Report on the investigation of

the collision between the fishing vessel

Homeland

and

the ro-ro passenger vessel

Scottish Viking

4.2 miles off St Abb's Head

5 August 2010

resulting in one fatality

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Report No 4/2011
March 2011

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, ACRONYMS AND TERMS

AB	-	Able Bodied Seaman
AIS	-	Automatic Identification System
ARPA	-	Automatic Radar Plotting Aid
AWLB	-	All Weather Lifeboat
COLREGS	-	International Regulations for Preventing Collisions at Sea 1972 (as amended)
CPA	-	Closest Point of Approach
ECS	-	Electronic Chart System
FRC	-	Fast Rescue Craft
GPS	-	Global Positioning System
ICS	-	International Chamber of Shipping
IMO	-	International Maritime Organization
ISM Code	-	International Management Code for the Safe Operation of Ships and for Pollution Prevention 1993, as amended
kW	-	Kilowatt
m	-	metre(s)
MAIB	-	Marine Accident Investigation Branch
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
OOW	-	Officer of the Watch
ro-ro	-	roll on, roll off
SAR	-	Search and Rescue
SMS	-	Safety Management System

SOLAS	-	International Convention for the Safety of Life at Sea 1974, as amended
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended
UTC	-	Universal Co-ordinated Time
VDR	-	Voyage Data Recorder
VHF	-	Very High Frequency
one point	-	an angle of 11¼ degrees

Courses: All courses are true unless otherwise stated

Times: All times used in this report are UTC (+1) unless otherwise stated

Photograph courtesy of www.shipspotting.com

Scottish Viking

Photograph courtesy of www.trawlerphotos.co.uk

Homeland

SYNOPSIS

At 1946 on 5 August 2010, the Italian registered ro-ro passenger ferry *Scottish Viking* was in collision with the UK registered fishing vessel *Homeland* about 4 miles off St Abb's Head. As a result of the collision the fishing vessel sank. The skipper was recovered from the sea but, despite an extensive search by the rescue services and a large number of local fishing vessels, the remaining crew member, Daniel McNeill, was lost.

*Scottish Viking'*s second officer had sighted a group of three crossing fishing vessels on the starboard bow. The fishing vessels were on a converging course, and when they were 1 mile from *Scottish Viking* a prompt by the lookout made the second officer alter the vessel's course to port using the autopilot. Seconds before the collision, the second officer ordered the AB to steer the vessel and alter further to port. *Homeland*'s wheelhouse had not been manned continuously and an effort by the skipper to alter course and put the engine astern, when he entered the wheelhouse at the last minute, did not prevent the collision.

Factors that led to the collision included:

- *Scottish Viking'*s watchkeeper did not: determine at an early stage if there was a risk of collision with *Homeland;* sufficiently monitor or plot *Homeland'*s track; and, once a risk of collision was deemed to exist, take sufficient action to avoid collision.
- *Homeland'*s watchkeeper did not: determine at an early stage if there was a risk of collision with *Scottish Viking;* maintain a proper lookout from the wheelhouse; or detect or recognise a risk of collision with *Scottish Viking* until it was too late to take effective action.

The investigation identified the following other contributing factors:

- *Scottish Viking* – complacency and lack of precautionary thought; ineffective implementation of the company's navigation policy and procedures.
- *Homeland* – restricted all-round visibility from the aft deck; conflicting task priorities and possible lack of watchkeeping proficiency.

The manager of *Scottish Viking* has taken a number of actions aimed at improving the performance of the company's bridge teams. These include: reiterating the importance of following the company's navigational procedures; introducing a procedure for masters to report on the competence of a newly joined officer; carrying out unscheduled navigational audits at sea; and randomly scrutinising VDR data to verify compliance with its procedures. Both the International Chamber of Shipping (ICS) and the MAIB have distributed the safety lessons arising from this investigation to the merchant shipping and fishing industry sectors respectively.

In view of the actions that have been taken, the MAIB has issued no safety recommendations.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *HOMELAND* AND *SCOTTISH VIKING* AND ACCIDENT

Vessel details		***Homeland***
Registered owner	:	Privately owned
Port of registry	:	Buckie
Flag	:	UK
Type	:	Prawn Trawler
Fishing number	:	BCK 225
Built	:	1981 in Polruan
Construction	:	Wood
Length overall	:	11.09m
Gross tonnage	:	22.59

Vessel details		***Scottish Viking***
Registered owner & Manager	:	Visemar di Navigazione Srl
Port of registry	:	Bari
Flag	:	Italy
Type	:	Ro-ro passenger
Built	:	2009 at Cantiere Navale Visentini
IMO number	:	9435454
Classification society	:	Registro Italiano Navale
Construction	:	Steel
Length overall	:	186.46m
Gross tonnage	:	26904
Engine power	:	2 x 10800 kW
Service speed	:	22 knots

Accident details

Category		:	Very Serious Marine Casualty
Time and date		:	1946, 5 August 2010
Location of incident		:	55º 59.06'N, 002º 06.46'W 4.2 miles off St Abb's Head
Injuries		:	1 fatality
Damage to:	*Homeland*	:	Total loss
	Scottish Viking	:	Superficial paint damage to starboard midship section extending aft

Figure 1

Homeland - taken before departure from Eyemouth

1.2 NARRATIVE

1.2.1 *Homeland*

Homeland left the port of Eyemouth at about 1845 on 5 August 2010, accompanied by two other fishing vessels, *Achieve* and *Seren y Don*. The three fishing vessels headed towards banks located off the northern coast of the Firth of Forth. They were within a quarter of a mile of each other; *Homeland* was ahead and to the port of *Achieve,* and *Seren y Don* was astern of *Achieve*.

Homeland was crewed by the skipper and his brother Daniel McNeill. On clearing the approaches to the port of Eyemouth, the skipper set a northerly course at 6.5 knots and switched the steering from manual to autopilot. He set the radar at 1.5 miles range, handed over the watch to Daniel and then went to the aft deck to mend a torn net. Soon afterwards, he asked Daniel to assist him. This required Daniel to leave the wheelhouse unattended for short periods of time before returning to check the navigational situation. The skipper periodically scanned the forward horizon by looking through three portholes located on the aft bulkhead of the wheelhouse. His all-round view was restricted by the shelter **(Figure 1)** fitted aft of the wheelhouse.

At 1946, about a minute after Daniel had returned from the wheelhouse, the skipper heard what he thought was two blasts on a whistle. He also heard a transmission by *Achieve* on VHF radio channel 6 warning of an imminent collision with a large vessel. The skipper ran into the wheelhouse, from where he saw the side of *Scottish Viking*. He put the engine astern and the wheel hard to port, but this did not prevent the vessels colliding. *Homeland*'s starboard bow struck *Scottish Viking'*s starboard side amidships and the fishing vessel immediately started taking water. Aware that *Homeland* was in imminent danger of sinking, the skipper and Daniel climbed onto the wheelhouse roof to deploy the liferaft. However, before they could release the liferaft, *Homeland* sank beneath them and they entered the water; neither man was wearing a lifejacket. When the skipper surfaced, he called for Daniel, but he could not see or hear him and so started swimming towards a liferaft that had been deployed by *Achieve*. As *Homeland* sank, the vessel's liferaft was automatically released and it inflated on reaching the surface.

The skippers of both *Achieve* and *Seren y Don* had identified a risk of collision with *Scottish Viking* and had taken avoiding action by altering course to port.

1.2.2 *Scottish Viking*

At 1720 on 5 August 2010, *Scottish Viking* left Rosyth bound for Zeebrugge, carrying 47 crew and 259 passengers. On departure, the bridge was manned by the master, the 4-8 second officer and an able bodied seaman (AB).

The vessel cleared the fairway buoy of the Firth of Forth at 1824. The master handed the con to the second officer and, at 1830, left the bridge. The port and starboard radars were set at 12 and 6 miles range respectively. The automatic identification system (AIS) overlay facility was in use on both radars and the vessel was being steered by the autopilot.

The master had previously informed the second officer that he was authorised to deviate from the passage plan after the vessel had passed Bass Rock, provided the prevailing weather and traffic conditions allowed this to be done safely. At about 1852, on clearing Bass Rock, the second officer therefore started altering course to starboard, in small increments using the autopilot, to follow the alternative courseline (118º) marked on the paper chart **(Figure 2)**.

The 8-12 second officer arrived on the bridge at 1900 to facilitate a meal break. The 4-8 second officer handed over the watch at 1907 when the vessel was steadied on a course of 110º. Traffic was light, and although there were some targets on the radar, none of them had been acquired for plotting. The 4-8 second officer left the bridge shortly afterwards.

