Report on the investigation of

the grounding of

mfv Horizonte Claro

Soyea Island, Loch Inver

21 October 2000

Marine Accident Investigation Branch
First Floor
Carlton House
Carlton Place
Southampton
United Kingdom
SO15 2DZ

Report No 23/2001

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

BA	-	British Admiralty
BBC	-	British Broadcasting Corporation
DGPS	-	Differential Global Positioning System
GPS	-	Global Positioning System
m	-	metre
MCA	-	Maritime and Coastguard Agency
Met Office	-	Meteorological Office
MGN	-	Marine Guidance Note
MRSC	-	Maritime Rescue Sub Centre
UK	-	United Kingdom
UTC	-	Universal Time Co-ordinated
VHF	-	Very High Frequency

SYNOPSIS

The 38.99m long, Spanish-registered fishing vessel *Horizonte Claro* landed her catch in Loch Inver, Scotland, on 20 October 2000. She then sailed at about midnight to return to the fishing grounds. Twenty minutes later she ran aground. Her crew had not detected that she had departed from her intended track to the south of Soyea Island, and she grounded to the east of it. There were no injuries and the crew was taken off by the Lochinver lifeboat. *Horizonte Claro* was refloated the next day by the coastguard tug *Anglian Prince*, and towed to Stornoway for survey and repair.

Maritime Rescue Sub-Centre (MRSC) Stornoway reported the accident to the MAIB by fax at 0030 UTC on 21 October, and an investigation started later that day.

The report concludes that several factors probably caused the departure from the planned track to remain undetected:

- Heavy rain reduced visibility and degraded the radar picture.
- The skipper relied completely on the video plotter for positional information.
- The video plotter was used primarily for fishing purposes, and was inadequate for the safe navigation of the vessel.
- Lookouts were not placed outside the wheelhouse as soon as visibility reduced.

In recent years, over-reliance on video plotters has caused, or contributed to, several accidents at sea. The primary recommendations in this report are aimed at improving the awareness of the dangers of such practice among watchkeepers in Spanish-registered fishing vessels operating from UK ports. Others are aimed at improving safety at sea by discouraging the consumption of alcohol before sailing, and ensuring lifesaving equipment is available for immediate use.

SECTION 1 - -FACTUAL INFORMATION

1.1 PARTICULARS OF *MFV HORIZONTE CLARO* AND ACCIDENT

Vessel details

Registered owner	:	Marbasa SA
Port of registry	:	Ondarroa,Spain
Flag	:	Spain
Type	:	Fishing Vessel
Built	:	1976 Ast Balenciaga
Construction	:	Steel
Length overall	:	38.99m
Gross tonnage	:	240
Classification	:	Bureau Veritas
Engine type	:	Oil engines, geared drive
Service speed	:	12.7 knots

Accident details

Time and date	:	0020(UTC+1) on 21 October 2000
Location of incident	:	58° 08.64N 005°18.32W. 090° 0.11 miles from Soyea Island
Persons on board	:	14
Injuries/fatalities	:	None
Damage	:	Minor damage was confined to the bar keel forward and to the rudder

Figure 1

Horizonte Claro alongside in Stornoway awaiting repair

1.2 BACKGROUND All times are UTC(+1)

Horizonte Claro was one of a number of Spanish and French vessels which operate in the fishing grounds off the UK, and land their catches in Lochinver for shipment by road to Spain and France. She sailed from Ondarroa, Spain on 10 October 2000 and, after several days fishing off St Kilda, arrived at Lochinver on 20 October to land her catch. The grounding occurred after sailing from Lochinver to return to the fishing grounds.

