Report on the investigation of

the grounding of

mv Harvest Caroline

Tanera More, Summer Isles

north west coast of Scotland

31 October 2006

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

Report No 13/2007
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Extract from

The United Kingdom Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2005 – Regulation 5:

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

NOTE

This report is not written with litigation in mind and, pursuant to Regulation 13(9) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	-	Able Seaman
AIS	-	Automatic Identification System
ALB	-	All weather lifeboat
BA	-	British Admiralty
DNV	-	Det Norske Veritas
DOC	-	Document of Compliance
DP	-	Designated Person
ECS	-	Electronic Chart System
ETV	-	Emergency Towing Vessel
GPS	-	Global Positioning System
IACS	-	International Association of Classification Societies
ICS	-	International Chamber of Shipping
IMO	-	International Maritime Organization
INSB	-	International Naval Surveys Bureau
IRCA	-	International Register of Certificated Auditors
ISM	-	International Safety Management
ISPS	-	International Ship and Port Facility Security Code
MCA	-	Maritime and Coastguard Agency
MEPC	-	Maritime Environment Protection Committee
MGN	-	Marine Guidance Note
MSC	-	Maritime Safety Committee
NIS	-	Norwegian International Shipping Register
OOW	-	Officer of the Watch
PAN PAN	-	International Urgency Call

SAR	-	Search and Rescue
SMC	-	Safety Management Certificate
SMS	-	Safety Management System
SOLAS	-	International Convention for the Safety of Life at Sea
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping incorporating the 1995 Amendments
VHF	-	Very High Frequency
UK	-	United Kingdom
UTC	-	Universal Co-ordinated Time

SYNOPSIS

Shortly after 0500 on 31 October 2006, the 712 grt general cargo ship *Harvest Caroline* started to drag her anchor in strong northerly winds. The ship was blown about 8 cables until she grounded on the eastern side of Tanera More, Summer Isles, at 0545. The crew were alerted as the ship started to take the ground and, although the engine was quickly started, the ship could not be re-floated.

At 0614, a PAN PAN call was transmitted to Stornoway Coastguard by VHF radio. A SAR helicopter, the Lochinver ALB, the ETV *Anglian Prince* and a shore rescue team were immediately activated and a female passenger was winched off the ship by the SAR helicopter at 0727. Shortly after 0940, *Harvest Caroline* re-floated on the rising tide and was taken in tow by *Anglian Prince* to Ullapool, where she arrived the same day. There was no pollution, and damage to the vessel was limited to indentations to the hull plating in way of the engine room. There were no injuries.

The investigation identified a number of factors which contributed to the ship dragging her anchor and subsequently grounding, including:

- The selected anchorage position was inappropriate in view of the depth of water, the anchor cable available and the predicted weather conditions.
- The length of anchor cable deployed was insufficient to prevent the holding power of the anchor from reducing in the strong northerly winds.
- The dragging of the anchor was not detected because the nominated OOW was in bed.

A number of factors affecting the overall safe operation of the ship were also identified during the investigation. These included:

- The safety management of the ship did not meet the objectives of the ISM Code.
- The ship manager had very little experience or expertise in ship management and operations.
- The ship's safety management system had not been properly established when the Interim Safety Management Certificate was issued on 30 May 2006, and was not tailored to the ship's operation.

To prevent a similar accident in the future, the ship manager has revised its instructions regarding bridge manning requirements when the ship is at anchor and has fitted a watch alarm. It has also taken action to improve the standard of safety management on board its vessel.

The MCA is preparing a proposal for submission to the IMO in July 2007, which recommends the provision of standards of competency required by designated persons be included in the Revised Guidelines on the implementation of the ISM Code by Administrations.

Recommendations made to the MCA, the St Vincent and the Grenadines Maritime Administration, and INSB aim to improve the effectiveness of ISM verifications and audits. A further recommendation to the MCA aims to assist the monitoring of the quality of ships operating predominantly in UK waters.


FERGUSON
TRANSPORT
HARVEST CAROLINE

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *HARVEST CAROLINE* AND ACCIDENT

Vessel details

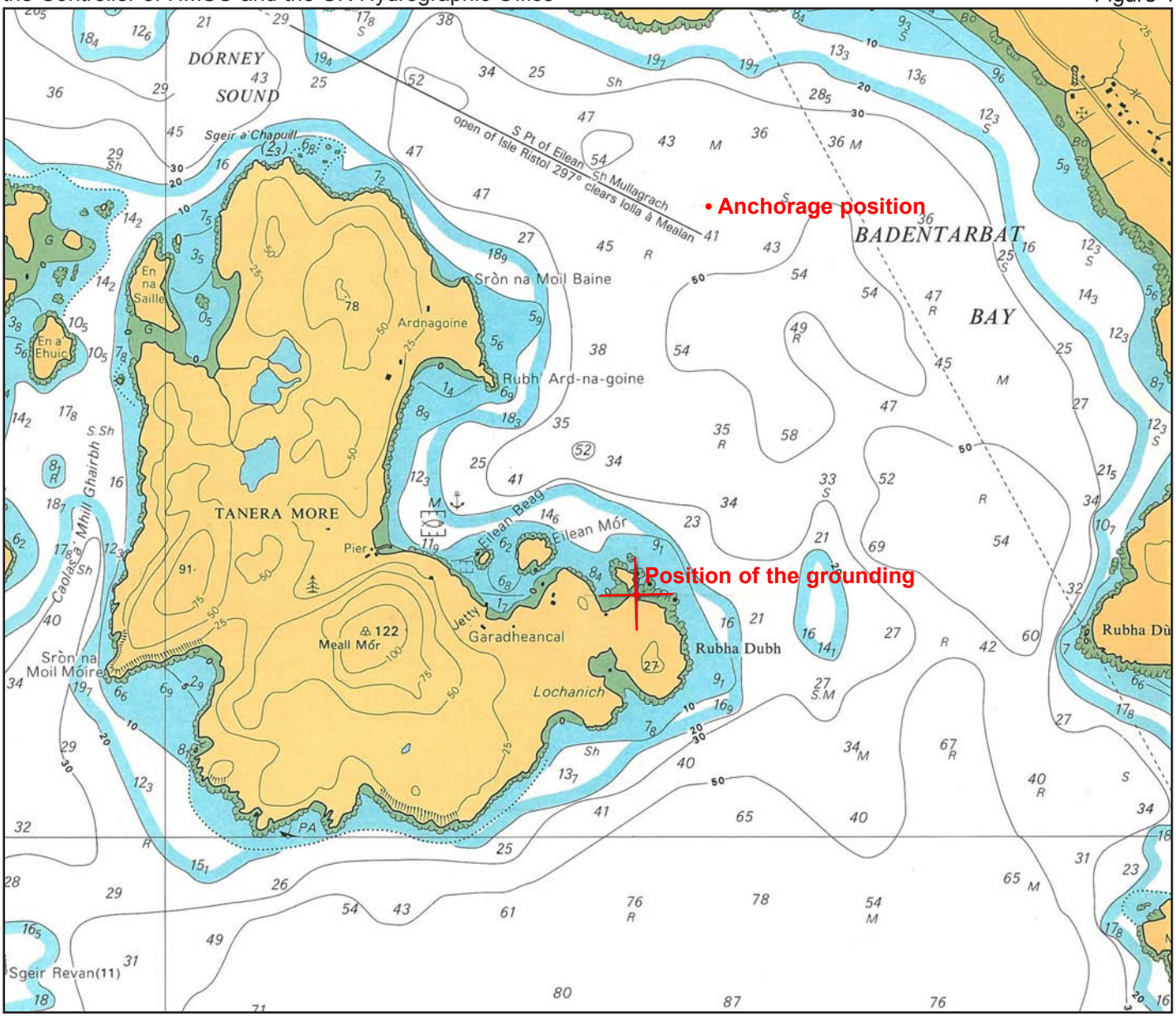
Registered owner	:	Ferguson Transport (Spean Bridge) Ltd
Port of registry	:	Kingstown
Flag	:	St Vincent and the Grenadines
Type	:	General cargo
Built	:	1971 in Elbewerften, Germany
Classification society	:	International Naval Surveys Bureau
Construction	:	Steel
Length overall	:	45.21m
Gross tonnage	:	712
Engine power and/or type	:	625kW
Service speed	:	10.5kn
Other relevant info	:	Single screw

Accident details

Time and date	:	0545 on 31 October 2006
Location of incident	:	58 00.5N 005 23.0W, east coast Tanera More, Summer Isles
Persons on board	:	6
Injuries/fatalities	:	Nil
Damage	:	Indentation of underwater hull plating and bilge keel in way of the starboard side of the engine room.

