Report on the investigation of

the grounding of

European Pioneer

off Fleetwood

1 December 2000

Marine Accident Investigation Branch
First Floor
Carlton House
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Southampton
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Report No 16/2001

Extract from

The Merchant Shipping

(Accident Reporting and Investigation)

Regulations 1999

The fundamental purpose of investigating an accident under these Regulations is to determine its circumstances and the cause with the aim of improving the safety of life at sea and the avoidance of accidents in the future. It is not the purpose to apportion liability, nor, except so far as is necessary to achieve the fundamental purpose, to apportion blame.

CONTENTS

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

ARPA	Automatic Radar Plotting Aid
DGPS	Differential Global Positioning System
GMDSS	Global Maritime Distress and Safety System
GPS	Global Positioning System
HW	High Water
kW	Kilowatt – unit of power
m	metre
MAIB	Marine Accident Investigation Branch
MCA	Maritime and Coastguard Agency
PEC	Pilotage Exemption Certificate
Ro-Ro	Roll on, roll off
SSE	South-south-east
SW	South-west
UTC	Universal Co-ordinated Time
VDR	Voyage Data Recorder
VER	Voyage Event Recorder
VHF	Very High Frequency (Radio)
VTS	Vessel Traffic Services

SYNOPSIS

European Pioneer, a ro-ro cargo ferry, ran aground on a sandbank while departing Fleetwood in the early hours of the morning of 1 December 2000. She had 103 units of cargo and 57 passengers on board. She was only superficially damaged and there was no pollution. She remained stranded over one tide and was subsequently able to continue her passage.

European Pioneer runs a regular daily service between Fleetwood and Larne, along with two other similar vessels. At the time of the grounding, the master, the chief officer, a seaman lookout and the bosun as helmsman manned her bridge. The master had the con. Both the master and the chief officer each held a Pilotage Exemption Certificate (PEC) for the port. The weather and visibility were good.

The approach to Fleetwood is a very narrow buoyed channel between drying sandbanks, which demands accurate navigation. The bridge team was following a familiar well-tried passage plan, which involved the master conning the vessel by eye from the bridge-front window. The role of the duty second officer was to monitor the navigation using radar parallel index techniques, and advising the master accordingly. However, on leaving the berth the second officer had duties at a mooring station, and no one monitored the radar in his absence.

A navigational mistake occurred before the second officer had returned to the bridge. A critical buoy was unlit which caused the master to underestimate a turn. By the time the mistake was noticed it was too late to correct it.

P&O Ship Management (Irish Sea) Ltd is recommended to reconsider the bridge resource management on its ships operating in and out of Fleetwood, and to review its procedures for ensuring the Voyage Event Recorders fitted on its vessels are fully operational for every voyage.

PARTICULARS OF *EUROPEAN PIONEER* AND ACCIDENT

Vessel details

Name	:	*European Pioneer*
Registered Owner	:	P&O Ship Management (Irish Sea) Ltd
Port of registry	:	Hamilton
Flag	:	Bermuda
Type	:	Passenger/ro-ro cargo
Built	:	1975, Hamburg
Classification society	:	Det Norske Veritas
Construction	:	Steel
Length overall	:	140.1m
Draught	:	4.22m forward 4.34m aft
Gross tonnage	:	14,426
Engine power and/or type	:	8826kW, Deutz diesel
Service speed	:	16.5 knots
Other relevant info	:	Bow thruster, twin variable pitch propellers, twin rudders

Accident details

Time and date	:	0432 (UTC) 1 December 2000
Environmental factors	:	Wind SSE 4 Tide NW'ly 1.5 knots HW Fleetwood 0143
Location of incident	:	53°56.05'N 003° 00.9'W Wyre Channel, Fleetwood
Persons on board	:	30 crew and 57 passengers
Injuries/fatalities	:	None
Damage	:	Superficial bottom damage

SECTION 1 - FACTUAL INFORMATION

(All times are UTC)

1.1 Background to the voyage

European Pioneer is one of 12 freight-only ro-ro ferries operated by P&O Ship Management (Irish Sea) Ltd which make regular daily sailings between Great Britain and Ireland. *European Pioneer* makes one round trip between Fleetwood and Larne each day, and her scheduled time of departure from Fleetwood is about 2200. This is often delayed by either low tide at Fleetwood or poor weather conditions in the Irish Sea.

Prior to the accident, *European Pioneer* had been delayed by bad weather. While on passage to Fleetwood from Larne, on the evening of 30 November, she had confronted force 9 head winds; she arrived at midnight.

