings are soundings from land stations. Two of the ASAP soundings were taken in harbour, one on the south-west coast of Greenland and the other in Colombia on the Caribbean coast. Whilst this case shows a favourable distribution of ASAP soundings, there are days with a much less even distribution, and days with much fewer soundings.

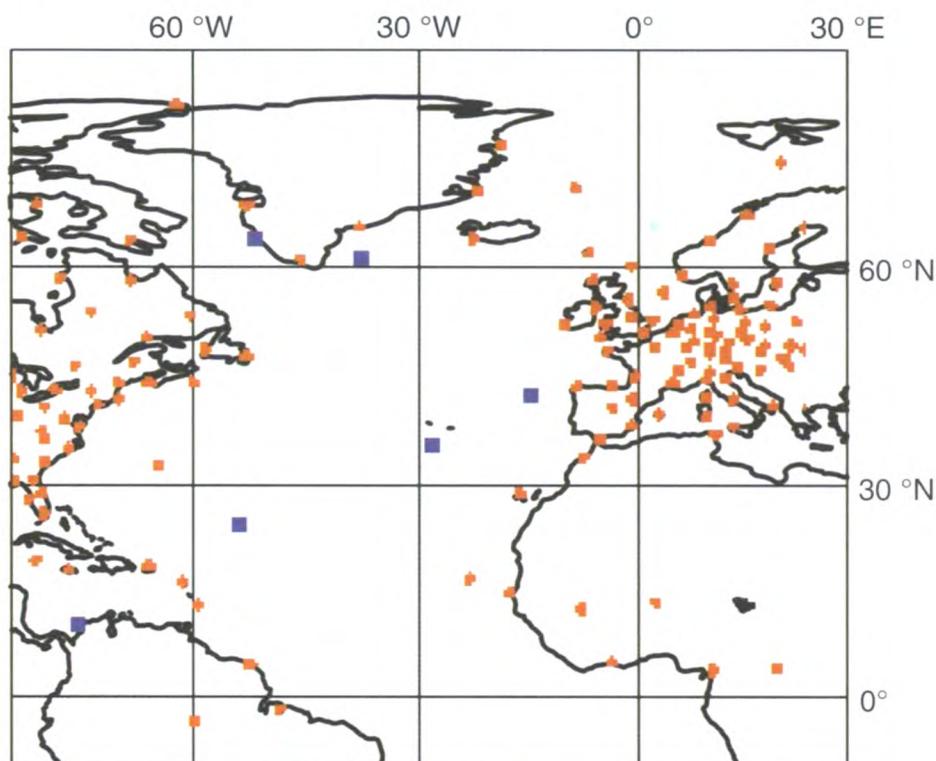


Figure 2. Data Coverage chart for soundings on 13 October 1999 at 00 UTC. (Courtesy ECMWF)

The quality of ASAP data relayed on the GTS has shown steady improvement. Meanwhile the annual number of ASAP soundings, having decreased slightly in recent years showed a marked increase in 1999, as indicated in Table 1.

Table 1 — Number of ASAP soundings globally, 1994–1999

Year	1994	1995	1996	1997	1998	1999
Total ASAP soundings	5014	5570	5709	5487	4801	5696

At the time of writing, vessels from Denmark, France, Germany, Japan, the United States, the United Kingdom, Russia and Sweden/Iceland are active ASAP participants.

Recent UK-ASAP developments

Throughout 1998 foundations were being laid for the revival of UK-ASAP involvement and, by the end of December that year, arrangements were in hand for the delivery to The Met. Office of a 10-foot container, adapted to house the balloon launcher. A suitable vessel was sourced from Canada Maritime Services Ltd whose newbuilding, *CanMar Pride*, was kindly offered as a carrier.

After initial trials of the system, a representative of The Met. Office who had participated in the original ASAP, undertook a voyage in July/August 1999 in order to train the ship's officers in the operation of the system. A further training voyage was undertaken in November/December, but due to a technical problem the edited raw data could not be coded and transmitted. Following the successful resolution of this problem, a third training voyage was undertaken in January 2000 and, since then, ship's personnel have demonstrated their competence in operating the system.

The present ASAP is known as a 'distributed' system. It therefore differs from the original 'modular' ASAP systems in that the computerised equipment is now located on the bridge, while the container is only used for launching the balloon and radiosonde. Technological progress has resulted in the processing and transmitting units being much reduced in size and they now occupy only a small space on the bridge. Instead of using a Data Collection Platform for storing the coded message to be transmitted at a fixed time, the system uses the commercial satellite system Sat-C to send the message directly to Bracknell via Goonhilly LES within minutes of the end of the sounding. This has resulted in a marked improvement in the quantity and quality of messages received.



Figure 3. Launch of a 350-g balloon from the new UK-ASAP ship *CanMar Pride*.

The new launching equipment has also enabled the use of larger balloons — 350 g (Figure 3) compared with 200 g previously used — resulting in average heights reached of 24–25 km compared with the previous averages of 21–22 km. The Vaisala radiosonde used is similar to previous designs, with sensors for measuring pressure, temperature and humidity, although wind-finding is now achieved using the Global Positioning System (GPS) of satellites.

The Future

The future for ASAP observations is looking promising. EUMETNET (a network of 18 European national meteorological services) has undertaken a feasibility study aimed at establishing two new ASAP operations (E-ASAP) — one in the Mediterranean Sea and another in the Atlantic. For the Mediterranean

E-ASAP, a ship providing good coverage of the western, central and eastern areas has been identified, whilst for the Atlantic E-ASAP different routes are being analysed. The priority route for the Atlantic E-ASAP is considered to be from the English Channel to the south-eastern United States, although two other options have been identified in case a suitable ship cannot be obtained on that route.

At present there are no ASAP units operating regularly in the Mediterranean, although suitably equipped research vessels may, once in a while, take some soundings there. Consequently the proposed Mediterranean route does not have to allow for other ASAPs operating in the area. In line with the general practice used by ASAP operators it is expected that a container ship will host the new Mediterranean E-ASAP. In principle other ship types could also be used, but as container ships normally operate on frequent and regular trades, they are generally considered preferable to ships operating with less regularity. Similarly, only container ships are being considered as potential hosts for the Atlantic E-ASAP.

The new UK-ASAP, in combination with the planned Atlantic E-ASAP, is expected to provide around 600 additional soundings annually in the area of the mid-North Atlantic not covered by ASAP.

Conclusion

Radiosonde ascents from ASAP vessels have become comparable in quality to soundings carried out by dedicated ocean weather ships, achieving average heights exceeding 20 km. Moreover, the progressive adoption of the Inmarsat-C satellite communications system has resulted in around 99 per cent communications efficiency for relay of ASAP data, a figure comparable to that for land-based radiosonde stations. Finally, the cost of an ASAP radiosonde flight is now similar to that for a land-based ascent and a fraction of that for a corresponding upper-air sounding from a dedicated weather ship.

Upper-air observations from ASAP-equipped vessels currently make a significant contribution to hemispheric and global analysis of the three dimensional structure of the atmosphere, supplying real-time data for areas from which no radiosonde soundings would otherwise be available. As a result, they contribute directly and substantially to improving the accuracy of short- and medium-range weather forecasts. In addition, they also provide essential observational data needed for studies of global climate and for the development of improved monthly and seasonal climate predictions.

References

- Annual Report of the Observations-Voluntary (Marine) branch for 1998. *The Marine Observer*, **69**, p. 51.
- Hatch, M. (1989) The Automated Shipboard Aerological Programme. *The Marine Observer*, **59**, pp. 78–82.
- Hedegaard, K. (1999) E-ASAP Feasibility Study. E-ASAP_REP_005, Final version.
- Hedegaard, K. (2000) E-ASAP Annual Report 1999. E-ASAP_REP_009, Final.
- Hedegaard, K., A Garcia-Méndez and W Keenan. The Automated Shipboard Aerological Programme. *WMO Bulletin*, **48**, No.3 (July 1999) pp. 280–285.
- <http://www.eumetnet.eu.org/>
- (Notes. ECMWF = European Centre for Medium-range Weather Forecasts)

Missing the right whale

The sight of a whale that has suffered severe lacerations as a result of a collision with a ship's propeller, or which has become impaled on a ship's bulbous bow, is always going to be distressing to the modern seafarer. Sometimes a collision will not be immediately apparent, and it may only be after a perceived change in a ship's performance, or manoeuvring characteristics, that visual inspection reveals the presence of several tons of whale draped over the bulbous bow. For a whale, death as a consequence of being struck and trapped in this way is virtually certain, and we are thankful that such reports from UK observing ships are rarely received.

However, the implications of such whale strikes assume greater significance if they involve an endangered species of whale. The population of the North Atlantic Right Whale (*Eubalaena glacialis*) is one of the most fragile among cetaceans and, such is the concern over this species, that specific action has been taken in an attempt to keep ships and whales apart in areas where ship traffic and high numbers of whale sightings overlap. Although a whale strike is a rare event, the likelihood of a North Atlantic Right Whale being hit by a ship at some point during its lifetime is comparatively high.

The nature of the beast

The North Atlantic Right Whale (NARW) is large, averaging 15 m for both sexes; the body is stocky and fat, smoothly rounded with no trace of a dorsal fin or ridge along the back. The head comprises about one-quarter of the body length and has a long, narrow, highly arched upper jaw from which are suspended the 2-m baleen plates. There are no throat grooves but white lumps or callosities are evident on the snout, also on the edge of the lower lip and above the eyes (the pattern of callosities, which may in turn host colonies of marine growths, can be used to identify individual whales). The body colour is usually black but there may be white patches on the belly. See Figure 1.

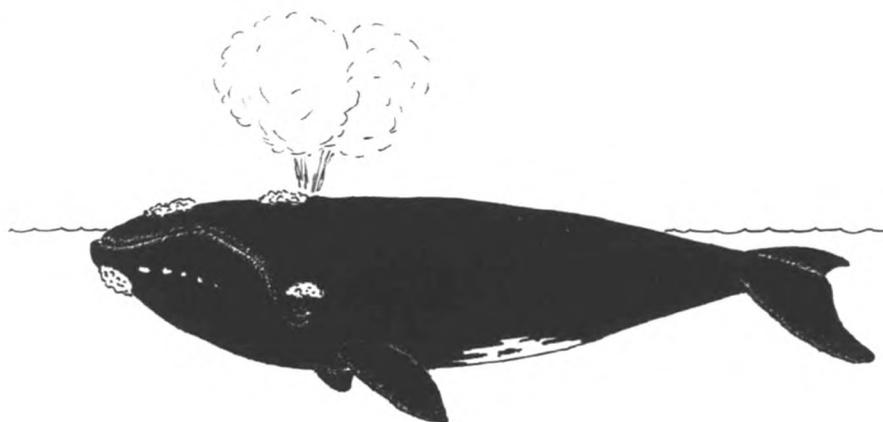


Figure 1. A representation of a North Atlantic Right Whale

The blow is characteristic. The blowholes are widely separated and produce two distinct spouts rising to 5 m in a V-shaped fan of mist; the whales normally cruise at the surface for 5–10 minutes, blowing roughly once per minute before diving (usually showing flukes) for 10–20 minutes.

These whales can live for 60 years but because they are so rare, little is known about their reproductive rate or general biology. However, it is thought that the whales do not breed before they are six years old, and a female will bear a calf only once every three to five years.

Extensive studies of the NARW show that there are three populations in the world: one each in the North Pacific and North Atlantic Ocean, the third in the southern hemisphere. The world-wide total may not even reach 2,000 individuals, the North Atlantic population amounting to no more than 350, possibly less than 300. It is the behaviour of these whales that contributes to the danger from shipping today, just as it made them easy targets for commercial whalers. They spend significant periods of time at or near the surface, seemingly oblivious to approaching ships; they move slowly (about 5 knots), and they feed by filtering plankton at the surface. In addition, calves have limited dive capabilities and must spend most of their time at the surface.

Hazards and injuries

Having been hunted almost to extinction in the years to 1935, some effort was made to help conserve the species the following year, and it has been fully protected since 1937, although showing little sign of recovery. Direct human influences in the form of marine pollution, the degradation of inshore habitat, offshore dumping, noise and other physical disturbance are considered threats to the whales. However, given a critically low population level combined with a low birth rate, whale biologists have determined that ship-related mortality and injury, although not intentional, are also significant factors.

Injuries found on whale carcasses include fractured skulls, severed tails and large propeller slashes, and seven per cent of living whales have been found to have large propeller wounds on their backs and flukes. Between 1970 and 1999, 16 of the 44 known deaths for this species were attributed to ship strikes, while nine of those occurred after 1991. The total number of deaths is not known since it is unlikely that all carcasses have been reported or recovered, but if there are even as few as two or three strikes in a year, that represents one per cent of the population killed in this way.

An additional hazard facing the whales is commercial fishing gear. Although there have been several instances of them becoming entangled in nets, no deaths have yet been recorded. In addressing the fishery issue, the US has restricted the use of lobster gear and gillnets in vital areas, while a law introduced by the US in July 1997 made it illegal to come within 500 yards (460 m) of a whale in US waters.

Action to reduce ship strikes

In the North Atlantic there are only a handful of seasonal sites in which the whales are known to aggregate, and females with their calves are known to migrate up the eastern coast of the US to Canada. The behavioural characteristics of this species coupled with the fact that the habitat preference includes areas within or near busy shipping lanes makes it even more vulnerable to being struck.

Government agencies in Canada and the US are taking measures to reduce the risk of ship strikes, as follows:

Canada

In a submission to the IMO Sub-Committee of Navigation, 45th Session (1999), two areas vital to NARW were identified as requiring special attention to reduce whale strikes, namely The Bay of Fundy and the Roseway Basin.

The Bay of Fundy conservation area, a 15-n mile by 12-n mile area in the Grand Manan Basin between Nova Scotia and New Brunswick, is the primary summer feeding area. It is thought that about half of the entire North Atlantic population congregates here from early June to mid-October, comprising nursing females, calves, juveniles and adults.

Unfortunately, the Traffic Separation Scheme (TSS) passes through much of this area, and large ships therefore cross it. However, during the course of their operations, officers of the Marine Communications & Traffic Services (MCTS) at Saint John note whale activity and advise vessels of whale locations. They recommend avoidance action where necessary and, thanks to the cooperation of mariners, have never needed to direct vessels away from whales. Educational material about the NAWR is also distributed through harbour pilots in Saint John and Halifax (Nova Scotia).

Locations of whales are also provided on a voluntary basis to the MCTS from research vessels (August and September), 'whale watch' vessels (June and July), Canadian Coast Guard and Navy vessels, and commercial ships in the area.

The Roseway Basin conservation area, a 20-n mile by 27-n mile region between Browns and Baccaro Banks on the southern Scotian Shelf, is a summer/autumn feeding area for juveniles and adults between June and late October. Large ships using the ports of Halifax and Saint John, and those on passage between the eastern US and Europe, cross the area and, to reduce the risk of collisions, harbour pilots in Saint John and Halifax provide information about the whales in this conservation area too.

A further proposal regarding these areas is expected to be submitted to the IMO Sub-Committee of Navigation, 46th Session, in July 2000, and possible actions to be investigated might include changes to the TSS in the Bay of Fundy, and the designation of Roseway Basin as an Area To Be Avoided.