1.3 NARRATIVE

In company with *Txori-Erreka*, another Spanish fishing vessel, *Horizonte Claro* arrived at Lochinver at 0930 on 20 October and completed landing her catch of hake, prawns and monkfish by about 1130. While alongside, she took on water and general provisions. A technician also attended to investigate a defect on her MaxSea video plotter. *Horizonte Claro* was due to sail with *Txori-Erreka* at 1900, but problems with her refrigeration plant necessitated her taking on ice before departure. Tidal constraints prevented her from shifting to the ice factory berth until 2300 and, after taking on ice, she finally sailed at about midnight.

During the departure two deckhands, posted on each side to act as lookouts, accompanied the skipper in the wheelhouse. The autopilot was engaged and course was adjusted to follow the track in the MPS 100 video plotter. In addition to monitoring the plotter, the skipper also checked the vessel's position visually and by radar, using the 1.5 mile range scale. Speed was about 7 knots.

As the vessel passed to the south of Glas Leac light, the wind increased to between 30 and 35 knots from the south-west, and it started to rain heavily. At this point visibility became severely restricted and, due to the clutter and false echoes induced by the weather, both of the wheelhouse radar displays became unusable. The skipper tried improving the quality of the radar pictures by adjusting the radar controls, but was unable to do so. He continued to adjust the course set on the autopilot to follow the track in the MPS 100 plotter, which was now his only method of monitoring position. The courses set on the autopilot are not known.

At about 0019, the skipper directed both lookouts to move outside the wheelhouse. One of them proceeded directly to the bow and saw land close by, directly ahead; he shouted immediately to the skipper to go astern. The skipper responded by putting the helm hard to port. Seconds later, at about 0020, *Horizonte Claro* grounded. Immediately, the skipper called the vessel's agent at home in Lochinver via VHF radio. He stated he was on the rocks on the south side of Soyea Island and required the lifeboat immediately. The agent alerted the coastguard quickly and the Lochinver lifeboat was activated. While waiting for the lifeboat, the skipper and crew of *Horizonte Claro* surveyed the vessel internally to ensure that her watertight integrity had not been breached. No attempt was made to refloat the vessel using the vessel's engine.

The lifeboat arrived on scene at 0048 with a Spanish-speaking representative of the vessel's agent on board, and found the vessel on the east side of Soyea Island in position 58° 08.64 N, 005° 18.32W; she was listing to starboard. The lifeboat coxswain was prepared to receive all personnel into the lifeboat, and passed this suggestion to the vessel via the agent's representative. During the transfer, which was completed by 0103, none of the crew was seen to be wearing lifejackets. The skipper was the last person across, having shut down the engines before leaving. The lifeboat coxswain and the skipper did not discuss towing the vessel off the rocks. The lifeboat returned to Lochinver at 0118 where she was met by the Lochinver coast rescue team and the vessel's agent.

Crew from the coastguard tug *Anglian Prince* boarded *Horizonte Claro* at 0845. There was no other sign of water ingress. The liferafts had not been used following the grounding and they remained lashed down on the wheelhouse roof. *Anglian Prince* successfully refloated *Horizonte Claro* at 1320, and towed her to Stornoway for survey and repair.

1.4 THE SKIPPER AND CREW

The Spanish skipper had joined the vessel on 10 October 2000 in Ondarroa. He had five years experience in this type of vessel and had operated from Lochinver on numerous occasions. He was well rested, having slept for about 3 hours in the afternoon before sailing, and for about 8 hours the previous night. The mate, who was also Spanish, and the remaining crew, who were a mix of Spanish and Portuguese, had been on board for at least one year. Neither the skipper nor crew spoke English.

1.5 ALCOHOL

The skipper had consumed one Irish coffee at lunchtime on 20 October; this was the only alcohol he drank that day. The quantity of alcohol consumed by the crew prior to sailing, however, is not known. Some eye-witness reports indicate that, following the grounding, many of the crew smelled of alcohol, were staggering, and were unable to climb a vertical ladder from the lifeboat to the jetty without considerable assistance. Other accounts state there was no evidence of alcohol consumption among the crew.