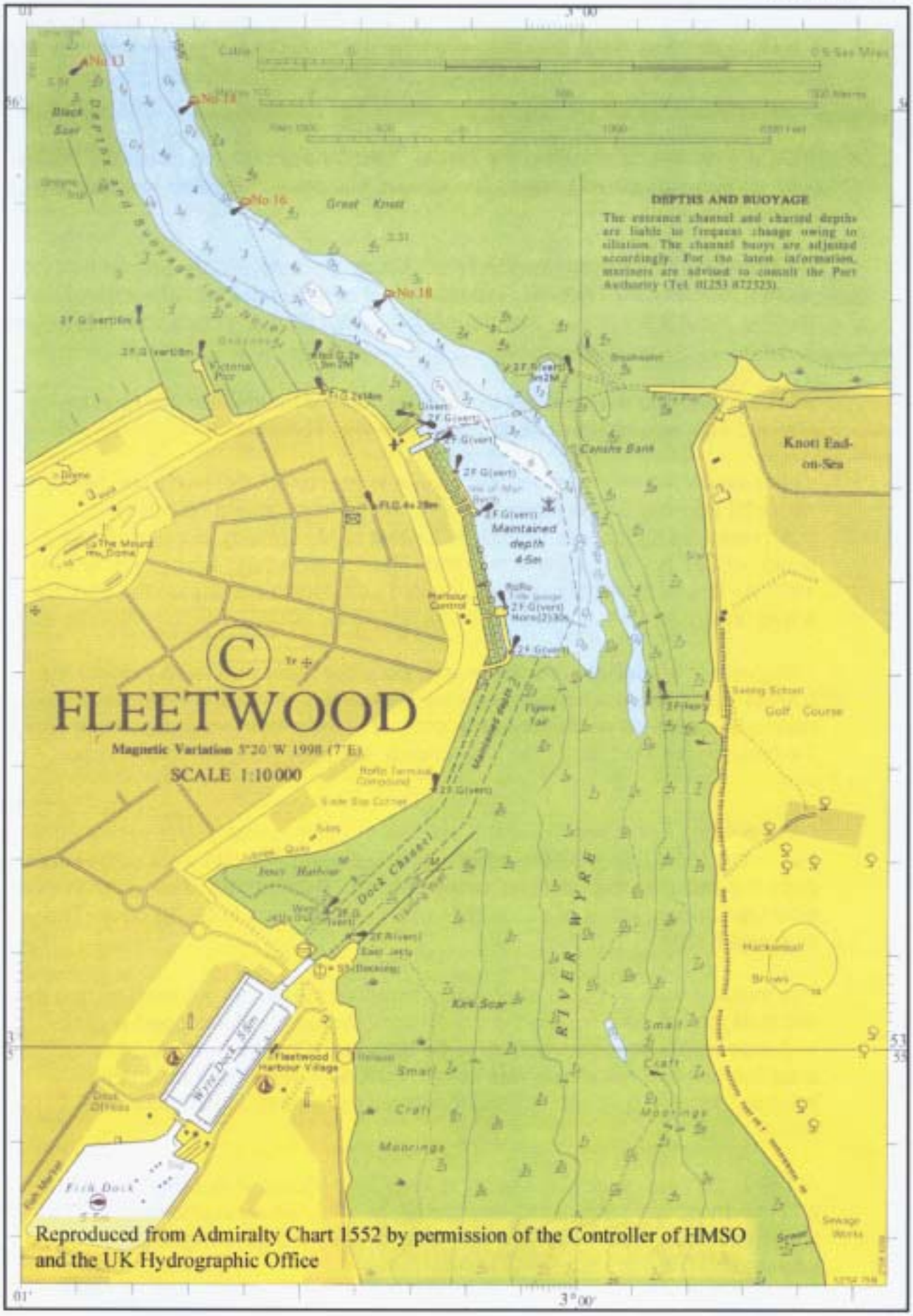
1.2 Narrative

Having arrived at Fleetwood on 30 November, *European Pioneer*'s master dealt with the mail and other administration tasks before resting for two hours between 0100 and 0300, while the cargo was being loaded. It was unusual for him to rest while the vessel was in Fleetwood but, in view of the late arrival, he chose to do so as a sensible measure.

Following his usual routine, the master joined the chief officer on the bridge half an hour before sailing. The time was about 0400. The chief officer completed the pre-sailing checks while the master updated himself on the cargo and the navigational aspects of the forthcoming passage. The pre-sailing checks included finalising the passage plan which ran from the seaward end of the Fleetwood Channel, and which was agreed with the master. Parallel index lines were also set on the radar to assist in safely navigating the outer part of the navigational channel.

European Pioneer departed the berth at 0425 with a cargo of 103 units and 57 drivers. She had 30 crew on board. The master and chief officer were on the bridge, along with a seaman lookout and the bosun on the helm. The weather was good, with a moderate south-south-easterly wind and good visibility.

Having berthed facing seaward, the master used the bow thrust and stern propulsion to manoeuvre out of the berth. Once clear, he came ahead and instructed the helmsman to head towards No 18 buoy which was clearly visible **(see Chart Extracts 1 and 2 with current buoy positions marked)**.


DEPTHS AND BUOYAGE
The entrance channel and charted depths are liable to frequent change owing to silitation. The channel buoys are adjusted accordingly. For the latest information, mariners are advised to consult the Port Authority (Tel. 01253 872323).
Great Knott
Knott End-on-Sea
Maintained depth 4·5m
FLEETWOOD
Magnetic Variation 5°20'W 1998 (7'E).
SCALE 1:10 000
RIVER WYRE
Dock Channel
Fleetwood Harbour Village
Reproduced from Admiralty Chart 1552 by permission of the Controller of HMSO and the UK Hydrographic Office

The master conned the vessel by eye from the centreline of the wheelhouse, and gave steering instructions to the bosun on the wheel. Standing by the propulsion combinator controls to starboard was the chief officer, who operated them as directed by the master. The chief officer also monitored the rudder indicator, on the deckhead in the centre of the wheelhouse, to check the bosun was applying the correct helm. The lookout had been instructed to report any sightings of lights.

As *European Pioneer* approached No 18 buoy the master ordered port helm to leave it to starboard. With her propulsion set at just under half ahead, and making about 9 knots over the ground with about 2 knots of ebb tide, she began to swing.

At about this time the second officer arrived on the bridge from his mooring station. This was entirely normal. The time was about 0428.

The master's intention was to alter course to port to put the next buoy, No 16, about 20 degrees on the starboard bow. As he came round he briefly interpreted the light of No 14 buoy to be that of No 16 buoy, but realised he could not see No 16 buoy and shouted "There's something wrong, where's No 16?" All three officers then looked forward and detected it fine on the port bow; it was unlit.

The master's immediate reaction was to consider more port helm to leave the buoy to starboard, but he then decided against this. Instead, he opted to alter course to starboard so as not to risk contact of the propellers and rudders on the bank on his starboard side. As a result, the buoy scraped down the port side.