United States

In 1993 government agencies, area ports, port pilots and whale biologists began work to develop an early warning system for ships which traverse the only known calving grounds of the NARW, off the south-east Georgia/eastern Florida coasts. The aim was to alert ships to whales that might be in the area and provide practical advice on how to avoid hitting them.

The calving area is particularly important for protecting the species in view of the long reproductive cycle. Whale sightings are provided through daily aerial surveys (weather permitting) during the calving season (December to March), by voluntary reports from research vessels, from US Navy and Coast Guard ships, and other transiting vessels. This information is then relayed to ships via NAVTEX, US Coast Guard Broadcast Notices to Mariners, and direct contact between survey flights and passing ships, while information is also provided through ports and harbour pilots.

A similar early warning system was put into operation in 1997 for the Cape Cod region off the north-east US coast, covering two seasonal NARW critical feeding habitats in Cape Cod Bay and the Great South Channel, and in 1999, Mandatory Ship Reporting (MSR) was introduced for both areas.

Mandatory Ship Reporting system

In accordance with Regulation V/8-1 of the 1974 SOLAS Convention, the US proposed the operation of Mandatory Ship Reporting applicable to ships entering their two critical NARW areas. This was subsequently adopted by the IMO Maritime Safety Committee as Resolution MSC 85(70) and entered into force on 1 July 1999. All vessels of 300 gross tons or more (except those vessels which are exempted by SOLAS Reg V/8-1(c)) are required to report to the US Coast Guard when entering the two NARW aggregation areas.

The first reporting area, off the north-eastern United States coast, includes Cape Cod Bay, Massachusetts Bay and the Great South Channel east and south-east of Massachusetts. These are essential feeding areas for NARW, the peak seasons being from January to April in Cape Cod Bay, and from April to June in the Great South Channel. The second area, off the south-eastern coast, covers part of the Georgia/Florida coastline and includes coastal waters within about 25 n mile along a 90-n mile stretch commencing at 30° N (see Figure 2).

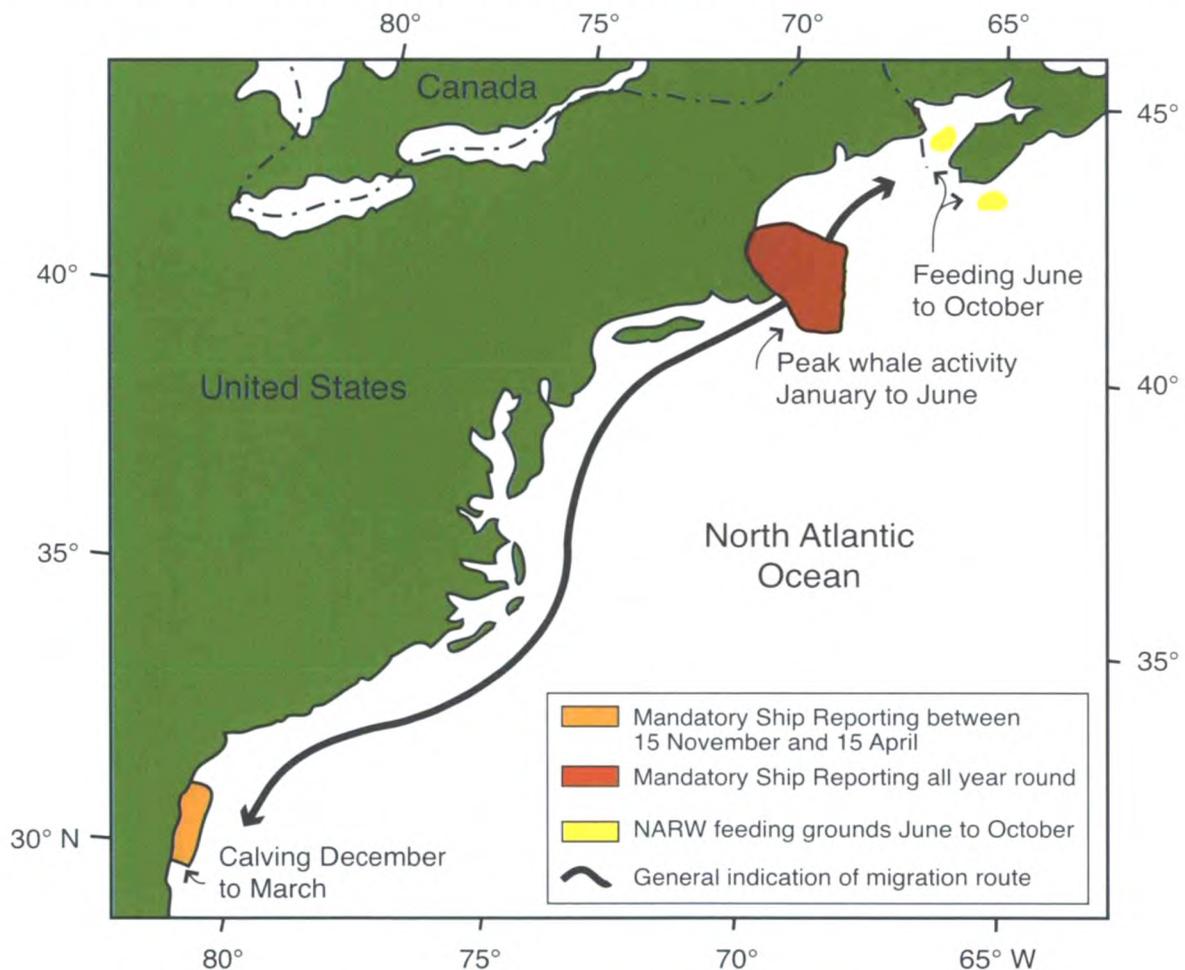


Figure 2. Sites of seasonal aggregations of NARW, and approximate boundaries of areas operating whale conservation measures.

The two reporting areas operate independently of each other: the north-eastern reporting system operates all year round whereas the south-eastern one operates from 15 November to 15 April, these periods corresponding with peak seasonal NARW occurrence.

(*Note.* Full details of the coordinates of the Mandatory Ship Reporting areas are delineated in Resolution MSC 85(70), and can also be found in US Coast Guard *Local Notice to Mariners No.27/99 (Monthly)* or at the US Coast Guard Navigation Center website www.navcen.uscg.mil/Inm/default.htm)

Method of reporting

Ships are only required to make reports when entering the designated area during a single voyage (that is a voyage in which a ship is in the area to visit one or more ports, or to traverse the area en route to a port outside the reporting area). They are not required to report when leaving a port in the reporting area, or when exiting the system. Reports should preferably be transmitted to the US Coast Guard through Inmarsat–C. The following methods of reporting are prescribed in US Coast Guard *Local Notice to Mariners No. 27/99*:

- (a) Vessels transiting MSR areas are required to report their course, speed, position, destination, and route to the U.S. Coast Guard upon entry into the reporting area. Vessels should report via INMARSAT C to one of the following addresses:

Email: RightWhale.MSR@noaa.gov or Telex: 236737831

- (b) Vessels not equipped with INMARSAT C should report via alternate satellite communications equipment to one of the following addresses:

Email: RightWhale.MSR@noaa.gov or Telex: 236737831

- (c) Vessels unable to use satellite communications equipment should contact the U.S. Coast Guard Communication Area Master Station, Chesapeake Bay, VA via SITOR/NBDP on 8426.3 kHz, 12590.8 kHz, 16817.8 kHz twenty four hours per day, or 6314.3 kHz from 2300 GMT until 1100 GMT and 22387.8 kHz from 1100 GMT until 2300 GMT.

Other action recommended to mariners

This species can occur anywhere along the east coast of the US and Canada; mariners are urged, therefore, to exercise prudent seamanship in their efforts to avoid these whales. Depending upon the individual circumstances in which a vessel may either come into contact with important whale habitats, or sight whales, the following actions are recommended:

Transit of whale critical habitat

- As soon as possible prior to entering the habitat, check US Coast Guard Broadcast Notice to Mariners, NAVTEX, NOAA Weather Radio, Cape Cod Canal Vessel Traffic Control, the Bay of Fundy MCTS, and other sources for reports of recent sightings.
- When approaching ports on the US or Canadian east coast, review any whale identification material, and maintain a sharp watch for whales. (*Note.* NARW identification drawings can be found on page 262 of *Admiralty Sailing Directions NP 68, Volume 1, East coast of the United States Pilot.*)
- When planning passage through critical habitat, attempt to avoid passages at

night and, whenever practical, minimise travel distances through the area. Anticipate delays owing to whale sightings.

- When the ability to spot whales is reduced through darkness, fog, rain, etc, mariners should bear in mind that reduced speed may lessen the risk of ship strikes.

In all coastal and offshore waters of the US and Canada

- If a whale is sighted within 20 n mile of a vessel's position, a lookout (ideally, familiar with whale-spotting) should be posted.
- If a whale is sighted from a ship, or reported along the intended track of a large ship, mariners should exercise caution and proceed at a slow, safe speed when within a few miles of its location, bearing in mind that reduced speed may minimise the risk of ship strikes.
- Do not assume that NARWs will move out of the way; they are generally slow-moving whales. Consistent with safe navigation, manoeuvre around actual whales or recently reported sighting locations. It is illegal for persons subject to US jurisdiction to approach, by ship, to within 500 yards (460 m) of any NARW.
- Any whale accidentally struck, any whale carcass spotted, and any whale observed entangled in fishing gear should be reported immediately to the US or Canadian Coast Guard, noting the precise location of the incident or sighting.

In the event of any whale strike or sighting, the following information should be supplied to the US Coast Guard: location of the incident or sighting; size and speed of ship; water depth; wind speed and direction; species and size (if known); description of the impact (if applicable); fate of the whale, if known.

References

Johnson, L. S., and G. K. Siber. The Endangered North Atlantic Right Whales—Reducing the threat of ship strikes with Mandatory Ship Reporting. *Mariners Weather Log*, April 1999, pp. 26–32.

Watson, L. (1985). *Whales of the world*. pp. 69–70.

IMO Sub-committee on Safety of Navigation, 45th Session, 1997. Nav 45/Inf.3, Ship strikes of endangered North Atlantic Right Whales in the waters off Eastern Canada.

IMO SN/Circ 205. Mandatory Ship Reporting Systems, 8 January 1999.

IMO *News*, 4/1997. Taking the right route to save a whale.

Websites:

Environment Canada (1999). Canadian Wildlife Service. Species at Risk in Canada: www.speciesatrisk.gc.ca/Species

Marine Communications & Traffic Services Canada (1999). Right Whales — An Endangered Species: www.ccg-gcc.gc.ca/mctts-sctm/info/whales_e.htm

US Department of Transportation - US Coast Guard (1999): www.navcen.uscg.mil

The *Maersk Surrey* — a ‘booby trap’?

In July 1999, the *Maersk Surrey* was accompanied by a number of seabirds between the 14th and the 23rd as it passed up the coasts of Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala and Mexico en route to Taichung. Chief Officer Stuart Gallaway compiled, on behalf of the ship’s company, the following account of the birds’ activity.

“At the start of this period we had getting on for 30 birds as company on our voyage. It was readily apparent that they all belonged to the Gannet family as they all had that distinctive shape, and the more mature birds had the typical black-and-white markings. The immature birds displayed grey-black to grey, and grey to white plumage and outnumbered the mature ones by three or four to one. We believed that they were known in this part of the world as ‘boobies’.

“Closer observation (or as close as they would allow you to get!) revealed that there was the possibility that we had two species on board. The mature adult birds had the glistening white plumage, a black bar along the upper surfaces of the wings and a bright-yellow area that encompassed the beak and eye areas. The webbed feet were a nondescript colour. The immature birds had the black bar across the top of the wings, and varying shades of grey substituted for the white plumage. However, some of these immature birds had a sort of duck-egg blue colouration to the beak and eye areas, which accounted for our thoughts on a second species.

“Anyway, these birds had adopted the fore part of the ship, which pleased me no end (not!). At the beginning of the period the birds were squabbling for a roosting position on the foremast lightning conductors. The more energetic stayed on the wing and rode the air currents over the bow area. From these high observation positions they watched the sea surface for any sign of flying-fish, either above or below the surface. If a large shoal of flying-fish was disturbed, a bird frenzy invariably ensued!

“Numerous flying-fish capture techniques were observed. The most spectacular generally being from the birds already on the wing flying ‘combat air patrol’ as it were! The wings would be drawn in slightly, the bird would roll sharply and start a near-vertical dive to accelerate and then pull up gradually without losing speed as it got close to the waves. At this point the bird was generally right on the tail of the flying-fish, and a high speed airborne capture was signalled by a rapid pull up and struggle for height.

“If the flying-fish evaded capture by crashing back into the sea once again, it still wasn’t safe! The birds had obviously watched *Top Gun* and had the next manoeuvre off ‘pat’. The fish splashed down, the bird slammed on its air brakes and nosed up for a bit of altitude before breaking right (or left!) and then diving into the sea right after its prey. Moments before entry, the bird’s wings were swung right back to clean up their configuration for entry into the water. Seconds later, it would reappear on the surface, quite often with a flying-fish in its beak.

“Another technique for the already airborne was observed and could be called the ‘multi-mission kamikaze’ type. A bird on ‘combat air control’ would simply

draw in its wings, roll sharply and dive almost vertically into the sea, swinging its wings back moments before entry. These dives were sometimes from a great height and appeared to be at a fair speed as well.

“The birds at roost on the foremast were occasionally prompted to join in the activity. They simply appeared to roll off their perches and then swoop to chase their prey or just dive straight into the sea after it. The only thing common to all methods of fish capture was that when a bird appeared with a wriggling fish in its beak, all the other birds wanted it, and much seaborne or airborne squabbling took place!

“The down side to all this spectacular flying and fish catching was the state of the deck downwind and below the foremast! A bit ‘grim’ is probably the politest way of describing it (see photograph).



S. Gallaway

“Over the period, the numbers dwindled until we were left with a singleton which eventually departed for who knows where? Unfortunately, not one of the birds throughout the period was particularly cooperative as far as cameras were concerned. A few long-distance shots by video camera were obtained but, as the digital camera still hasn’t got a zoom lens, nothing was committed to ‘memory’ ”.

The path covered by *Maersk Surrey* during the period lay on a Great Circle route between 08° 40’ N, 88° 00’ W and 21° 42.2’ N, 140° 00’ W.

Editor’s note 1. Captain Peter Chilman, of the Royal Naval Birdwatching Society, said of this account:

“Boobies as you say, tropical members of the Gannet family. (These were) almost certainly Masked Boobies, otherwise known as Blue-faced Booby (*Sula dactylatra*). The browner ones would be immatures. The largest and heaviest of the tropical boobies which breed in many parts of the tropics, almost always on islands. I have often seen them chasing flying-fish as you report.”

Editor’s note 2. A photograph of a Masked Booby appears on page 122, along with examples of two other species of booby.

Booby gallery



L.M. Rainford

A Masked Booby photographed from the Colombo Bay on 15 August 1999 when the vessel was on passage between Hong Kong and Singapore.