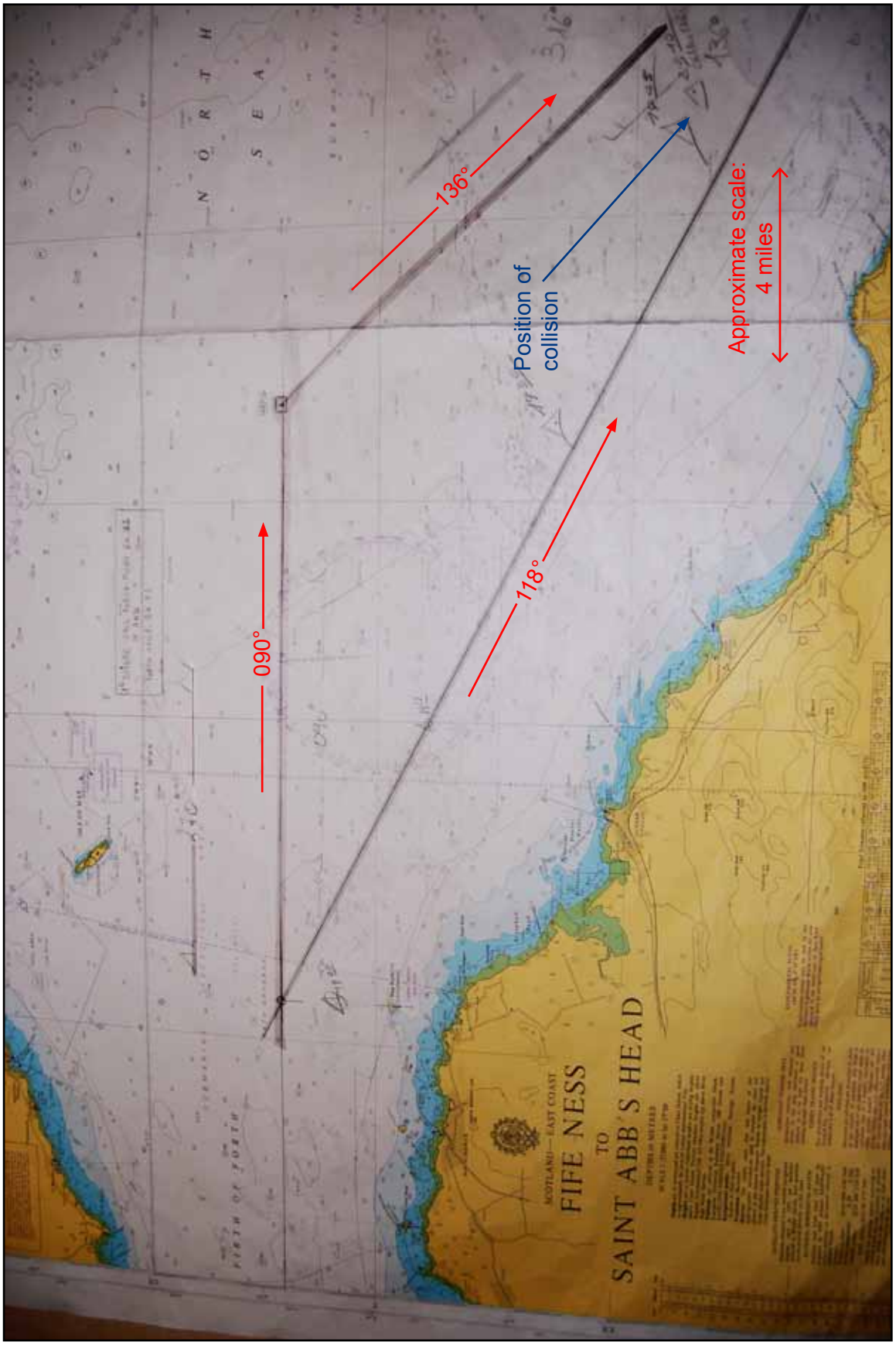
At 1912 and 1930 the second officer plotted the vessel's position on the chart and found she was north of the charted courseline of 118º **(Figure 2)**. At 1932 the 8-12 AB arrived on the bridge and, after a short handover, the 4-8 AB departed. At 1936, the second officer initiated an alteration of course to 118º using the autopilot. He then interrogated an AIS target on the starboard radar. The target was 6.52 miles ahead with a closest point of approach (CPA) of 0.24 mile in 16.5 minutes **(Figure 3)**. At 1939, the second officer altered course to 122º, which resulted in an increased CPA of 0.93 mile with the vessel ahead **(Figure 4)**.

While standing between the steering console stand and the starboard radar **(Figure 5)**, the second officer sighted three fishing vessels at about one point on the starboard bow. The AB, who was conducting a visual lookout and was positioned by the starboard clear view screen **(Figure 5)**, also noted these vessels. No visual bearings were taken of these vessels, and their radar targets were not plotted, nor were their bearings otherwise monitored. Both the second officer and AB continued to observe visually the three fishing vessels. At 1944 **(Figure 6)**, when the nearest fishing vessel (*Homeland*) was at 1 mile range, the AB expressed concern that the vessels were crossing, and that there was a possibility of a close-quarters situation. The second officer acknowledged this.

Just after 1945, the second officer initiated an alteration of course of up to 10º to port **(Figure 7)** on the autopilot. The AB again voiced his concern and questioned the sufficiency of the second officer's action. The second officer then moved to the starboard bridge wing **(Figure 5)**. Both saw the second fishing vessel (*Achieve*) make a bold alteration to port **(Figure 8)**.

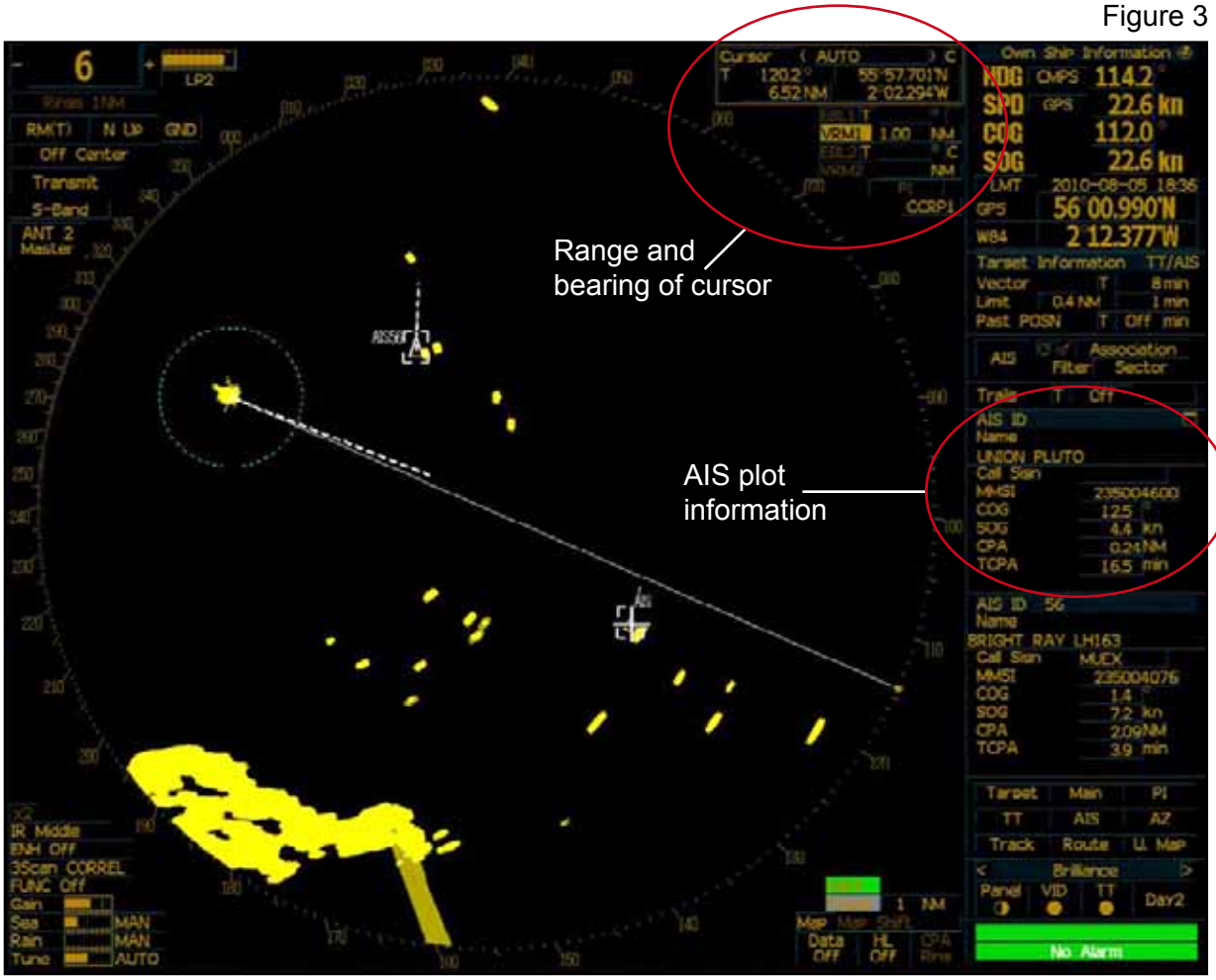
Reproduced from Admiralty Chart 175 by permission of the Controller of HMSO and the UK Hydrographic Office