Despite using helm propulsion and the bow thruster to realign the vessel within the channel, the effects of the north-westerly flowing ebb tide were sufficient to carry the vessel to the opposite, or west side, of the channel. *European Pioneer* grounded on a heading of about 340° with the bow close to No 13 buoy. The time was 0432.

The master made a couple of attempts to refloat the vessel but realised that the ebb tidal stream was holding the vessel firmly aground. He stopped engines and ordered the starboard anchor to be dropped. Checks were made to establish whether the vessel was holed. Tank soundings were taken and internal spaces inspected. A hand leadline was used to sound around the vessel.

At 0440, the fleet nautical manager at P&O Ship Management (Irish Sea) Ltd was informed. The coastguard was told of the situation soon afterwards. The public address system on board was used to keep the passengers and crew informed.

The checks were completed at 0535 and had revealed no damage or pollution. The vessel refloated on the tide at 1140. She then proceeded to a position to the west of the Lune Deep buoy where further watertight integrity checks were made. All reports were favourable and at 1300 the vessel resumed her passage to Larne.

European Pioneer arrived at Larne at 2021 where a diver's inspection revealed only superficial damage to the bottom plating and propeller tips.

1.3 *European Pioneer* - relevant vessel details

European Pioneer is an elderly but well-maintained freight-only ro-ro passenger vessel. She underwent a port state control inspection by the MCA 17 days before the accident. She was correctly certificated according to national and international rules at the time of the accident.

The wheelhouse **(see Photographs 1 and 2)**, which is sited forward on the ship, is well equipped with navigational instruments including:

Decca Mk 90 GPS

Skipper echo sounder

LM X400 DGPS

2 x Decca ARPA radars,

Atlas Echograph 466 echo sounder

Anshultz gyro compass and auto-pilot

2 x Sailor VHF radio sets

Full GMDSS radio equipment

Broadgate - VER

The wheelhouse is arranged with a central hand steering position set back from the bridge-front. The autopilot controls are on a column immediately in front of the hand steering position at the bridge front. The two radars are sited together, back from the bridge front and to port of the steering position. The propulsion is controlled from combinators on the starboard side of the wheelhouse. The echo sounder, DGPS display, and a small chart table are adjacent to the propulsion controls.

At the time of the accident, and unbeknown to the officers and crew, there was a major system fault on the Broadgate VER and no data was saved. This major fault went unrecognised because there is only one alarm indicator and there was an existing alarm for a known minor fault.

Photograph 1

Views of bridge equipment

Photograph 2

1.4 Crew complement, training and routines

The complement of 30 included navigating and engineer officers, a motorman and senior catering personnel of British nationality. The deck crew and junior catering ratings were Spanish. The deck department consisted of the master, chief officer, two second officers, bosun and 10 seamen. In the period immediately preceding the accident, the master was on the bridge with the chief officer, a seaman lookout and the bosun. The bosun was on the wheel.

The 56 year old master obtained a master (foreign going) certificate of competency in 1971 and had served as master with P&O Ship Management (Irish Sea) Ltd (formerly P&O European Ferries) for 25 years. He had first obtained a PEC for the Port of Fleetwood in 1981, and had been able to do at least the requisite minimum number of trips to the port each year to retain it since that time. He was appointed to *European Pioneer* on the Fleetwood/Larne route in September 2000. He had been on leave until 1½ days before the accident occurred. He had never before been involved in a reportable incident.

The 44 year old chief officer held a master (foreign going) certificate of competency. He had worked at sea in various vessels for 27 years. He undertook bridge management training while serving with the Royal Navy, and had worked as a marine superintendent and as an operations manager. He joined P&O Ship Management (Irish Sea) Ltd 5 years before the accident, and *European Pioneer* on 29 October 2000. He held a PEC for the Port of Fleetwood.

The officers operate a work/leave ratio of 2 weeks on/2 weeks off. Bridge watchkeeping is carried out by the two second officers on a 6 hours on/6 hours off basis. The chief officer is in charge of the loading and discharging at each port of call, and assists the master on the bridge during berthing and unberthing operations and during pilotage. The master carries out all the pilotage as well as managing the administration of the vessel.

All the deck officers have undergone bridge team management training. The master and second officer had both attended a course at Fleetwood in September 2000.

1.5 Bridge team management

The master operates a bridge routine which is in accordance with the Fleet Regulations/Safety Management Manual and the Bridge Standing Orders.

Prior to departure the chief officer is assigned to carry out the bridge pre-departure checks. The master comes to the bridge about half an hour before departure to ensure compliance with the checklist procedures, and to make himself fully conversant with the tides, traffic situation and other relevant factors.

The pre-departure checks include setting up the appropriate initial radar parallel index lines for the beginning of the passage. A general passage plan for the route has been formed and agreed with P&O Ship Management (Irish Sea) Ltd, which includes suggested parallel index plans for departure and arrival in Fleetwood, and for the Port of Larne. Copies of these plans are displayed close to each radar position **(see Photograph 3)**. The plan for departure Fleetwood includes the area where the accident occurred. During pre-departure checks the chief officer sets up one of the radars with the first two or three parallel index lines only, as experience has shown that too many lines clutter up the radar screen.