Reproduced from Admiralty Chart 2501 by permission of
the Controller of HMSO and the UK Hydrographic Office

Figure 1



Extract of chart BA 2501

1.2 NARRATIVE

All times are UTC, and all courses are true.

1.2.1 Anchoring

During the afternoon of 30 October 2006, *Harvest Caroline* was on passage to deliver fish food to a fish farm on the eastern side of Tanera More **(Figure 1)**. As the ship passed the south east corner of the island at 1535, the master was advised by telephone that it was not possible to discharge the fish food that evening due to the limited daylight remaining.

The master decided to anchor overnight between Tanera More and Badentarbat Bay **(Figure 1)**. The ship had anchored in this position on 23 September 2006 and the master considered that it would provide shelter from strong winds, which were predicted to veer from the south west to the north overnight.

The ship approached the anchorage on a course of about 350° but was manoeuvred into the south west wind just before the port anchor was let go at 1600. The ship's speed over the ground at the time the anchor was let go was less than 0.5 knot. Five shackles[1] of chain cable were paid out to the waterline. The master had estimated that with a charted depth of about 40m at least 2 of the 5 shackles would remain on the seabed.

1.2.2 Events at anchor

After securing the forecastle, the chief officer went to the bridge from where he kept an anchor watch until he was relieved by the master at 1800. The chief officer then ate, showered and retired to bed.

The master did not remain on the bridge continuously during his anchor watch. He periodically visited the bridge to check the ship's position, but otherwise he played cards and watched TV in his cabin with a female passenger. The master also visited the mess room and galley, where at 2300 alcohol was smelled on his breath by a member of the crew, but he did not appear to be drunk. Between 1800 and 2400, the wind decreased and veered from south west, force 8, to west, force 6.

The chief officer got out of bed at about 2345 and went to the bridge. The master went to bed at 2400 but, due to conflicting accounts, it has not been possible to determine if the officers spoke before the chief officer took over the anchor watch. Once on the bridge, the chief officer monitored the ship's position, corrected several charts, and kept the deck log up to date. When making an entry in the log for 0100, the chief officer also wrote:

0600 anchor position checked frequently by radar ok

At 0200, the chief officer went to bed in his cabin, but returned to the bridge about 1 hour later because he could not sleep. He checked the ship's position and, after putting his portable VHF radio on charge, he returned to his bed and went to sleep.

At about 0530 a deck rating was woken by the noise of the wind blowing through a small gap in his cabin scuttle. He got out of bed, dressed and went onto the main deck from where he saw that the sea was short and steep. The rating went immediately to the bridge and saw the ship had merged with the land on both the ECS and the radar displays. The rating then felt a series of bumps and saw land nearby through the starboard bridge door.

1.2.3 Events after the grounding

The rating immediately went to the master's cabin, where the master had just been woken by his alarm set for 0545. The rating informed the master that the ship was grounding and then alerted the rest of the crew in their cabins. The master went directly to the bridge where he heard and felt the ship making contact with the rocks astern. He ordered the chief engineer, who had quickly made his way to the engine room, to start the main engine and to provide power to the windlass. As soon as the main engine was started, the master engaged the clutch to provide power ahead, but this was quickly disengaged when further noises were heard coming from aft. The master also ordered the chief officer to heave in on the anchor once the windlass was operable, but this action was also stopped when the master re-considered that such action might cause

[1] 1 shackle = 90 ft or 27.42m

the ship to fall broadside onto the rocks. The starboard anchor was then let go underfoot. The chief engineer checked for damage in the engine room and found a small number of indentations in the underwater hull plating **(Figure 2)**. A small ingress of water in the engine room bilge was also detected.

At 0610, the master informed the ship's owner of the situation by telephone. He then initiated a PAN PAN message via VHF radio to Stornoway Coastguard at 0614. The coastguard scrambled a SAR helicopter in case the crew had to abandon the vessel, activated the Lochinver ALB, and tasked the Coastguard ETV *Anglian Prince* to proceed to Tanera More. The Achiltibuie coastguard team were also tasked to observe the ship from the shore.

At 0727, the SAR helicopter winched a salvage pump onto, and the female passenger from, *Harvest Caroline*. When *Anglian Prince* arrived at the scene at 0940, *Harvest Caroline* had already started to re-float on the rising tide. She was taken in tow by the ETV **(Figure 3)**, and was clear of the rocks by 1050. No pollution was detected by coastguard aircraft, either at the scene, or during the vessel's passage to Ullapool, where she arrived the same day.

On completion of an underwater survey and temporary repair to a small area of underwater hull plating, *Harvest Caroline* sailed from Ullapool on the evening of 1 November 2006. She arrived in Greenock the following day, where permanent repair was undertaken.

Figure 2

Photograph of damage to hull plating

Photograph courtesy of MCA

Figure 3

Photograph of tow in progress

1.3 RECORDED POSITION AND WIND INFORMATION

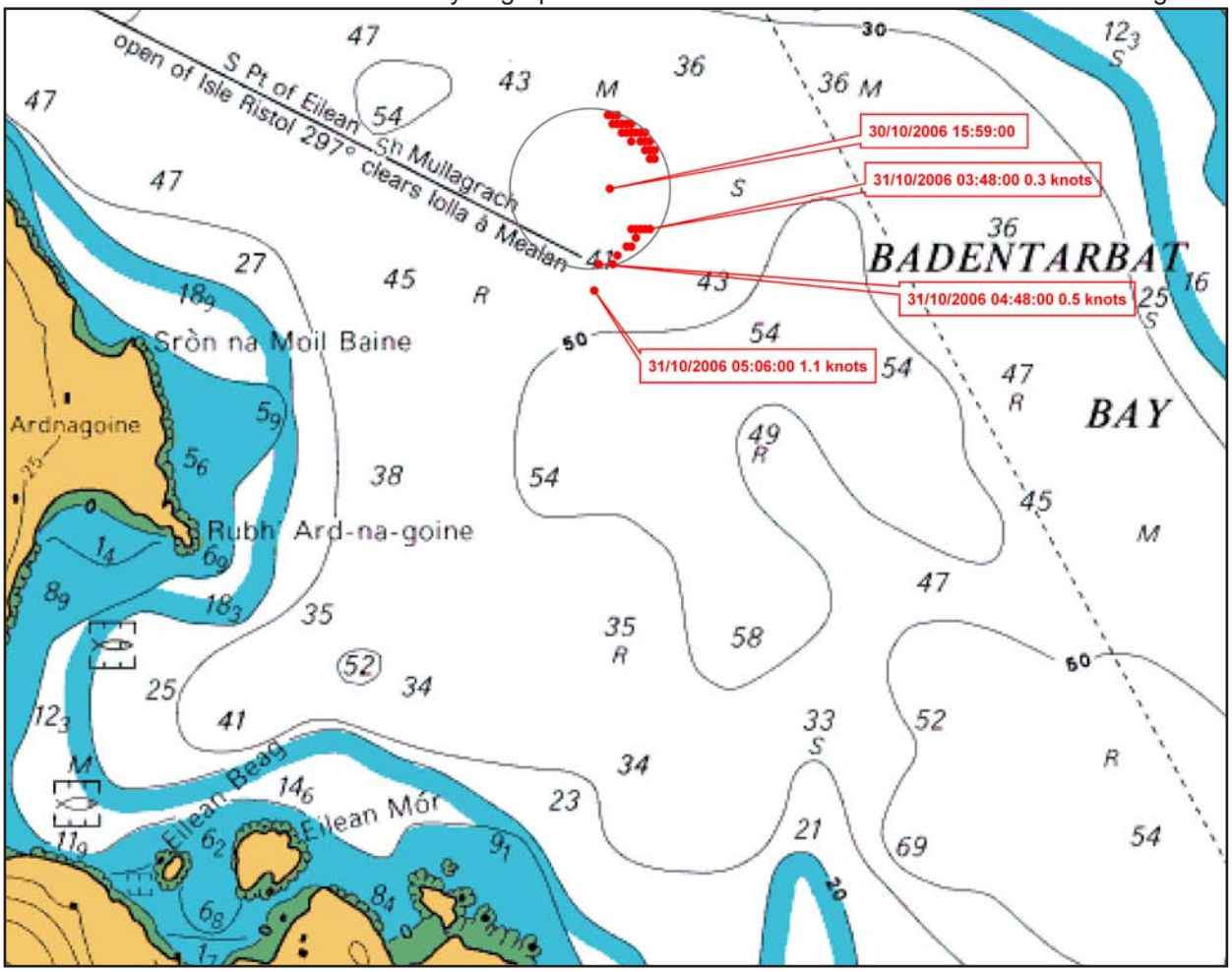
Positional data transmitted by the ship's AIS between 0300 and 0506 on 31 October 2006 is shown at **Figure 4**. No transmissions were received after 0506 until the ship grounded. The ground track from the ship's anchorage to the position of grounding, recovered from the ship's GPS receiver, is at **Figure 5.** No positional information was recorded on the ship's ECS.

