Report on the Investigation

of the grounding of the passenger ferry

Quiberon

in Plymouth Sound

on 17 March 1999

FILE:MAIB 1/6/110

Marine Accident Investigation Branch
Carlton House
Carlton Place
Southampton
SO15 2DZ

Report No 16/2000

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 causes 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.

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

knot	unit of velocity (one nautical mile per hour)
kW	kilowatt - unit of power
m	metre - unit of length
MAIB	Marine Accident Investigation Branch
MCA	Maritime and Coastguard Agency
PEC	pilotage exemption certificate
RFA	Royal Fleet Auxiliary
Ro-Ro	roll on roll off - a vessel onto which vehicles can drive directly from ashore
UTC	Universal Co-ordinated Time
VTS	Vessel Traffic Services

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SYNOPSIS

(all times are UTC)

At 0208 on 18 March 1999, the Marine Accident Investigation Branch (MAIB), was informed by HM Coastguard that a ferry had grounded in Plymouth Sound the previous day. An investigation began later that day and was conducted by MAIB inspector Captain Nick Beer.

The ferry *Quiberon*, which is owned and operated by Brittany Ferries, left her Mill Bay berth at Plymouth at 2330 on Wednesday 17 March, for a scheduled sailing to Roscoff, France. The weather was fine with a gentle north-north-westerly breeze and good visibility. Low water was predicted to occur at 0004 and it was a period of spring tides. As the vessel rounded Drake's Island in Plymouth Sound, the master, who had the con, decided to pass to the west of Melampus buoy to give greater clearance to two anchored vessels.

The change in plan was neither communicated to the chief officer, who was also on the bridge, nor carefully considered. The passage to the west of the buoy, between it and dangerously shallow water, was, at best, only 80m wide. The master was navigating mainly by eye and the chief officer was not monitoring the vessel's progress against a passage plan.

The manoeuvre was misjudged and the vessel grounded on Pilot Shoal. She was successfully refloated about an hour later and was able to return to her berth under her own power. She had sustained only superficial damage and was able to resume her schedule later on 18 March.

The investigation has highlighted shortfalls in the bridge team management and passage planning on board *Quiberon* and an appropriate recommendation is made to Brittany Ferries.