Figure 2



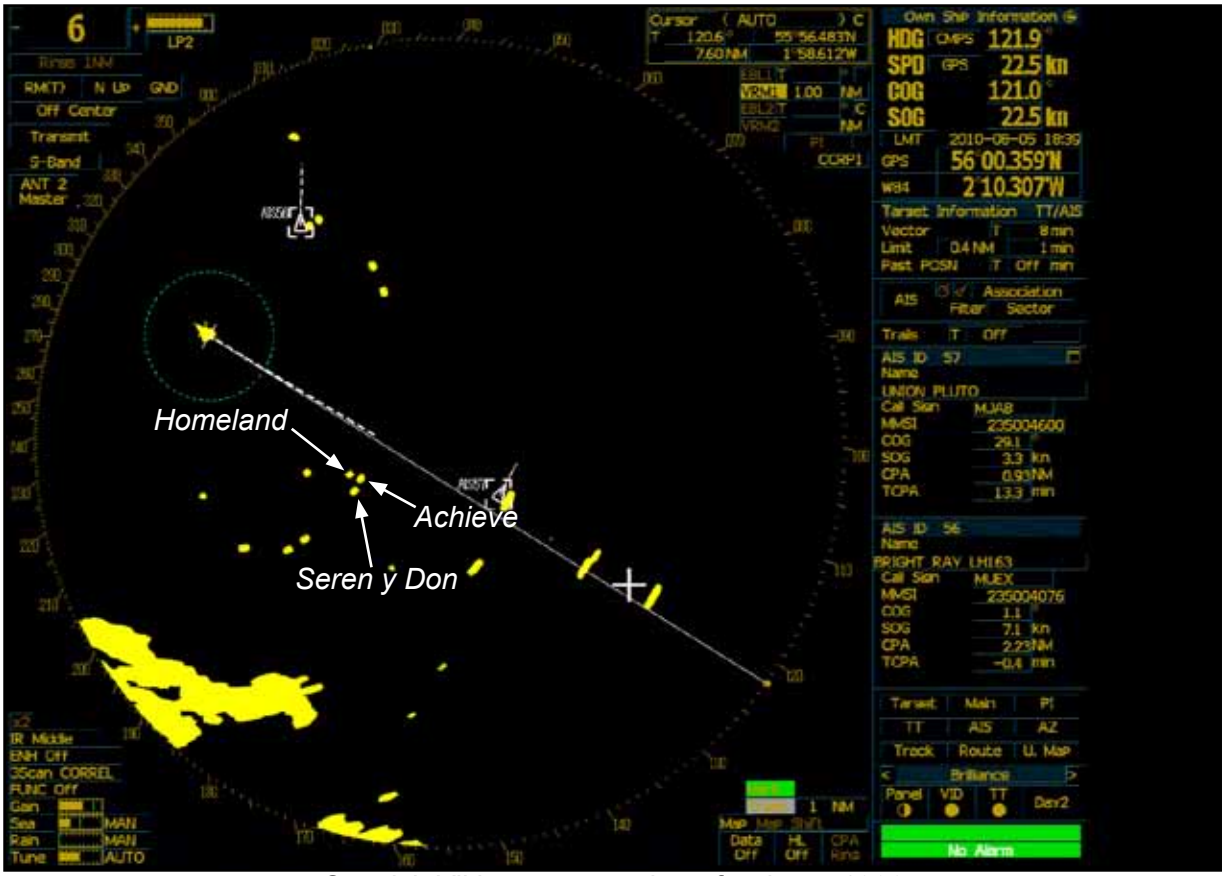
BA Chart 175 - Fife Ness to Saint Abb's Head

Figure 3



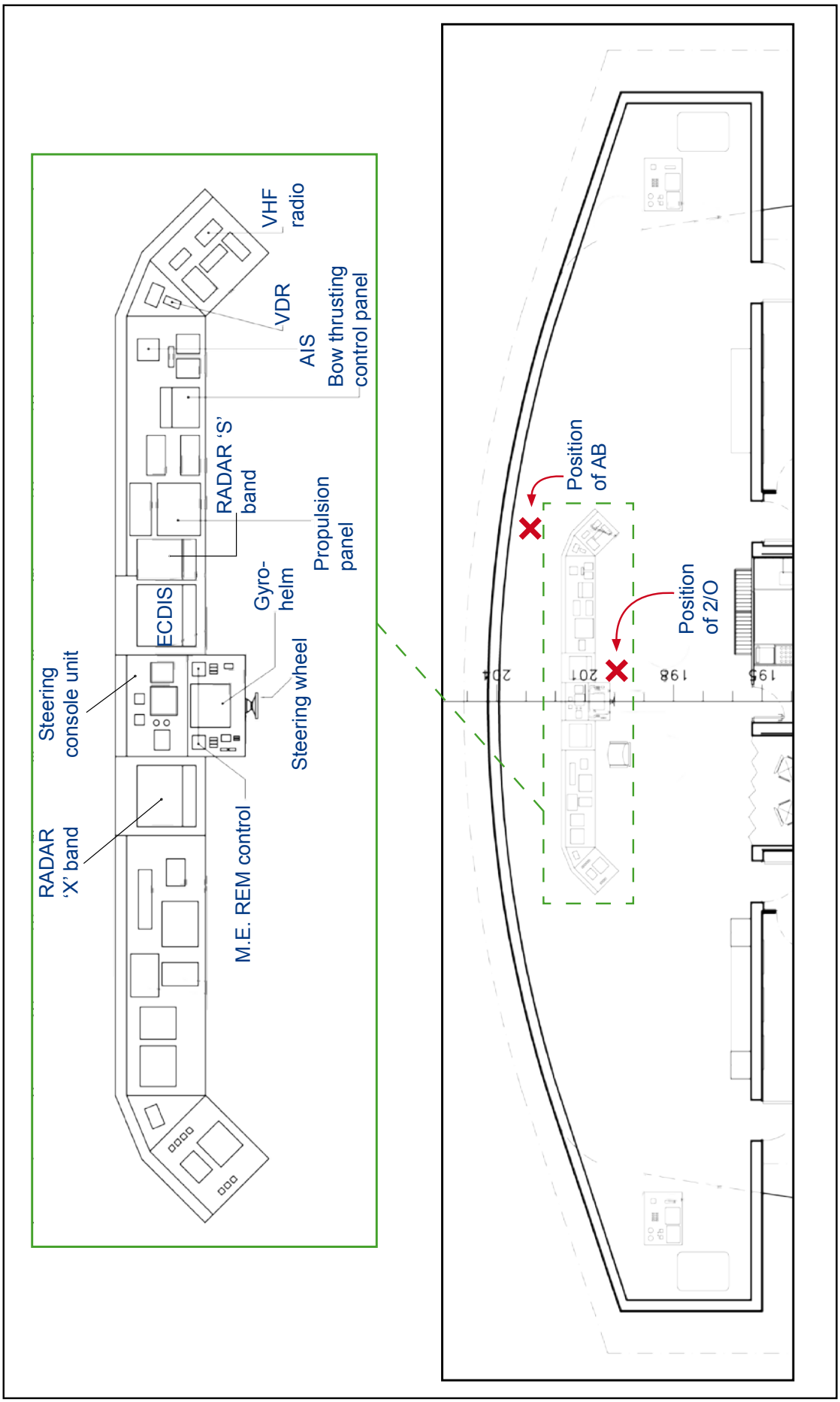
Scottish Viking - screen shot of radar at 1936

Figure 4



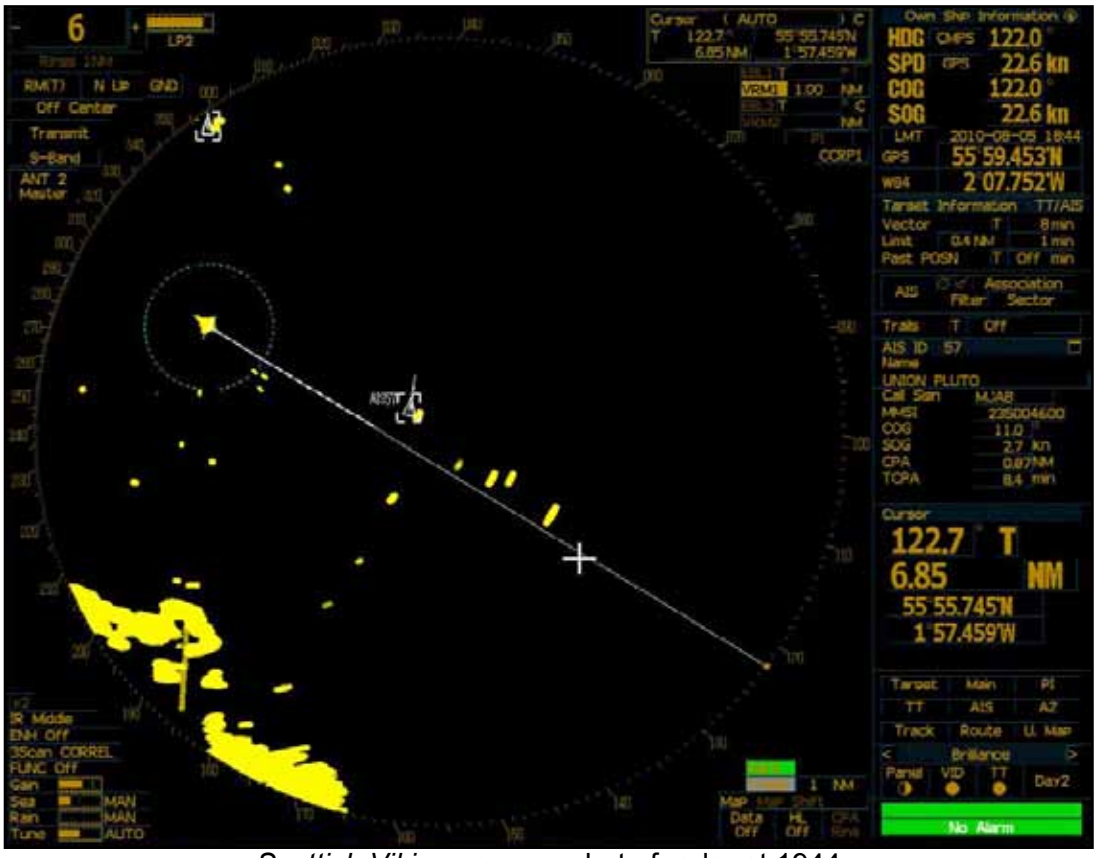
Scottish Viking - screen shot of radar at 1939