Wind speed and direction recorded at a military range in position 57°28.36N 005° 52.31W, 36 miles south-south-west from *Harvest Caroline* during the morning of 31 October 2006, was:

0430	-	316° at 23.5 kts
0445	-	334° at 35.6 kts
0500	-	336° at 37.3 kts
0515	-	353° at 36.3 kts
0530	-	353° at 31.5 kts
0545	-	352° at 43.1 kts

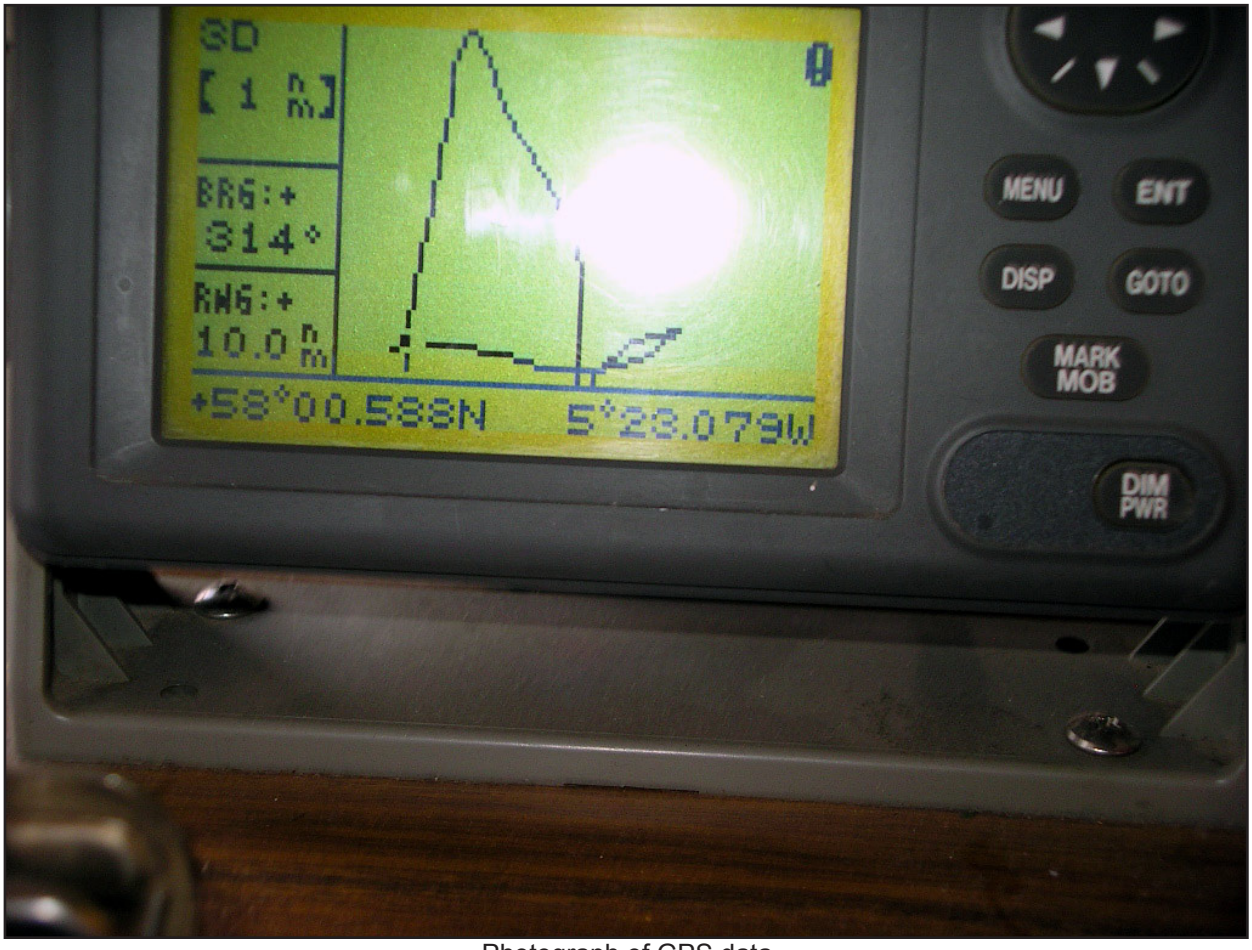
During this period, the maximum wind strength recorded at the range was 55.2 kts from a direction of 352° at 0543. The most easterly wind direction recorded was 004° at 44.5 kts, at 0533.

Figure 4



AIS Positional Data

Figure 5



Photograph of GPS data

1.4 WEATHER FORECAST, TIDAL AND ALMANAC DATA

The 24 hour weather forecast issued for the area by the Meteorological Office at 1700 on 30 October 2006, and transmitted by Stornoway Coastguard on VHF radio channel 67 stated:

Wind: southwest veering north 6 to gale 8, occasionally severe gale 9.
Weather: showers at first
Sea State: rough to very rough

The predicted time of high water at Tanera More on 31 October 2006 was 0203, and 1421. Low water was at 0804 and it was neap tides. The tidal streams in the vicinity of the Summer Isles reach a maximum rate of 0.5 kt and the direction and times at which they begin are uncertain. Sunset on 30 October 2006 was at 1639, and sunrise on 31 October 2006 was 0730.

1.5 THE CREW

1.5.1 Manning

The ship's crew comprised the master, chief officer, chief engineer, and two deck ratings. The master, chief officer and an AB, who was also nominated as the ship's cook, were Polish, and were recruited via a Polish manning agency. The chief engineer and the remaining deck rating were both British. The female passenger was the master's partner.

1.5.2 Watchkeeping and work routines

Bridge watchkeeping duties were shared between the master and chief officer, with the master keeping the 0600 to 1200 and the 1800 to 2400 watches. The master also kept the bridge watch when the vessel was discharging cargo at the fish farms because of a frequent need to manoeuvre the main engine and bow thruster in order to maintain position.

Neither deck rating was employed on lookout duties when underway or when at anchor. The ship's safe manning certificate required that both ratings be qualified as watch ratings[2], but only the AB cook held the required STCW certification. The British deck rating had worked on board fishing vessels for several years and on board the company's workboat since January 2006, but did not hold any STCW certification. Both ratings were employed on the deck during the discharge of the cargo; one operated the crane, and the other loaded the bags onto the crane hook. It was usual for the chief officer to relieve the AB cook on deck between1030 and midday, to allow the AB to prepare lunch.

1.5.3 The master

The master was 52 years old. He first went to sea as a fisherman at the age of 15, but had worked on merchant ships since 1978. He had been employed mainly on small dry cargo vessels operating within northern Europe throughout his merchant career and had qualified as a master in 1993. When joining *Harvest Caroline* for the first time at the beginning of June 2006, the master had not been to sea since 2004. He was engaged on 2 month contracts, the first ended on 5 August 2006 and the second commenced on 8 September 2006. In the intervening period, a relief master took command of the ship. The relief master also took command between 7 and 12 October 2006 while the master returned to Poland to deal with personal matters.

[2] In accordance with STCW Regulation II/4

During his first contract, the master was warned by the ship's owner for consuming alcohol on board. He was also seen bringing alcohol onboard by the crew during his second contract. The master seemed unfamiliar with the contents of the on board manuals during his interviews with MAIB inspectors following the accident.

1.5.4 The chief officer

The chief officer was 48 years old. He first went to sea as a factory worker on factory fishing vessels between 1985 and 1993. After then working as a deck rating on bulk carriers and oil and chemical tankers, he qualified as a third officer in 1998, a second officer in 2000, and as a chief officer in 2003. Since then, he had served as chief officer on board cement, bulk, and timber carriers. The chief officer started his first contract onboard *Harvest Caroline* on 26 July 2006. The contract was initially for 2 months, but had been extended for personal reasons.