VESSEL AND ACCIDENT INFORMATION

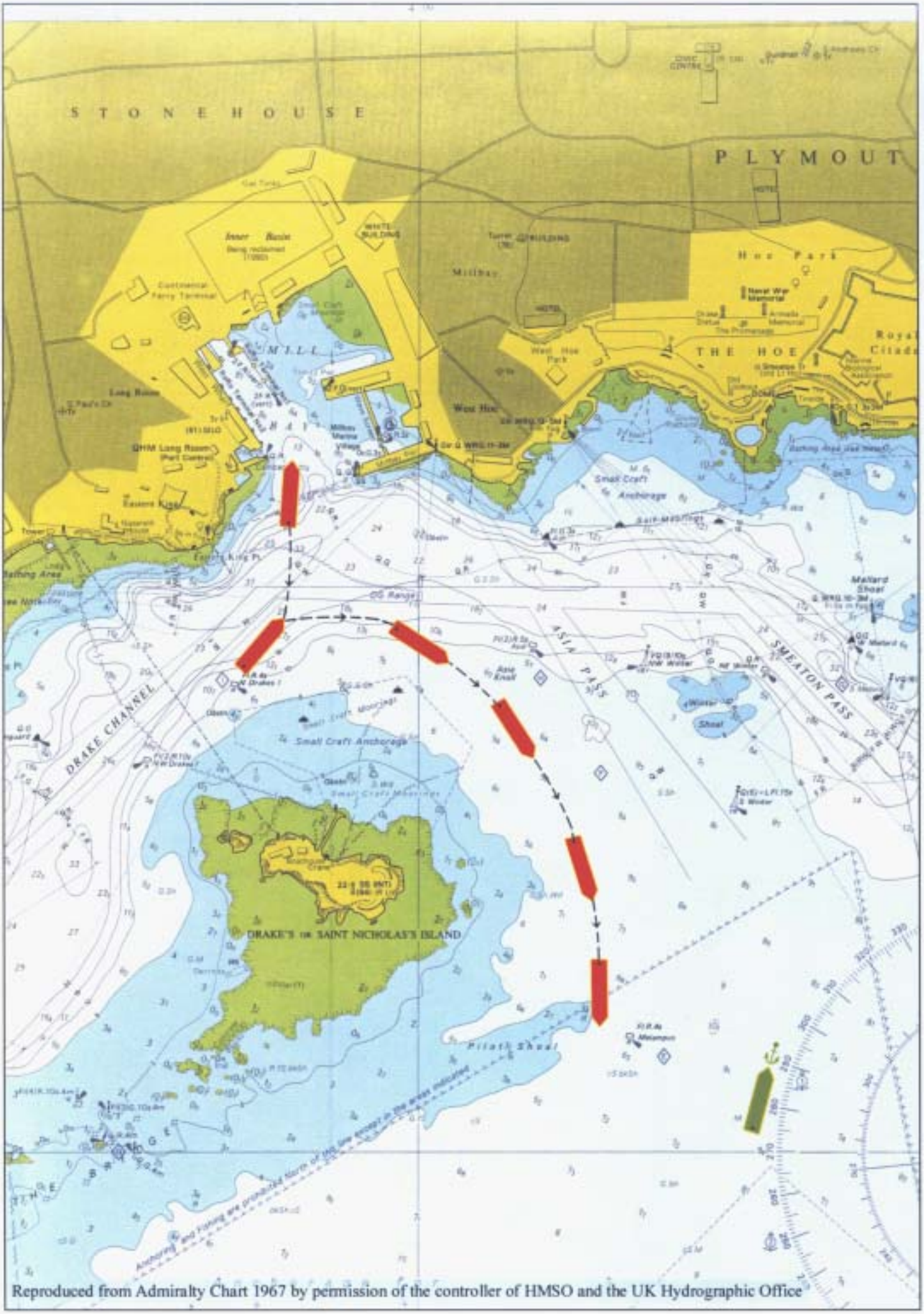
Vessel

Name	:	*Quiberon*
Type	:	Passenger/ro-ro cargo ferry
Call Sign	:	FNQI
Port of Registry	:	Morlaix, France
Length	:	129m
Beam	:	21.06m
gt	:	8314
Place of Build	:	Rendsburg, Germany
Date of Build	:	1975/6
Propulsion	:	4 Werkspoor diesel engines geared to two shafts with controllable pitch propellers
Propulsive Power	:	11,769kW
Classification	:	Bureau Veritas
Owner	:	Brittany Ferries
Crew	:	73 at the time of the accident
Passengers	:	271 at the time of the accident (max 1140)

Accident

Date of Accident	:	17 March 1999
Time of Accident	:	2346
Place	:	Near to Melampus buoy, Plymouth Sound
Weather	:	Wind WNW'ly 2; visibility good
Sea Conditions	:	Calm, negligible tidal stream
Injuries	:	None
Damage	:	Superficial
Pollution	:	None

Quiberon [photograph supplied courtesy of Brittany Ferries]



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SECTION 1 - FACTUAL INFORMATION

1.1 Background to the Accident

Brittany Ferries is a French company based in Roscoff. It operates a number of ro-ro passenger ferries on routes between ports in north-west France, southern England, Ireland and northern Spain.

One of its fleet, *Quiberon*, **(see Photo from Brittany Ferries)** operates a summer seasonal scheduled service for passengers, cars and freight lorries between Roscoff and the ports of Plymouth, and Cork. The Plymouth/Roscoff service had recommenced for the 1999 season on 13 March. The vessel's mid-week schedule consisted of an overnight sailing from Plymouth to Roscoff, followed by a lay-up period in Roscoff and then a five-hour return sailing to Plymouth in the evening. *Quiberon* had arrived in Plymouth and secured at the Mill Bay ferry terminal, at her scheduled time of 2130 on Wednesday 17 March. After her arrival, several other vessels arrived to anchor or moor to buoys in Plymouth Sound. One of them was *Helio* which anchored to take bunkers in No 1 anchorage.