Figure 5



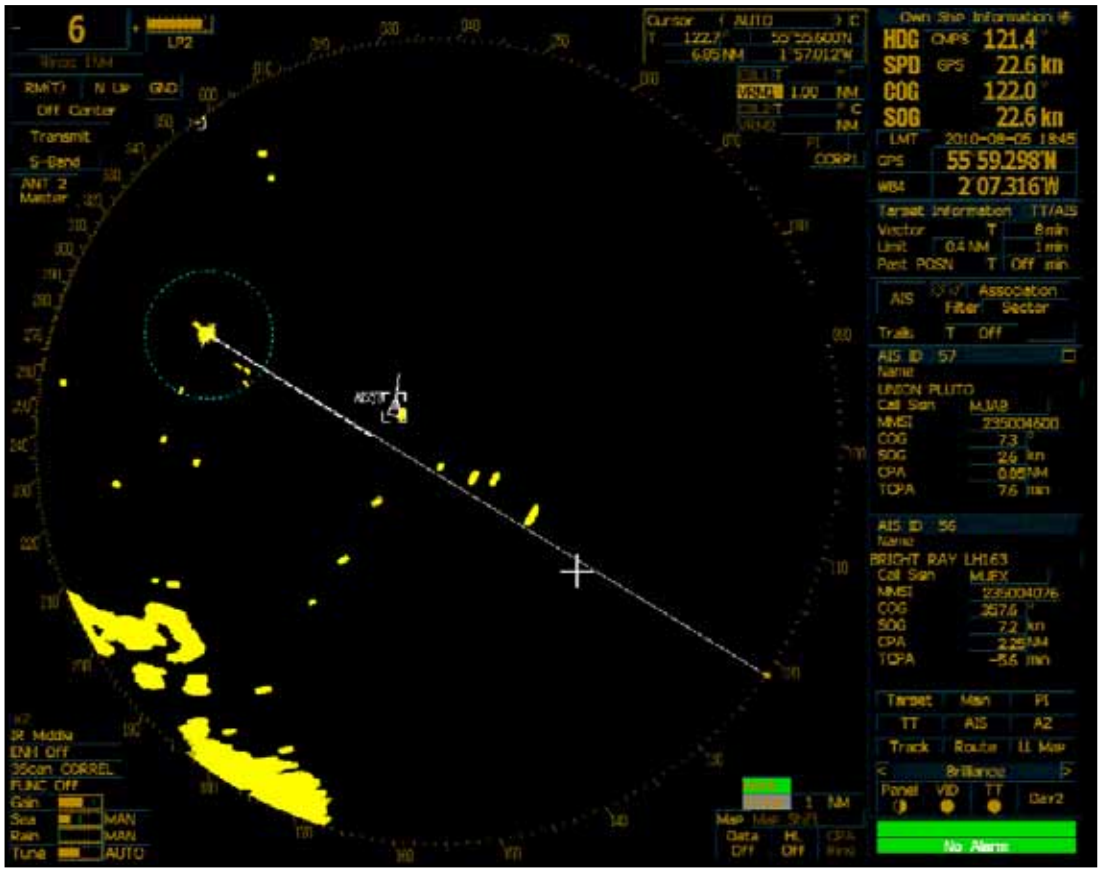
Scottish Viking - Bridge layout

Figure 6



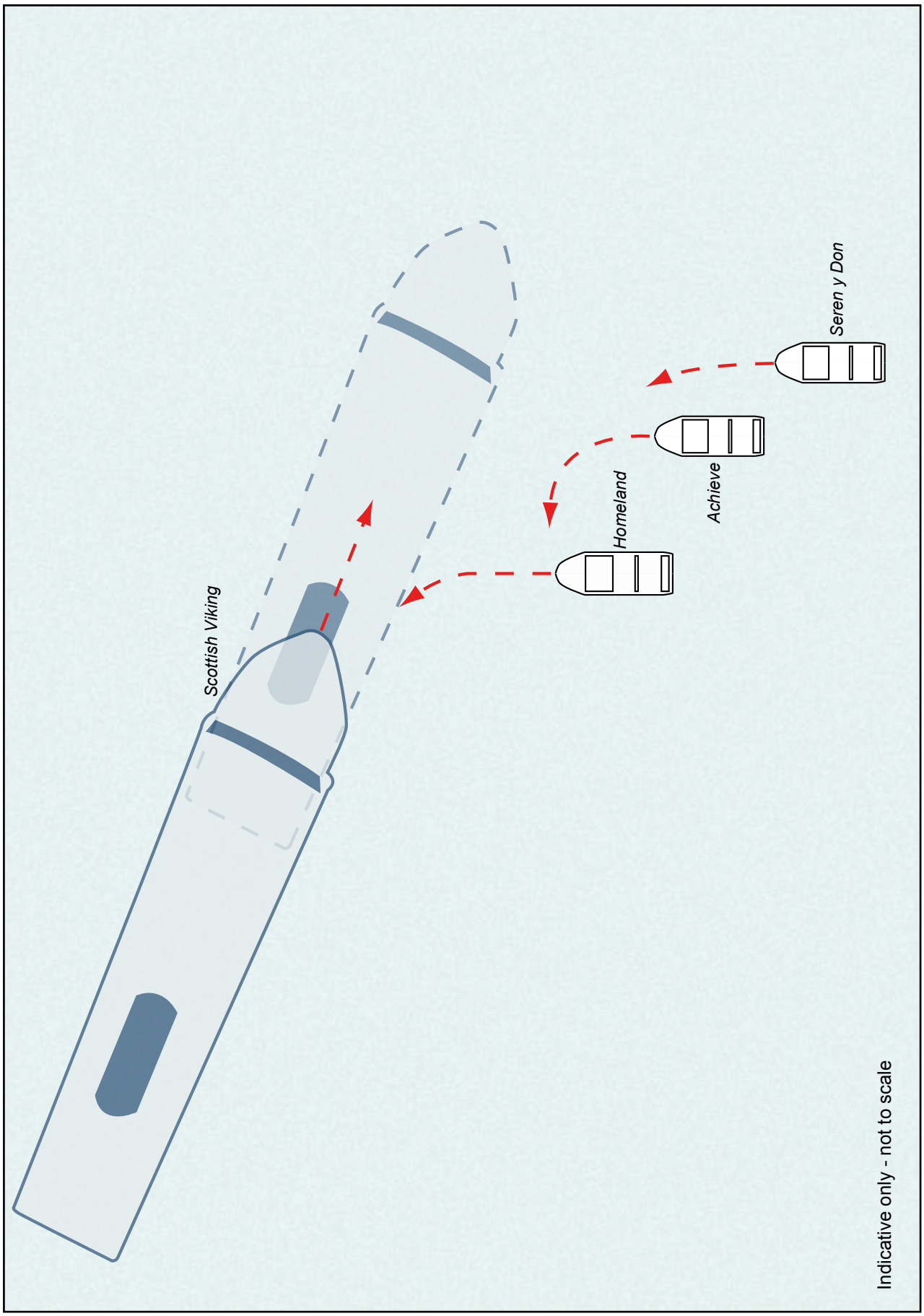
Scottish Viking - screen shot of radar at 1944

Figure 7



Scottish Viking - screen shot of radar at 1945

Figure 8



Reconstruction of the collision

At 1946, as the range with *Homeland* continued to decrease, the second officer ordered the AB to commence manual steering and alter course to port **(Figure 9)**. The AB complied. The second officer also sounded one short blast on the vessel's whistle. The AB applied about 20º port helm, which caused the vessel to heel significantly to starboard. Almost immediately, he turned the wheel the other way to correct this heel. A few seconds later the second officer told the AB that the vessel had collided with the fishing vessel, and instructed him to call the master.

The collision occurred at 1946.38. A table of *Scottish Viking'*s speed and heading, extracted from her voyage data recorder (VDR) for the period just before and after the collision, is provided in **Table 1**.