The chief officer's cabin was small and was reported to be uncomfortable and lacking ventilation. The chief officer did not feel unusually tired during the morning of 31 October 2006. His recorded hours of work and rest for October 2006 are at **Annex A**.

1.6 NAVIGATION AND ANCHORING

1.6.1 Vessel operation

Harvest Caroline supplied fish food to over 50 fish farms on the west coast of Scotland and Hebrides. The fish food was loaded in Kishorn **(Figure 6)**, and discharged at the fish farms by crane onto pontoons, or onto 'C' caps **(Figure 7)**. The vessel's loading/delivery cycle was between 2 to 3 days depending on the weather conditions experienced. During darkness, the ship was routinely either at anchor, on passage, or moored alongside at Kishorn or Kyle of Lochalsh, where she fuelled. She anchored overnight on 14 occasions in October 2006.

1.6.2 Bridge equipment and anchors

The navigational equipment fitted to the bridge of *Harvest Caroline* included an ECS, a SAAB AIS transceiver, a Pronav radar display, and a Faruno GPS receiver. The ship was not fitted with a bridge watch alarm or an echo sounder.

The ship was equipped with two Gruson stockless anchors, each weighing 791Kg, and each with 7 shackles of mild steel chain cable attached.

1.7 CONDUCT OF THE ANCHOR WATCH

1.7.1 Company requirements

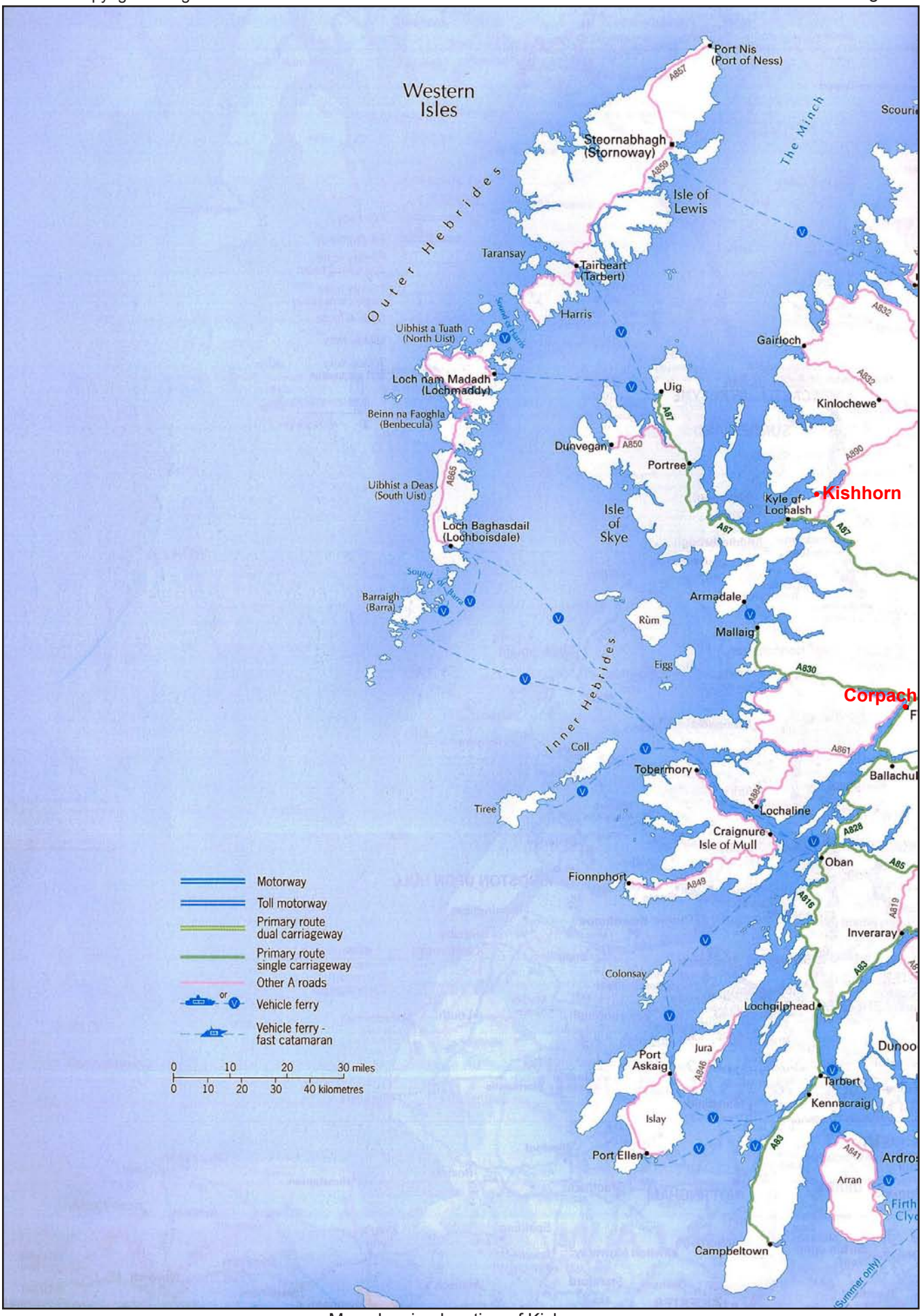
With regard to the vessel being at anchor, the on board safety management manual included:

> *If the master deems it necessary, the Bridge might be manned and an efficient lookout may be maintained when the vessel is at anchor. In that case the watchkeeper should ensure the following:……*

The safety manual also stated:

> *S010: Check List "Anchoring and Anchor Watch". This placard in a placard form shall be kept in the "Check List" file. Following the relevant checks a record shall be entered in the Log-Book. [sic]*

Figure 6



Map showing location of Kishorn

Figure 7

Photograph of ship unloading cargo at a 'C' cap

A laminated copy of Form S010 was affixed above the bridge chart table, which had been completed when the ship anchored on 30 October 2006. Examination of the deck logbook showed that no record of the completion of this check list was maintained as required by the ship's management manual during October 2006. It had only occasionally been recorded in the deck log between July and September 2006.

1.7.2 The master's expectations

The master expected the anchor watch to be maintained along similar lines to a bridge watch when underway, although he considered it reasonable for the OOW to leave the bridge for brief periods. As required by the ship's SMS, the master provided his own standing orders to supplement the company instructions. He also wrote 'night' or 'watch' orders on six occasions when the vessel was underway or alongside. The last time he wrote these orders was on 15 September 2006, which was the only occasion he produced them during his second contract. Neither the master's standing orders, nor any of the 'night' or 'watch' orders, provided any instructions for when the ship was at anchor.

1.7.3 The chief officer's watchkeeping practices

When the chief officer joined *Harvest Caroline*, the Polish master was in command for the first 10 days. During this time, the chief officer remained up and about during his anchor watches. However, the relief master preferred to personally monitor the ship's position at anchor and, because he had occasionally told the chief officer not to bother getting out of bed for his watch, the chief officer understood that it was acceptable to retire to bed during his anchor watches, after first ensuring the ship was in her anchorage position.

Although the chief officer again remained up and about during his night anchor watches following the return of the Polish master, he resumed the practice of retiring to bed at about 0200 from 21 September 2006.

The chief officer had been warned on one occasion by the relief master for leaving the bridge unattended for about 8 minutes when the ship was underway at night.

1.7.4 Guidance

Guidance on the conduct of an anchor watch is found in several publications, including the ICS Bridge Procedures Guide **(Annex B)**, MGN 315(M) and STCW (*Section A-VIII/2 part 3-1.51)*. The guidance provided is similar in all of these publications.

1.8 THE SHIP OWNER AND MANAGER

1.8.1 Operation and organisation

The owner and manager of *Harvest Caroline* was Ferguson Transport (Spean Bridge) Ltd. The family owned company was founded in 1959 and moved to Spean Bridge in 1974 where it specialised in warehousing, distribution, cargo handling and sea freight. The company employs over 100 personnel, owns over 40 road haulage vehicles, and operates its own workshops, test facilities and a team for the analysis of road regulation. In addition to *Harvest Caroline*, the company also operates a workboat named *Harvest Anne* to distribute fish food from Kishorn.

The company's management is headed by its managing director, assisted by two other directors. None of the directors had any commercial marine management experience before the purchase of *Harvest Anne* in 2004.