The roles of the officers on the bridge during pilotage are set out in the Bridge Standing Orders as follows:

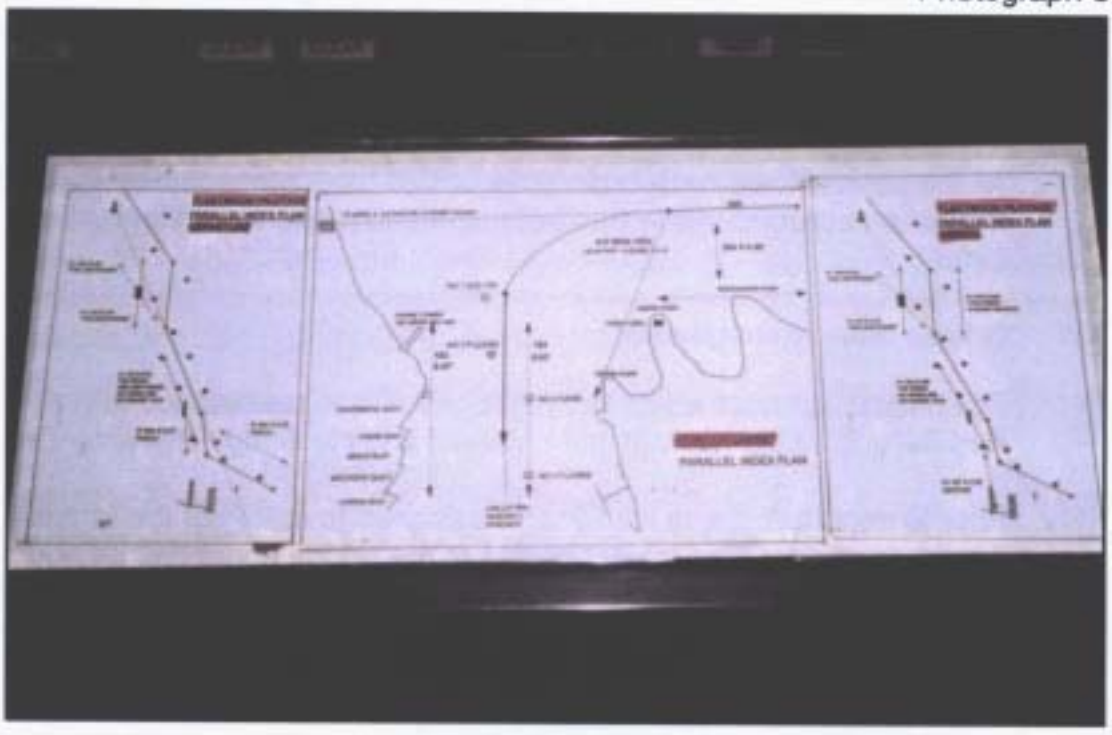
Chief Officer to be stationed by the bridge combinators operating pitch, echo sounder and VHF communication. As directed by the master.

Second Officer to be stationed at the radar. Reporting as directed by the master.

On departure from the berth the duty second officer is in charge of one of the mooring stations and comes to the bridge as soon as the vessel clears the berth. When he arrives on the bridge he assumes the role outlined above. Prior to that time no one monitors the radars.

The master cons the vessel, giving helm orders to the bosun at the wheel. The chief officer ensures that the bosun carries out the orders correctly and operates the combinator controls on the instructions of the master.

Photograph 3



Parallel index plan

1.6 Fatigue

The master and deck officers had joined *European Pioneer* on Wednesday 29 November after a period of leave. At that time the vessel was running behind her usual schedule; she departed Fleetwood at 0210 on 30 November, rather than the scheduled 2200 (28 November). This was not an unusual situation and had been caused by a period of poor weather conditions. The poor weather had continued during 30 November, which had delayed the vessel further.

The master's usual routine, when the vessel was running roughly to schedule, was to rest on the passage north to Larne, after clearing the pilotage area off Fleetwood. This normally gave him about 5½ hours rest between, say, midnight and arrival off Larne. The turn-round in Larne was about 3½ hours, but there were a number of administration tasks requiring the master's attention, which prevented him from resting. On the return passage, drills and other tasks were generally carried out in the morning, and the master was able to get about 2 hours rest during the afternoon prior to arrival at Fleetwood. Having arrived, he was once again preoccupied with a variety of administrative tasks, and usually would not expect to get much rest.

The master was content with this routine, and felt he managed to achieve adequate rest under normal circumstances.

The movement of the vessel in force 9 head winds the evening before the accident had, however, disturbed the master's rest period. Unusually, he decided to catch up on sleep while in port, so he could be better rested before taking the vessel to sea on completion of the turn-round.

1.7 Pilotage navigation on *European Pioneer*

The master, officers and crew were very familiar with the navigational requirements for departure Fleetwood.

The master navigates in a close pilotage situation by eye from a position at the front of the wheelhouse. The Wyre Channel is narrow and well marked by buoys. On departure from the berth and until the second officer arrives on the bridge, the master uses the beach, which is close to port, and the buoys, principally No 18, to gauge his position in the channel.

In clear visibility, the second officer usually arrives on the bridge when the vessel is close to buoy No 18. From that time he will feed the master relevant navigational information derived from the radar, either spontaneously or on request. When visibility is restricted, the vessel remains near the berth until the second officer arrives.

Positions are not plotted on the chart in the initial stages of the passage on departure Fleetwood.

1.8 The harbour authority

Associated British Ports operate the Port of Fleetwood, and navigational matters are the harbour master's concern.

There is no VTS service for the port, but a listening watch is maintained on VHF radio from 2 hours before, to 1½ hours after, high water.

1.9 The Wyre Channel

The port is approached from the Lune Deep by a narrow channel formed by the River Wyre which lies between drying sandbanks. The following note is included on Admiralty Chart 1552 with respect to the Wyre Channel:

DEPTHS AND BUOYAGE

The entrance channel and charted depths are liable to frequent change owing to siltation. The channel buoys are adjusted accordingly. For the latest information mariners are advised to consult the Port Authority on (tel: 01253 872323).

The channel is approximately 1¼ miles long and approximately 150 to 200m wide. The direction of the channel takes a sharp bend close offshore **(see Chart Extracts)**.