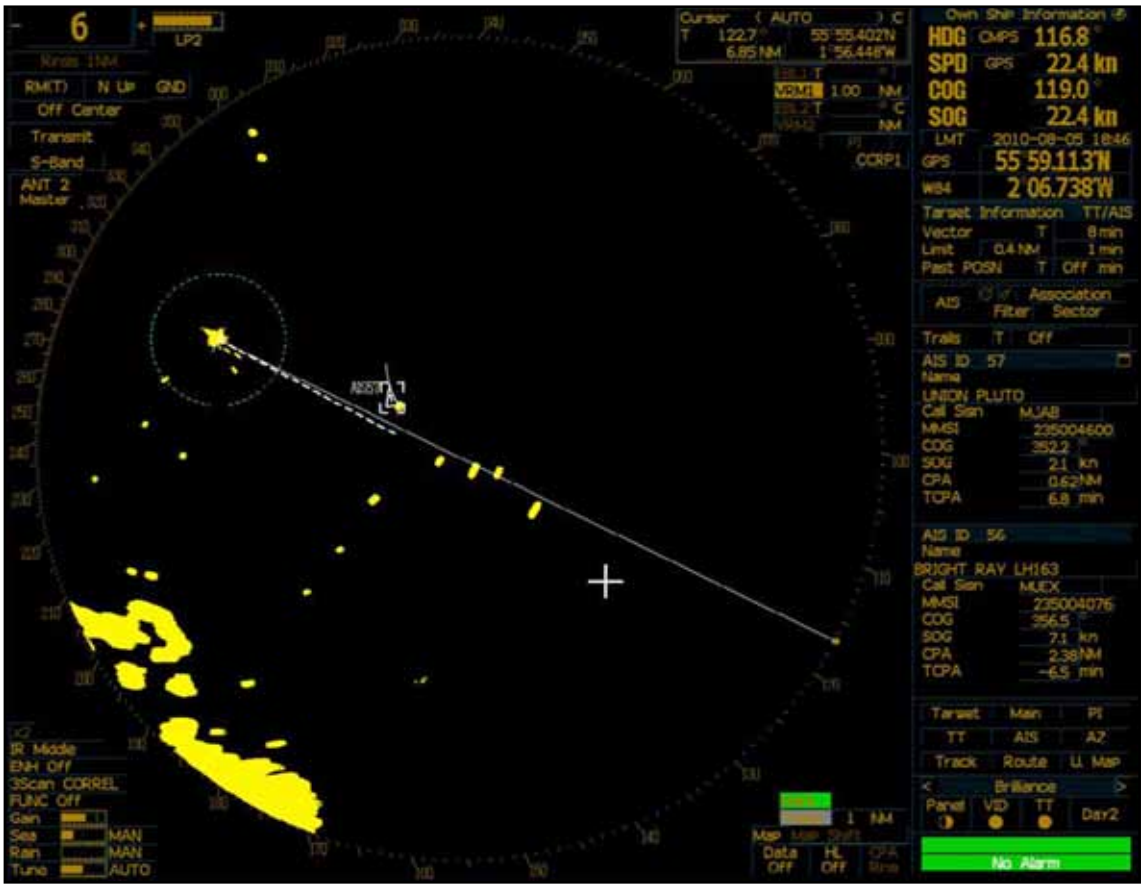
The master arrived on the bridge about 20 seconds after the collision. He quickly assessed the situation, reduced the vessel's speed, and continued to turn *Scottish Viking* slowly to port until such time as the vessel's fast rescue craft (FRC) was ready to be launched.

Table 1

Time	Heading	Speed	Analysis of events
1935.54	110º	22.6	Initiates alteration to starboard on autopilot
1937.36	118º	22.5	Course steadied on 118º
1939.07	119º	22.5	Course altered to starboard
1939.45	122º	22.5	Steady on 122º- *Homeland* **3nm brg 135º**
1944.25	122º	22.6	*Homeland* **1 nm away brg 133º**
1945.20	121º	22.6	Initiates alteration to port on autopilot
1945.32	121º	22.5	(ROT -8.7) **FV *Achieve* alters course**
1946.02	118º	22.4	(ROT -19.7)
1946.10	115º	22.4	(ROT -19.7)
1946.16	113º	22.3	(ROT -19.7) **Change over to manual steering**
1946.20	112º	22.3	(ROT -14.5) **Whistle sounded**
1946.30	107º	22.1	(ROT -54.7) **Indicates large helm to port**
1946.38	098º	21.8	(ROT -67.9) **Collision with *Homeland***
1946.44	092º	21.2	(ROT -71.4) **Helm to starboard**
1946.48	088º	20.9	(ROT -51.6)
1947.00	082º	20.4	**Master arrives on the bridge**

Heading and speed – *Scottish Viking*

Figure 9



Scottish Viking - screen shot of radar at 1946

1.3 SEARCH AND RESCUE OPERATIONS

Achieve and *Seren y Don* were on scene almost immediately to rescue the crew of *Homeland*. The crews of both vessels saw the skipper and Daniel surface after they had entered the water. While *Achieve*'s skipper deployed his vessel's liferaft and urged *Homeland*'s skipper to swim towards it, *Seren y Don*'s skipper headed towards where he had last seen Daniel. He had sighted Daniel right ahead in the water, but owing to his vessel's momentum could not stop immediately for fear of hitting him with the propeller. By the time he had turned *Seren y Don* around, Daniel had disappeared from sight.

*Homeland'*s skipper was recovered by *Seren y Don* shortly afterwards. Thereafter, both vessels started to search for Daniel.

At 1947, within 50 seconds of *Homeland* sinking, the first report of the accident to the coastguard was transmitted by the fishing vessel *Good Fellowship*. By 1953, search and rescue (SAR) helicopter R131 had been tasked to assist. Eyemouth, St Abb's and Dunbar lifeboats were also tasked. At 2008, *Scottish Viking* launched her FRC, and at 2018 the Eyemouth all weather lifeboat

(AWLB) arrived on scene and was appointed the on-scene co-ordinator for the SAR operation. By 2039, R131 was on scene and a large number of fishing vessels had also joined the search.

At 2217, Eyemouth AWLB reported to the coastguard that it was getting dark. The coastguard told *Scottish Viking* to recover her FRC and allowed her to resume passage. At 2244, R131 was also released. At 2247, the coastguard informed all surface assets that they could stand down once they had completed their respective search areas.

The search for Daniel resumed at 0404 the following day, and initially involved lifeboats from Dunbar, Berwick, St Abb's and Eyemouth along with about 20 local fishing vessels. At about 1000, the SAR operation was assisted by the arrival of R100, which remained on scene until 1202. Daniel was not found, and the coastguard SAR operation was terminated at 1329.

1.4 ENVIRONMENTAL CONDITIONS

The weather conditions at the time of the accident were fine. Visibility was good with a force 2/3 north-westerly wind and slight seas. The air and sea temperatures were 15º and 14.6º C respectively, and sunset occurred at 2112.

1.5 *HOMELAND*

1.5.1 General

Homeland was bought by the current owner in May 2007. At the time of the accident, she was skippered by his son and was operated as a prawn trawler.

The vessel was built in 1981 in Polruan and was required to comply with The Fishing Vessels (Code of Practice for the Safety of Small Fishing Vessels) Regulations 2001, as amended. She was equipped with a magnetic compass linked to an autopilot, radar, chart plotter incorporating a global positioning system (GPS), and VHF radio. The vessel was also fitted with a shelter, which allowed the crew to handle and gut fish on the aft deck during inclement weather. However, when the crew were standing inside the shelter, they had very limited all round visibility **(Figure 1)**.

Homeland operated out of Eyemouth, departing port in the evening, trawling between dusk and dawn, and returning to port in the morning to land her catch. After landing her catch and attending to routine maintenance, the crew typically slept during the day in preparation for departing port in the evening. The routine was normally followed for about 14 days after which a 6-day break was taken.

1.5.2 Manning and qualifications

Homeland was usually operated by a skipper and a deckhand.

Skipper

The skipper was a 20-year old UK national and had been a fisherman for 4 years. Soon after becoming a fisherman, in 2006, he completed all mandatory safety training courses. He was appointed skipper on one of his father's vessels soon after his 17th birthday and had been skipper of *Homeland* for 2 years. In 2009, he obtained a Seafish[1] Under 16.5m Skipper's Certificate.

Daniel McNeill

Daniel McNeill was 16 years old. Since the age of 14, he had intermittently worked at sea on one of his father's four vessels during school summer holidays. He had recently joined *Homeland* to assist the skipper, his brother, when the previous deckhand had moved to another vessel. Daniel had not attended any mandatory safety training courses.

1.6 *SCOTTISH VIKING*

1.6.1 Vessel overview

Scottish Viking was built in 2009 at the Cantiere Navale Visentini shipyard in Italy. She was owned and managed by Visemar di Navigazione Srl (Visemar) based in Porto Viro. The vessel was time-chartered to Norfolkline for a dedicated service between Zeebrugge and Rosyth, which had started in May 2009.

Norfolkline was acquired by the DFDS group in December 2009. The ferry service was rebranded in July 2010 and had since been operated by DFDS Seaways.