1.8.2 The designated person

The ISM Code[3] requires that a company nominate a designated person (DP)[4] for each of its ships. The DP for *Harvest Caroline* was the manager of the company's warehousing and port facilities at Kishorn. He had been employed by the company for 2 years, having previously worked in aquaculture. During his career in fish farming, the DP had periodically taken a number of short passages of about 24 hours on board both purse seine fishing vessels and well boats which were transporting salmon smolts[5]. Although the DP was on board to monitor the wellbeing of the fish, he also spent a lot of time in the wheelhouses as an assistant to the watchkeepers, and was occasionally left on watch by himself for short periods. The DP had also spent about 10 days at sea on a fishing vessel in about 1995. A native of the Isle of Lewis, the designated person was familiar with the area of the ship's operation.

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[3] The ISM Code, contained in Chapter IX of the SOLAS Convention, was applicable to dry cargo vessels over 500grt undertaking international voyages no later than 1 July 2002. The Code provides an international standard for the safe management and operation of ships and for pollution prevention. Its objectives are to ensure safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment. The Code requires every ship owner and ship manager to develop, implement and maintain a safety management system.

[4] With regard to designated persons, the Code states:

To ensure the safe operation of each ship and to provide a link between the Company and those on board, every Company, as appropriate, should designate a person or persons ashore having direct access to the highest level of management. The responsibility and authority of the designated person or persons should include monitoring the safety and pollution prevention aspects of the operation of each ship and ensuring that adequate resources and shore-based support are applied, as required.

[5] A smolt is a young salmon at an intermediate stage of development when it first migrated from fresh water to the sea.

1.9 VESSEL ACQUISITION

1.9.1 Purchase

Before the company owned *Harvest Caroline*, it chartered the Faroese registered vessel *Von* to distribute fish food. When *Von* was deemed to be beyond economical repair during a periodic survey early in 2006, Ferguson Transport decided to buy a replacement vessel rather than to arrange another charter. In March 2006, the company's managing director identified the dry cargo ship *Fjordbulk* as a possible purchase. The vessel was registered with the Norwegian International Shipping Register (NIS), and classed with Det Norske Veritas (DNV). As the managing director had no marine experience, he approached a marine consultant from Dorset Marine Surveys (International) Ltd to assist with the purchase. The consultant was known to the managing director through survey work he had conducted on *Harvest Anne*.

1.9.2 Flag and classification

Ferguson Transport considered several options regarding the vessel's registration and classification. Its initial intention was to keep the ship in class with DNV and to either remain with NIS, or to transfer her registration to the UK. An application was made to the Maritime and Coastguard Agency (MCA) regarding UK registration during the first week of April 2006, but this was rejected on 18 April 2006. The option of remaining with the Norwegian register was discounted soon after because some of the administrative conditions of the register were considered to be too onerous.

The St Vincent and Grenadines Maritime Administration was then approached to register the vessel via its UK representative, Elsmore Shipping Ltd. The application was confirmed on 22 May 2006 and a St Vincent and Grenadines surveyor was arranged to conduct a pre-registration survey of the ship after she arrived in Corpach, Scotland, the following day. Also on 22 May 2006, Ferguson Transport requested the International Naval Surveys Bureau (INSB) arrange for the issue of an Interim Document of Compliance (DOC)[6] as required by the ISM Code. Again, this was done via Elsmore Shipping Ltd, which was also the society's regional office.

A surveyor, nominated by Elsmore Shipping Ltd to conduct both the pre-registration survey and to issue the Interim DOC, attended the vessel in Corpach on 24 and 25 May 2006 during the ship's handover. During this period, Ferguson Transport also arranged for the vessel's classification to be transferred to INSB from DNV, and the same surveyor conducted the vessel's class surveys and the verification required for the issue of her interim Safety Management Certificate (SMC)[7] between 27 and 30 May 2006.

Harvest Caroline sailed from Corpach on 30 May 2006, the day her provisional certificate of registry was issued. The chronology of the ship's purchase, registration, and classification is at **Table 1**.

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[6] See Annex C

[7] See Annex C

Early March 2006	Vessel identified for purchase
18 April	Application to transfer to the UK Register rejected (Option of remaining with NIS progressed)
15 May	Purchase agreed
22 May	Application made to transfer to St Vincent and Grenadines Register via Elsmore Shipping Ltd Application to INSB for Interim DOC verification via Elsmore Shipping Ltd SMS purchased from Dorset Marine Surveys (International) Ltd
23 May	Ship arrives in Corpach for handover
24/25 May	Surveyor conducted pre-registration survey and Interim DOC Interim DOC issued (until 24 Oct)
By 26 May	May – Owner decides not to remain with DNV
27-30 May	Interim SMC verification and class surveys conducted
28 May	Replacement SMS ordered from Elsmore Shipping Ltd DOC document review signed off at INSB head office Polish master and other crew recruited via a Polish manning agency arrive on board.
30 May	SMS received from Elsmore Shipping Ltd and taken to ship Interim SMC issued (valid until 29 October) Ship Sailed (Norwegian deck officer in command) then hit a rock in Loch Sunart
3 Oct	Internal Audit
24 Oct	Initial DOC audit
25 Oct	Initial SMC audit
31 Oct	Ship grounded

Table 1 – Chronology of Events

1.9.3 Crewing policy

The aim of Ferguson Transport was to employ all UK crew onboard *Harvest Caroline*, but the company recognised that this would be difficult to achieve immediately following purchase. On the advice of marine consultants, the company approached a Polish manning agency to provide the appropriately qualified crew it required in the short term. The company also arranged for a Norwegian deck officer and an engineer rating to remain on board the ship for 2 weeks after the completion of the purchase to facilitate a more rapid familiarisation of the new crew with her operation.

1.10 INTERIM ISM VERIFICATION AND CERTIFICATION

1.10.1 Requirements and guidelines

An extract of the ISM Code detailing its requirements for interim certification is at **Annex C.** Revised guidelines on the implementation of the ISM Code by administrations are provided in IMO Resolution A913(22), which is included at **Annex D**.

1.10.2 Interim Document of Compliance

During the Interim DOC verification of Ferguson Transport, the INSB surveyor discussed the responsibilities of the DP with the port facilities manager, and although the nominated DP did not have a detailed knowledge or background in the operation of a small cargo ship, he was enthusiastic and the surveyor considered that he had sufficient background knowledge to be able to learn. When considering the merits of interim certification, the surveyor also took into account that: the DP was experienced in the operation of *Harvest Anne* and the company's port facilities at Kishorn; the DP was supported by the expertise of marine consultants through Dorset Marine Surveys; this was a single ship operation involving a vessel of low risk compared to vessels such as gas tankers, and; the DP would have regular contact with the ship during its frequent loading periods in Kishorn.

The Safety Management System (SMS)[8] presented to the surveyor was purchased on 22 May 2006 by Dorset Marine Surveys. The system was provided on the basis that its vendor would assist Ferguson Transport to supplement and tailor its contents to the operation of *Harvest Caroline.* The INSB surveyor considered this system did not contain sufficient information and advised that it would probably not be approved when reviewed by the INSB head office without more detail being provided. He also made the company aware that an SMS acceptable to INSB was available via Elsmore Shipping Ltd. Ferguson Transport was issued a DOC by the INSB representative on 25 May 2006 on the basis that, although an inadequate SMS was in place, it would be supplemented with additional information, or replaced. The Interim DOC was valid until 24 October 2006.

On 28 May 2006, Ferguson Transport ordered an SMS from Elsmore Shipping. The newly purchased SMS was reviewed and approved by the INSB head office on the same day. The review concluded:

Company's SMS covers all the requirements of the SMS Code. Elements of the system found to comply with the ISM Code as well as the relevant elements of the Code are addressed by the Management System [sic]

INSB was familiar with the SMS supplied by Elsmore Shipping Ltd, and had approved the system on a number of previous audits with other companies and ships. The system comprised two manuals: one containing procedures, and the second containing forms and check lists. Ferguson Transport received the system by e-mail on 30 May 2006.