1.10 Buoyage

Navigational buoys, each with a distinctive character **(see Annex 1)**, mark the extremities of the Wyre Channel. In addition to the lights and shapes indicated, buoys 4,8 and 16, being those critical for alter course positions, are marked with retro-reflective tape. Although the channel is subject to siltation, the buoys do not have to be moved frequently to redefine the channel. The last time any buoys were repositioned for this reason was between 11 and 13 June 1996. On board *European Pioneer* the officers had up-to-date information on the buoy positions.

On occasions in the past, the buoys have been discovered to be unlit, dimly lit or out of position. The crews of the P&O ferries would often be the first to discover the problem and report the fact to the harbour master. On the master's previous tour of duty, No 3 buoy had been unlit.

The port authority regularly maintains the buoys and a detailed maintenance history is kept for each one **(see Annex 2 - Maintenance History of Buoy 16)**. Maintenance can only be carried out in fairly calm sea conditions.

It can be seen from the maintenance history that, among other things, buoy No 16 was found to be 60m out of position by *European Pioneer* on 4 September 2000.

1.11 Buoy 16

Engineers from Associated British Ports inspected the buoy soon after the accident. Their damage survey report is included at Annex 3.

The report reveals that the buoy was found to be 45m out of position to the west. It showed signs of a recent collision; there was an indentation with paint removed. During the inspection the photocell was covered (to simulate darkness) and the buoy remained unlit. The bulb was changed but, unfortunately, the original bulb was lost overboard from the survey launch in the process. The buoy was subsequently towed ashore where a detailed inspection found three broken battery leads.

1.12 Propulsion and steering control

The propulsion and steering control machinery on board *European Pioneer* was reported to have been functioning correctly at the time of the accident.

SECTION 2 - ANALYSIS

2.1 Aim

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations, if any, with the aim of preventing similar accidents occurring again.

This section will determine why *European Pioneer* grounded while being piloted by an experienced master in good weather conditions.

2.2 Buoy 16

A key feature of this accident is that buoy No 16 was reported to be unlit as *European Pioneer* approached it in the early hours of 1 December 2000. Its light had, however, been seen a few hours earlier on the inbound passage.

During the post-accident damage survey of No 16 buoy, damage to battery leads was discovered which would have caused the buoy to be unlit. The damage survey report **(Annex 3)** speculates that a shock movement due to impact with the buoy could have caused the damage to the battery leads. *European Pioneer* made contact with the buoy just before the grounding. These facts lead to speculation as to whether, in fact, the buoy was lit before *European Pioneer*'s contact with it. However, due to the loss of the original bulb, it is impossible to come to a firm conclusion as to what caused the buoy to become unlit.

In the absence of firm evidence to the contrary, it is concluded that the buoy was unlit as the vessel made her departure from the port.

2.3 The accident

A channel only 150 - 200m wide, or less at certain levels of tide, leaves very little room for error, especially with a strong cross-setting tidal stream. Wheel-over positions have to be gauged with great precision and even a few seconds delay, translated to distance travelled, can have serious consequences. Such positions become second nature to experienced pilots and most PEC qualified masters and mates, who soon know how to adjust them depending on vessel's speed, wind and tide. A key element in the conduct of such precise navigation is reliable aids which can be provided by a number of means, and a fall-back system which must be available instantly, should anything go wrong.

European Pioneer's master was very experienced. He knew the channel very well and usually conducted the pilotage himself.

On leaving the berth the master instructed the helmsman to steer a specific course towards No 18 buoy. As the vessel approached it, he ordered port helm, intending to come around on to a course of about 295° to put No 16 buoy on the starboard bow.

Navigation was done entirely by eye, using buoys. Although *The Mariner's Handbook* cautions against using buoys as the sole reference for navigation, their use in familiar waters is an accepted technique, and most experienced pilots build up a mental picture of each buoy's position relative to others or other navigational features. *European Pioneer*'s master had every expectation that the buoys in the Wyre Channel would be in position and lit. Not only was he very familiar with the channel, but he had also passed that way on the inbound passage a few hours earlier, and had seen nothing then that might have given him cause for concern. He had every expectation that the outbound transit would be straightforward and entirely as normal.

A back-up system did exist. The pilotage passage plan allowed for parallel indexing to ensure the correct line in the channel was achieved **(see Figure 1)**. Parallel indexing was taken from fixed marks, so that any discrepancy in the position of a buoy would be easily discernible. Such a method depends on three factors, additional to having the index lines accurately aligned: a competent person using them, a proven system that ensures the operator knows exactly what his responsibilities for monitoring the navigation are, and extensive practice. Nobody was on the radar from sailing, and, as the vessel approached No 16 buoy, the chief officer had other duties. The second officer habitually arrived on the bridge a few minutes after sailing and, according to the Bridge Standing Orders, was to be "stationed at the radar. Reporting as directed by the master". On this occasion his arrival on the bridge coincided with the master altering course to port, to put No 16 buoy on the starboard bow.

With the vessel turning to port, the master was relying totally on seeing No 16 buoy to gauge when to stop the swing and steady the heading. His exclamation at that juncture "There's something wrong, where's No 16?" suggests his entire focus of attention was looking for the buoy. No 16 buoy was the key element in his plan and he could not see it.

At that precise, crucial, moment the back-up system was unavailable. Nobody on the bridge was monitoring the vessel's position, despite the extensive array of available equipment.