(Captain Peter Chilman, of the Royal Navy Birdwatching Society, said that this species is the largest and heaviest of the tropical boobies, breeding mostly on islands within tropics. They range far from land, preferring deep water into which they carry out spectacular dives.)



N. Lovesy

A Red-footed Booby at ease courtesy of its host, R. Burns in May 1996 off Ascension Island. The booby circled for a short time before enjoying the comfort of its human perch for some 20 minutes, and Mr Burns enjoyed a can of soft drink with the booby in place.



I.C. Oke

A Northern Gannet photographed on 21 September in the North Atlantic.

Scene at sea

Common Dolphins on 21 September 1999, in position 48° 19.8' N, 09° 20.5' W.
(This species of dolphin was also sighted on 10 August 1999 by C.G. Vernon, Chief Officer on the *British Valour* when the vessel was in position 56° 42' N, 24° 12' W.)



I.C. Oke



I.C. Oke

Two views of a Cattle Egret

Scene at sea



I.C. Oke

Frigatebirds on a beacon in the Berbice River, Guyana on 7 October 1999.



I.C. Oke

The total solar eclipse of 11 August 1999

The astronomical event of 1999 went off without a hitch; on ‘E-day’ the Earth, moon and sun duly reached their critical alignment, and the shadow of the moon swept across the south-western area of the UK before crossing the English Channel and heading off into Europe. However, few people actually saw totality, at least in the UK, because Mother Nature also produced another spectacularly well-timed event — the arrival of cloud which all but obscured the entire show!

Judging by the reports received from UK VOF ships, the story cannot have been much different at sea because only four ships sent in any reports concerned with the eclipse. Unfortunately, none of them were in suitable locations for witnessing totality, and so we have nothing of that aspect to report back to readers. Be that as it may, we nevertheless thank observers on the following vessels for sending us their reports of the partial eclipse: *Alkman*, *P&O Nedlloyd Southampton*, *Norna* and *Taunton*.

Summarising the four reports: the greatest coverage of the sun’s disc was observed from the *Alkman* whose observers appear to have had the longest sighting of the partial eclipse, at three hours. They noted that, at 0937 UTC, “nearly 90% of the sun was covered by the moon”. Also observed was a decrease of about 2° in the air temperature.

The most detailed report came from observers on the *P&O Nedlloyd Southampton*, in the western Mediterranean. A number of diagrams were drawn to show the progression of the eclipse, the maximum coverage of the sun occurring at 1020 when about five-eighths of it was obscured. Observers on this vessel managed to view the event between 0905 and 1153.

The *Norna* provided the most northerly observation (59° 58′ N, 04° 32′ W) from which location the partial eclipse was watched from 1000. The ship’s two sextants were “used for the first time in years” as means of watching the event, and welding visors were also found to be effective. A pinhole camera was found to give the “best idea of what was going on with very little effort, even on a moving ship”, and those on board noted that a ‘camera’ with an aperture of any size would give a crescent-shaped image, even one formed with finger and thumb.

The most distant observation came from the *Taunton* (05° 57.5′ S, 68° 59.7′ E) where the partial eclipse of the setting sun was observed for two minutes at 1320; about five per cent of the sun’s disc was “chipped off” the top right-hand “corner”.

Perhaps seafarers were not too disappointed to have missed this eclipse, for they have more opportunity than many, in the course of their work, to find themselves in the right place at the right time to view a total one.

So, on to the next one, due on 21 June 2001, and visible for 4 minutes 57 seconds at 11° S, 3° E —the South Atlantic and southern Africa — (cloud conditions permitting). How many observing ships will be in that area? Only time will tell. (Further details of forthcoming eclipses can be found on page 221 of the *Marine Observer’s Handbook*.)

Coding tips

Although logbooks received from UK observing ships continue to be of an extremely high standard, our quality control procedures occasionally reveal coding errors. These inaccuracies, whilst few in number, can mean that some ships' observations are flagged as unsuitable for our forecasting purposes.

To help reduce the incidence of such errors we have prepared some basic coding tips to assist observers to prepare correctly coded reports. The most common areas where coding problems occur are highlighted below together with a few pointers on filling in the logbook and transmitting the report.

(Column numbers refer to those given in the *Ship's Meteorological Logbook*.)

Column 4 — Time of Observation:

GG – The midnight UTC observation should be coded as 00 and NOT as 24.

Column 11 — Weather group indicator:

i_x – As a consequence of recent changes to the code group **7wwW₁W₂** (see 'Noticeboard' item on page 129) **i_x** should normally always be entered as 1.

Column 12 — Height of Lowest Cloud:

h – If low cloud is reported then **h** should be coded between 0 and 8.
– If no low cloud, but medium cloud is reported then **h** should be either 7, 8 or 9.
– If no cloud, or high cloud only is reported, then **h** is 9.
– / is only used when the sky is not discernible owing to fog etc.

Column 14 — Total Cloud Amount:

N – The amount of cloud must not be less than that reported in **N_h**.
– If code figures 43, 45 or 47 are used in **ww**, then codes **N** and **N_h** must be coded as 9 (sky is not discernible).

Column 15 — Direction of Wind:

dd – 00 should only be used for calms and in such cases the wind speed **ff** should also be coded as 00.
– 99 can only be used when the wind direction is indiscernible and will not normally be used if the wind speed is over 5 knots.
A north wind should be coded as 36 — NOT 00.

Column 16 — Wind Force/Speed:

ff – This column in the logbook should be coded with the Beaufort scale figure on the top line and the speed in knots on the bottom line.
Only the speed in knots is transmitted — NOT the Beaufort force.

Column 18 — Air Temperature:

TTT – Air temperatures must be reported in degrees and tenths of a degree.
(This also applies to Wet Bulb, Dew point and Sea Temperatures)

Column 22 — Dew Point Temperature:

T_dT_dT_d – This is the most common error — **please double-check your interpolation of the dew-point tables. To be reported in degrees and tenths of a degree.**

Column 28 — Present Weather:

ww – In fog, present weather will probably be coded from 41 to 49 — visibility **VV** should then be coded 93 or less, and
– If 43, 45 or 47 is coded then cloud amount **N** and **N_h** will be coded as 9 (in columns 14 and 30).

Column 29 — Past Weather:

W₁W₂ – The highest code figure, if the two elements are different, is to be reported first.
– If there has been no significant weather in the last six hours then **W₁W₂** must be coded as 00, 11 or 22 depending on the cloud cover during the previous six hours.

Column 30 — Amount of Low/Medium Cloud:

N_h – This amount must not be greater than **N**.

Columns 34 and 35 — Course made good and Average Speed:

D_s and **v_s** – These codes are for the average course and speed made good during the last three hours and NOT at the time of observation.
– If the vessel is stopped, this should be coded as 00.

Column 36 — Sea Temperatures sign and type:

s_s – Use the correct code for the method of measuring sea temperature
e.g. 0 = positive intake reading, and 2 = positive bucket reading.

Tips for entering data in the logbook

- In Column 23, the ‘as read’ barometer reading on the top line should include the small calibration correction.
NOTE that the correction to Mean Sea Level in the lower box is **always added** to the ‘as read’ value and that this correction varies with the height of eye and the outside air temperature.
- If there are no swell waves or ice to report, please leave these columns blank. Do not use solidii (‘//’). The exception is **d_{w2}d_{w2}** (column 41) where ‘//’ is used when there is only one swell reported.

- Please place a small horizontal line through each solidus being entered (to avoid confusion with the number '1' when the logbook is examined by Met. Office staff).
- All entries should be made in ink.
- The name of the vessel should always be entered on the front cover.
- Don't forget to include all the officers' details on pages 3 and 54.
- The year should always be entered at the top, left corner of each even numbered page.
- Remember to complete the 'Remarks', 'Maintenance' and 'Transmission' columns when appropriate.

Tips for transmitting reports

- Leave just one space between groups. Do not insert solidii between groups.
- The ship's Call Sign group should always follow the identifier group BBXX. There should be ONE space between BBXX and the call sign, ONE space between the call sign and the coded observation, and all should be on the same line.
- Remember to put an 'equals' sign ('=') at the end of your satcom transmission.

Personalities

Obituary — David John George, known as the 'Cod Wars' meteorologist died on 23 January 2000. Destined to become more well known by his second name, he was born on 22 August 1928 at Abergwesyn, Powys, and his early education was at schools in Llantwrtyd Wells and Builth Wells. In childhood the effects of windchill and exposure were his natural environment during return walks from home, (283 m) up in the Welsh hills, to school.

He joined the Air Training Corps at the age of 17 and then completed his National Service with the RAF before joining the then Meteorological Office in 1948, his first posting being to Grimsetter (Orkney Islands). In 1952 he was appointed for a three-year tour of duty with the Falkland Islands Dependencies Survey during which time he spent a year at Deception Island and was then base leader at Admiralty Bay in the South Shetland Islands.

Late in 1958, having returned to the UK in the meantime, he was posted to the Meteorological Office's training school as an instructor on courses for weather observers and, for several years passed on his knowledge and enthusiasm for his subject to innumerable students. He then, in 1970, became a volunteer instructor for 'Mountain Weather' courses in Snowdonia, and continued with this work for the next 24 years at various locations in Wales. However, perhaps his greatest 'claim to fame' as far as mariners are concerned, came during the 'Cod Wars' when he volunteered for five stormy tours of duty in four winters between 1972 and 1976, working as a meteorologist on board trawler support vessels. The UK

trawler fleet benefitted from his timely warnings of impending severe storms and, through careful observations, he also contributed greatly to oceanographic knowledge of the sea areas in which he worked. For his work during this period he was awarded the Ministry of Defence “L.H. Groves Memorial Award” in 1976.

Further postings, to Ascension Island in 1984 and Port Stanley in 1987, followed, and even after reaching retirement age he was swift in volunteering as an aviation forecaster in Abu Dhabi during the Gulf War events of 1990 and 1991.

Although John George spent his career mainly at land-based stations, his forecasting expertise in the far north and in the South Atlantic Ocean doubtless assisted, albeit anonymously, the work of many a trawlerman and voluntary weather observer.

Editor's note. Our thanks go to W.S. Pike, FRMetS, for his notes celebrating the life of John George, upon which the above is based.

Noticeboard

NAVTEX

On 1 February 2000 the Maritime and Coastguard Agency (MCA) took over the responsibility for broadcasting NAVTEX Maritime Safety Information. Accordingly, the Maritime Rescue Coordination Centre (MRCC) at Falmouth will undertake the NAVTEX coordination role previously carried out by British Telecom at Stonehaven.

This change will not affect the timing or frequencies of the NAVTEX broadcasts which will continue to be made from Cullercoats, Niton and Portpatrick. (Full details of NAVTEX broadcasts are given in *ALRS Volume 5*).

Change to SHIP Code FM 13–XI

An amendment to the Ship Code recommended by the WMO Commission for Basic Systems came into effect on 3 May 2000. The amendment concerns the mandatory group 7wwW₁ W₂, and requires that when the past weather conditions for the period applicable to the report are unknown, the group shall take the form 7ww// (even if the present weather is coded as 00, 01, 02 or 03).

New address for Port Met. Office–Bristol Channel

By now many seafarers will already be aware that the Port Met. Office at Cardiff, serving the Bristol Channel, relocated to a new address on 16 March. The move was finalised too late for notification to be included in earlier editions of the journal, but the address is confirmed as:

The Port Met. Officer The Met. Office Titan House Cardiff Bay Business Centre
Lewis Road Ocean Park Cardiff CF24 5BS.

Telephone: 029 2045 1323

Fax: 029 2045 1326

BT Coast Radio Station closures

Readers will be aware of the protracted consideration that has been given to the future of British Telecom's remaining Coast Radio Stations following a decline in the use of terrestrial maritime radio services brought about by the formal implementation of GMDSS. As advised in the April edition of this journal, these stations had remained open pending the outcome of a report by the industry regulator OFTEL (Office of Telecommunications).

With the consent of OFTEL, BT has now initiated a programme of closures for its UK terrestrial maritime radio services. At the time of writing, the closures had reached the following stage.

- **Portishead Radio**
All maritime and aeronautical services (radiotelegraph, radiotelex and radiotelephone) operated by Portishead Radio were withdrawn at — **Noon GMT, Sunday 30 April 2000**, and the station closed at that time.
- **VHF Services**
All short-range VHF stations closed for service at — **Noon GMT on Sunday 30 April 2000**.
- **MF Services**
The remaining medium-range MF radiotelephone services via Wick Radio, Stonehaven Radio, Humber Radio, Lands End Radio and Portpatrick Radio will close at — **Noon GMT on Friday 30 June 2000** and the stations will close.

Effectively, this means that the Atlantic Weather Bulletin for shipping (commonly referred to as the 'North Atlantic Bulletin') will also terminate on *30 April 2000*. Vessels required by SOLAS to be fitted with Sat-Comms. equipment will continue to be able to obtain High Seas forecasts and Storm Warnings via the SafetyNet system when Portishead closes.

Besides the forecast implications there are also serious consequences for those UK VOS which are not required by SOLAS, owing to their service areas, to be fitted with Sat-Comms. equipment, and which will therefore no longer be able to transmit their observations to the BT Coast Radio Stations and thence to Bracknell. Most coastal 'MARID' ships and a number of 'Selected' ships operating solely in coastal waters, or on near continental ferry routes, are going to be affected. Consideration is therefore being given to providing alternative means of receiving observations from these ships and, in addition, the MCA has been approached about the possibility of Coastguard stations assuming at least some of the responsibility for the collection of terrestrially transmitted observations.

VOS Climate Project

It has been agreed that The Met. Office should participate in an important new climate project established by the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM). The primary objective of the project, which forms part of JCOMM's integrated observing network strategy, is to provide a high quality subset of marine meteorological data to be available in both real time and in delayed mode.

The current proposal is that real-time observational data monitoring and comparison with model fields will be handled by a new Real-time Monitoring Centre which is expected to be operated by The Met. Office. This will, therefore, be a natural extension of our current role as the lead centre for monitoring quality of marine surface observations within the World Weather Watch. The resultant real-time data will then be submitted to a new 'Data Assembly Centre' for merging with the delayed mode reports and for the compilation of a complete data set.

An initial target of 200 observing ships has been set for the project, drawn from the voluntary observing fleets of the participating National Meteorological Services. Once the criteria for participation have been agreed, it is expected that approximately 30 to 40 UK Voluntary Observing Ships operating world wide, will be selected to contribute to the project.

The project will necessitate the collection of some additional observations from participating ships and, as a consequence, may also require changes to the SHIP Code. Some changes to electronic observing programs, such as TurboWin, are also anticipated. A new website, project newsletter and award scheme associated with the project are also planned.

More details of the VOSCLIM project will appear in *The Marine Observer* in due course.

Subscriptions for *The Marine Observer*

The printing and publishing arrangements for *The Marine Observer* are presently under review by The Met. Office. This should have no effect on participating voluntary observing ships, officers, marine superintendents and shipping companies who will continue to receive free complimentary quarterly copies as previously. Similarly, National Meteorological Services, Port Met. Officers, organisations and individuals who currently receive complimentary copies of the publication, including organisations which receive copies as part of an exchange agreement with The Met. Office National Meteorological Library, should be unaffected.