1.6 NAVIGATIONAL EQUIPMENT

The wheelhouse was fitted with a Furuno and an Anritsu radar, an MLR Electronique MPS 100 video plotter, a Sercel NR51 DGPS receiver, an MLR Electronique CMO15 GPS receiver, and an echo sounder. This equipment appeared to be working correctly both prior to sailing and alongside in Stornoway. The magnetic compass was believed to be accurate and was last adjusted in July 2000. A MaxSea video plotter, capable of displaying electronic charts, was fitted, but was defective and not in use.

The MPS 100 plotter displayed a latitude and longitude grid only; it was primarily used when fishing and could not display electronic charts. During the departure from Lochinver, the plotter was operating on a 1:32000 scale with separate symbols indicating the vessel's positions input from the DGPS and GPS receivers. At this scale, the width of the DGPS and GPS position markers was about 100m. The MPS 100 plotter did not have a cross-track-error alarm facility.

The technical specifications of the wheelhouse equipment are unknown, as are the datums against which the DGPS, GPS and MPS 100 plotter were displaying positional information.

1.7 THE DEPARTURE TRACK

The vessel's intended track was displayed on the plotter. It was based upon waypoints inserted at intervals during a previous entry or departure, and is shown at **Figure 2**. The skipper was of the opinion that, during the departure and when aground, there was no appreciable difference between the DGPS and GPS positions, and both indicated the vessel was on the track displayed on the plotter.

1.8 KEEPING A SAFE NAVIGATIONAL WATCH ON FISHING VESSELS

Marine Guidance Note (MGN) 84(F) which is published by the Maritime and Coastguard Agency (MCA), provides useful guidance on watchkeeping practices and states:

*Over-reliance on **video plotters** has been a factor in several recent collisions and groundings. Using an electronic system does not remove the need for proper passage planning and navigation, using appropriately scaled paper charts. Assessments or assumptions based on video plotters alone are dangerous and unreliable. A video plotter used for fishing purposes is not adequate for safe navigation.*

If you use a video plotter, bear in mind the limitations of this type of equipment and always cross check the accuracy of your position, course and speed. Equipment of this type may be an aid to navigation, but it cannot replace the fundamental need to maintain a visual lookout.

MGN 63(M+F) also provides useful advice regarding the use of electronic aids to navigation. *Horizonte Claro* did not carry a copy of these or other relevant MGNs which were available in English on the MCA's website.