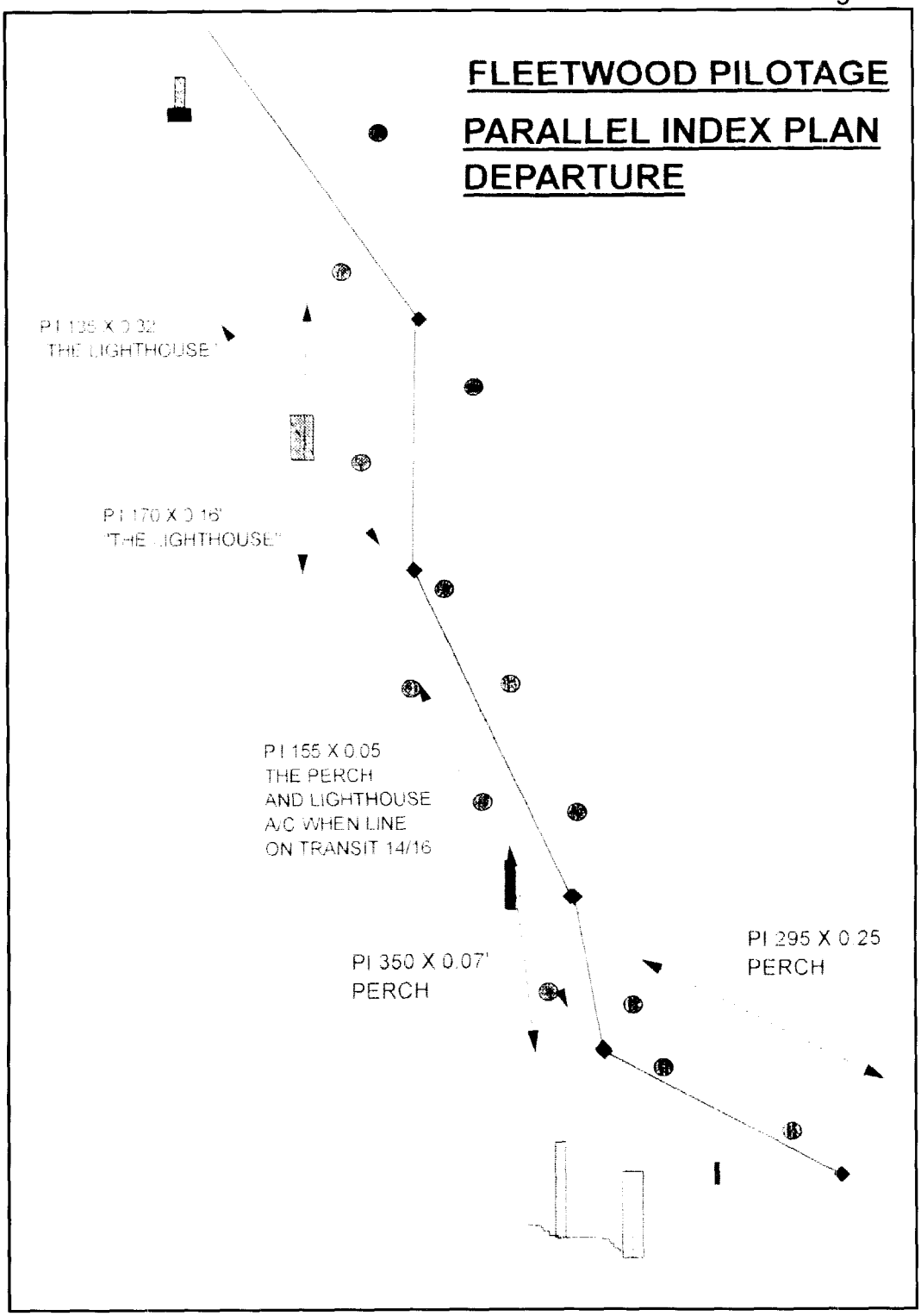
The second officer had had no time to familiarise himself with the radar picture before the master made his exclamation that, in essence, sought help in looking for the buoy. The second officer obliged, as did the chief officer.

Although it only took a few seconds to find the buoy, the ship was by then out of position and the master found he had no option but to take the unlit No 16 buoy on the wrong side. In trying to realign with the channel thereafter, the effects of the strong ebb tide in such a confined channel overrode the actions taken on the bridge, and *European Pioneer* took the ground.

The initiating event which set in motion the chain of circumstances that eventually led to the vessel grounding was that the master briefly interpreted the light of No 14 buoy as that of No 16 buoy.

With No 16 buoy unlit he was denied his key aid to navigation, while the bridge organisation in place failed to alert the master that the ship was being offset to one side of the navigable channel.

Figure 1



2.4 Fatigue

The accident occurred at about 0430, in that period of the day when human performance is at its lowest ebb. The investigation explored whether fatigue contributed to the underlying reasons for this accident.

The master himself does not believe he was fatigued. He had only just returned from leave, and there was no history of weeks or even days of broken sleep or excessive working hours. Since returning from leave, the normal schedule had, however, been severely disrupted by bad weather, and the master's opportunities for rest were occurring later and at less optimum times. The body's circadian clock can adjust to a new schedule at between 1 and 1½ hours each day. The vessel was running about 6 hours behind its usual schedule and the master's circadian clock would have been adversely affected as a result.

Body temperature, and general alertness, reaches its lowest ebb between about 0100 and 0600. A very high percentage of accidents involving human judgement fall into this time bracket. There is every reason to believe this matched this pattern. Everyone on the bridge of *European Pioneer* at 0430 on 1 December fell into this category. Although the contribution made by the time of day was probably very small, it might have been a factor.

The consequences of working in the middle of the night are recognised in most industries. There are higher risks involved, and individuals' response times are likely to be slower than during the day. Providing this is allowed for and managed, the additional risks should present no problems.

Although the master was not tired, as he had slept during the vessel's period in Fleetwood, it is highly probable he had not fully adjusted to the schedule being worked that night and, together with the time of day, his general alertness would have been adversely affected.