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[8] Paragraph 1.2.3 of the ISM Code states:

The safety management system should ensure:

.1 compliance with mandatory rules and regulations; and

.2 the applicable codes, guidelines and standards recommended by the Organization, Administrations, classification societies and maritime industry organizations are taken into account [sic]

1.10.3 Interim Safety Management Certificate

Instructions regarding the conduct of the interim SMC verification were sent by e-mail from INSB to Elsmore Shipping Ltd on 26 May 2006. The e-mail, which also contained instructions for the conduct of the interim DOC verification, stated that special attention should be paid to:

- *The proper familiarisation of the senior officers*
- *The proper establishment of the SMS*
- *The proper STCW certification of the personnel on board*
- *The proper class and statutory certification of the vessel*

After the ship's arrival in Corpach, her Norwegian owners had removed the SMS and planned maintenance records from the vessel. The SMS provided through Dorset Marine Surveys was initially placed on board, but was replaced on the final day of the audit by the SMS purchased from Elsmore Shipping Ltd. This was accepted by the INSB surveyor, who advised that, although approved by INSB, the system would need to be adapted to suit the vessel's operation. The check list completed by the INSB auditor indicated the crew comprised: a Polish master; a Russian chief engineer; a Lithuanian chief officer; a British engineer; a Norwegian deck officer, a Norwegian engineer rating; and, a Polish deck rating. The master, chief officer and the Polish deck rating joined the ship during the afternoon of 28 May 2006. The INSB surveyor issued an SMC for *Harvest Caroline* on 30 May 2006, which was valid until 29 October 2006.

1.11 INTERNAL AND ISM INITIAL AUDIT

1.11.1 Internal audit

On 3 October 2006, an internal audit was conducted of Ferguson Transport and *Harvest Caroline* by a consultant arranged through Dorset Marine Surveys Ltd. During the audit, the consultant reviewed the SMS in place with the DP and compiled a list of items which were considered to be irrelevant to the operation of *Harvest Caroline* **(Annex E)**. It was intended to send this list to INSB to approve the removal of the items listed to ensure that essential information was not removed in error, but this action was not undertaken. In addition to the non-conformities identified **(Annex F)**, the consultant also advised the DP that a superintendent or technical manager had not been appointed.

1.11.2 ISM initial audit[9]

Initial DOC and SMC audits were conducted by an auditor from INSB's head office on 24 and 25 October 2006 respectively. During these audits, the company's SMS was not reviewed and only minor non-conformities were identified **(Annex G)**. On completion of the audits, DOC and SMC certificates were issued, which were valid until 23 and 24 March 2007 respectively[10].

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[9] See paragraph 3 of Annex D.

[10] Other than for interim certification, the period of validity of DOC is up to 12 months, and the period of an SMC is up to 5 years. The issue of certificates less than the maximum period allowed is at the discretion of the issuing authority.

1.12 INSB

1.12.1 General

INSB is a Greek based classification society, which was founded in 1977. It has had a long association with the St Vincent and Grenadines Maritime Administration, for which it is a recognised organisation authorised to conduct statutory survey and certification, including ISM and ISPS Codes, on its behalf. Other maritime administrations for which the society is fully authorised include: Union of Comoros, Honduras, Cambodia, Lebanon, Madagascar, Costa Rica, Somaliland Republic, Sudan, Sierra Leone, Republic of Togo, Paraguay, Ecuador, Equatorial Guinea, and Cape Verde. The society has a worldwide network of over 350 surveyors. The 3 year detention rate of the society (2003-2005), published under the Paris Memorandum of Understanding on port state control[11] is at **Annex J**. The society is not a member of IACS.

1.12.2 ISM and ISPS systems department

The department responsible for the conduct of ISM audits and certification comprises three auditors located in the company's head office in Piraeus, along with an independent auditor who works exclusively for INSB. These auditors are assisted by surveyors of the society's worldwide network who have been trained as ISM auditors. The auditors at the society's head office were trained as lead auditors via in-house seminars, which began in 2002 and have been held about every 1 to 2 years thereafter. The seminars are 4 days in duration and are reported to contain the same training elements as the training procedures followed by IACS members. All of the society's ISM auditors must hold an external auditors' qualification or certification issued by an administration, classification society, or marine college, and have attended a familiarisation visit to the society's head office in Piraeus. They are authorised to conduct interim verification and certification, but only auditors who had attended one of the society's in-house lead auditor seminars are authorised to conduct initial and periodic audits. Where possible, all initial audits are undertaken by an auditor from the society's head office.

1.12.3 ISM auditor in UK

The interim certification of Ferguson Transport and *Harvest Caroline* was conducted by one of two surveyors used by the society in the UK, through Elsmore Shipping Ltd. He had attended an ISM internal auditors' course facilitated by DNV in London in 1998 and had also attended an ISM/ISO 9001.2000 lead auditors' course at North Ferriby College in 2002. The auditor had carried out work for INSB for two years, during which he had completed two interim DOC audits, and five interim SMC audits. The surveyor qualified as a master in 1981, and worked as a ship superintendent until becoming self employed 6 years ago. Since then, he has undertaken statutory surveys and certification work on behalf of the St Vincent and Grenadines Maritime Administration, and other flag sates including; Malta, Antigua and Barbuda, Vanuatu, and Belize. He does not work for any classification society other than INSB.

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[11] The Paris MOU consists of 25 participating maritime Administrations and covers the waters of the European coastal States and the North Atlantic basin from North America to Europe. The MOU aims to eliminate sub-standard shipping through a harmonized system of port state control.

1.13 PREVIOUS ACCIDENTS AND PORT STATE CONTROL INSPECTIONS

On completion of her SMC audit on 30 May 2006, *Harvest Caroline* sailed from Corpach with the Norwegian deck officer in command. Shortly after, the ship hit a charted submerged rock in Loch Sunart and was holed below the waterline. *Harvest Caroline* proceeded to Buckie on the east coast of Scotland where she underwent survey and repair with the INSB surveyor in attendance. The circumstances of the accident are not known. Also, in July 2006, *Harvest Caroline* suffered a main engine failure and was taken in tow to Mallaig. Neither of these accidents was recorded on the appropriate form within the ship's SMS titled '*Report of Non-Conformity, Accidents & Hazardous Occurrences'*, nor were they reported to the MAIB as required by regulation[12]. The first occasion a record of an accident or hazardous occurrence was appropriately recorded was on 29 July 2006, following a further breakdown of the ship's main engine.

A Port State Control Inspection conducted on board *Harvest Caroline* in Kishorn on 27 September 2006 identified eight deficiencies. These were generally minor in nature, but included the failure to produce records of work and rest.

1.14 ALCOHOL POLICY

The policy of Ferguson Transport was that no alcohol was allowed on board *Harvest Caroline.* Employment contracts arranged via the Polish manning agency included a clause which stated that any employee who failed to comply with this policy will '*expose him/her to immediate disciplinary dismissal'*. To assist with the enforcement of the alcohol policy, the ship's DP was provided with a digital breathalyser in September 2006. The master was informed that random testing would take place, but none was undertaken.

The ship's safety management manual included:

a. *Alcohol is not allowed aboard any vessel*

b. *On some vessels alcohol is only allowed in strictly limited quantities and its consumption is controlled to ensure that:*

- *Consumption is limited to ensure blood alcohol levels do not exceed 0.8% blood alcohol level (BAC)*
- *Consumption is prohibited during work periods and four hours before any scheduled work period*

1.15 APPLICATION TO TRANSFER TO THE UK REGISTER

All applications for ships to transfer to the UK register are initially assessed using a matrix. The completed matrix for *Harvest Caroline* is at **Annex I**. The points scored (110) exceeded the maximum permitted (99). As the vessel was over 15 years old, the application was referred to the MCA "Flag-in Panel", which decided not to accept her onto the UK register. The Black, Grey and White lists[13] produced under the terms of the Paris Memorandum of Understanding on port state control referred to in the matrix, are at **Annex H**.

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[12] See MGN 289 (M+F) Accident Reporting and Investigation, which is applicable to all ships operating within UK waters

[13] The Black, Grey and White Lists are a grading of maritime administrations according to the detention rates of the vessels on their registers. Administrations on the Black list are the poorest performing, administrations on the Grey List are of average performance and administrations on the White list are those with a consistently low detention record.

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 to prevent similar accidents occurring in the future.

2.2 FATIGUE

When *Harvest Caroline* dragged her anchor and grounded, the chief officer, who was the OOW, was asleep in his bed. There are several factors which might have caused the chief officer to feel fatigued, including: he had worked a 6 hours on, 6 hours off watch pattern for 3 months; the quality of his sleep was possibly degraded by the lack of comfort and ventilation in his cabin, and; one of his 6 hour rest periods was frequently interrupted by a requirement to relieve the AB cook on deck between 1030 and midday. However, as the chief officer had rested during all of his night anchor watches from 21 September 2006, which included 14 occasions in October 2006 (although this is not reflected at **Annex A**), and he also had opportunities for additional rest when the ship was alongside in Kishorn and the Kyle of Lochalsh, it is unlikely that fatigue was a significant contributing factor in this accident. The chief officer did not feel particularly tired on the morning of 31 October 2006, and his decision to go to bed was consistent with his usual behaviour, rather than an overriding need to sleep.