However, depending upon the outcome of this review, there may be some implications for those individuals, companies, colleges and organisations who currently subscribe to *The Marine Observer* on an annual basis. Consequently, if any subscribers experience problems regarding unfulfilled subscriptions it is recommended that, in the first instance, they should contact the current publishers, The Stationery Office Ltd, who presently manage all subscriptions. Should there be any future changes in the subscription arrangements then they will be promulgated through future copies of *The Marine Observer*.

Notwithstanding the above any readers experiencing problems in obtaining their copy of *The Marine Observer* are always welcome to contact the editorial team at the address given on the first page of this journal.

Fleet Lists

UNITED KINGDOM — Information dated 31 March 2000

The names of ships' personnel are as given in the latest meteorological returns received to 31 March 2000.

Notes: Radio Officers (where carried) are indicated by **bold** face.

Recent recruited vessels from which a logbook has yet to be received, are indicated by *.

Vessels from which no return has been received during the 12 months prior to the above date, are indicated by †.

Dates of latest receipt given within brackets [], indicate TurboWin data, without logbook, received to 15 March 2000.

All returns received will be acknowledged by the Observations-Voluntary (Marine) branch of The Met. Office. Port Met. Officers will call on vessels as opportunity permits, or upon request.

Masters or operators of ships are particularly requested to advise of any circumstances which may call for the removal from the ship of equipment loaned by The Met. Office.

Selected and Supplementary Ships

Name of Vessel	Latest receipt	Master	Observing Officers and Radio Officers	Owner/Manager
<i>Aberdeen</i>	†	—	—	Northern Marine Management Ltd
<i>African Ruby</i>	13.08.99	S.W.C. Hyde	G. O'Kelly, M. Villamor	MOL Tankship Management Ltd
<i>Al Awdah</i>	†	—	—	Kuwait Oil Tanker Company
<i>Al Funtas</i>	17.02.00	—	—	Kuwait Oil Tanker Company
<i>Al Samidoon</i>	12.11.99	P.J. Ward	S. Zubeir, K.E. Emam, W. Fares, R. Ilar	Kuwait Oil Tanker Company
<i>Al Shuhadaa</i>	04.05.99	K.J. Fear	S.O. Bari, F.O. Terres	Kuwait Oil Tanker Company
<i>Al Tahreer</i>	†	—	—	Kuwait Oil Tanker Company
<i>Al Wajba</i>	†	—	—	United Arab Shipping Company (S.A.G.)
<i>Al Zohal I</i>	10.01.00	H.M. Jones	N.T.G. Wewewattia, A. Weerasekera, D. Joachim	London Ship Managers Ltd
<i>Al-Farahidi</i>	23.11.99	P. Prabhavalkar	G. Al Jandali, V. Karicari	United Arab Shipping Company
<i>Alam Selaras</i>	†	—	—	Pacific Ship-Managers Sendirian Berhad
<i>Alkman</i>	03.11.99	M. Mesbah	D. Marwin, Y. Agapov, V. Kryvstov, R.E. Forson	Wallem Shipmanagement Ltd
<i>Alliance</i>	04.01.00	L. Holschmidt	J. Davison, D. Wood, N. Samson	Denholm Ship Management (UK) Ltd

<i>Ambon</i>						Wallem Shipmanagement Ltd
<i>Amfiriti</i>	15.12.99	R. Chadha	I. Marginean, A.K. Thottapilli, M. Jomon			Acomarit (UK) Ltd
<i>Anja C</i>	15.03.00	V. Kapyelov	R. Andryushkov, S.S. Syvytsky, V. Stankevich	†		Carisbrooke Shipping plc
<i>APL Orchid</i>				†		Neptune Shipmanagement Services (Pte) Ltd
<i>APL Pearl</i>	14.03.00	T.K. Holk				Neptune Shipmanagement Services (Pte) Ltd
<i>Arcadia</i>	12.04.99	R.M. Smith	K. O'Callaghan, C.G. Fowler, B. Lloyd			P&O Cruises (UK) Ltd
<i>Arcic Goose</i>	19.07.99	T. Misuro	A. Fzodorovs, Z. Krawczyk, D. Kovacevic			Holy House Shipping AB
<i>Arcic Swan</i>				†		Holy House Shipping AB
<i>Argentina Star</i>	06.12.99	M. Power	A. Hemedez, J. Kagadan, D. De La Rosa			P&O Nedlloyd Ltd
<i>Arkis Force</i>				†		Elite-Shipping A/S
<i>Arunbank</i>	04.01.00	J.P. Warren	C.G. Berry, E.M. Kemp, J. Keeshan	*		Andrew Weir Shipping Ltd
<i>Alixco</i>						Transportaçion Maritima Mexicana S.A. de C.V.
<i>Auckland Star</i>	17.12.99	G.M. Clark	O.O. Astronomo, H.J. Jalos, J.D. Amo			Norbulk Shipping UK Ltd
<i>Audacity</i>	14.02.00	C.P. Jones	A. Hatto, R. Patten, P.M. Belcher			F.T. Everard & Sons Ltd
<i>Auk Arrow</i>	05.07.99	S. Narang	R. Joshi, N. Ambosta, C.V.N. Sateesh			Gearbulk (UK) Ltd
<i>Aya II</i>				†		Transportaçion Maritima Mexicana S.A. de C.V.
<i>BT Nautilus</i>				†		BT Shipping (London) Ltd
<i>BT Navarin</i>				†		BT Shipping (London) Ltd
<i>BT Navigator</i>	01.09.99	M.J. Broomwich	N.F. Mistry, R.C. John, S. Srivastava, G.A. D'Cunha			BT Shipping (London) Ltd
<i>BT Neptune</i>	22.09.99	M.J. Heffer	V.J. Hatekar, N.A.K. Shelke, A. Kulkarni			BT Shipping (London) Ltd
<i>BT Nestor</i>	07.02.00	C.J. Bland	J. Woodcock, P.D. Nair, Y. Singh			BT Shipping (London) Ltd
<i>BT Nimrod</i>	28.06.99	G. Sharatkumar	S. Siwach, G.P.S. Diwan, A.G.M. Labo, K.B. Irani			BT Shipping (London) Ltd
<i>BT Sream</i>	07.09.99	I. Carmichael	D.W. D'Souza, K. Rahul, J. Giby			BT Shipping (London) Ltd
<i>Baltic Breeze</i>	14.06.99	T.H. Wat	M. Lwin, K. Khaung, K.K. Lwin, U. Hla Baw			Wallenius Shipmanagement Pte. Ltd.
<i>Baltic Eagle</i>				*		Andrew Weir Shipping Ltd
<i>Baltic Eider</i>				†		Andrew Weir Shipping Ltd
<i>Baltic Tern</i>	20.03.00	J.S. Howard	A. Thomson, M. Causon, C. Taylor			Andrew Weir Shipping Ltd
<i>Barbet Arrow</i>	17.01.00	M.M. Grass	R.M. Robles, W.R. Abellanosa, E.E. Sagang			Gearbulk (UK) Ltd
<i>Belo Oriente</i>				†		Eurasia Shipping & Management Co. Ltd
<i>Berge Atlantic</i>	05.10.99	S.K. Jain	S. Debashis, L. D'Souza, S. Paravinkumar			Bergesen d.y. ASA
<i>Berlin Express</i>	12.01.00	A.E. Spencer	D.G. Bell, D.R.N. Cropley, M.F. Burton			P&O Nedlloyd Ltd
<i>Bow Tribute</i>				†		MOL Tankship Management Ltd
<i>British Admiral</i>	27.10.99	J.G. Tarling	R.D. Holt, E. Salmon, D. Witts			BP Amoco Shipping Ltd
<i>British Adventure</i>	24.01.00	P.R. Anderson	N.A. Hopgood, C. Doolan, G.F. Morrison			BP Amoco Shipping Ltd
<i>British Argosy</i>				†		BP Amoco Shipping Ltd

Selected and Supplementary Ships (contd)

Name of Vessel	Latest receipt	Master	Observing Officers and Radio Officers	Owner/Manager
<i>British Esk</i>	†	—	—	BP Amoco Shipping Ltd
<i>British Harrier</i>	28.01.00	C.R. Shoolbraid	D.A. Hunter, I.K. Maesepp, T. Radford	BP Amoco Shipping Ltd
<i>British Hawk</i>	07.03.00	K.E. Peacock	M. Graaskov, R. Janus, D. Sutton	BP Amoco Shipping Ltd
<i>British Pioneer</i>	*	—	—	BP Amoco Shipping Ltd
<i>British Ranger</i>	21.12.99	D.R. Lewis	D. Misier, S. Kember, A. Mikolajczak	BP Amoco Shipping Ltd
<i>British Skill</i>	24.01.00	M. Mansbridge	P.R. Anderson, T.L. Tilbury, A. Lincoln	BP Amoco Shipping Ltd
<i>British Spirit</i>	10.02.99	J. Buchanan	C.P. Doolan, D.A. Hill, P. Adamowicz	BP Amoco Shipping Ltd
<i>British Steel</i>	17.01.00	D. Bowman	D. Lyon, N. Eginlioglu, A. Valenzuela	Furness Withy (Shipping) Ltd
<i>British Success</i>	05.11.99	A. Macleod	M. Ramsay, D. Austin, C. Kelly	BP Amoco Shipping Ltd
<i>British Tamar</i>	23.11.99	C. Ogeman	A.D. Roaf, P. Jamroz, A.D. Singleton	BP Amoco Shipping Ltd
<i>British Valour</i>	15.11.99	J.N. Gregson	G.J. Davies, B. Blythe, L.N. Paul	BP Amoco Shipping Ltd
<i>British Vigilance</i>	04.01.00	I. Alexander	G. Whamond, M. Stronge, A. Gilues	BP Amoco Shipping Ltd
<i>Bucclerich</i>	03.06.99	R. Lachotia	M.T. Joseph	Associated Bulk Carriers (London) Ltd
<i>BUE Skye</i>	15.03.00	D.J. O'Connor	B. Fielding, W. Spark, G. Hughes	BUE North Sea Ltd
<i>C.S. Monarch</i>	†	—	—	Global Marine
<i>C.S. Nexus</i>	22.02.00	G.A. Davies	A.W. Lowicki, H.M. Francis, I. Pinney, N.J. Whitfield	James Fisher (Shipping Services) Ltd
<i>C.S. Sovereign</i>	13.09.99	C.D. Knight	M.R. Swaffield, W. Ellis, N. Daniel	Global Marine
<i>Cable Innovator</i>	†	—	—	Global Marine
<i>Cable Installer</i>	†	—	—	Global Marine
<i>Cable Retriever</i>	†	—	—	Global Marine
<i>Cabo Negro</i>	†	—	—	Global Marine
<i>Caledonian Isles</i>	26.07.99	J.J.H. Beggs	D. MacNeil, P. Welsh	MOL Tankship Management Ltd
<i>CanMar Conquest</i>	14.12.99	V. Chawla	N. Kumar, Z.F. Mistry, V. Khurana	Caledonian MacBrayne Ltd
<i>CanMar Courage</i>	24.12.99	J.M. Mistry	K.S. Singh, A. Khanna, P. Valles	Canada Maritime Services Ltd
<i>CanMar Fortune</i>	†	—	—	Canada Maritime Services Ltd
<i>CanMar Glory</i>	12.08.99	P. Bland	C. Robitaille, F. D'Souza, R.G. Singh	Canada Maritime Services Ltd
<i>CanMar Honour</i>	01.02.00	C. D'Souza	K. D'Silva, K. Khambata, H. Johari	Canada Maritime Services Ltd
<i>CanMar Pride</i>	[13.03.00]	M.B. Daroga	F. D'Souza, S. Chauhan, P. Raina	Canada Maritime Services Ltd
<i>CanMar Triumph</i>	†	—	—	Canada Maritime Services Ltd
<i>CanMar Victory</i>	†	—	—	Canada Maritime Services Ltd

<i>Canterbury Star</i>	26.01.00	G.W. Bryson	G.C. Amados, R.M. Canete, P.T. Medrano	Norbulk Shipping UK Ltd
<i>Cape Horn</i>	†	—	—	MOL Tankship Management Ltd
<i>Caribbean Reef</i>	01.09.99	M.R. Rutter	M.A.C. Munaweera, W.U.C. Mendis, D.M.C. Danasekara	London Ship Managers Ltd
<i>Caronia</i>	*	—	—	Cunard Line Ltd
<i>Cartagena</i>	†	—	—	Enterprises Shipping & Trading S.A.
<i>Cast Performance</i>	20.12.99	K. Nayyar	H. Pal, B. Majumdar, M. Dua	Canada Maritime Services Ltd
<i>Cast Power</i>	30.08.99	D.N. Chawla	R.N. Mamlatdar, P. Khatu, D. Das	Canada Maritime Services Ltd
<i>Cast Privilege</i>	†	—	—	Canada Maritime Services Ltd
<i>CGM Caravelle</i>	21.09.99	R.M. Raybould	D.J. Miller, E. Postin, R. Stone	Andrew Weir Shipping Ltd
<i>Challenger</i>	19.08.99	J.C. Holmes	R.A. Warner, P.T. Oldfield, P.B.W. Newton	NERC Research Vessel Services
<i>Charles Darwin</i>	17.09.99	K.O. Avery	M.P. Hood, P.C.T. Reynolds, M.H. Graves	NERC Research Vessel Services
<i>Cheshire</i>	†	—	—	Bibby Line Ltd
<i>Chilham Castle</i>	07.01.00	P.J. Ward	M.A. Malik, H. Kabir, V.J. Bhadkamkar, M. Balel	Kuwait Oil Tanker Company
<i>Chiquita Belgie</i>	†	—	—	Great White Fleet Ltd
<i>Chiquita Bremen</i>	05.10.99	P. Ruszczynski	F. Santillan, M. Miraflores, M. Dziurka	Great White Fleet Ltd
<i>Chiquita Brenda</i>	[10.01.00]	G.M. Walker	G.V. Pasirana, J.A.D. Tampus, J. Tagala	Great White Fleet Ltd
<i>Chiquita Deutschland</i>	04.01.00	H.S. Wright	L.C. Lapitan, M. Morshed, D. Orcales	Great White Fleet Ltd
<i>Chiquita Elke</i>	10.01.00	R.I. Hay	L.C. Bukay, J.M. Mabatan	Great White Fleet Ltd
<i>Chiquita Frances</i>	20.09.99	R. Somerville	R. Famaloan, R. Morton, R. Colon	Great White Fleet Ltd
<i>Chiquita Italia</i>	20.09.99	A. O'Neil	L.S. Delfin, R. Morton, V.P. Oquiano	Great White Fleet Ltd
<i>Chiquita Jean</i>	16.08.99	M. Cherry	J. Velasco, J.H. Clamp	Great White Fleet Ltd
<i>Chiquita Joy</i>	06.10.99	D.A. Tomlinson	J. Tindog, V. Battad, D. Aquino	Great White Fleet Ltd
<i>Chiquita Nederland</i>	09.12.99	P. Nicholson	S. Mariusz, E. Wilson, B. Vanmeensel	Great White Fleet Ltd
<i>Chiquita Rostock</i>	30.06.99	G. Bent	B. Dumanic, R. Cornulis, E. Nierras	Great White Fleet Ltd
<i>Chiquita Scandinavia</i>	03.09.99	H.S. Wright	C.C. Hopton, B. Van Hulle, R.A. Pacis	Great White Fleet Ltd
<i>Chiquita Schweiz</i>	†	—	—	Great White Fleet Ltd
<i>Chrimmir</i>	02.09.99	J. Barratt	K.M. Cooling, G. Preston, A.J. Hannah	Souter Shipping Ltd
<i>CIC Vision</i>	†	—	—	Elite-Shipping A/S
<i>Cirolana</i>	†	—	—	CEFAS
<i>City of Amsterdam</i>	*	—	—	Denholm Ship Management (UK) Ltd
<i>City of Barcelona</i>	15.09.99	W. Bartlett	M.W.J. Goodman, S.P. Steen, J. Charlton	Denholm Ship Management (UK) Ltd
<i>City of Cape Town</i>	06.03.00	G.J.H. Peaston	M.J. Turner, N.J. Sharp	P&O Nedlloyd Ltd
<i>City of Paris</i>	*	—	—	Azalea Maritime Agency
<i>City of Rome</i>	*	—	—	Azalea Maritime Agency
<i>City of Sunderland</i>	10.02.00	J. Murray	J.P. Steen, A. Rugg, P.A. Rock	Denholm Ship Management (UK) Ltd