1.2 Narrative of Events

At 2300, 30 minutes before the scheduled departure time, the radio officer arrived on the bridge to complete the pre-departure checklist. Information on the checklist included; the departure draughts of 4.9m forward and 5.05m aft; the predicted time of low water, 0004(18th); and the tidal coefficient 1.01(indicating spring tides).

The master went to the bridge before departure where he was shown the checklist and departure stability calculation. He was aware of the vessel's draught and the state of tide. At 2315, using the VHF radio, Longroom Port Control was called and notified of the vessel's intention to leave ten minutes later.

At 2330 *Quiberon* called Longroom Port Control to request permission to leave. This was granted and no other information was exchanged. Meanwhile the chief officer and a helmsman had joined the bridge team and *Quiberon* let go, clearing the berth at 2334.

The vessel moved astern out of Mill Bay and into Drake Channel. With the stern close to N Drakes Island buoy she was swung, bow to starboard, towards a south-easterly heading to begin the passage out to the west of Asia Pass **(see chart extract)**.

The master gradually increased ahead engine power, using the combinator controls at the starboard side of the wheelhouse, intending to reach the maximum permissible harbour speed of 10 knots. There was a gentle north-westerly breeze and good visibility.

Quiberon passed to the west of Asia buoy while continuing to increase speed and swing to starboard to round Drake's Island. The master, who was navigating by eye with occasional reference to the radars, became aware of two vessels at anchor to the east of Melampus buoy. One was showing a red light indicating that she was taking bunkers. Information later gathered from

port control confirms that *Helio* was taking bunkers in No1 anchorage and that RFA *Sir Bedivere* was anchored in No 2 anchorage. The master intended passing to the west of the anchored vessels.

By this time the combinator was set to enable *Quiberon* to work up to 10 knots and the master had moved away from the engine controls. As he turned the vessel towards Melampus buoy, he decided to pass to the west of it, to give the anchored vessels a wider berth. He had taken *Quiberon* to the west of the buoy a number of times previously.

The master, while continuing to navigate mainly by eye, gave helm orders to continue the slow starboard turn towards a more southerly heading. The master was conning the vessel to pass very close to the buoy. The vessel's speed was about 5 to 6 knots and still increasing, when suddenly he felt vibration as though the propellers were cavitating heavily. Immediately he pulled the combinator controls to zero setting. It was about 2346. He very soon realised that the vessel was aground, close to Melampus buoy.

Longroom Port Control called *Quiberon* at 2346 to ask whether she was all right. *Quiberon* replied that she had grounded. Arrangements for the assistance of a tug and pilot were put in hand by port control. The harbour pilot boarded at 0010 and reported to Longroom Port Control that the vessel's starboard quarter appeared to be aground on the edge of Pilot Shoal. *Quiberon* was very close to the west of Melampus buoy. The ship's crew, meanwhile, had sounded round and ascertained that she was not holed.

The harbour tug *Faithful* was made fast at 0033. Her immediate attempt to pull *Quiberon* off the bank was unsuccessful. However, as the tide rose, the vessel was successfully towed off at 0049 and taken to the north-east of Melampus buoy where the tug let go. *Quiberon* returned to Mill Bay ferry terminal under her own power. She was moored alongside at about 0115.

Commercial divers checked the vessel's hull and found only minor plating damage. *Quiberon* was able to resume her passage at 1430 on 18 March.

1.3 Environmental Conditions

The wind was recorded at Longroom Port Control as north-west at 10 knots. Low water in Plymouth was predicted for 0004 on 18 March. It was a period of spring tides. The height of tide at the time in the position of the grounding was about 0.8m above chart datum, and there was negligible effect from tidal streams. It was dark and there was no moon.