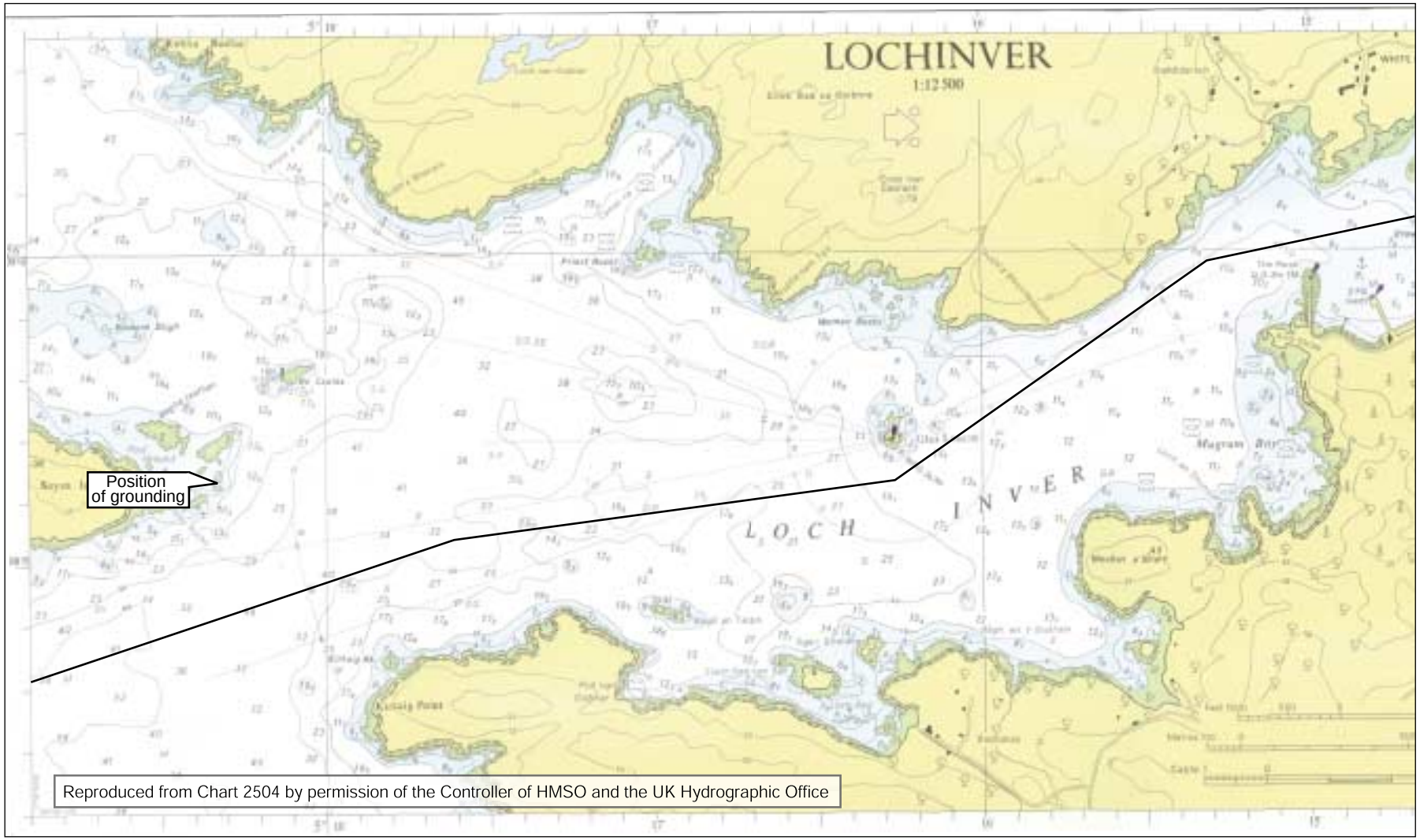

Figure 2

Intended track and position of grounding of *Horizonte Claro*

1.9 LOCH INVER

Chart BA 2504 was available, but not used, and did not show *Horizonte Claro*'s departure track. The datum shift shown on the chart when plotting satellite derived positions is 0.08 miles eastwards and 0.02 miles northwards, and the charted magnetic variation was 7°24'W.

Admiralty Sailing Directions (West Coast of Scotland) states:

The main entrance to Loch Inver is between Kirkaig Point and Soyea Island, 5 cables NW, as the route NE of Soyea Island is restricted to vessels with a draught of less than 5m.

Between Lochinver Harbour and Soyea Island, Glas Leac light is the only aid to navigation. The sectored white, red and green light has a nominal range of 5 miles, with the white sectors indicating the safe water in the channels to the north and south of Soyea island and the harbour approaches. The limits of Lochinver harbour, under the control of the Highlands and Islands Council, extend to seaward as far as Glas Leac. Thereafter the Northern Lighthouse Board is responsible for the maintenance of navigation aids.

1.10 WEATHER FORECASTS

Weather forecasts issued by the Meteorological Office on 20 October 2000 for the area from the Mull of Kintyre to Cape Wrath were:

At 1630: Wind: south or southeast veering west or southwest, Gale 8 to Storm 10, decreasing 4 or 5 later. Weather: showers, squally at first. Visibility: moderate or poor becoming good. Sea State: very rough becoming rough later.