Selected and Supplementary Ships (contd)

Name of Vessel	Latest receipt	Master	Observing Officers and Radio Officers	Owner/Manager
<i>Clansman</i>	†	—	—	Caledonian MacBrayne Ltd
<i>Clipper Frontier</i>	†	—	—	Dockendale Shipping Company Ltd
<i>CMBT Asia</i>	13.10.99	P. Doyle	C. Lingard	Safmarine Ship Management
<i>CMBT Europe</i>	†	—	—	Safmarine Ship Management
<i>Colombo Bay</i>	06.01.00	P.D. Davies	R. Halewood, B. Baker, I.M. Percival	P&O Nedlloyd Ltd
<i>Columbus</i>	†	—	—	V.Ships Florida L.C.
<i>Condor Arrow</i>	†	—	—	Gearbulk (UK) Ltd
<i>Copiapo</i>	†	—	—	London Ship Managers Ltd
<i>Coppenname</i>	26.01.00	C. Eames	R. Quiambad, S. Fraser, J.M. Cinco	Celtic Marine Ltd
<i>Coral Reef</i>	07.05.99	P.M. Frost	K.P.M. Senadipathy, K.K.S. Perera	London Ship Managers Ltd
<i>Cormorant Arrow</i>	†	—	—	Gearbulk (UK) Ltd
<i>Cornelie Oldendorff</i>	*	—	—	Barber Ship Management Inc
<i>Corystes</i>	†	—	—	CEFAS
<i>Cotswold</i>	29.02.00	E.M. Holmyard	U.C. Shenai, D.K. Singh, R. Sarma	Associated Bulk Carriers (London) Ltd
<i>Cottica</i>	12.01.00	D. Robinson	D. Alagon, D. Teodoro, R.M. Quiambao	Celtic Marine Ltd
<i>Criscilla</i>	14.12.99	R. Walton	K. Flanagan, R. Rychter, A.A. Jagger	Marr Vessel Management Ltd
<i>CSO Marianos</i>	09.12.99	D. Thompson	P.H.R. Binks, A.P. Wood, R. Layton	Coflexip Stena Offshore Ltd
<i>Curico</i>	14.10.99	B.R. Richmond	N.C. Nacu, S.A. Tinsay, C.A.W. Samaranyakez	London Ship Managers Ltd
<i>Dallington</i>	07.02.00	E. Gaffney	R.T. Bennett, M. Arden, T.L.J. Evans	Stephenson Clarke Shipping Ltd
<i>Discovery</i>	28.06.99	R.A. Appleby	Z. Falconer, A. Baker, T.T. Latto	Stolt Comex Seaway Ltd
<i>Discovery</i>	28.02.00	R.C. Plumley	T.A. Owoso, C. Vrettos, P.C. Sarjeant	NERC Research Vessel Services
<i>Dominica</i>	10.12.99	R.J. Hawkins	A. Scales, A. Bieniek, W. Artymionek	Interocean Uglad Management AS
<i>Donnington</i>	12.08.99	M. McKinnon	M. Smith, M. Arden, D.M. Shaw	Stephenson Clarke Shipping Ltd
<i>Drin</i>	*	—	—	V.Ships Inc
<i>Duhallow</i>	14.02.00	K.A. Maltby	A. Dawar, D.S. Baweja	Associated Bulk Carriers (London) Ltd
<i>Durrington</i>	07.10.99	C.D.G. Grahame	S.T. Dembowska, R. Hulsh	Stephenson Clarke Shipping Ltd
<i>Eagle</i>	24.12.99	S. Williams	D.D. Grundy, J.R. Mileham, B. Roberts	Mobil Shipping Co. Ltd
<i>Eastern Bridge</i>	11.10.99	S.J. Honey	P.J. Perera, G. Sivanesan, A. Bridgeman	Ropner Ship Management Ltd
<i>Eastern Express</i>	*	—	—	Univan Ship Management Ltd

<i>Eburna</i>	†	—	—	Shell Marine Personnel (IOM) Ltd
<i>Egoli</i>	†	—	—	Target Marine S.A.
<i>Elk</i>	[14.12.99]	B. Kay	A.R. Anning, D.M. Turner, R. Ryder	P&O Ferrymasters Ltd.
<i>Emily C</i>	†	—	—	Carisbrooke Shipping plc
<i>Enchanter</i>	*	—	—	Mammoet Shipping B.V.
<i>English Star</i>	02.02.00	N.J. Barr	E.C. Gerona	Norbulk Shipping UK Ltd
<i>Enterprise</i>	†	—	—	Denholm Ship Management (UK) Ltd
<i>Eridge</i>	17.01.00	M.J. Walker	A.A. Lahiri, Z.S. Irani, W.R. Howell	Associated Bulk Carriers (London) Ltd
<i>Erna Oldendorff</i>	*	—	—	Egon Oldendorff
<i>Ernest Shackleton</i>	*	—	—	British Antarctic Survey
<i>Ernst Oldendorff</i>	*	—	—	Egon Oldendorff
<i>Erradale</i>	24.02.00	M.E. Pidgeon	I.B. Mella, N.M. Hennessy, K.M. Chesner	The China Navigation Company Ltd
<i>Ervilia</i>	†	—	—	Shell Marine Personnel (IOM) Ltd
<i>Euplecta</i>	†	—	—	Shell Marine Personnel (IOM) Ltd
<i>European Envoy</i>	31.01.00	J.T. Jamieson	D.J. Crerar R.H. Whalley, D.A. McAuley	P&O Ship Management (Irish Sea) Ltd
<i>European Leader</i>	†	—	—	P&O Ship Management (Irish Sea) Ltd
<i>European Navigator</i>	†	—	—	P&O Ship Management (Irish Sea) Ltd
<i>European Pathfinder</i>	[24.12.99]	I. Griffith	A. O'Dwyer, G.R. Henderson, C. Jackson	P&O Ship Management (Irish Sea) Ltd
<i>European Pioneer</i>	†	—	—	P&O Ship Management (Irish Sea) Ltd
<i>European Seafarer</i>	†	—	—	P&O Ship Management (Irish Sea) Ltd
<i>European Shearwater</i>	†	—	—	James Fisher (Shipping Services) Ltd
<i>European Trader</i>	†	—	—	P&O Ship Management (Irish Sea) Ltd
<i>Eye of the Wind</i>	†	—	—	Crediton Country Courier
<i>Falcon Arrow</i>	†	—	—	Gearbulk (UK) Ltd
<i>Federal Bergen</i>	13.01.00	B. Fernandes	V. Rawat, G. Chopra, R. Mistry	Anglo-Eastern Ship Management Ltd
<i>Federal Rhine</i>	*	—	—	Anglo-Eastern Ship Management Ltd
<i>Federal St Laurent</i>	*	—	—	Anglo-Eastern Ship Management Ltd
<i>Fernie</i>	28.02.00	R.V. Prakash	S. Barua, V.K. Sinha, R. Sood	Associated Bulk Carriers (London) Ltd
<i>Finch Arrow</i>	†	—	—	Gearbulk (UK) Ltd
<i>Flinders</i>	†	—	—	ASP Ship Management
<i>Foylbank</i>	[02.03.00]	P. Stapleton	P. Aravanis, K. Klyucharev, V. Mantul	Andrew Weir Shipping Ltd
<i>French Bay</i>	15.03.00	Y.M. Thanawala	N.S. Gajendra-Singh, G.A. Dias, M.S. Shamsul-Alam	Unique Shipping (H.K.) Ltd
<i>Front Rider</i>	†	—	—	Nordic Oriental Shipmanagement Pte. Ltd
<i>Front Sunda</i>	29.11.99	A. Mansur	K.C. Sudeesh, N. Ganguly, S.C. Nambiar	Wallem Shipmanagement Ltd

Selected and Supplementary Ships (contd)

Name of Vessel	Latest receipt	Master	Observing Officers and Radio Officers	Owner/Manager
<i>General Delgado</i>	†	—	—	Aboitiz Jebsens Shipmanagement
<i>General Tirona</i>	†	—	—	Aboitiz Jebsens Shipmanagement
<i>General Villa</i>	†	—	—	Aboitiz Jebsens Shipmanagement
<i>Geo Prospector</i>	16.06.99	M.N. Baxter	S. Allen, R. Bassi, R. Sneddon	Eidesvik Shipping Ltd
<i>Glasgow Maersk</i>	*	—	—	The Maersk Company Ltd
<i>Glen Maye</i>	†	—	—	MOL Tankship Management Ltd
<i>Glen Roy</i>	†	—	—	MOL Tankship Management Ltd
<i>Golden Duke</i>	†	—	—	Jardine Ship Management Ltd
<i>Grafton</i>	15.02.00	A.D. Mohan	A. Diesai, S.T. Hussain, A. Babu	Associated Bulk Carriers (London) Ltd
<i>Grand Princess</i>	10.01.00	G. Romano	V. Riccardo, R. Surez, K. Taylor	Princess Cruises Inc.
<i>Greenwich Maersk</i>	*	—	—	The Maersk Company Ltd
<i>Gull Arrow</i>	†	—	—	Gearbulk (UK) Ltd
<i>HSH Kusu</i>	18.02.00	N.B.M. Rais	H. Hlaing	OW Ship Management Pte. Ltd
<i>HSH Ubin</i>	21.06.99	D. Markisic	A.B. Omar, W. Naing oo, R.A.L. Rajaretnam, U.T. Zaw	OW Ship Management Pte. Ltd
<i>Hadiyah</i>	†	—	—	Kuwait Oil Tanker Company
<i>Harmac Dawn</i>	18.02.00	B. Jayant	N. Hafiz, S.K. Paik, S. Badgel	Barber Ship Management AS
<i>Harrier</i>	†	—	—	Mobil Shipping Co. Ltd
<i>Hato Arrow</i>	03.06.99	R. Vuksa	M. Mario, S. Stabile	Gearbulk (UK) Ltd
<i>Havdrott</i>	04.01.00	R. Tanguy	S.C.A. Cooper, M. Pageante, A. Dawson	Bergesen d.y. ASA
<i>Havjarl</i>	†	—	—	Bergesen d.y. ASA
<i>Havkong</i>	23.04.99	D.J. Elson	N.J. Blacker, I.J. Finlayson, E.C. Avida	Bergesen d.y. ASA
<i>Hebridean Isles</i>	†	—	—	Caledonian MacBrayne Ltd
<i>Hekabe</i>	†	—	—	Bergesen d.y. ASA
<i>Helios</i>	14.01.00	D.T. Simpson	F.R. Bautista, J.R. Cudias	Bergesen d.y. ASA
<i>Hellen C</i>	†	—	—	Cyprus Maritime Co. Ltd
<i>Hemina</i>	11.10.99	T. N. Ferguson	P. Belcher, D. Abuel, O. Lopez	Bergesen d.y. ASA
<i>Hesiod</i>	†	—	—	Bergesen d.y. ASA
<i>Heythrop</i>	†	—	—	Associated Bulk Carriers (London) Ltd
<i>Hoegh Duke</i>	†	—	—	Egon Oldendorff

<i>Hoi Siang No.1</i>	†	—	—	IKS Fishing Co. Ltd
<i>Ibis Arrow</i>	03.12.99	A. Racic	P.N. Jardim	Gearbulk (UK) Ltd
<i>Ibn Abdoun</i>	†	—	—	United Arab Shipping Company (S.A.G.)
<i>Iolair</i>	20.12.99	M. Ramsbottom	J.J. MacDonald, P. Berglund, C. Miller	R&B Falcon Ltd.
<i>Ironbridge</i>	14.02.00	R.A. Whistler	J.Z. Castro, J. Hollamby, A.M. Tayo	Furness Withy (Shipping) Ltd
<i>Isle of Arran</i>	13.03.00	D. Fyffe	D.J. Allen, F. Miller	Caledonian MacBrayne Ltd
<i>Isle of Lewis</i>	†	—	—	Caledonian MacBrayne Ltd
<i>Isle of Mull</i>	11.02.00	C. W. Billimore	T.G. Moore, I. Jamieson, S. Ross	Caledonian MacBrayne Ltd
<i>Isomeria</i>	†	—	—	Shell Marine Personnel (IOM) Ltd
<i>Ivory Dawn</i>	*	—	—	Cool Carriers AB
<i>James Clark Ross</i>	13.09.99	M.J.S. Burgan	J.A. McCarthy, R. Kilroy, G.P. Chapman, S.J. Mee	British Antarctic Survey
<i>Jarikaba</i>	20.03.00	R. Cox	J.B. Clemente, R.A. Derreales	Celtic Marine Ltd
<i>Jeannie</i>	†	—	—	Tomazos Shipping Co. Ltd
<i>Jervis Bay</i>	14.02.00	C.C. Woodward	J.A. Hale, R.M. Barnsley, J. Poulter	P&O Nedlloyd Ltd
<i>Judith Borchard</i>	†	—	—	Charles M. Willie & Co. (Shipping) Ltd
<i>Kagoro</i>	05.10.99	G. K. Thomson	N.A. Joshua, O.A. Isaac, K.P. Edmund	Acomarit (UK) Ltd
<i>Kalahari</i>	08.02.00	W.G. Morgan	M.B. Simogan, C.D. Diasanta, G.F. Fiordeliza	The South African Marine Corporation Ltd
<i>Karoo</i>	07.12.99	J.A. Birtles	R.A. Delen, N.C. Acot	The South African Marine Corporation Ltd
<i>Kazimah</i>	21.09.99	A.G. Bagley	A. Habib, N. Al Najdi, A.G. Pinto	Kuwait Oil Tanker Company
<i>Kedah</i>	†	—	—	Kapal Management (Pte) Ltd
<i>Kent Voyager</i>	29.09.99	K. Taylor	P. Boguslawski, R. Regalado, A. Marte	Kent Line Ltd
<i>Kintampo</i>	27.01.00	A.G.J. Macpherson	E.P. Perlas, M. Ocampo, R. Langkay	Acomarit (UK) Ltd
<i>Kiwi Arrow</i>	†	—	—	Gearbulk (UK) Ltd
<i>Knock Allan</i>	14.03.00	M. Holland-Lloyd	—	Red Band AS
<i>Knock Stocks</i>	28.02.00	J. Del Rio	W. Zawada, N. Castellon, C. Wilsbeck	Red Band AS
<i>Lady Barbara</i>	†	—	—	Anglo-Eastern Ship Management Ltd
<i>Lady Stephanie</i>	21.12.99	R. Fernandez	C.D.F. Roach, C. Rai, M. Gupta	Herbert Watson & Co. (Shipping) Ltd
<i>Lapponian Reefer</i>	27.05.99	T.E. Liden	R.M. Gabutin, J.N. Nonato, G.F. Son	Holy House Shipping AB
<i>Leopardi</i>	22.11.99	W.B. Fernades	P.S. Bawa	Barber Ship Management Inc
<i>Licorne Pacifique</i>	26.10.99	M. Kennedy	V. Flores, D.G. Aluldo, R.A. Fong	Sosema S.A.
<i>Linares</i>	01.03.00	A.N. Mudalige	B.A. Tolosa, D.H.S. Wimalasiri, J.L. Panghulan	London Ship Managers Ltd
<i>Lincolnshire</i>	†	—	—	Bibby Line Ltd
<i>Linderos</i>	31.08.99	R.J. Kendall	T.P. Relayosa, P.P.G. Uvindra, R.B. Lavictoria	London Ship Managers Ltd
<i>Lord Nelson</i>	12.04.99	G.R. Mills	C.L. Cupples, D.G. Hood, R. Stephenson	Jubilee Sailing Trust