1.4 The Officers

The master was 51 years old. He was first promoted to command in 1981 while serving on Truckline Ferries, a subsidiary freight ferry company of Brittany Ferries. He subsequently transferred to work on the passenger ferries. He held pilotage exemption certificates (PECs) for the UK ports of Poole, Portsmouth and Plymouth. The PEC for Plymouth was obtained in 1996 when he was first appointed to serve on *Quiberon*. He worked a routine of one week on duty followed by one week off. His last duty period had started on Friday 12 March, when he took the vessel from St Malo to Roscoff in preparation for the start of the summer service. He was in

command on the bridge and had the con at the time of the accident. He was controlling the vessel's heading by giving helm orders to the helmsman and controlling the propulsion by using the combinator controls situated on the starboard side of the bridge. He was navigating and judging distances by eye and with occasional reference to the radar.

The chief officer was 39 years old. He had obtained a master's certificate of competency in 1987 and had been chief officer on ferries since 1989. In common with most chief officers serving with Brittany Ferries, he did not hold a PEC. He worked a routine of one week on duty followed by one week off. His last duty period had started earlier on 17 March. He was on the bridge at the time of the accident. His role during a port passage in good visibility had been to carry out harbour communications; to act as a lookout, to draw the master's attention to lights, ships and other hazards; to watch how the master piloted the vessel with a view to gaining experience; and, to generally assist the master. He monitored the master's navigation and judged distances by eye with occasional reference to the radar.

1.5 Pilotage Exemption Certificates

To obtain a pilotage exemption certificate for the port of Plymouth an applicant must be the bona fide master or first mate of a vessel. He or she must undertake 12 trips while being overseen by a licensed pilot, six of these must be inbound and six out. Four of the passages must be conducted during the hours of darkness. The applicant then has to undergo the same oral examination as a licensed pilot. When a PEC is issued, it is specific to one berth and one vessel. Thereafter, a PEC holder must conduct 12 trips annually to maintain the currency of the certificate.

1.6 Bridge Team Management

There was no formal passage plan for *Quiberon*'s departure. Although the pre-departure checklist showed draught and height of tide information, it was not used as the basis of a passage plan. Nothing was marked on the chart.

The vessel had entered the harbour through the Sound two hours earlier. Therefore, the master on departure, had some recent knowledge of the positions of ships at anchor, and a general impression of the traffic situation in the Sound. An update of this knowledge was neither requested from, nor offered by, Longroom Port Control during the brief pre-departure communications, although several ships had meanwhile entered the harbour.

The master had been content to move astern out of Mill Bay before deciding the route to take, by which time he could see and assess the traffic situation himself. He decided to pass west of Asia Pass; this is a common procedure for outbound ferries. The normal route then takes the vessel to the east of Melampus buoy before altering towards the Plymouth breakwater entrance. He was controlling the engines himself from the starboard side of the bridge, gradually increasing the engine power to give full harbour speed. He was judging the positions of anchored vessels and generally navigating by eye. He did not communicate the route or his intentions to the chief officer. The master was piloting the vessel, and the chief officer was there to assist him. The chief officer had no role in the navigation, apart from watching the actions of the master to learn about the pilotage.

As the vessel approached Melampus buoy the master decided to pass to the west of it to give the anchored vessels more room. He had done this previously and, although he knew that he must keep close to the buoy, he did not think the proposed action was hazardous. He neither referred to the chart, nor did he tell the chief officer of his changed intentions. The decision was taken on the spur of the moment, and his assessment of the safety of the manoeuvre was based solely on past experience.

As the master conned the vessel towards the buoy, both he and the chief officer were judging the vessel's position and her distance from the buoy by eye. It was dark, there was a new moon and the buoy itself could not be seen. Only its light was visible, flashing red every four seconds. The vessel's position and distance off the buoy was misjudged, and the vessel grounded on the easterly end of Pilot Shoal.

1.7 The Role of Longroom Port Control

The Cattewater Harbour Commissioners are the competent harbour authority in the port of Plymouth but the district is, in terms of vessel traffic services (VTS), administered by the Queen's Harbour Master at Longroom Port Control.

The personnel manning Longroom Port Control were monitoring the situation using the port radar system and VHF radio. At 2346, they noticed that *Quiberon* appeared to be in trouble and asked if she was all right, before they were told she had grounded.

Quiberon was required to seek permission from port control before leaving her berth. This was done at 2330. It was normal practice for Longroom Port Control to offer information about vessels moving in the Sound. No such information was passed on this occasion, nor was any reference made to the ships at anchor.