2.3 SIMILAR ACCIDENTS

This is the 19th accident in United Kingdom territorial waters since 1992, of which the MAIB is aware, that involved vessels over 500grt dragging their anchor and subsequently grounding. Fourteen hazardous incidents, where vessels dragged their anchors but did not ground, were also reported. Analyses of these accidents and incidents in the MAIB investigation report into the grounding of the general cargo ship *Thunder* in the port of Mostyn, England, in August 2006 concluded that the key contributory factors were: *the chosen anchor position; the length of cable veered; weather conditions; and the main machinery's notice of readiness*.

Following the grounding in 2002 of the product tanker *Willy* in Plymouth Sound, England, the MAIB issued a Safety Bulletin (1/2002). Among its recommendations to owners and masters were:

- *Ensure that watchkeeping practices and navigational aids are optimised to provide immediate detection of a ship dragging her anchor.*
- *Carefully consider the prevailing and forecast conditions when determining the amount of cable to be used when anchoring or when at anchor.*
- *Carefully reconsider the safety of the anchored position in deteriorating weather conditions.*

2.4 ANCHORAGE SELECTION AND AMOUNT OF CABLE USED

The amount of cable to be used when anchoring depends upon a number of factors, including: the depth of water; the nature of the seabed; the proximity of navigational hazards and other ships at anchor; the strength and direction of the wind and tidal stream, and; the duration of the stay at anchor. Of particular significance on this occasion was the depth of water and the wind speed and direction.

For an anchor to achieve its maximum holding power, it is important that sufficient cable leads along the seabed before rising gently to the hawse pipe. In this case, the master assessed that in a depth of 40m, the use of 5 shackles of cable would enable 2 shackles to lie on the seabed. This was an estimate; it was not determined by calculation. A frequently used formula for calculating the amount of cable required to provide a suitable scope between the anchor and the vessel, contained in the Admiralty Manual of Seamanship, is:

Number of shackles required = 1.5 x √ depth of water in metres

Using this formula, the number of shackles to be used was:

1.5 x √40 = 1.5 x 6.32 = 9.489 shackles

This was almost twice the amount of cable used by *Harvest Caroline*. When the wind strengthened and veered to the north overnight, as is evident from the recordings at the nearby military range, the ship was blown towards the southern edge of her swinging circle **(Figure 4)**. The loading on her anchor and cable would then have increased, and it is probable that the angle of the lead of the cable from the anchor stock would then have risen above the shank axis. As this would have reduced the holding power of the anchor, it was not surprising it started to drag. It is likely that the stockless anchor failed to re-grip due to the increasingly rocky nature of the seabed to the south of the anchorage position **(Figure 1)**, along with the instability of the anchor caused by the absence of a stock. Even if all 7 shackles of cable fitted to the port anchor had been utilised, this was still considerably less than that required by calculation, and in view of the weather conditions experienced, the risk of the anchor dragging would have remained. An anchorage in shallower water would therefore have been a safer option.

2.5 ANCHOR WATCH

The dragging of an anchor need not result in a grounding, or similar accident, providing it is quickly detected and positive action is taken. *Harvest Caroline* first started to drag her anchor and moved outside her anchor swinging circle shortly before 0506 **(Figure 4)**. As she did not ground until about 39 minutes later, on rocks 8 cables to the south, there was ample time and sea room for the ship's movement to be detected and for successful remedial action to be taken. However, when the chief officer went to bed at 0300, the ship's position was no longer monitored. In the absence of a watch alarm, none of the crew was alerted to this dangerous situation.

There are no international regulations which require a bridge to be manned when at anchor, and the ship's safety management manual **(see Paragraph 1.7.1)** deferred this decision to the master. Current guidance **(Annex D)** indicates a need to fix the ship regularly and maintain a proper lookout, but it is evident from the chief officer's practice of going to bed at 0200, that this guidance was ignored.

Although the origins of the chief officer's behaviour lay in his time on board with the relief master, it is almost certain that it was also condoned by the Polish master. Otherwise, it is difficult to understand why the chief officer's absence from the bridge was not questioned by the master at the start of his watch at 0600. Regardless of the lax anchor watch routine usually adopted on board, which might have developed in benign conditions experienced during the summer months, it is not known why it was not revised in light of the predicted weather forecast. It is possible that the master and the chief officer had become complacent because of the number of occasions the ship

had anchored overnight without encountering any problems, along with the easing of the wind towards midnight on 30 October 2006. Had the master consumed alcohol, as indicated by one of the crew, it is also possible this might have influenced his judgment and attitude to risk.

2.6 FAILURE TO MEET ISM OBJECTIVES

The failure to routinely ensure the safety of the ship at anchor, and a number of significant departures from the ship's onboard SMS identified during the investigation, indicate that the safety management of the vessel was not meeting the objectives of the ISM Code. These departures included: the chief officer leaving the bridge unattended when the ship was underway at night; not providing an additional lookout on the bridge when underway during darkness; the consumption of alcohol on board when prohibited; the employment on board of an unqualified deck rating, and; the failure to log and report accidents to the ship. While none of the above could reasonably have been expected to have been observed during the Flag State's interim ISM verification audit, some or all of them would have been evident during the subsequent initial ISM audit. However, only the lack of qualification of the deck rating was identified **(Annex G)**. The failure to record accidents was not identified, even though the INSB surveyor had attended the vessel's repair following her accident in Loch Sunart on 30 May 2006.

2.7 THE DESIGNATED PERSON

The role of the DP is crucial to the successful implementation of the ISM Code, irrespective of the size of a ship manager's organisation and its fleet. Larger companies invariably have a management infrastructure in place which enables the DP to focus on ensuring that the safety management system is operating correctly. In smaller companies, the DP is as likely to be as involved in the day to day aspects of operational and technical management as he is in safety management. Whatever the range of functions a DP might perform within a company, he remains instrumental in introducing and monitoring safety management strategies on board its ships.

Notwithstanding the assessment of the INSB surveyor that the DP for *Harvest Caroline* had sufficient experience to develop the skills and knowledge this role required, the failure of the safety management of the ship to meet the objectives of the ISM Code possibly indicates that his knowledge of safety management and vessel operation was still only developing at the time of the ship's grounding. Had the DP possessed these skills and knowledge from the outset, he would have been better placed to: positively influence and monitor the safe operation of the vessel; ensure the SMS was properly established before the ship sailed following handover; make an immediate start on the tailoring of the SMS to the vessel's operation, rather than wait for the advice of the internal auditor over 4 months later; properly investigate the accident to the ship in Loch Sunart on 30 May 2006, and; enforce the ship manager's alcohol policy using the equipment made available. However, neither the ISM Code, nor its guidelines **(Annex D)** provide minimum competency requirements (experience, qualifications and training), which would strengthen the implementation of the Code by ensuring the DP has the required competence to effectively meet the responsibilities of his role.

2.8 APPROACH TO ISM VERIFICATION AND AUDIT

Interim certification allows a company and its vessels to operate within a specified period while its SMS develops. The criteria to be examined during interim verification **(Annex C)** are necessarily centred on the provision and planned implementation of

an SMS, which meets the objectives of the ISM Code and with which personnel are familiar and understand. The verification is therefore not an audit of records, because none exist, or to ensure that procedures are being followed. It is to check that the basic elements required to facilitate the implementation of those procedures and records are in place.

During the interim verification process of Ferguson Transport and *Harvest Caroline*, the INSB surveyor's acknowledgement of the positive measures adopted by the ship manager was understandable, but it is considered that the circumstances of the situation demanded a more critical assessment. First, the ship manager entered ship management at very short notice **(Table 1)**. Second, as its managers also had virtually no experience of maritime operations or of international maritime regulations or codes, the initial nominations of designated person, technical manager and superintendent could initially only have been an administrative measure. Third, the ship was in the midst of a very disruptive and uncertain period during her change of owners, managers, flag, classification society, and crew. Fourth, all planned maintenance records and documentation had been removed. Fifth, there was obviously confusion or indecision regarding who was in command of the vessel on 30 May 2006. Finally, the initial SMS was purchased only 2 days before the Interim DOC verification and its replacement arrived onboard the ship on the day the Interim SMC was issued. The company's managers and ship's crew therefore barely had time to read the manuals, let alone to understand their requirements. Therefore, the decision of the INSB surveyor to issue the interim certification was inappropriate, particularly as he had been instructed to pay attention to the *proper establishment of an SMS*.