Selected and Supplementary Ships (contd)

Name of Vessel	Latest receipt	Master	Observing Officers and Radio Officers	Owner/Manager
<i>Lord of the Isles</i>	†	—	—	Caledonian MacBrayne Ltd
<i>Lough Foyle</i>	†	—	—	G. Heyn & Sons Ltd
<i>Lowlands Rose</i>	*	—	—	Euroship Services Ltd
<i>Macoma</i>	*	—	—	Shell Marine Personnel (IOM) Ltd
<i>Maersk Baffin</i>	*	—	—	Dorchester Maritime Ltd
<i>Maersk Gannet</i>	†	—	—	Maersk Co. (I.O.M.) Ltd
<i>Maersk Humber</i>	21.01.00	N. Vause	B. Nisbet, D. Tee, E. Dick	The Maersk Company Ltd
<i>Maersk Mariner</i>	20.01.00	M. Szymura	D. Hardman, N. Smith, R. Kendrick	The Maersk Company Ltd
<i>Maersk Scotland</i>	18.10.99	W. T. Munro	I. Gray, M. Le Dorven, I. Blair	Maersk Co. (I.O.M.) Ltd
<i>Maersk Shetland</i>	†	—	—	The Maersk Company Ltd
<i>Maersk Somerses</i>	25.10.99	C.N. Fitton	L.A. Jenkins, V.D. Hede, A. Davidson	The Maersk Company Ltd
<i>Maersk Stafford</i>	18.08.99	J. Boreman	R.N. Pierce, G.R. Guthrie, P.A. Carmichael	The Maersk Company Ltd
<i>Maersk Suffolk</i>	08.09.99	C.A. Cleverley	K.G. Fiske, J.F. Belzile, G.M. Moir	The Maersk Company Ltd
<i>Maersk Surrey</i>	21.09.99	S. Cresswell	J.J. Barnes, R.W. Forrest, G.T. Terriza	The Maersk Company Ltd
<i>Maersk Sussex</i>	15.11.99	R. Orange	A.A. Simpson, S. McKenzie, K.M. Nair	The Maersk Company Ltd
<i>Magnolia</i>	†	—	—	Mobil Shipping Co. Ltd
<i>Matrangi Bay</i>	07.03.00	D. Hughan	W.N. Scott, J.G. Swindlehurst, J. Fowler	P&O Nedlloyd Ltd
<i>Mansal 18</i>	†	—	—	Racal Surveys Ltd
<i>Maracas Bay</i>	28.02.00	P.J. Jameson	D.C. Fermin, A. Cacatian, A. Azucena	MOL Tankship Management Ltd
<i>Mark-C</i>	10.06.99	J. W. Jackson	R.J. Sandey	Carisbrooke Shipping plc
<i>Mary C</i>	†	—	—	Carisbrooke Shipping plc
<i>Matco Clyde</i>	09.08.99	P.A. Crabtree	N.B. Mehta, W.B. Gosswell, B. Roberts	Mobil Shipping Co. Ltd
<i>Matco Thames</i>	†	—	—	Mobil Shipping Co. Ltd
<i>Matilde</i>	[21.02.00]	L. Andrews	N.A. Binns, G.J. O'Mahony, B. Connor	Souter Shipping Ltd
<i>Mineral Century</i>	†	—	—	Anglo-Eastern Ship Management Ltd
<i>Mineral Colombia</i>	10.05.99	R. Gupta	A.R. Shetty, A. Jose, R.G. Carvalho	Anglo-Eastern Ship Management Ltd
<i>Mineral Dragon</i>	*	—	—	Anglo-Eastern Ship Management Ltd
<i>Mineral Europe</i>	10.01.00	S. D'Silva	A.A. Paranjape, S. Anand, M. Rajan	Anglo-Eastern Ship Management Ltd
<i>Mineral Venture</i>	†	—	—	Wah Kwong Shipping Agency Co. Ltd.

<i>MSC Clorinda</i>	*	—	—	—	Medite Agency
<i>Multi Trader</i>	†	—	—	—	Cyprus Maritime Co. Ltd
<i>Murex</i>	08.09.99	J. Sharp	C.A. Johnson, M. Ahmed, J.N. Lucas	—	Shell Marine Personnel (IOM) Ltd
<i>Myrina</i>	†	—	—	—	Shell Marine Personnel (IOM) Ltd
<i>Nanda Arrow</i>	†	—	—	—	Gearbulk (UK) Ltd
<i>Naparima</i>	29.11.99	A. Jehaes	A. Wide, J. Catte, Shoson	—	MOL Tankship Management Ltd
<i>Nariva</i>	17.01.00	J.R. Salter	C.D. Manga, A. Tingson, E.F. Blanes	—	MOL Tankship Management Ltd
<i>New Generation</i>	†	—	—	—	James Fisher (Shipping Services) Ltd
<i>Newport Bay</i>	23.11.99	L.J. Fletcher	B.R. Simpson, W.D. Hope, R. Hawthorne	—	P&O Nedlloyd Ltd
<i>Newton</i>	†	—	—	—	Royal Maritime
<i>Nivaga II</i>	†	—	—	—	Government of Tuvalu (Ministry of Home Affairs)
<i>NOL Agate</i>	18.03.99	M.A. Trollope	W.M. Nyen, C.K. Wai, D. Singh	—	Neptune Shipmanagement Services (Pte) Ltd
<i>NOL Cyprine</i>	†	—	—	—	Neptune Shipmanagement Services (Pte) Ltd
<i>NOL Iolite</i>	*	—	—	—	Neptune Shipmanagement Services (Pte) Ltd
<i>Nolizwe</i>	†	—	—	—	Safmarine Ship Management
<i>Nordstrand</i>	†	—	—	—	Carisbrooke Shipping plc
<i>Norna</i>	31.08.99	M.C.J. Jewell	J.J. Coyle, M.P. Donnelly, D.G. Bolton	—	Scottish Office, Agr. & Fisheries Dept
<i>Norrissa</i>	†	—	—	—	Shell Marine Personnel (IOM) Ltd
<i>Norsea</i>	†	—	—	—	P&O North Sea Ferries Ltd
<i>North Pacific</i>	12.01.00	S. Pankaj	R. Dutta, M.M. Parvez, A.P.J. Sumaylo, A.G. Lobo	—	Wallem Shipmanagement Ltd
<i>Northella</i>	†	—	—	—	Marr Vessel Management Ltd
<i>Northern Horizon</i>	†	—	—	—	Marr Vessel Management Ltd
<i>Northern Prince</i>	†	—	—	—	Marr Vessel Management Ltd
<i>Northia</i>	09.11.99	R.N. Richards	S.P. Ashton, A.L. MacNeil, S.P. Clapperton	—	Shell Marine Personnel (IOM) Ltd
<i>Ocean Goose</i>	†	—	—	—	Yacht "Ocean Goose"
<i>Ocean Princess</i>	*	—	—	—	P&O Cruises (UK) Ltd
<i>Ocean Spirit of Moray</i>	*	—	—	—	Gordonstoun School
<i>Ogooue</i>	†	—	—	—	Jolane S.A.
<i>OOCL Belgium</i>	22.10.99	D. Llewellyn	B. Keegan, A. Murphy, C. Joon	—	OOCL (UK) Ltd
<i>OOCL Britain</i>	12.01.00	Goy Ah Chon	Wai Ho Kong, Lee Eng Xong, Ka Wai Fung	—	OOCL (UK) Ltd
<i>OOCL Canada</i>	17.01.00	P.T. Gatea	N.J. Smyth, W. Coxon, J. Hann	—	OOCL (UK) Ltd
<i>Oriana</i>	09.11.99	C.P. Campbell	T.J. Wingate, P.J. Miller, R.B. Martin	—	P&O Cruises (UK) Ltd
<i>Oriental Bay</i>	06.10.99	P.R. Kaye	D. Atkinson, A.A. Ward, C.I. Macleod	—	P&O Nedlloyd Ltd
<i>Oriental Venture</i>	†	—	—	—	BP Amoco Shipping Ltd

Selected and Supplementary Ships (contd)

Name of Vessel	Latest receipt	Master	Observing Officers and Radio Officers	Owner/Manager
<i>Orion Reefer</i>	22.11.99	V. Petrovsky	—	Wallem Shipmanagement Ltd
<i>Ormond</i>	10.01.00	C.J. Davies	G.C. Hiremath, S. Fernandes, R.S. Chauhan	Associated Bulk Carriers (London) Ltd
<i>P&O Nedlloyd Kobe</i>	19.01.00	D.G. Baily	A.M. Jameson, M. Barraclough, M. Samin	P&O Nedlloyd Ltd
<i>P&O Nedlloyd Lyttelton</i>	11.10.99	D.R. Johnston	A.C. Rayburn, R.A. Eames, G.P. Williams	P&O Nedlloyd Ltd
<i>P&O Nedlloyd Marseille</i>	10.01.00	K.D. Campbell	D.G. Evans, G.E. Wade, M. Langford	P&O Nedlloyd Ltd
<i>P&O Nedlloyd Southampton</i>	23.11.99	B.V. Chipperfield	G. Feleppa, J.A. Milner, T. Oliver	P&O Nedlloyd Ltd
<i>P&O Nedlloyd Tasman</i>	*	—	—	P&O Nedlloyd Ltd
<i>Pacheco</i>	09.08.99	R.H. Nightingale	D.J. Sweet, J.D. Hayes, A.C. Montgomery	Andrew Weir Shipping Ltd
<i>Pacific Breeze</i>	*	—	—	Wallenius Shipmanagement Pte. Ltd
<i>Pacific Crane</i>	17.12.99	J.B. Appleby	L. Saxton, D.P. Hadfield, C.J. Cooper	James Fisher (Shipping Services) Ltd
<i>Pacific Guardian</i>	†	—	—	Global Marine
<i>Pacific Pintail</i>	28.01.00	J. Miller	M.D. Brown, T. Lunt, J.I.N. Marsham, P. Austen	James Fisher (Shipping Services) Ltd
<i>Pacific Princess</i>	†	—	—	P&O Cruises (UK) Ltd
<i>Pacific Sandpiper</i>	25.10.99	G.P. Farrell	P. Spencer, R. Mitcheson, T. McMahon	James Fisher (Shipping Services) Ltd
<i>Pacific Swan</i>	27.09.99	M.J. Stares	J.S. Ward, A.J. Howlett, J.P. Gaskin, P.A. Murray	James Fisher (Shipping Services) Ltd
<i>Pacific Teal</i>	02.12.99	D. Marr	R.G. Barry, N.S. Patterson, J.G. Worthington	James Fisher (Shipping Services) Ltd
<i>Pacific Venture</i>	†	—	—	MOL Tankship Management Ltd
<i>Pacific Wave</i>	†	—	—	MOL Tankship Management Ltd
<i>Palliser Bay</i>	07.02.00	D.K. MacCorquodale	C. Moss, S. Illingworth	P&O Nedlloyd Ltd
<i>Pantokrator</i>	†	—	—	Athenian Management S.A.
<i>Pegasus Bay</i>	26.01.00	D.A.K. Bamford	L.H. Musselwhite, S.M. Monger, A.S. Deans	P&O Nedlloyd Ltd
<i>Pelican Arrow</i>	†	—	—	Gearbulk (UK) Ltd
<i>Peninsular Bay</i>	20.09.99	B.L. Brierley	A. Firman, L. Rigby, C. Henderson	P&O Nedlloyd Ltd
<i>Petro Fife</i>	29.02.00	A. Hodgson	G.R. Dunkley, J.R. Shannon, D.J. Buckley	Standard Marine
<i>Pharos</i>	03.06.99	W. Tulloch	A. Provan, S. Tyler, S. Rathbone	Northern Lighthouse
<i>Pioneer Leader</i>	†	—	—	Wallem Shipmanagement Ltd
<i>Pisces Trader</i>	06.12.99	A. Nayyar	K. Janvekar, S. Mandrekar, S. Hasnain	Bibby Line Ltd
<i>Pisces Voyager</i>	21.05.99	I.A. Desouza	J. Yayati, S.K. Sharma, R. Krishnamurphy	Bibby-Harrison
<i>Plover Arrow</i>	*	—	—	Gearbulk (UK) Ltd