Quiberon normally let port control know of her intended route out after she cleared Mill Bay. A typical report would have been "west of Asia" for instance. There was no such communication on this occasion.

1.8 Fatigue

The master had had opportunities to rest during the day before the accident. In general, the schedule of sailings being maintained by *Quiberon* is not an unduly onerous one for the master.

The chief officer had rejoined the vessel from leave on the day of the accident.

There is no evidence to suggest that fatigue was a contributory factor.

1.9 The Vessel

All relevant machinery and instrumentation were working correctly before, during and after the accident.

1.10 Subsequent Action

Since the accident the Queen's Harbour Master has reviewed the communication practices of Longroom Port Control and enhanced procedures are now in place. These include the customary passing of tidal information.

SECTION 2 - ANALYSIS

2.1 The Decision to Pass West of Melampus Buoy

The distance between the end of Pilot Shoal and Melampus buoy is only 80m. The depth of water over the east end of Pilot Shoal was about 4.2m at the time of the grounding. The vessel's maximum draught was 5.05m and her beam is 21m. The safety of the vessel and, ultimately, that of her crew and passengers, depended on the buoy being in the correct charted position and on the master's ability to judge exactly the distance of a flashing light at night and to con the vessel precisely to pass within metres of the buoy. In the event, the master misjudged the situation and failed to pass close enough to the buoy.

It is poor navigational practice to rely on the position of a buoy for close navigation. Buoys range on their moorings, and their positions are therefore imprecise, especially at low water. Taking into account the nature of the mooring and the depth and range of tide, the scope of each buoy in Plymouth Sound is calculated and regularly checked. The scope of Melampus buoy had been calculated to be a maximum of 25m. Its position and scope were checked soon after the accident and found to be correct. At the time of the grounding there was a spring tide and it was nearly low water; the buoy could, therefore, have been up to 25m from its charted position.

It is impossible to judge exactly the distance from a flashing light at night solely by eye. Even if radar had been used to assist the navigators, the tolerances allowed to pass safely between the buoy and the shoal were too small. There was an 80m wide passage that may have been reduced to 55m by the scope of the buoy. *Quiberon*'s beam is 21m.

The decision, taken on the spur of the moment, to pass to the west of Melampus buoy on the night of 17 March was, therefore, flawed. In taking the decision, the master relied solely on his knowledge and previous experience. He did not consult the chart or consider fully the implications of the predicted height of tide, his draught or the proximity of the shoal. There was no formal passage plan. Even a rudimentary passage plan formed with the information contained in the pre-departure checklist would have indicated that *Quiberon* could not pass to the west of Melampus buoy safely.

The originally intended route to the west of Asia pass and east of the Melampus buoy takes the vessel through designated anchorages. An alternative route lies further to the east, via the main channel and Smeaton Pass. This channel is kept clear of anchored vessels and fishing vessels but it is a longer route to the entrance. Masters of ferries, who are often operating to tight time schedules, will usually choose the shortest route, despite the extra hazards. The decision to vary the chosen route and pass to the west of the buoy was taken on the basis that it would leave more room for the vessels at anchor. However, it is also true that the chosen route further cut the corner towards the harbour entrance.

2.2 Bridge Team Management

1. The roles

There were four people on *Quiberon*'s bridge when she grounded. Apart from the master and chief officer, there was the radio officer, who had responsibility for communications, and a seaman on the helm.

Although the master and chief officer had specific roles, they did not function as a team. The master had taken sole responsibility for navigation and conning the vessel. He decided which route to follow, and conned the vessel accordingly, without telling the chief officer of his intentions. The master did not delegate sufficiently and, at times, found himself formulating the plan of action, controlling the engines, navigating and conning the vessel at the same time.

The chief officer's primary role was to assist the master in specific areas. It was not his responsibility to monitor the master's performance to check that the vessel was being safely navigated. His role in this respect was only to watch and learn about pilotage. In any case, without knowing the master's precise intentions in the form of an updated passage plan, he could not have monitored his performance adequately.