At 2330:Wind: west or southwest, 6 to Gale 8, decreasing 4 or 5, backing southerly later. Weather: showers, squally at first. Visibility: moderate or good. Sea State: very rough becoming rough later.

Although copies of weather forecasts were available from the agent's office, the skipper relied mainly on BBC radio for this information. A weather forecast was received prior to sailing.

1.11 ENVIRONMENTAL CONDITIONS

Predicted high water at Lochinver was at 0217 on 21 October; the height was 4.2m and it was about 90% springs. The height of tide at 0015 was about 3.6m. Tidal streams have no significant effect in the approaches to Lochinver. Wind was south-west force 6 to 7.

SECTION 2 - ANALYSIS

2.1 SAFE NAVIGATION AND PROPER LOOKOUT

With the skipper and two deckhands in the wheelhouse, two serviceable radars, a GPS and a DGPS receiver, a video plotter, an echo sounder, and chart BA 2504 available, *Horizonte Claro* was adequately manned and equipped to safely depart Lochinver and maintain a proper lookout. After sailing, the skipper's primary method of monitoring the vessel's position was using the video plotter, but he was not reliant upon it. He was also able to check the vessel's position by radar and visual references. On passing Glas Leac, however, the situation altered significantly, as visibility was reduced and the radar pictures degraded with the onset of heavy rain. Apparently, unable to obtain radar and visual references, such as Soyea Island and the light on Glas Leac, the skipper was now totally reliant on the video plotter for keeping the vessel on track and clear of navigational dangers. Better use of the equipment and manpower available, however, could possibly have reduced this dependency.

By not showing the vessel's departure track on chart BA 2504, or using the chart during the departure, the skipper denied himself two alternative methods of verifying his position. First, as it would have taken about 8 minutes to transit from Glas Leac to the position of grounding, it is unlikely that, in the windy and squally conditions, all radar conspicuous features within Loch Inver would have been obscured for the entire period. Several probably would have been discernible, albeit briefly, and could have been used in conjunction with the chart to derive positional information through the plotting of radar ranges and bearings. Second, the latitude and longitude positions shown on either the DGPS or GPS receiver could have been plotted on the chart after applying the datum shift. The plotting of either radar ranges and bearings or DGPS/GPS information on a chart showing the planned navigational track would not only have shown the vessel's position relative to the planned track but also the proximity of navigational dangers.

It is also possible that the lookouts could have been used more effectively. Even though the lookouts were readily available in the wheelhouse, they were not posted outside until immediately before the grounding. This was about 7 minutes after the onset of reduced visibility. Had this action been taken as soon as it was apparent the radar pictures were unusable, and that visibility from inside the wheelhouse was severely reduced, Soyea Island might have been sighted in time to allow effective avoiding action to be taken.

2.2 SOURCES OF ERROR

The accuracy of a video plotter is dependent on the accuracy and interface of its inputs and how the information is displayed. In this case, as the skipper reported that the DGPS and GPS ship marks were apparently on the track in the plotter throughout the departure to the time of grounding, there must have

been one or more errors in either the received or displayed positions, the track, or the skipper's assessment. The source of the discrepancy, however, between the vessel's position by plotter and her position when grounding, which was about 400m, is not obvious. The error could not have been constant; it must have increased as the vessel proceeded to the west, otherwise she would always have been 400m to the north of the planned track, and would have passed to the north of Glas Leac. An error caused by differences in the datums used by the DGPS and GPS receivers, and the plotter, would have produced a constant error over such a short distance and can, therefore, probably be discounted. A GPS error of this magnitude, although not impossible, is unlikely and would have resulted in a difference between the DGPS and GPS ship symbols that should have been apparent to the skipper. The track should also have been accurate, being recorded on to the plotter using actual positions during a previous entry or departure and, therefore, not susceptible to plotting errors when transferring waypoints from a chart.