1.6.2 Bridge equipment

Scottish Viking was equipped with an integrated bridge system **(Figure 5)** fitted with predominantly Japan Radio Company navigational equipment. This included two radars with automatic radar plotting aid (ARPA) facilities, and an electronic chart system (ECS) unit, all capable of overlaying AIS data on their respective screens. Both radars were capable of interrogating AIS targets to provide information for use on collision avoidance. A gyro repeater and azimuth ring for the taking of visual bearings was provided at each bridge wing.

The primary means of navigation was by paper chart and the ECS was solely used as an aid to position monitoring.

The vessel was fitted with a Rutter 100G2/S voyage data recorder (VDR). Following the accident, the master pressed the 'save' button at 2004 on 5 August. The saved VDR data was downloaded by Marine Accident Investigation Branch (MAIB) inspectors on the vessel's return to Rosyth on 7 August.

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[1] Seafish is a Non Departmental Public Body funded and supported by the four UK government fisheries departments. It provides vocational and safety training to the industry through its network of affiliated Group Training Associations.

1.6.3 Bridge team

Scottish Viking carried a master, chief officer and three second officers, one in excess of the minimum safe manning required by the flag administration. This allowed the chief officer to supervise the loading and discharging operations at both ends of the route and the master to be available to the bridge team at all times during the sea passages. At the time of the accident, the bridge was manned by one officer and a helmsman/lookout in accordance with the company's procedure on bridge watch organisation that applied when the vessel was operated in conditions of unrestricted sea areas and good visibility.

Master

The master was an Italian national who had joined the company in 1998. He held an International Convention on Standards of Training, Certification and Watchkeeping (STCW II/2) unlimited master's certificate of competency. He was promoted to the rank of master in 2003. Having taken delivery of *Scottish Viking* from the shipyard in May 2009, he had sailed on her on a regular basis.

8-12 second officer

The second officer, an Italian national, started his career at sea as a deck cadet in 1992. He obtained his first watchkeeping certificate of competency in 1995 and had since sailed predominantly as a second officer. He obtained his unlimited chief officer's certificate of competency (STCW II/2) in 2006.

This was his second contract with the company. His first tour of duty lasted 3 months and was on a similar size and type of vessel which had operated in the Mediterranean Sea. He had joined *Scottish Viking* on 1 August 2010 in Zeebrugge and this was his second visit to Rosyth.

8-12 helmsman/lookout

The helmsman was also an Italian national. He was qualified to serve as a rating forming part of a navigational watch (STCW II/4). He had been actively employed on merchant ships as an AB since 1998, sailing predominantly on ro-ro passenger vessels. He had worked on board *Scottish Viking* as an AB since May 2010.

1.7 SAFETY MANAGEMENT

Visemar held a valid document of compliance in accordance with the requirements of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code). This certificate permitted Visemar to operate ro-ro passenger ferries and other cargo ships, and was issued on 9 June 2008. In addition to *Scottish Viking*, the company managed three other similar vessels.

1.7.1 Safety management compliance

Scottish Viking held a current safety management certificate issued by the flag administration on 24 April 2010 following an initial audit conducted alongside in Rosyth. No non-conformities were identified during the initial audit.

1.7.2 Vessel internal audit

The last annual internal audit of the vessel was carried out on 21 June 2010 by the designated person ashore, who was also responsible for the company's safety and security department. This audit was carried out while the vessel was alongside in Zeebrugge. The scope of the audit is contained in the safety management system (SMS) internal audit preparation form **(Annex A)** and did not include Chapters 13 and 14 of the SMS, which relate to navigation policy and procedures respectively.

The audit resulted in three non-conformities being identified. They were minor in nature and were confirmed as rectified on 26 June.

1.8 BRIDGE PROCEDURES

The company operated a paper-based SMS which contained its policies, procedures and instructions for the safe management and operation of the ship types it managed.

1.8.1 Navigation policy

In line with the ISM Code, Section 5 - Master's Responsibility and Authority **(Annex B)**, the company's navigation policy required the master to be primarily responsible for the safe and effective navigation of the vessel. It also required the navigation policies contained in the SMS to be strictly followed by the master and watchkeepers. Of particular note, and relevant to this accident, are the following requirements contained in Chapter 13 of the SMS:

Section 13.8 '*At sea, a closest point of approach ("CPA") of no less than one (1) mile shall be maintained whenever possible, and in accordance with Regulations for Preventing Collision at Sea ("COLREGS"). Master standing orders can modify this minimum safe distance, but can not decrease it'. [sic]*

Section 13.18 '*The primary means of plotting shall be the efficient use of all automatic radar plotting aids ("ARPA").*

Section 13.22 '*Deck Watch Officers are reminded that a closest point of approach of no less than one (1) miles must be maintained whenever possible.' [sic]*

1.8.2 Navigation procedures

Visemar provided comprehensive procedures on bridge watchkeeping. The master was free to enhance the company's procedures but was not allowed to make any fundamental changes without the company's approval.

Guidance to the bridge team on collision avoidance, clear weather watchkeeping, and on the use of radar and automatic pilot was contained in Chapter 14 of the SMS. Extracts of the procedures relevant to this accident are at **Annex C**.

1.8.3 Master's orders

In accordance with the company's navigation policy, the master was required to issue his own personal standing orders. These orders had been signed by all watchkeeping officers to acknowledge that they had read and understood them. The full text is available at **Annex D**.

The master also issued daily night orders, which provided a formal means to supplement the company's and master's standard navigational requirements with specific instructions to the navigating officers. The entry on 5 August and, indeed, most of the other days' entries was recorded as:

> '*Give all vessels a wide berth act as per colreg and master's orders call me in any problem or doubt….' [sic]*

1.9 THE COLLISION REGULATIONS

The following rules, from the International Regulations for Preventing Collisions at Sea 1972 (as amended) (COLREGS), are relevant to this accident and are reproduced at **Annex E**.

- Rule 2 – Responsibility
- Rule 5 – Lookout
- Rule 7 – Risk of collision
- Rule 8 – Action to avoid collision
- Rule 15 – Crossing situation
- Rule 16 – Action by give-way vessel
- Rule 17 – Action by stand-on vessel
- Rule 34 – Manoeuvring and warning signals

1.10 FORMAL GUIDANCE

1.10.1 Maritime and Coastguard Agency (MCA)

The MCA provides guidance on keeping a safe navigational watch to both fishing and merchant vessels in the following Marine Guidance Notes (MGN).

- MGN 313 (F) Keeping a Safe Navigational Watch on Fishing Vessels
- MGN 315 (M) Keeping a Safe Navigational Watch on Merchant Vessels

Both MGNs emphasise the requirement of maintaining a proper lookout, assessment of risk of collision and keeping the wheelhouse/bridge attended at all times.

The full text of MGN 313 (F) and MGN 315 (M) is at **Annex F** and **Annex G** respectively.

MGN 324 (M+F) Radio: Operational Guidance on the Use of VHF Radio and Automatic Identification Systems (AIS) at Sea provides operational guidance for AIS equipment on board vessels. Appendix III of this MGN contains an extract of the International Maritime Organization's (IMO) guidelines on the use of AIS for collision avoidance[2], and is at **Annex H**.

1.10.2 International Chamber of Shipping (ICS)

ISM

'Guidelines on the application of the IMO International Safety Management (ISM) Code' is published by the ICS. The fourth edition provides comprehensive guidance to companies when maintaining, reviewing and seeking to improve the effectiveness of their SMS.

Extracts relevant to this accident are at **Annex I**.

Bridge procedures

The fourth edition of the ICS's Bridge Procedures Guide is intended to reflect best navigational practices on merchant vessels, with the aim of improving navigational safety and protection of the marine environment.

Extracts that are relevant to this accident are at **Annex J**.

1.11 SIMILAR ACCIDENTS

The MAIB database of accidents for the period covering 1991 to 2009 records 147 collisions in UK waters between merchant ships of greater than 100gt and fishing vessels. During this period, 42 of these collisions resulted in full MAIB investigations and 18 were the subject of an MAIB preliminary examination.

The following are among the accidents which have been investigated and found to have similar safety issues to those identified during this investigation:

In January 2005, a fishing vessel collided with a tanker in good visibility. The fishing vessel was returning to port to land her catch and the skipper had left the wheelhouse unattended. Although the tanker had sighted the fishing vessel on her port bow, she was the stand-on vessel and expected the fishing vessel to take avoiding action. The tanker ultimately took avoiding action but this did not prevent the vessels from colliding. Fortunately, the fishing vessel sustained a glancing blow and relatively minor damage.

In October 2007, a collision occurred between a fishing vessel and a cargo vessel in good visibility. Neither vessel was keeping a proper lookout. The cargo vessel sighted the fishing vessel at close range and took late avoiding action. The fishing vessel suffered severe structural damage and sank with the loss of one life.

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[2] Resolution A.917.(22) Guidelines for the onboard operational use of shipborne Automatic Identification Systems (AIS). Full text available from www.imo.org

In September 2008, a collision occurred between a container vessel and a fishing vessel. Both vessels had detected each other about 10-15 minutes before the collision but did not establish if there was a risk of collision. The fishing vessel's skipper then left the wheelhouse unattended to assist his crew with mending the trawl net, while the container vessel's master became dazzled with the glare of the sunlight. Neither took any avoiding action. The fishing vessel suffered significant damage to her hull and had to be towed into port.