2.5 Bridge Team Management

The essence of effective bridge team management is to have a system that is sufficiently flexible to cater for all conditions, and capable of preventing accidents at all times. It demands careful thought, imaginative training and extensive practice. Teams that work together regularly are likely to be the most proficient, providing everyone makes a positive contribution.

This approach should produce an organisation that is capable of handling any situation, such as proceeding down a very narrow channel in the middle of the night when a key buoy used for navigating a turn is suddenly discovered to be unlit.

The bridge team management arrangement in *European Pioneer* would have satisfied any normal check. It had worked satisfactorily many hundreds of times in good weather and bad. The routine operated by the master of pre-departure

checks and pilotage passage planning was a good one. The officers had been trained in bridge team management, and both the master and second officer had recently attended a training course in Fleetwood. The allocation of duties to personnel on the bridge matched those in most similar vessels around the world, yet, on the one occasion when it was needed to cope with a difficult and unexpected predicament, it failed.

One obvious reason was it was not fully operational on departure. A key member of the team, the duty second officer, was not on the bridge on departure, and did not arrive from his mooring station until the vessel was already making her way down the channel. He was, therefore, not in a position to give navigational advice, and if anything had gone wrong in those early moments, the team was not in a position to function properly. Evidently the risks of anything going wrong were judged to be minimal but, in the event, this confidence was misplaced. It only needed No 16 buoy to be unlit to expose the flaw.

It was known that faults occurred with the channel buoys quite frequently. This fact should have alerted the master to the possibility of an accident occurring if nobody was monitoring the radar. The most effective way of discovering and overcoming potential problems with the buoys is by efficient use of the radar. Therefore, monitoring the radar and, in particular, fully utilising the parallel indexing facility should have been a priority for the bridge team as soon as the berth was cleared.

This could have been achieved by either waiting off the berth until the second officer was ready to assume his duty on the bridge, or by a temporary change in the roles of the remaining members of the bridge team.

2.6 VOYAGE DATA RECORDERS

Vessels in the P&O group have been fitted, at some expense, with Voyage Event Recorders (VERs), often referred to as Voyage Data Recorders (VDR). They have been provided for a variety of purposes including the provision of accurate data in the event of an accident. Such information is extremely useful for the reconstruction of the circumstances surrounding an accident and, especially, in understanding why things happened.

In this instance a defect on the VER 1000A denied the MAIB inspectors important information. A known, and apparently, minor defect masked a more serious one which no one knew existed. This was not helpful.

It was P&O's decision to fit the VDR in *European Pioneer*. It was a decision fully and enthusiastically supported by the MAIB. It is the company's responsibility to ensure that it works properly at all times, and it is very strongly recommended that it reviews its procedures for ensuring this item of equipment is fully operational for every voyage.

SECTION 3 - CONCLUSIONS

3.1 Findings

1. The grounding occurred at 0432 in the vicinity of No 13 buoy Wyre Channel, Fleetwood. [1.2]

2. *European Pioneer* was fully manned and certificated at the time of the accident. [1.3]

3. The vessel was well equipped with modern navigational instruments. [1.3]

4. Unbeknown to the officers on board there was a major system fault with the VER and no data was recorded. This major fault with the VER was undetected as the instrument had an existing alarm and only one alarm indicator. [1.3]

5. The bridge routine was in accordance with company and bridge standing orders after the duty second officer had arrived in the wheelhouse after mooring duty. [1.5]

6. Pre-departure checks were carried out in accordance with company policy. [1.5]

7. At the time of the accident, the master, chief officer, bosun and one seaman manned the bridge. The second officer had just returned to the wheelhouse from his mooring station. [1.2, 2.2]

8. The radar was not being monitored prior to the second officer returning to the bridge. [1.5, 1.7]

9. Navigational buoy No 16 was unlit. It had been lit when the vessel passed it about 5 hours earlier. [1.3, 2.2]

10. The vessel's schedule and the quality of rest available to the officers and crew had been adversely affected by poor weather in the days preceding the accident. [1.6]

11. It is highly probable that the master had not fully adjusted to the schedule being worked that night and, together with the time of day, his general alertness would have been adversely affected. [1.6, 2.4]

12. At the time of the accident, navigation was being conducted by eye. [1.7]

13. There have been a number of reports of buoys being dimly lit, unlit or out of position in the past. [1.10]

14. There was no malfunction of the propulsion and steering machinery. [1.12]

3.2 Causes

3.2.1 The Initiating Cause

The initiating event that set in motion the chain of circumstances which eventually led to the vessel grounding was that the master briefly interpreted the light of No 14 buoy as that of No 16 buoy. [2.3]

3.2.2 Contributory Causes and Underlying Factors

A navigational buoy, which was crucial to the master's chosen method of navigation, was unlit. [2.2]

An adequate check on his performance was not being carried out. [2.3]

In particular, nobody was monitoring the radar and using the parallel index lines, suggested in the pilotage passage plan in the minutes preceding the grounding. [2.5]

The bridge team was not fully operational as planned until the second officer returned from his mooring station after departure. [2.5]

It is highly probable that the master's general alertness was adversely affected by fatigue, although to what extent is uncertain. [2.4]

The effect of the ebb tide prevented the master from re-aligning the vessel within the channel. [2.3]

SECTION 4 - RECOMMENDATIONS

P&O Ship Management (Irish Sea) Ltd is recommended to:

1. Review the level of bridge manning on its vessels and the roles of the bridge team during departure and arrival at Fleetwood;

2. Ensure that the navigation of the master/pilot is always checked/assisted using radar parallel indexing techniques or another suitable and equivalent method throughout the pilotage; and