In the absence of the technical specifications of the equipment in use, details of the datums against which they were operating, or recorded positional information, the source or sources of the error cannot be determined. Irrespective of the source of the error, however, the accident probably would not have occurred if the plotter had not been the only method in use for assessing the vessel's position. The plotter, which was primarily used for fishing purposes, was on a 1:32000 scale in confined waters where the width of the position markers was about 10% of the navigable water, displayed no cartographic information, and, consequently was inadequate for safe navigation. The skipper's report of being aground on the south side, rather than the east side, of Soyea Island was perhaps indicative of the paucity of information available via the plotter and his inaccurate appreciation of the vessel's position.

2.3 DISTRIBUTION OF MARINE GUIDANCE NOTES

MGNs 84(F) and 63(M+F) provide useful guidance to fishing vessels, not only regarding the use of video plotters, but also on many other topics relating to keeping a safe navigational watch. *Horizonte Claro* did not hold a copy of these MGNs. Had the skipper been aware of their contents, and heeded the advice regarding the use of video plotters, radars and other electronic aids, this accident might have been avoided.

2.4 ACTIONS FOLLOWING THE GROUNDING

After grounding, the skipper very quickly requested assistance via the agent. The availability of the vessel's Spanish-speaking agent ashore via VHF radio outside office working hours enabled the coastguard to be alerted almost immediately, which otherwise might not have been the case. The agent's provision of a Spanish-speaking representative in the lifeboat also resolved any potential language difficulties during the rescue of the crew.

Apart from requesting help, and checking there was no water ingress resulting from the grounding, the crew appear to have taken no other precautions. Lifejackets were not donned, and the liferafts remained lashed down on the wheelhouse roof. While the skipper might have known that the lifeboat was on its way and the vessel was reasonably steady, it would have been prudent to order the wearing of lifejackets, and prepare the liferafts. When aground, a vessel is completely vulnerable and at the mercy of the elements. It only takes one large wave to cause serious damage and the crew must be prepared to abandon ship at short notice. Liferafts should never be lashed down. Had they been required in an emergency, the lashings would have certainly delayed, if not prevented, their use. The wearing of lifejackets for the transfer to the lifeboat, which was at night and in poor weather, would also have been a prudent measure.

2.5 ALCOHOL

Alcohol is not considered to have been a factor in the grounding but, had the conditions and damage been more severe and help not so readily to hand, the chances of survival of those who were possibly under the influence of alcohol might have been severely reduced. Had the crew been forced to abandon *Horizonte Claro* before the lifeboat arrived, any crew requiring assistance to disembark from the lifeboat in Lochinver would probably have also needed help to get into a liferaft. In such a situation, those crew would have been a liability and might have endangered the lives of others.

2.6 NAVIGATION IN LOCH INVER

Loch Inver is relatively steep-to and has very few unmarked dangers for a vessel of *Horizonte Claro*'s size. At night the approach channels are marked by the sectored white light on Glas Leac, and, in reduced visibility, there are numerous radar conspicuous features which can be used to determine a vessel's position. If no navigation marks are visible, or a vessel's position cannot be determined by radar, the waters are too confined to rely on the accuracy of a video plotter alone.

SECTION 3 - CONCLUSIONS

3.1 FINDINGS

3.1.1 *Horizonte Claro* grounded on the east side of Soyea Island at about 0020 on 21 October 2000. [1.3]

3.1.2 The grounding was not the result of any mechanical failure. [1.3]

3.1.3 The grounding occurred about 400m north of the intended track. **[Fig 2]**

3.1.4 The grounding occurred about two hours before high water in Lochinver at a speed of about 7 knots. [1.3,1.11]

3.1.5 The crew did not attempt to refloat the vessel. [1.3]

3.1.6 The vessel was not seriously damaged during the grounding, and was later refloated by *Anglian Prince* and towed to Stornoway. [1.3]