<i>Pride of Bilbao</i>	23.09.99	C.E. Banks	P.G. Bowett, A.B.W. Rugg, B.G. Hardy	P&O European Ferries
<i>Pride of Bristol</i>	†	—	—	The Pride of Bristol Trust
<i>Pride of Cherbourg</i>	27.01.00	P.I. Hillman	D.C. Ray, D.L. Ellis, C.P.J. Robins	P&O European Ferries (Portsmouth) Ltd
<i>Pride of Hampshire</i>	17.12.99	R.J. Ross	D.H. Worrin, P. Holden, G.I. Hamer	P&O European Ferries (Portsmouth) Ltd
<i>Pride of Le Havre</i>	†	—	—	P&O European Ferries (Portsmouth) Ltd
<i>Pride of Portsmouth</i>	17.03.99	A.F. Bonehill	J.P. Whiteley, P. Johnston, I. H. Roberts	P&O European Ferries (Portsmouth) Ltd
<i>Pride of Suffolk</i>	†	—	—	P&O North Sea Ferries (Felixstowe) Ltd
<i>Primo</i>	†	—	—	Barber Ship Management Inc
<i>Prince Nicolas</i>	†	—	—	Cyprus Maritime Co. Ltd
<i>Prince of Waves</i>	*	—	—	Seatrade Groningen B.V.
<i>Princess Nadia</i>	*	—	—	Ravenscroft Shipping Inc
<i>Providence Bay</i>	14.03.00	K.W. Smith	C.G. Puttock, L. Rigby, A.W. Lewington	P&O Nedlloyd Ltd
<i>Puerto Cortes</i>	†	—	—	Sea Containers Services Ltd
<i>Pufford Achates</i>	23.11.99	J.R. Yensen	R. Head, A. Roach, A. Hepburn	Boston-Putford Offshore Safety Ltd
<i>Pufford Achilles</i>	†	—	—	Boston-Putford Offshore Safety Ltd
<i>Pufford Aries</i>	31.03.99	C.P. Knights	P.G. McCardle, W.B. McCormack, M.A. Chapman	Boston-Putford Offshore Safety Ltd
<i>Pychley</i>	27.01.00	C.C. Yeh	K. Li XG Wang, H. Chen, S.C. Wang	Associated Bulk Carriers (London) Ltd
<i>Queen Elizabeth 2</i>	08.03.00	R.W. Warwick	S. Whalley, R.R. Clunas, O.S. Ghoshroy	Cunard Line Ltd
<i>Queenland Star</i>	10.02.00	S.R. Pridmore	M. Catanyag, F. Yuycankiat, R.S. Pineda	P&O Nedlloyd Ltd
<i>Raven Arrow</i>	19.07.99	R.K. Mathur	C.V.N. Sateesh, N.K. Baitha, S. Chopra	Gearbulk (UK) Ltd
<i>Regent Rose</i>	†	—	—	United Sea Service S.A. de C.V.
<i>Regina Oldendorff</i>	†	—	—	Egon Oldendorff
<i>Repulse Bay</i>	17.01.00	B. Graham	B.R. Simpson, J.S. Norris, M.K. Hill	P&O Nedlloyd Ltd
<i>Resolution Bay</i>	24.12.99	J.N. Kelleher	C.C. Puttock, K.E. Fuller, S.C. Lugg	P&O Nedlloyd Ltd
<i>Rhone</i>	†	—	—	United Ship Management Ltd
<i>Rixta Oldendorff</i>	†	—	—	Egon Oldendorff
<i>Rocknes</i>	†	—	—	Wilson Ship Management (Bergen) AS
<i>Royal Princess</i>	27.05.99	R.D. Knight	C. Middleton, J. Smart	P&O Cruises (UK) Ltd
<i>St Clair</i>	28.02.00	N. Barnes	G. Gove, E. Mackay, E. Smith	P&O Scottish Ferries Ltd
<i>St Helena</i>	16.08.99	M.L.M. Smith	S. Jordan, A. Greentree, B. Bennett	Curnow Shipping Ltd.
<i>St Lucia</i>	15.11.99	R.A. Cole	M. Peplinski, A. Mos, J. Kolacinski	Interocean Ugland Management AS
<i>St Sunniva</i>	†	—	—	P&O Scottish Ferries Ltd
<i>Saga Horizon</i>	28.02.00	T. Haxell	M.F. Ariel, S.P. Dominader, E.R. Mariano	Patt Manfield & Co. Ltd
<i>Saga Rose</i>	*	—	—	Saga Shipping Co. Ltd

Selected and Supplementary Ships (contd)

Name of Vessel	Latest receipt	Master	Observing Officers and Radio Officers	Owner/Manager
<i>Saga Wind</i>	†	—	—	Patt Manfield & Co. Ltd
<i>Sagacity</i>	24.12.99	T. Sienkiewicz	M. Smigielski, A. Nadolski, K. Strozek	F.T. Everard & Sons Ltd
<i>Saldanha</i>	†	—	—	The South African Marine Corporation Ltd
<i>Saloma</i>	*	—	—	Univan Ship Management Ltd
<i>Scillonian III</i>	†	—	—	Isles of Scilly Steamship Co. Ltd
<i>SCL Infanta</i>	31.08.99	N. Golder	N. Nacu, T.V. Williams, C.P. Winterton	Safmarine Ship Management
<i>Scotia</i>	†	—	—	Marr Vessel Management Ltd
<i>Scott Guardian</i>	24.01.00	J. Cargill	M. Bradley, I. Sanderson, R. Sorensen	BUE North Sea Limited
<i>Scottish Star</i>	14.12.99	P. Buckley	R. Nieto, A.R. Braulio, F. Mercado	Norbulk Shipping UK Ltd
<i>Sea Amethyst</i>	17.01.00	W. Venning	M.B. Wdowikowski, I.J. Roemmele, M. Smith	Stephenson Clarke Shipping Ltd
<i>Sea Princess</i>	†	—	—	Princess Cruises Inc
<i>Seabourn Sun</i>	*	—	—	Cunard Line Ltd
<i>Selectivity</i>	29.07.99	—	—	F.T. Everard & Sons Ltd
<i>Semac I</i>	†	—	—	European Marine Contractors Ltd
<i>Seniority</i>	08.06.99	J. Norton	D.R. Spurling, G. Oliver, L. Mariciuc	F.T. Everard & Sons Ltd
<i>Severn Fisher</i>	†	—	—	James Fisher (Shipping Services) Ltd
<i>Shenzhen Bay</i>	02.02.00	D.W. Lax	G. Mathias, R.J.C. Neale, A.B. Hughes	P&O Nedlloyd Ltd
<i>Shetland Service</i>	13.03.00	I.G.C. Ferguson	J. Thompson, M.E. Russell, R. Miller	BUE North Sea Limited
<i>Shun Kim</i>	24.08.99	N. Passey	R. Degan, Salahuddin, A. Rahman	Wallem Shipmanagement Ltd
<i>Singapore Bay</i>	12.01.00	P.A. Furmeaux	R.G.C. Noble, A.W. Piggott, R.M. Barnsley	P&O Nedlloyd Ltd
<i>Sir Eric Sharp</i>	24.12.99	S. Hibberd	L. Waterfield, K.S. Bowden, R.J. Ferry	Global Marine
<i>Siskin Arrow</i>	†	—	—	Gearbulk (UK) Ltd
<i>Snow Crystal</i>	13.09.99	I.J. Minnis	O.B. Gonzaga, P. Kostic, G.S. Sadeleza	Holy House Shipping AB
<i>Snow Drift</i>	07.02.00	B. Yelland	E.J. Bismonte, R. Sobrepena, V. Ancic	Holy House Shipping AB
<i>Snow Flower</i>	14.02.00	T. Liden	N. Jabay, N. Tonog, M. Rosas	Holy House Shipping AB
<i>Snow Land</i>	19.01.00	W. Lockie	M. Sorra, K. Klimansky, N. Belano	Holy House Shipping AB
<i>Sociality</i>	†	—	—	F.T. Everard & Sons Ltd
<i>Solena</i>	†	—	—	Shell Marine Personnel (IOM) Ltd
<i>Solitaire</i>	†	—	—	Allseas Engineering

<i>Southampton Star</i>				World Marine Co. Ltd
<i>Spar Topaz</i>	†			Spar Shipping AS
<i>Spear</i>	†			Good Faith Shipping Co. S.A.
<i>Speciality</i>	†			F.T. Everard & Sons Ltd
<i>Speybank</i>	29.11.99	W. Campbell	A. Khil, B. Dooley, V. Arbatskiy	Andrew Weir Shipping Ltd
<i>Stavros S Niarchos</i>	*			STA Tall Ships
<i>Stolt Kittiwake</i>	*			Stolt-Nielsen B.V.
<i>Storrington</i>	08.03.00	B. Standerline		Stephenson Clarke Shipping Ltd
<i>SubSea Mayo</i>	23.03.99	R. Greenwood	G. Winter, M. Bilteel, M. Ramsay, C.J. Delahunty	SubSea Offshore Ltd
<i>Sulisker</i>	†			Scottish Office, Agr. & Fisheries Dept
<i>Summer Flower</i>	†			Hoegh Fleet Services AS
<i>Summer Meadow</i>	†			Hoegh Fleet Services AS
<i>Summer Wind</i>	†			Hoegh Fleet Services AS
<i>Sun Suma</i>	21.01.00	W.P. Masnayon	B. Daymiel, R. Mercado, H.E. Venegas	United Ship Management Ltd
<i>Superiority</i>	21.06.99	E. K. Andoh-Wilson		F.T. Everard & Sons Ltd
<i>Swan Arrow</i>	†			Gearbulk UK Ltd
<i>Swan Bay</i>	†			Wallem Shipmanagement Ltd
<i>Swan River</i>	†			Wallem Shipmanagement Ltd
<i>Swan Stream</i>	†			Wallem Shipmanagement Ltd
<i>Talca</i>	10.08.99	I. Cuthbertson	C.P. Medagedara, A.U.K. Arachchige, R. Uthamarajah	Unicool Ship Ltd
<i>Tanamonta</i>	†			V.Ships (UK) Ltd
<i>Tamar F. I.</i>	†			Byron Marine Ltd
<i>Taunton</i>	25.02.00	P.A. Miley	A.M. Joshi, R.R. Talli, K. Meher-Homji	Associated Bulk Carriers (London) Ltd
<i>Teignbank</i>	05.10.99	A.D. Macpherson	A. Siyukhov, A. Stammers, I. Kirichenko	Andrew Weir Shipping Ltd
<i>Tema</i>	†			Target Marine S.A.
<i>Teno</i>	23.11.99	M. Murshed	H.A.H. Weekakody, R.N. Elikewela, P. Senevirathne	London Ship Managers Ltd
<i>Tepoziteco II</i>	†			Transportación Marítima Mexicana S.A. de C.V.
<i>Texas</i>	02.11.99	L.H.M. Johnson	A. Mackenzie, S. Azim, S.J. McNeil	P&O Nedlloyd Ltd
<i>Thorvil Maersk</i>	01.03.00	K.J. Hope	S. Quirk, G. Gibson, C. MacSweeney	The Maersk Company Ltd
<i>Tobias Maersk</i>	19.10.99	S. Grainger	A.W. Smith, R.W. Oliver, K.L. Goggin	The Maersk Company Ltd
<i>Toisa Cougar</i>	†			Sealion Shipping Ltd
<i>Toisa Petrel</i>	†			Sealion Shipping Ltd
<i>Toisa Sentinel</i>	12.01.00	J. Martinez	Z. Majkowski, A. Mason, T. Maciejuk	Sealion Shipping Ltd
<i>Torben Maersk</i>	12.01.00	M.I. Khan	R. Keown, D.O. Donovan, N.G. Barratt	The Maersk Company Ltd
<i>Torben Spirit</i>	†			Norbulk Shipping UK Ltd

Selected and Supplementary Ships (contd.)

Name of Vessel	Latest receipt	Master	Observing Officers and Radio Officers	Owner/Manager
<i>Trade Apollo</i>	28.06.99	A.G. Williams	Z.T. Hua, D. Bandara, Z.S. Zhong, Y.C. Zhi	Wah Tung Shipping Agency Co. Ltd
<i>Trade Cosmos</i>	†	—	—	Wah Tung Shipping Agency Co. Ltd
<i>Trade Eternity</i>	26.01.00	R.E.F. Fletcher	—	Wah Tung Shipping Agency Co. Ltd
<i>Trade Maple</i>	14.04.99	R. McMillan	Ni Zhong Wei, Li Chang Ming	Wah Tung Shipping Agency Co. Ltd
<i>Trade Selene</i>	07.02.00	A. Shah	Z. Bin, G.L. Jun, L.K. Wing	Wah Tung Shipping Agency Co. Ltd
<i>Trein Maersk</i>	07.03.00	A. Groom	P. Madsen, S.K. Charley, J.J. Barnes	The Maersk Company Ltd
<i>Trojan Star</i>	†	—	—	Norbalk Shipping UK Ltd
<i>Tsuru Arrow</i>	†	—	—	Gearbulk UK Ltd
<i>Tudor Star</i>	19.10.99	A. Tibbott	H. Hingpit, R. Cuaresma, F. Octa	Norbalk Shipping UK Ltd
<i>Tundra Princess</i>	03.12.99	J. Moen	J.S. Garrovillas, J. Calderon, E. Ebanle	Interocean Ugland Management AS
<i>Tycho Brahe</i>	†	—	—	Hanseatic Shipping Co. Ltd
<i>Ullswater</i>	30.11.99	J.M. Milloy	G. Mornit, R. Doshi, D. Kapoor	Associated Bulk Carriers (London) Ltd
<i>Victoria</i>	†	—	—	P&O Cruises (UK) Ltd
<i>Vigilant</i>	30.03.99	D.L. Beveridge	R. Whyte, A. MacCallum, A. Beveridge	Scottish Office, Agr. & Fisheries Dept
<i>Vine</i>	24.12.99	J.W. Scarisbrick	S. Mathews, D. Irani, S. Nag	Associated Bulk Carriers (London) Ltd
<i>Waasland</i>	†	—	—	Exmar N.V.
<i>Waterford</i>	07.03.00	S.B. Tudor	S. Rohjesh, M.U.G. Shaikh, D.J. Nelson	Associated Bulk Carriers (London) Ltd
<i>Western Bridge</i>	16.08.99	I.C. Gravatt	M.A.G. Anthony, G.A.B. Salva, S. Chase	Ropner Ship Management Ltd
<i>Westfield</i>	10.06.99	Z. Novak	O. Risen, R. Flores, A. Bein	Gearbulk (UK) Ltd
<i>Westra</i>	[10.03.00]	I. Campbell	M. Carruthers, G. Maitland, S. Adams	Scottish Office, Agr. & Fisheries Dept
<i>Whitcrest</i>	†	—	—	John H. Whitaker (Tankers) Ltd
<i>World Nord</i>	†	—	—	International United Shipping Agencies Ltd
<i>World Place</i>	17.12.99	S.V.S. Reddy	H. Sharma, J.J. Tharakan, T.T. Lwin	Univan Ship Management Ltd
<i>World Spark</i>	†	—	—	Eurasia Shipping & Management Co. Ltd
<i>Yeoman Brook</i>	27.05.99	G. Mayle	H. Tenoso, A. Pura, I. Barbash	Egon Oldendorff
<i>York</i>	01.03.00	I.W. Connor	D. Basu, J.A. Vaz, L.M. Gopal	Associated Bulk Carriers (London) Ltd
<i>Zeitland</i>	06.01.00	J.H. Brierley	U.C. Shenai, N.R. Shetty, R.T.S. Mattos	Associated Bulk Carriers (London) Ltd
<i>Zuljalal</i>	†	—	—	United Ship Management Ltd

The following Auxiliary Ships are also currently reporting for the United Kingdom: *Al Fujairah, Amer Choopa, Anastasis, Cattleya Star, Chin Shan, Clipper Fantasy, El Dorado, Endeavour, Green Ice, Hightide, Lady Sushil II, Mineral Ordaz, Nord Jahre Transporter, Nordbeach, Rama Deep, Uraga.*

‘Marid’ Ships

The following are ships recruited primarily to report sea temperatures from UK coastal waters.
Masters are requested to point out any errors or omissions.