The onus of ensuring that an SMS is implemented, and is effective in meeting the objectives of the ISM Code, lies with the ship manager. However, while it is recognised that safety management is an ongoing process that develops over time, interim verification has an important role to play in ensuring an acceptable baseline has been established. Although an interim DOC may be issued following a company's demonstration that it has a documented SMS which addresses all the elements of the ISM Code, and that plans exist for its implementation throughout its organisation and fleet, it seems appropriate that the company must also demonstrate it has the capability to put such plans into effect. This would not usually be problematic for a long-standing manager but, had the factors outlined above been considered when planning and conducting both the interim verifications and initial audits of Ferguson Transport and *Harvest Caroline*, a more critical approach would have been justified. This is likely to have caused some short term disruption but, importantly, it would also have helped facilitate more effective adherence to the ISM Code more quickly.

The ISM Code's revised guidelines **(Annex D)** do not provide guidance on the conduct of interim verifications. It is also unfortunate that the guidelines specify that a lesser competency is required to conduct interim verifications than for Initial and Periodic audit. This guidance, which was followed by INSB when allocating its auditors, might be suitable in most cases where a company's expertise and ability to implement an ISM is not in doubt, but possibly not where previous ship management experience is limited or non-existent.

2.9 EFFECTIVENESS OF WRITTEN REQUIREMENTS AND AUDIT

During the course of the Interim DOC verification, it is evident that Ferguson Transport was sufficiently influenced by the INSB surveyor to replace the SMS it had purchased with an alternative provided by Elsmore Shipping Ltd, despite the fact that the vendor of the original system had agreed to assist with its adaptation. The SMS provided by Elsmore Shipping Ltd was generic, and contained many procedures which did not apply to the operation of *Harvest Caroline*. Its instructions regarding alcohol consumption were also contradictory **(Paragraph 1.14)**. As Elsmore Shipping Ltd was the UK office for INSB, the independence of the review and approval of this system by the society was questionable.

If an SMS is not adapted to a vessel's operation, its credibility is likely to be questioned. Accordingly, the risk of it being ignored is increased. Possible examples of this are the master's: violation of the alcohol policy on board, which was possibly in moderation but which, nevertheless, set a poor example to the ship's crew; lack of familiarity with the SMS, and; waning provision of 'night' or 'watch' orders. The decreasing number of confirmations in the deck log, that the anchorage check list had been completed, is a possible further example. The removal of unnecessary instructions and procedures from the on board manuals would have encouraged their use. It would also have provided a useful indication of the development of the safety management of the vessel. A lack of a review of the SMS during the Initial ISM audit to see what, if any, changes had been identified or implemented, was therefore a missed opportunity in this respect.

2.10 UK FLAGGING-IN PROCEDURE

The MCA's use of a matrix to ensure the quality of the ships transferred onto the UK register and, hence, guard its status on the 'White List' **(Annex H)** allows a number of factors, such as age and ship type, to be weighted to determine the risk involved. However, the MCA also has a substantial interest in the quality of shipping operating in UK waters, and as *Harvest Caroline* was purchased by a British company with the intention of her operating only in Scottish waters with a predominantly UK crew, it was surprising that the application for her to transfer to the UK register was rejected. Examination of **Annex I** indicates this was primarily due to her age and the fact that the company was new to ship management and therefore not known to the MCA. Following the MCA's rejection, the ship was subsequently registered with a 'Black Listed' administration **(Annex H)** and classed with a non IACS classification society with a 'low' performance level based on a 3-year detention rate of vessels under its classification **(Annex J)**. As a result, the MCA had very little influence on her material quality and safety management, other than via Port State Control Inspection.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES

3.1.1 Safety issues directly contributing to the accident which have resulted in recommendations:

1. The failure to routinely ensure the safety of the ship at anchor, along with departures from the SMS which were not detected during the initial audits, indicated that the safety management of the vessel was not meeting the objectives of the ISM Code. [2.6]

2. The decision of the INSB surveyor to issue the interim certification was inappropriate, particularly as he had been instructed to pay attention to '*the proper establishment of an SMS'*. A more critical approach to interim verification and initial audit would have helped facilitate a quicker and more effective adherence to the ISM Code. [2.8]

3. Following the MCA's rejection of the ship manager's application for *Harvest Caroline* to transfer to the UK register, it had very little influence on her material quality and safety management, other than via Port State Control Inspection. [2.10]

3.1.2 Other safety issues identified during the investigation, also leading to recommendations:

1. The independence of the review and approval by INSB of the SMS provided by its office in the UK was questionable. [2.9]

3.1.3 Safety issues identified during the investigation, which have not resulted in recommendations but have been addressed (see Section 4):

1. The ship's anchor dragged in strong winds because insufficient anchor cable was deployed. [2.4]

2. In view of the predicted weather conditions and the amount of anchor cable available, an anchorage in shallower water would have been a safer option. [2.4]

3. The dragging of the anchor was not detected because the OOW was in bed and the ship's position was not being monitored. [2.5]

4. It is possible the master's judgment and attitude to risk might have been influenced by the consumption of alcohol. [2.5]

5. The DP did not possess the necessary experience and knowledge when the interim DOC was issued to positively influence and monitor the establishment of the SMS to ensure the safe operation of the vessel. [2.7]

SECTION 4 - ACTION TAKEN

Ferguson Transport has:

- Met with the MCA and DNV on 6 February 2007 with a view to transferring the classification of *Harvest Caroline* to DNV and transferring flag to the UK register.

- Amended the instructions for anchoring in its safety management manual.

- Prohibited the consumption of alcohol by crew serving on board *Harvest Caroline* at any time. A breathalyser has been provided on board the ship, and all officers have been instructed that if any crew member is suspected of having consumed alcohol they are to be breathalysed and, if found positive, they are to leave the vessel.

- Instructed that between October and March, anchoring should be avoided whenever possible in darkness or bad weather, and that the ship should preferably be moored alongside even where this requires deviation from the cargo route. The company has informed its masters that it is willing to incur the extra costs involved to ensure the safety of the ship and her crew, and a list of safe havens within the ship's operational area has been compiled.

- Fitted a watch alarm on the bridge linked to the ship's general alarm.

- Reviewed communication channels between the company and ship. As a result, a questionnaire and instructions for use by shore personnel when dealing with subsequent incidents have been compiled.

- Arranged for the DP to attend an ISM auditor course.

- Appointed a marine consultant as its superintendent and technical manager.

- Replaced the AB on board *Harvest Caroline* until he has qualified as a watch rating.

- Removed the items from the SMS of *Harvest Caroline*, which were identified during the internal audit on 3 October 2006 as being irrelevant to the vessel's operation.

The MCA has:

- Prepared proposals for submission to the 56th session of the Marine Environment Protection Committee (MEPC) at IMO in July 2007, which recommends that standards of competency required by designated persons be included in the Revised Guidelines on implementation of the ISM Code.

INSB has:

- Conducted an additional audit of Ferguson Transport on 3 February 2007, and confirmed that the non-conformities identified during the company and vessel Initial ISM audits have been properly addressed.

SECTION 5 - RECOMMENDATIONS

The St Vincent and the Grenadines Maritime Administration and the Maritime and Coastguard Agency are recommended to:

2007/155M Review the effectiveness of instructions to auditors (Flag State, and Recognised Organization) on the implementation of the International Safety Management Code to include consideration of the scope of all verification audits and what additional assurance is required to take into account factors such as:

- recent changes in ownership, register and class;
- the marine experience of the company;
- the knowledge of the company in operating the ship type; and
- degree of familiarity with the safety management system procedures in use.

Take forward the results of the reviews to the International Maritime Organization for inclusion in the Guidelines on implementation of the ISM Code by Administrations.

The Maritime and Coastguard Agency is recommended to:

2007/156 Review its procedures for flagging in ships to the UK Register to assist in the promotion of the quality of ships operating predominantly in UK territorial waters.

The International Naval Surveys Bureau is recommended to:

2007/157 Adopt measures to ensure that there is no conflict of interest during the review of safety management systems provided by its worldwide network of agents.

2007/158 Ensure auditors follow its instructions regarding the familiarity of senior officers and managers with the safety management system in use during SMC and DOC verifications.

Marine Accident Investigation Branch
June 2007