3.1.7 The departure tracks were displayed on the MPS 100 video plotter, but not on chart BA 2504. [1.3, 1.6]

3.1.8 Two lookouts accompanied the skipper in the wheelhouse for the departure. [1.3]

3.1.9 With the exception of the MaxSea video plotter, all other navigation equipment was believed to be working correctly. [1.6]

3.1.10 On passing Glas Leac light at about 0012, heavy rain reduced visibility and degraded the radar displays. [1.3]

3.1.11 The skipper was unable to improve the quality of the radar displays by adjusting the controls. [1.3]

3.1.12 The skipper became totally reliant on the MPS 100 plotter for monitoring the ship's position. [1.3]

3.1.13 The MPS 100 plotter displayed a latitude and longitude grid only; it did not display electronic charts. [1.6]

3.1.14 Positional information in the MPS 100 plotter was supplied by GPS and DGPS inputs. [1.6]

3.1.15 The lookouts were not posted outside the wheelhouse until immediately prior to the grounding. [1.3]

3.1.16 Course and speed were maintained until the skipper was alerted by a lookout. [1.3]

3.1.17 Avoiding action was taken, but it was too late to be effective. [1.3]

3.1.18 The skipper was familiar with the approaches to Lochinver. [1.4]

3.1.19 The skipper and crew were either Spanish or Portuguese, and spoke no English. [1.4]

3.1.20 The skipper was well rested and not under the influence of alcohol. [1.4]

3.1.21 It is possible that some of the crew had been drinking and required assistance to disembark from the lifeboat. [1.3,1.5]

3.1.22 The skipper received a weather forecast prior to sailing. [1.9]

3.1.23 The skipper did not hold a copy of MGNs 84(F) or 63(M+F). [1.7]

3.1.24 The availability of the Spanish-speaking agent in Lochinver to respond to the skipper's VHF radio call enabled the lifeboat to respond rapidly. [1.3,2.4]

3.1.25 The presence of the agent's Spanish-speaking representative of the agent in the lifeboat resolved potential language difficulties when the crew were transferred to the lifeboat. [1.3,2.4]

3.1.26 None of the crew wore lifejackets. [1.3]

3.1.27 The liferafts were lashed to the wheelhouse roof. [1.3]

3.2 CAUSES

The immediate cause

3.2.1 The immediate cause of the accident was that the skipper was unaware that *Horizonte Claro* was about 400m north of the intended track and heading towards Soyea Island. [2.1,2.2]

Other causes and underlying factors

3.2.2 Heavy rain reduced visibility and degraded the radar picture. [2.1]

3.2.3 The skipper was totally reliant on the MPS 100 video plotter for the safe navigation of the vessel in confined waters. [2.1,2.6]

3.2.4 The skipper's assessment of the vessel's position, based upon the MPS 100 plotter, was inaccurate. [2.2]

3.2.5 The MPS 100 plotter, primarily used for fishing purposes, was not adequate for safe navigation. [1.6,2.2]

3.2.6 The skipper was apparently unable to utilise positional information from the degraded radar picture. [2.1]

3.2.7 DGPS and GPS positions were not plotted on the paper chart. [2.1]

3.2.8 The lookouts were not posted outside the wheelhouse when visibility reduced. [2.1]

SECTION 4 - RECOMMENDATIONS

The owner, Marbasa SA is recommended to:

1. Ensure that all of its skippers are aware of the dangers of over-reliance on video plotters for the safe navigation of their vessels and the correct use of electronic aids to navigation as highlighted in MGNs 84(F) and 63(M+F).

2. Discourage crews from consuming alcohol when ashore, immediately prior to sailing.

3. Ensure that liferafts on its vessels are ready for immediate use.

The Maritime and Coastguard Agency is recommended to:

4. Liaise with the Spanish administration, advising it of the existence of MGNs 84(F) and 63(M+F), and recommending it to relay them, and other relevant MGNs, to the owners and skippers of vessels which operate from UK ports.

Marine Accident Investigation Branch
May 2001