In December 2009, a collision between a bulk carrier and a fishing vessel resulted in one fatality. The bulk carrier had altered her course to avoid a collision, but this was rendered ineffective when the fishing vessel, which was not keeping a lookout, changed her course to start shooting her pots. The fishermen were forced to abandon their vessel as she lay semi-submerged on her port side. The fishermen were not wearing any form of buoyancy aid and did not have time to don their lifejackets.

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

There is no evidence that the watchkeepers on either vessel were suffering from fatigue. Fatigue is therefore not considered to be a contributing factor in this accident.

2.3 OVERVIEW OF COLLISION

The collision between *Homeland* and *Scottish Viking* occurred because those responsible for the watch on either vessel had not taken sufficient action to determine that a risk of collision existed. On board *Homeland*, the stand-on vessel, this was primarily because an inadequate lookout was being kept and the wheelhouse was not being manned continuously. On board *Scottish Viking*, the give-way vessel, the watchkeeper took insufficient action to determine that a risk of collision was developing; delayed taking action when it became apparent that risk of collision did exist; and, when the collision was imminent, did not take effective action to avoid the two vessels colliding.

2.4 LOOKOUT

It is a fundamental requirement of the COLREGS that a proper lookout is maintained at all times. If there is no lookout, many of the regulations intended to prevent collisions in varying circumstances cannot be applied. The importance of keeping a proper lookout as required by Rule 5 of the COLREGS **(Annex E)** is emphasised in both MGN 313 (F) **(Annex F)**, and MGN 315 (M) **(Annex G)**.

Homeland

While Rule 5 of the COLREGS does not stipulate from where a lookout needs to be maintained, MGN 313 (F) implies that it should be kept in a position from which an all-round view can be achieved. This, in most cases, is the wheelhouse, the bridge or another position from where a vessel is steered.

In the case of *Homeland*, the wheelhouse was equipped with an operational radar, the use of which was required by Rule 5 so as to make a full appraisal of the situation and of the risk of collision.

The skipper and Daniel had been standing on the aft deck within a shelter that significantly restricted their all-round view. While they had limited visibility ahead, *Scottish Viking* remained obscured from this position during the period leading up to the collision.

Although Daniel had intermittently returned to the wheelhouse to check the navigational situation, these checks were insufficiently thorough to identify a risk of collision with *Scottish Viking*. His ability to maintain a proper lookout was

compromised by the skipper's priority of requiring his assistance with mending the torn net on the aft deck. Further contributing factors might have been the effect of glare from the setting sun in the direction of *Scottish Viking* and a lack of watchkeeping proficiency, given Daniel's lack of appropriate qualifications and limited experience.

Scottish Viking

When the 8-12 second officer took over the watch, the vessel's heading had already been altered to follow the alternative courseline of 118º. Although this was a deviation from the formal passage plan, it had been approved by the master. The course alteration was reasonable in the circumstances, and gave the second officer no cause for concern.

Although the second officer and AB had sighted the fishing vessels, the second officer did not make a full appraisal of the situation or of the risk of collision by using the radar. In view of the number of fishing vessels in the vicinity of *Scottish Viking*, the second officer should have been using the radar in maintaining a proper lookout as required by Rule 5 of the COLREGS, and reinforced in MGN 315 (M).

2.5 ASSESSMENT OF RISK OF COLLISION

Homeland

In accordance with Rule 7 of the COLREGS, *Homeland's* watchkeeper was required to use all appropriate available means to establish if there was a risk of collision with other vessels in the vicinity.

This should have included the use of long-range radar scanning to provide an early warning of the risk of collision, particularly as the wheelhouse was intended to be left unmanned intermittently for short periods of time. The radar was set at 1.5 miles range. Given her relative course and speed, *Scottish Viking's* radar echo would not have appeared on *Homeland*'s radar display until about 3 minutes before impact. Daniel had given no indication to the skipper of any potential risk of collision when he returned from the wheelhouse about 1 minute before *Scottish Viking*'s whistle sounded. Therefore it can be concluded that he either had not detected *Scottish Viking* by sight or radar, or had not understood or anticipated the developing situation.

Scottish Viking

At 1939, with *Scottish Viking's* course steadied on 122º **(Table 1)**, the second officer turned his attention to the group of three fishing vessels on the vessel's starboard bow **(Figure 4)**. When determining if there was a risk of a collision with these vessels, he should have, as a minimum:

- Taken a series of visual compass bearings using the starboard azimuth ring, or
- Taken a series of compass bearings using the radar's electronic bearing line, or
- Monitored or plotted the radar's targets using the cursor or ARPA facility.

Instead, he chose to visually monitor the fishing vessels using a pair of binoculars. In the prevailing good weather he considered this was sufficient to establish if there was an appreciable change of bearing and, hence, a risk of collision.

The second officer's practice when navigating in close proximity to fishing vessels was to observe them visually and to take avoiding action only when necessary to maintain a CPA of about 0.5 mile. His experience was that fishing vessels often carried out erratic manoeuvres, and that taking early avoiding action could result in unnecessary close-quarters situations.

Rule 7 of the COLREGS requires watchkeepers to make proper use of radar equipment, including long range scanning, to determine whether a risk of collision exists. Similar guidance is contained in the ICS Bridge Procedures Guide, Visemar's company procedures (which included a minimum CPA of 1 mile), and also the master's standing orders. This sound advice stems from the reality that once vessels get in close proximity to each other, the freedom of action to avoid a collision can become limited, and dangerous situations can develop very quickly. In this accident, *Scottish Viking*'s watchkeeper not only showed an unprofessional attitude towards regulation and guidance, but also a failure to appreciate the hazard he was creating by intentionally navigating in close proximity to other vessels.

2.6 ACTION TO AVOID COLLISION

At 1944, when the fishing vessels were 1 mile away from *Scottish Viking,* the AB on the bridge voiced his concern that a close-quarters situation was developing. This prompted the second officer to recognise that he needed to take avoiding action.

The second officer interpreted *Scottish Viking* to be the give-way vessel in accordance with Rule 15 - Crossing Situation, of the COLREGS, and initially considered altering the vessel's course to starboard. However, he dismissed this option because:

- He assessed that he would have to make a large alteration to pass astern of the fishing vessels.
- The required rate of turn to achieve this alteration would cause the vessel to heel significantly, resulting in potential discomfort and injury to the passengers and crew.
- He perceived a risk of another close-quarters situation developing with other vessels forward of the starboard beam **(Figure 6)**.
- The course alteration would take *Scottish Viking* closer towards the coast.

The second officer decided to alter course to port, limiting the alteration to 10º in order to avoid causing *Scottish Viking* to heel significantly. In taking this action he expected and was now relying on the combined actions of both vessels to avoid collision.

The second officer's late recognition of the need to take avoiding action prevented him from taking early avoiding action in accordance with Rule 8 - Action to Avoid a Collision, and Rule 16 - Action by Give-Way Vessel, of the COLREGS. An unannounced rapid alteration of course at speed can pose a risk of injury to passengers as a consequence of a vessel's resulting heel. However, this can be avoided by the officer of the watch (OOW) taking appropriate early action. In this case, despite the second officer's concerns, an immediate course alteration to starboard at 1 mile would have avoided such risk and would have been an appropriate action in compliance with Rule 15. The second officer delayed his decision, thereby eliminating his options of collision avoidance by reducing speed or altering course to starboard, particularly after *Achieve* had altered her course to port. His only remaining option was then to alter course to port, albeit contrary to the spirit of Rule 15.

Rule 2 of the COLREGS allows for a departure from the Rules to avoid immediate danger and warns against "*the neglect of any precaution which may be required by the ordinary practice of seamen or by the special circumstances of the case"*. The second officer's decision in not making an immediate substantial course alteration to port, albeit at the risk of the vessel heeling significantly, lacked precautionary thought and was contrary to the spirit of Rule 2.

Had the second officer placed the vessel in hand steering and put the AB on the wheel as soon as he had assessed there was a risk of collision, any decision to alter course could have been enacted immediately and without compromising his ability to monitor the situation. Such action would have been in accordance with the master's standing orders and the company's procedures, and is reinforced in MGN 315 (M).

2.7 ACTION OF A STAND-ON VESSEL

In accordance with Rule 15 – Crossing Situation, of the COLREGS, *Homeland* was the stand-on vessel and was required to maintain her course and speed. However, when collision cannot be avoided by the give-way vessel alone, Rule 17(b) requires the stand-on vessel to "*take such action as will best aid to avoid collision*".

On being alerted to the risk of collision with *Scottish Viking*, *Homeland'*s skipper attempted to comply with Rule 17(b) in putting the engine astern and the wheel hard to port. However, these actions were too late to be effective.

2.8 USE OF SOUND SIGNALS

The second officer on board *Scottish Viking* sounded one short blast on the ship's whistle about 18 seconds before the collision with *Homeland*. This was a last-minute attempt to attract *Homeland*'s attention and prompt her to take avoiding action.

Rule 34 of the COLREGS requires the use of sound signals when vessels are manoeuvring in sight of one another. Recognising that action was required by *Homeland* to avoid a collision, the second officer should have sounded at least five short and rapid blasts on the whistle in accordance with Rule 34(d). In other circumstances, his one short blast, meaning 'I am altering my course to starboard' could have deterred a stand-on vessel from reducing speed or altering course to port for fear of creating a head-on collision.