3. Review its procedures for ensuring the Voyage Event Recorders on its vessels are fully operational for every voyage.

Marine Accident Investigation Branch
April 2001

FLEETWOOD BUOYAGE

OCTOBER 1999

BUOY NO.	CHARACTERISTIC	FLASH CHARACTERISTIC	BUOY COLOUR	REF. TAPE
FAIRWAY	QK.FI. WHITE	0.3 + 0.7 = 1SEC	YELLOW	YES
3	V.QK.FI. GREEN	0.3 + 0.3 = 0.6SEC	GREEN	
4	V.QK.FI. RED	0.3 + 0.3 = 0.6SEC	RED	YES
5	OC 3SEC. GREEN	2 + 1 = 3SEC	GREEN	
6	FI.3SEC. RED	0.2 + 2.8 = 3SEC	RED	
7	QK.FI. GREEN	0.2 + 0.8 = 1SEC	GREEN	
8	V.QK.FI. RED	0.3 + 0.3 = 0.6SEC	RED	YES
9	FI.3SEC. GREEN	0.3 + 2.7 = 3.0SEC	GREEN	
10	FI.3SEC. RED	0.3 + 2.7 = 3.0SEC	RED	
PERCH	QK.FI. GREEN	0.3 + 0.7 = 1.0SEC	GREEN	
12	QK.FI. RED	0.15 + 0.85 = 1.0SEC	RED	
13	OC 3SEC. GREEN	2 + 1 = 3.0SEC	GREEN	
14	FI.3SEC. RED	0.3 + 2.7 = 3.0SEC	RED	
16	V.QK.FI. RED	0.3 + 0.3 = 0.6sec	RED	YES
18	QK.FI. RED	0.15 + 0.85 = 1.0SEC	RED	
20	QK.FI. RED	0.15 + 0.85 = 1.0SEC	RED	
22	QK.FI. RED	0.15 + 0.85 = 1.0SEC	RED	
23	DUMB BUOY		GREEN	YES
24	DUMB BUOY		RED	YES
25	DUMB BUOY		GREEN	YES
LOWER LIGHT HOUSE	**F1 G 2.0 SEC**		**LIGHTS IN LINE 156°(T)**	
UPPER LIGHT HOUSE	**F1 G 4.0 SEC**			

ASSOCIATED BRITISH PORTS DETAILED EQUIPMENT HISTORY FOR SITE 525000 - PERIODICAL INSPECTIONS OF BUOYS AND CHAINS Run Date 01/12/00

Test date range 03/04/93 - 01/12/00 Report 42

DATA SELECTION: Full Tests, Site = 525000, Equip no. = BUOY 16 Page 1

TesterSerNo	Date /Usercode	TestNO /Person	Status /Notes	Location
Equipment BUOY 16 BUOY NR. 16 MAINT ON STATION Maker's serial no REF O				RIVER MYRE CHANNEL
ABP	03/04/93			
			#CP Refurbished Ref: 16 and laid on CP	
			13/4/94 new lamp fitted	
ABP	10/05/95			
			#CP Refurbished Ref: C and laid on CP	
ABP	06/08/96			
			#CP Refurbished Ref: O and laid on CP	
ABP	20/12/96			
		DH	20/12/96;Rptd lit on & off	
			23/12/96;Checked on station batt = 12.8 v OK	
			01/04/97;buoy reported out of position.	
			03/04/97;buoy relayed in C.P.Buoy was 45 METERS OUT of postion.	
			15/09/97: buoy reported extinguished by M V BISON	
			16/09/97 High winds prevented us boarding	
			17/09/97 Replaced lamp & tested OK	
			TEST FOR BACKUP	
			22/12/97, Found extinguished by W Surveyor	
			Replaced P/C	
ABP	17/03/98			
			Refurbished Ref: B and layed on CP.	
			03/4/98 Buoy reported unlit Replaced cont fuse.	
			11/6/99 Buoy reported off CP Replaced on CP	
			19/11/99 Buoy reported extinguished. New lamp	
			fitted.	
			16/02/00 Check for damage by P&O with assessors.	
			NO DAMAGE FOUND.	
	01/01/00			
			04/09/2000 : Reported off station by European	
			Pioneer Found to be over 60 mtrs from	
			CP. Lifted accouring and repositioned	
			at CP.Noted wear on links on tail	
			chain.	

Total number of items = 1

Total number of tests = 6

Maintenance History of Buoy 16

DAMAGE SURVEY REPORT – NO. 16 BUOY 1-12-00

On 1.12.00 Capt D Mackrell, Dock & Harbour Master reported that the light on No. 16 buoy was extinguished, (No damage was noted by the ABP hydrographer on 30.11.00 at 13.00 hrs when the Wyre Surveyor relaid No.4 Buoy).

At approximately 13.00 hrs on 1.12.00 (high water at 14.06) the buoy was inspected using ABP survey vessel "Wyre Surveyor" and found to be approx. 45m west of chart position. One daymark had broken off and a second one bent. There was signs of a fresh collision evidenced by a new indentation with paint removed.

The buoy was photographed and paint scrapings taken. The photocell was covered to simulate darkness and the buoy remained unlit. As a result of this, the bulb was changed and a temporary battery lashed to the framework. Because of time restraints the buoy was not lifted but was dragged back to approximately, to charted position. It was not possible to ascertain as to whether the bulb was working. Unfortunately during a difficult recovery situation the bulb was lost into the river.

On 11.12.00 No. 16 Buoy sinker was lifted and the buoy towed to a harbour berth where both buoy and sinker were lifted onto the quay. The chain was untangled and a detailed inspection of the buoy undertaken. It was found that three battery leads had broken at the termination crimps inside the battery box, probably caused by shock movement due to impact on the buoy. Battery leads were repaired. Batteries were tested and found to be in a charged condition. Batteries were then re-wedged in the battery box. A new photocell was fitted as a precaution due to any possible impact damage. The buoy lantern was tested and the buoy was then replaced on chart position.

R.L. Cowling
Engineering Resources Manager.