The chief officer was an experienced and well qualified officer whose capabilities were not used to their full extent within the bridge team.

2. The Lack of a Passage Plan

In a close pilotage situation it is customary for the pilot (or PEC holder) to con the vessel by eye using his local knowledge. It is also customary for the pilot to communicate his intentions to the bridge team so that they can fulfil their responsibilities to ensure the vessel is being navigated safely. Where the master, as PEC holder, is acting as pilot, he too must communicate his plan to another responsible officer who can provide a check on safe navigation. A single mistake by any member of the team, must not be allowed to go undetected and threaten the safety of the vessel.

To this end, simple passage planning and good two-way communication between the officers are essential. If the master is conning the vessel by eye, the chief officer should plot positions on the chart, and check her progress against the agreed plan, reporting any concerns or discrepancies to the master. Dangerously shallow areas close to the vessel's intended route should be clearly indicated on the chart by cross hatching in pencil or similar. This sort of preparation becomes especially important when plans are changed at the last minute, as inevitably they will be on occasions. The chart should be central to the passage plan, and should give a clear and instant indication of safe water in case of emergency. The positions of anchored vessels close to the intended track should be plotted as soon as they are known. It is only with this sort of pro-active approach to the navigation of the vessel that safety can be assured.

The lack of any sort of formal passage plan was a direct causal factor in *Quiberon*'s grounding.

2.3 Communication with Longroom Port Control

Longroom Port Control has a role to play in passing relevant traffic information to vessels.

On departure, the master did not receive any traffic information from the VTS at Longroom Port Control.

It is their role to appraise masters and pilots of the traffic situation and likely hazards to safe navigation. Of particular relevance was the newly arrived vessel in No 1 anchorage, which was taking bunkers and therefore needed a wide berth.

The ability for Longroom Port Control to give appropriate information was reduced by not knowing the intended route of *Quiberon*. The master normally let port control know but, on this occasion, did not.

Better communications between *Quiberon* and Longroom Port Control would have made the accident less likely and would have demonstrated good VTS practice.

2.4 Previous Occurrences

The master had taken *Quiberon* to the west of Melampus buoy on previous occasions.

The wisdom of taking a sizeable vessel to the west of Melampus buoy at any state of tide is considered questionable, and indicates a degree of complacency on the part of the master.

SECTION 3 - CONCLUSIONS

3.1 Findings

1. *Quiberon* grounded on the extreme eastern end of Pilot Shoal at 2334 on 17 March 1999. [1.2]

2. The vessel was only superficially damaged and there was no pollution. [1.2]

3. The weather conditions at the time were good. [1.2]

4. There were four people on the bridge at the time of the accident. [2.2]

5. *Quiberon* was making about 5-6 knots at the time of the grounding. [1.2]

6. Navigation was being conducted mainly by eye. [1.2]

7. The detail of the passage was not pre-planned. [1.6]

8. The master had decided, on the spur of the moment, to pass to the west of Melampus buoy. [1.6]

9. The master was very experienced and the holder of a PEC. [1.4]

10. Fatigue was not a contributory factor. [1.8]

11. All the relevant machinery and instrumentation were working correctly. [1.9]

12. The Queen's Harbour Master has since reviewed the communication practices of Longroom Port Control and enhanced procedures are now in place. [1.10]

3.2 Causes

1. The Immediate Cause

The direct cause of the accident was a misjudgment made by the master while conducting close navigation of the vessel. [2.1]

2. Other causes and underlying factors

The decision to pass to the west of Melampus buoy without establishing that it was reasonable and safe to do so. [2.1]

Poor bridge team management in that:
- there was no passage plan;
- the chart was not used;
- the master did not communicate his intentions to the chief officer;

- the role of the chief officer did not include monitoring the master's performance against an intended plan;
- the chief officer's knowledge and experience was not fully utilised;
- best use was not made of the bridge navigational equipment, especially radars. [2.2]

Poor communication of relevant facts between Longroom Port Control and *Quiberon*. [2.3]

A degree of complacency on the part of the master in that *Quiberon* had been taken to the west of Melampus buoy in the past. [2.4]