2.9 ARPA VERSUS AIS PLOTS

Visemar's procedures and the master's standing orders required all navigating officers to use the radar and, in particular, the ARPA facility as the primary means of plotting targets to establish if a risk of collision existed. However, evidence from the VDR replay covering the period of 12 hours before the accident, indicated that this facility, although occasionally employed by the 8-12 second officer, was generally seldom used. The navigating officers had a preference for interrogating AIS targets on the radar display **(Figure 3)**.

The IMO currently considers AIS to be an additional source of navigational information, and users should not rely on it solely **(Annex H)**. AIS does not replace, but supports radar tracking. There are some distinct advantages in using AIS data for collision avoidance:

- Changes in heading and speed are readily apparent.
- Targets are not lost in clutter, or through target swap or fast vessel manoeuvres.
- A target's name and/or call sign and status are readily identified.

IMO Resolution A.917(22) **(Annex H)** cautions on the reliance of AIS in that:

- *Not all ships carry AIS.*
- *The officer of the watch (OOW) should always be aware that other ships, in particular leisure craft, fishing boats and warships, and some coastal shore stations including Vessel Traffic Services centres, might not be fitted with AIS.*
- *The OOW should always be aware that AIS fitted on other ships as a mandatory carriage requirement might, under certain circumstances, be switched off on the master's professional judgement.*

There is a case for both ARPA and AIS technologies to complement each other, and OOWs should not place total reliance on either one because both are prone to errors. There is a danger that increased reliance on AIS plotting can lead to watchkeepers interrogating only AIS targets. This, in turn, can engender a mis-perception that only targets with AIS symbols warrant interrogation, with all other targets on the radar display being ignored without determining if they actually pose a danger.

2.10 IMPLEMENTATION OF PROCEDURES

In accordance with the ISM code **(Annex B)** and the company's navigation policy, *Scottish Viking*'s master was responsible for the safe and effective navigation of his vessel. He was thus responsible for ensuring that his own standing orders **(Annex D)** and all relevant company procedures were followed. The investigation identified a number of lapses by the second officer in following the required navigational procedures. These were:

- Visual compass bearings were not taken in clear weather.
- The 1 mile CPA minima was not maintained.
- ARPA plotting was not undertaken to assess the risk of collision.
- A preference for interrogating AIS targets instead of ARPA plotting.
- Not changing over at an early stage from automatic steering to manual in a potentially hazardous situation.

The master did not take a navigational watch himself and, therefore, was available to routinely monitor bridge watchkeeper performance. The ISM Code places responsibility on Visemar to develop and implement instructions and procedures for the safe operation of its vessels, and to make its masters responsible for implementing and verifying that these procedures are being followed on board. However, it is apparent that the master's approach did not sufficiently motivate the second officer to follow the required procedures, or verify that they were being complied with.

2.11 NAVIGATIONAL AUDITS

Visemar had provided comprehensive guidance and well-documented procedures for the vessel to maintain a safe navigational watch. It also required the master to implement and ensure compliance with its navigation policy (Section 1.8.1). In this case, the policies of maintaining a CPA of no less than 1 mile, the use of radar plotting as the primary means of establishing risk of collision, and taking early avoiding action to prevent a collision were not followed by the second officer.

The last internal audit of *Scottish Viking* was carried out on 21 June 2010 while the vessel was alongside. Elements of navigation policy or procedures (Chapter 13 and 14 respectively of the SMS) were not audited. Operational procedures of a navigational nature are best audited while the vessel is underway. This gives the auditor a better opportunity to assess if the company's policies and procedures are being followed and, if not, to identify appropriate corrective action.

A ship manager needs to periodically evaluate the effectiveness of the company's SMS. This should not be limited to the assessment of paper records and documents. The ICS's 'Guidelines on the application of the IMO International Safety Management (ISM) Code' **(Annex I)** recommends

companies to formally evaluate mandatory monitoring equipment such as VDR data, which can be easily downloaded. Unscheduled audits of this data can help identify complacent[3] attitudes and poor procedures, which can then be addressed.

The presence of an internal or external auditor on board will encourage the crew to comply with laid-down procedures and work routines. However, evaluations of VDR data taken from vessels following accidents have provided the MAIB with invaluable evidence on how vessels normally operate away from the scrutiny of company officials.

EU directive 2009/18/EC[4] encourages the use of VDR data for accident investigation and also as a preventative tool. The directive advocates the routine examination of VDR data to enable experience to be gained of the circumstances capable of leading to accidents or incidents. Such examination provides incontrovertible information on watchkeeping standards under normal operating conditions.

2.12 WEARING A LIFEJACKET

This case highlights the lack of time available in an emergency to locate and don a lifejacket. Although *Homeland*'s crew knew where the lifejackets were stowed, they had insufficient time to retrieve them before the vessel sank.

Annex 1 of MGN 311 (F)[5], which provides operational guidance on the use of personal protective equipment, considers a lifejacket to be an essential item when working on deck.

The wearing of a lifejacket has value in:

- Keeping the person afloat with the airway and face clear of the water.
- Decreasing cooling due to additional insulation against the cold, reduced need to exercise and fewer periods of head immersion.
- Decreasing cardiac workload due to reduced need to exercise.
- Increasing detection and enabling more effective means of recovery from the water.

Had Daniel McNeill been wearing a lifejacket, his chance of survival, and detection by the rescue services, would have improved significantly.

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[3] The human consequence resulting from familiarity of task or operation

[4] Directive 2009/18/EC, establishing the fundamental principles governing the investigation of accidents in the maritime transport sector and amending Council Directive 1999/35/EC and Directive 2002/59/EC of the European Parliament and the Council, paragraph 21.

[5] MGN 311(F) Working and Protective Gear for Fishermen available at www.mcga.gov.uk

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT WHICH HAVE BEEN ADDRESSED

1. Although Daniel had intermittently returned to the wheelhouse to check the navigational situation, these checks were insufficiently thorough to identify a risk of collision with *Scottish Viking*. [2.4]

2. Daniel's ability to maintain a proper lookout was compromised by the skipper's priority of requiring his assistance with mending the torn net on the aft deck. [2.4]

3. Daniel might have lacked sufficient watchkeeping proficiency, given his absence of qualifications and limited experience. [2.4]

4. *Scottish Viking'*s second officer did not use the radar to fully appraise the situation or the risk of collision. [2.4]

5. Daniel had not understood or anticipated the developing situation. [2.5]

6. *Scottish Viking*'s second officer, when navigating in close proximity to fishing vessels, did not usually take early avoiding action. His experience was that fishing vessels often carried out erratic manoeuvres and that taking early avoiding action could result in unnecessary close-quarter situations. [2.5]

7. *Scottish Viking*'s second officer showed a poor attitude towards guidance and regulations. He lacked precautionary thought and failed to appreciate the hazard he was creating by intentionally navigating in close proximity to other vessels. [2.5, 2.6]

8. It is apparent that *Scottish Viking'*s master did not sufficiently motivate the second officer to follow the company's navigational procedures, or verify that they were being complied with. [2.10]

9. Visemar di Navigazione Srl's policies of its vessels maintaining a CPA of no less than 1 mile, the use of radar plotting to be the primary means of establishing risk of collision, and taking early avoiding action to prevent a collision, were not followed by the second officer. [2.11]

3.2 OTHER SAFETY ISSUES

1. *Homeland*'s shelter significantly restricted all-round visibility from the aft deck. [2.4]

2. The incorrect sounding of the whistle by a give-way vessel could prevent a stand-on vessel from taking appropriate last-minute action to prevent a collision. [2.8]

3. *Scottish Viking*'s navigating officers preferred to interrogate AIS targets instead of using ARPA. [2.9]

4. Navigational audits while the vessel is underway give an auditor a better opportunity to assess if the company's policies and procedures are being followed. [2.11]

5. Had Daniel McNeill been wearing a lifejacket, his chance of survival, and detection by the rescue services, would have improved significantly. [2.12]

SECTION 4 - ACTION TAKEN

4.1 VISEMAR DI NAVIGAZIONE SRL

Following the accident, the company carried out an internal investigation in which it identified a number of issues. To ensure similar accidents are avoided, it has carried out a review of its procedures and:

- Has distributed a fleet circular on the importance of following the company's navigational procedures.
- Has introduced an additional procedure that requires masters to report on the competence of a newly joined officer within 7 days of joining a vessel.
- Intends to carry out unscheduled navigational audits at sea and to randomly scrutinise VDR data to verify compliance with its procedures.

4.2 THE INTERNATIONAL CHAMBER OF SHIPPING

Has distributed a circular to its members highlighting its concerns regarding standards of watchkeeping **(Annex K)**.

4.3 THE MARINE ACCIDENT INVESTIGATION BRANCH

Has issued a flyer to the fishing industry **(Annex L)** highlighting the lessons learned from this accident.

SECTION 5 - RECOMMENDATIONS

In view of the actions already taken as a result of this accident, the MAIB has issued no safety recommendations.

Marine Accident Investigation Branch
March 2011