Name of vessel	Master	Owner/Manager
<i>Activity</i>	G. Smith	F.T. Everard & Sons Ltd
<i>Allurity</i>	—	F.T. Everard & Sons Ltd
<i>Anchorman</i>	R.M. Astridge	James Fisher (Shipping Services) Ltd
<i>Aptity</i>	A. Everett	F.T. Everard & Sons Ltd
<i>Arco Avon</i>	J. Quayle	ARC Marine Ltd
<i>Arco Dart</i>	—	ARC Marine Ltd
<i>Azalea</i>	—	James Fisher (Shipping Services) Ltd
<i>Blackfriars</i>	T. Baker	Crescent Shipping Ltd
<i>Celtic Terrier</i>	—	Campbell Maritime Ltd
<i>Chartsman</i>	D. Bee	James Fisher (Shipping Services) Ltd
<i>City of Cardiff</i>	E. Nutt	United Marine Dredging Ltd
<i>City of Chichester</i>	M. James	United Marine Dredging Ltd
<i>European Highlander</i>	H.T. Jones	P&O EF/IS Ltd
<i>Hera</i>	J. Furubotyn	Skibsaksjeselskapet Solvang AS
<i>Hernes</i>	—	Oesterreichischer Lloyd Ship Management (Cyprus)
<i>Hordnes</i>	—	Wilson Ship Management (Bergen) AS
<i>Lord Rank</i>	—	Ocean Youth Club
<i>Lough Fisher</i>	D. Kennedy	James Fisher (Shipping Services) Ltd
<i>Marine Explorer</i>	R. Wood	Eidesvik Shipping (UK) Ltd.
<i>Merchant Brilliant</i>	P. Ankers	Merchant Ferries Ltd
<i>Merchant Venture</i>	S. Quayle	Merchant Ferries Ltd
<i>Mersey Fisher</i>	R. Rea	James Fisher (Shipping Services) Ltd
<i>Northern Star</i>	—	Celtic Marine Ltd
<i>Ocean Defender</i>	D. Fett	Earthkind
<i>Petro Avon</i>	J.A. Dunlop	Standard Marine Services Ltd
<i>River Lune</i>	N. Humphries	Merchant Ferries Ltd
<i>Royalist</i>	—	Sea Cadet Offshore Office
<i>Saga Moon</i>	G. Black	Merchant Ferries Ltd
<i>Spheroid</i>	H. Thomson	Celtic Marine Ltd
<i>Stena Caledonia</i>	J. Taylor	Stena Line (Stranraer) Ltd
<i>Stena Challenger</i>	D.P. Farrell	Stena Line (Holyhead) Ltd
<i>Stena Galloway</i>	—	Stena Line (Stranraer) Ltd
<i>Stolt Avocet</i>	—	Stolt-Nielsen B.V.
<i>Superferry</i>	K. Stamatios	Swansea-Cork Ferries Ltd
<i>Taikoo</i>	—	Ocean Youth Club
<i>Tees Fisher</i>	G.E. Lowry	James Fisher (Shipping Services) Ltd
<i>UKD Bluefin</i>	C. Weisman	UK Dredging
<i>Union Arbo</i>	D. Wright	Union Transport Group plc
<i>Vanessa C</i>	G. Dvlaras	Carisbrooke Shipping plc
<i>Waverley</i>	S. Colledge	Waverley Excursions Ltd
<i>Wear Fisher</i>	R. Dawson	James Fisher (Shipping Services) Ltd
<i>Welsh Piper</i>	J. Norman	British Dredging Aggregates Ltd

Fixed and mobile installations

Installation	Owner/Operator
<i>AH001</i>	Amerada Hess Ltd
<i>Berge Hugin FPSO</i>	Pierce Production Co.
<i>Beryl A</i>	Mobil North Sea
<i>Beryl B</i>	Mobil North Sea
<i>Buchan A</i>	Talisman Energy (UK) Ltd
<i>Captain WPP A</i>	Texaco North Sea (UK) Co.
<i>Drill Star</i>	Transocean Sedco-Forex
<i>Glomar Adriatic IX</i>	Global Marine Drilling Company
<i>Glomar Arctic III</i>	Global Marine Drilling Company
<i>Gryphon A</i>	Kerr-Magee Oil (UK) plc
<i>Jack Bates</i>	Reading & Bates Falcon Ltd
<i>Janice A</i>	Kerr-Magee Oil (UK) plc
<i>Maersk Endurer</i>	Maersk Contractors Ltd
<i>Morecambe Bay API</i>	British Gas Hydrocarbon Resources Ltd
<i>Noble Ton Van Langeveld</i>	Noble Drilling (UK) Ltd
<i>Northern Producer</i>	Atlantic Floating Production Company
<i>Ocean Guardian</i>	Diamond Offshore (UK) Ltd
<i>Paul B. Loyd Jr.</i>	Reading & Bates Falcon Ltd
<i>Ravenspurn North</i>	BP Amoco Ltd
<i>Santa Fe Britannia</i>	Santa Fe Techserv (North Sea) Ltd
<i>Santa Fe Galaxy 1</i>	Santa Fe Drilling (North Sea) Ltd
<i>Santa Fe Galaxy 111</i>	Santa Fe Techserv (North Sea) Ltd
<i>Santa Fe Magellan</i>	Santa Fe Drilling (North Sea) Ltd
<i>Santa Fe Monarch</i>	Santa Fe Techserv (North Sea) Ltd
<i>Santa Fe Monitor</i>	Santa Fe Techserv (North Sea) Ltd
<i>Santa Fe Rig 135</i>	Santa Fe Techserv (North Sea) Ltd
<i>Santa Fe Rig 140</i>	Santa Fe Techserv (North Sea) Ltd
<i>Sedco 711</i>	Transocean Sedco-Forex
<i>Sedco 712</i>	Transocean Sedco-Forex
<i>Sovereign Explorer</i>	Transocean Sedco-Forex
<i>Tartan A</i>	Texaco North Sea (UK) Co.
<i>Tiffany Platform</i>	Agip (UK) Ltd
<i>Transocean Explorer</i>	Transocean Sedco-Forex
<i>Transocean John Shaw</i>	Transocean Sedco-Forex
<i>Viking B</i>	Conoco (UK) Ltd

India (Information dated 3 March 2000)

Name of vessel		
<p>Selected Ships:</p> <p><i>Akbar</i> <i>Arunachal Pradesh</i> <i>B R Ambedkar</i> <i>Bharatendu</i> <i>Bhavabhuti</i> <i>Harshavardhan</i> <i>Kanpur</i> <i>Lokmanya Tilak</i> <i>Major Dhansingh Thapa</i> <i>PVC</i> <i>Patilputra</i> <i>Sabarimala</i> <i>Sagar Kanya</i> <i>Sagar Sampada</i> <i>Samudra Manthan</i> <i>State of Andhra Pradesh</i> <i>State of Gujurat</i> <i>State of Nagaland</i> <i>Tirumalai</i> <i>Vishva Pallav</i></p> <p>Supplementary Ships:</p> <p><i>Abdul Kalam Azad</i> <i>A B Tarapore PVC</i> <i>APJ Anand</i> <i>APJ Angad</i> <i>APJ Anjali</i> <i>APJ Shalin</i> <i>APJ Sushma</i> <i>Aditya Vijay</i> <i>Aditya Vikram</i> <i>Alaknanda</i> <i>Ankaleshwar</i> <i>Annapurna</i> <i>Arcadia Progress</i> <i>Aurobindo</i> <i>Bankimchandra Chatterjee</i> <i>Bharat Seema</i> <i>Bharati Darsan</i> <i>CHM Piru Singh PVC</i> <i>C.V. Raman</i> <i>Chandidas</i></p>	<p>Supplementary Ships:</p> <p><i>Chennai Ookkam</i> <i>Chennai Perumai</i> <i>Chennai Polivu</i> <i>Chennai Veeram</i> <i>Chennai Velarchi</i> <i>Chettinad Glory</i> <i>Chettinad Princes</i> <i>Chhatrapati Shivaji</i> <i>Continental Rose</i> <i>Dadabhai Nowroji</i> <i>Dakshineshwar</i> <i>Dweep Setu</i> <i>Fonj Shekhon PVC</i> <i>Gandhar</i> <i>Ganga Sagar</i> <i>Gem of Madras</i> <i>Guru Bachan Singh Salaria</i> <i>PVC</i> <i>Guru Gobind Singh</i> <i>Hardwar</i> <i>Havildar Abdul Hamid PVC</i> <i>Homi Bhabha</i> <i>Indian Goodwill</i> <i>Indira Gandhi</i> <i>Jag Manek</i> <i>Jag Palak</i> <i>Jag Parit</i> <i>Jag Pradip</i> <i>Jag Pragati</i> <i>Jag Prakash</i> <i>Jag Prayog</i> <i>Jag Preeti</i> <i>Jag Ratna</i> <i>Jag Vijay</i> <i>Jag Vikram</i> <i>Jagat Swamini/Priyamvada</i> <i>Jiyamvada</i> <i>Jagat Samrat</i> <i>Jagat Vijeta</i> <i>Jala Doot</i> <i>Jawaharlal Nehru</i> <i>Jay Narayan Vyas</i></p>	<p>Supplementary Ships:</p> <p><i>Jhulelal</i> <i>Kabirdas</i> <i>Kanchan Junga</i> <i>Lal Bahadur Shastri</i> <i>Lance Naik Albert Ekka PVC</i> <i>Lt Arun Khetrapal PVC</i> <i>Lok Kirti</i> <i>Lok Kranti</i> <i>Lok Maheshwari</i> <i>Lok Pragati</i> <i>Lok Prakash</i> <i>Lok Pratap</i> <i>Lok Pratima</i> <i>Lok Prem</i> <i>Lok Rajeshwari</i> <i>Maharajah Agrasen</i> <i>Maharashtra</i> <i>Maharshi Dayanand</i> <i>Maharshi Karve</i> <i>Major Hoshiar Singh PVC</i> <i>Major Shaitan Singh PVC</i> <i>Major Somnath Sharma</i> <i>PVC</i> <i>Mandakini</i> <i>Mizoram</i> <i>Motilal Nehru</i> <i>Murshidabad</i> <i>Naik Jadunath Singh PVC</i> <i>Nancowry</i> <i>Nand Hari</i> <i>Nand Kishore</i> <i>Nand Rati</i> <i>Nand Smiti</i> <i>Nand Srishti</i> <i>Nanga Parbat</i> <i>Netaji Subhash Bose</i> <i>Nicobar</i> <i>Nirmal Bhushan</i> <i>Prabhu Das</i> <i>Prabhu Daya</i> <i>Prabhu Jivesh</i> <i>Prabhu Puni</i></p>

Supplementary Ships:	Supplementary Ships:	Supplementary Ships:
<i>Prabhu Satram</i>	<i>Satya Murti</i>	<i>Varanasi</i>
<i>Rabindranath Tagore</i>	<i>Skandy Surveyor</i>	<i>Vishva Kaumudi</i>
<i>Rafi Ahmed Kidwai</i>	<i>State of Haryana</i>	<i>Vishva Nandini</i>
<i>Raja Mahendra</i>	<i>State of Manipur</i>	<i>Vishva Pankaj</i>
<i>Rajiv Gandhi</i>	<i>State of Orissa</i>	<i>Vishva Parag</i>
<i>Rama Raghoba Rane PVC</i>	<i>State of Tripura</i>	<i>Vishva Parijat</i>
<i>Ramdas</i>	<i>Subhedar Jogindar</i>	<i>Vishva Parimal</i>
<i>Ravidas</i>	<i>Singh PVC</i>	<i>Viswa Doot</i>
<i>Sagar Deep</i>	<i>Suvarna Swarajya</i>	<i>Vivekananda</i>
<i>Sagar Samrat</i>	<i>Tamil Kamaraj</i>	<i>Yerawa</i>
<i>Sampurna Swarajya</i>	<i>Tulsidas</i>	
<i>Sanmar Pioneer</i>	<i>Uttar Kashi</i>	

Auxiliary Ships:

India has 40 Auxiliary Ships currently reporting.

New Zealand (Information dated 1 February 2000)

Name of vessel		
Selected Ships:	Selected Ships:	Selected Ships:
<i>Ariake</i>	<i>Ngamaru III</i>	<i>Tasman Explorer</i>
<i>America Star</i>	<i>Pacific Chieftain</i>	<i>Tasman Navigator</i>
<i>Capitaine Kermadec</i>	<i>Pacific Onyx</i>	<i>Taiko</i>
<i>Capitaine Wallis</i>	<i>P&O Nedlloyd Napier</i>	<i>Tangaroa</i>
<i>Columbia Star</i>	<i>P&O Nedlloyd Tauranga</i>	<i>Toanui</i>
<i>Challenger</i>	<i>SeaTow 22</i>	<i>Rotoiti</i>
<i>Columbia Star</i>	<i>SeaTow 25</i>	<i>Rotoma</i>
<i>Forum Samoa</i>	<i>Soren Larsen</i>	<i>Wellington Express</i>
<i>Golden Bay</i>	<i>Spirit of Competition</i>	
<i>Italian Reefer</i>	<i>Spirit of Freedom</i>	Supplementary Ships:
<i>Kakariki</i>	<i>Sydney Express</i>	<i>Arahanga</i>
<i>Karamea</i>	<i>Sydney Star</i>	<i>Arahura</i>
<i>Kiwi Breeze</i>	<i>Tasman Adventurer</i>	<i>Aratere</i>
<i>Melbourne Star</i>	<i>Tasman Challenger</i>	<i>Straitsman</i>
<i>New Zealand Pacific</i>	<i>Tasman Crusader</i>	<i>Suilven</i>

Auxiliary Ships:

New Zealand has a fleet of 12 Auxiliary Ships currently reporting.

**The
Stationery
Office**

Published by The Stationery Office and available from:

The Stationery Office

(mail, telephone and fax order only)

PO Box 29, Norwich NR3 1GN

Telephone orders/General enquiries 0870 600 5522

Fax orders 0870 600 5533

Subscription enquiries 0870 600 5522

www.thestationeryoffice.com

The Stationery Office Bookshops

123 Kingsway, London WC2 6PQ

020 7242 6393 Fax 020 7242 6412

68-69 Bull Street, Birmingham B4 6AD

0121 236 9696 Fax 0121 236 9699

33 Wine Street, Bristol BS1 2BQ

0117 926 4306 Fax 0117 929 4515

9-21 Princess Street, Manchester M60 8AS

0161 834 7201 Fax 0161 833 0634

16 Arthur Street, Belfast BT1 4GD

028 9023 8451 Fax 028 9023 5401

The Stationery Office Oriel Bookshop

18-19 High Street, Cardiff CF1 2BZ

029 2039 5548 Fax 029 2038 4347

71 Lothian Road, Edinburgh EH3 9AZ

0870 606 5566 Fax 0870 606 5588

Accredited Agents

(see Yellow Pages)

and through good booksellers

© Crown copyright 2000

Published with the permission of The Met. Office on behalf of the
Controller of Her Majesty's Stationery Office.

Applications for reproduction should be made in writing to

The Copyright Unit, Her Majesty's Stationery Office,

St. Clements House, 2-16 Colegate, Norwich, NR3 1BQ.

Annual subscription

£29 including postage

£8

ISSN 0025-3251

