Report on the investigation of

the collision between

Scot Explorer and *Dorthe Dalsoe*

Route 'T' in the Kattegat

Scandinavia

2 November 2004

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Carlton House
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Extract from

The 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 purpose is to attribute or apportion liability or blame.

CONTENTS

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	-	Able Seaman
BA	-	British Admiralty
COLREGS	-	International Regulations for Preventing Collisions at Sea, 1972, as amended
CPA	-	Closest Point of Approach
DOC	-	Document of Compliance
DP	-	Designated Person
GPS	-	Global Positioning System
IMO	-	International Maritime Organization
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
MSC	-	Maritime Safety Committee
MSN	-	Merchant Shipping Notice
OOW	-	Officer of the Watch
SMC	-	Safety Management Certificate
SOLAS	-	International Convention of Safety of Life at Sea
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping incorporating the 1995 Amendments
UTC	-	Universal Co-ordinated Time
VHF	-	Very High Frequency

SYNOPSIS

The UK registered, 1882 grt, general cargo vessel *Scot Explorer* sailed from Corpach, Scotland on 30 October 2004 for passage to Varberg, Sweden, carrying 2107 tonnes of timber logs. At 1840(UTC+1) on 2 November 2004, she collided with the 14.7m Danish fishing vessel *Dorthe Dalsoe* in international waters in the Kattegat. *Dorthe Dalsoe* sustained considerable damage to her bow and required assistance from a Danish patrol vessel and other vessels in the vicinity, being subsequently towed safely into port. The damage to *Scot Explorer* was superficial and she was able to continue her voyage.

The collision occurred when *Scot Explorer* was following 'Route T' on a course of 131° at 9.8 knots, and *Dorthe Dalsoe* was on a course of 260° in autopilot at 7 knots. The fishing vessel was returning to Denmark to land her catch of prawns, after being at sea since 0300(UTC+1) the previous day. It was dark and visibility was good.

At the time of the accident, the crew of *Dorthe Dalsoe*, which comprised her skipper and an inexperienced deckhand, were working on the vessel's shelter deck, from where they were unable to see any vessels forward of the beam. Before leaving the wheelhouse, her skipper had seen a masthead light on the starboard bow but did not take any further action to determine if a risk of collision existed. He also configured the navigation lights to indicate that the vessel was not under command on the assumption that other vessels would keep out of the way.

The master of *Scot Explorer*, who was on watch on the bridge, had detected *Dorthe Dalsoe* both visually and by radar. He had assessed that she would pass between 3 and 4 cables down the port side. When the fishing vessel had closed to within 1 mile, the master attended to some routine work at the chart table. When he next looked out of the window, about 2 minutes later, he saw *Dorthe Dalsoe* very close off the port bow. Although the master of *Scot Explorer* immediately changed from auto to manual steering and applied starboard helm, collision could not be avoided.

The investigation highlighted several causal and contributory factors. These included:

Dorthe Dalsoe

- Her skipper might have been fatigued as a result of insufficient and poor quality sleep during the period leading up to the accident.
- Her skipper's knowledge of the COLREGS with regard to lookout, the use of radar, and the use of 'not under command' lights was poor, and its application dangerous.
- The navigation lights displayed were confusing.
- Her starboard side navigation light was probably not discernible among her bright white deck lights.
- A proper lookout was not maintained and a risk of collision could not be determined by the skipper when working on the shelter deck.

Scot Explorer

- The estimation of the CPA of *Dorthe Dalsoe* by radar was inaccurate because of the rudimentary methods used. Had more of the radar facilities available been used, a more accurate assessment of the CPA, and therefore risk of collision, would have been possible.
- The acceptance of a CPA of 4 cables was inappropriate given the sea room available and the lack of other shipping in the vicinity.
- The master of *Scot Explorer* was distracted as the vessels closed.
- The master was alone on the bridge. Had an additional lookout been on the bridge, he would have been well placed to alert the master to the approach of the fishing vessel.
- The AB nominated as lookout on the bridge of *Scot Explorer* was unavailable because priority was given to his duties in the galley.
- Although manned in accordance with her safe manning document, it was difficult for the vessel to comply with the STCW 95 requirements for a dedicated bridge lookout.

Following the collision, the ship managers of *Scot Explorer* increased the manning of the vessel above the minimum required by her safe manning document, and issued guidance on the use of bridge lookouts, and the determination of safe passing distances. The Danish Maritime Authority stated its intention to promulgate the lessons learned from this and other accidents involving Danish fishing vessels, to the Danish fishing industry, on completion of a safety study currently in progress.

In response to recommendations previously made by the MAIB, the Maritime and Coastguard Agency has commissioned an independent survey of safe manning levels across Europe. Depending on the outcome of this study, a report will be forwarded to the IMO highlighting the inconsistencies identified. The Maritime and Coastguard Agency also intends to issue guidance on the use of lookouts in an MGN.

In view of the actions already taken, a recommendation has been made to the MCA to maintain the priority given to those actions currently in progress regarding safe manning and the use of bridge lookouts. A recommendation has also been made to the International Chamber of Shipping to promulgate to its members the need to ensure that ships are able to meet the requirements for a dedicated lookout during darkness, and that bridge equipment must be used to its full potential if passing distances are to be accurately determined.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF SHIPS AND ACCIDENT

Scot Explorer **(Figure 1)**

Vessel details

Registered owner	:	Scot Explorer Shipping Ltd
Manager	:	Intrada Ships Management Ltd
Port of registry	:	Rochester
Flag	:	UK
Type	:	General cargo
Built	:	1996, Societatea Comerciala Navol S.A.
Classification society	:	Germanischer Lloyd
Construction	:	Steel
Length overall	:	81.68m
Gross tonnage	:	1882
Engine power	:	749kW

Dorthe Dalsoe **(Figure 2)**

Vessel details

Registered owner	:	Privately owned
Port of registry	:	Frederikshavn
Flag	:	Denmark
Type	:	Side trawler
Built	:	1962
Construction	:	Wood
Length overall	:	14.7m
Gross tonnage	:	19.7
Engine power and/or type	:	125kW

Figure 1

Scot Explorer

Figure 2

Dorthe Dalsoe

Accident details

Time and date	:	1840(UTC+1) on 2 November 2004
Location of incident	:	57°30.9N 011°17.0E
Persons on board	:	*Scot Explorer* – 5 *Dorthe Dalsoe* – 2
Injuries/fatalities	:	Nil
Damage	:	*Scot Explorer* – Superficial *Dorthe Dalsoe* – The stem post was broken and the fore deck crushed. Damage was most extensive on the port side of the bow where the hull was breached close to the waterline.

1.2 NARRATIVE

(All times are UTC+1, and all courses are true)

1.2.1 *Scot Explorer*

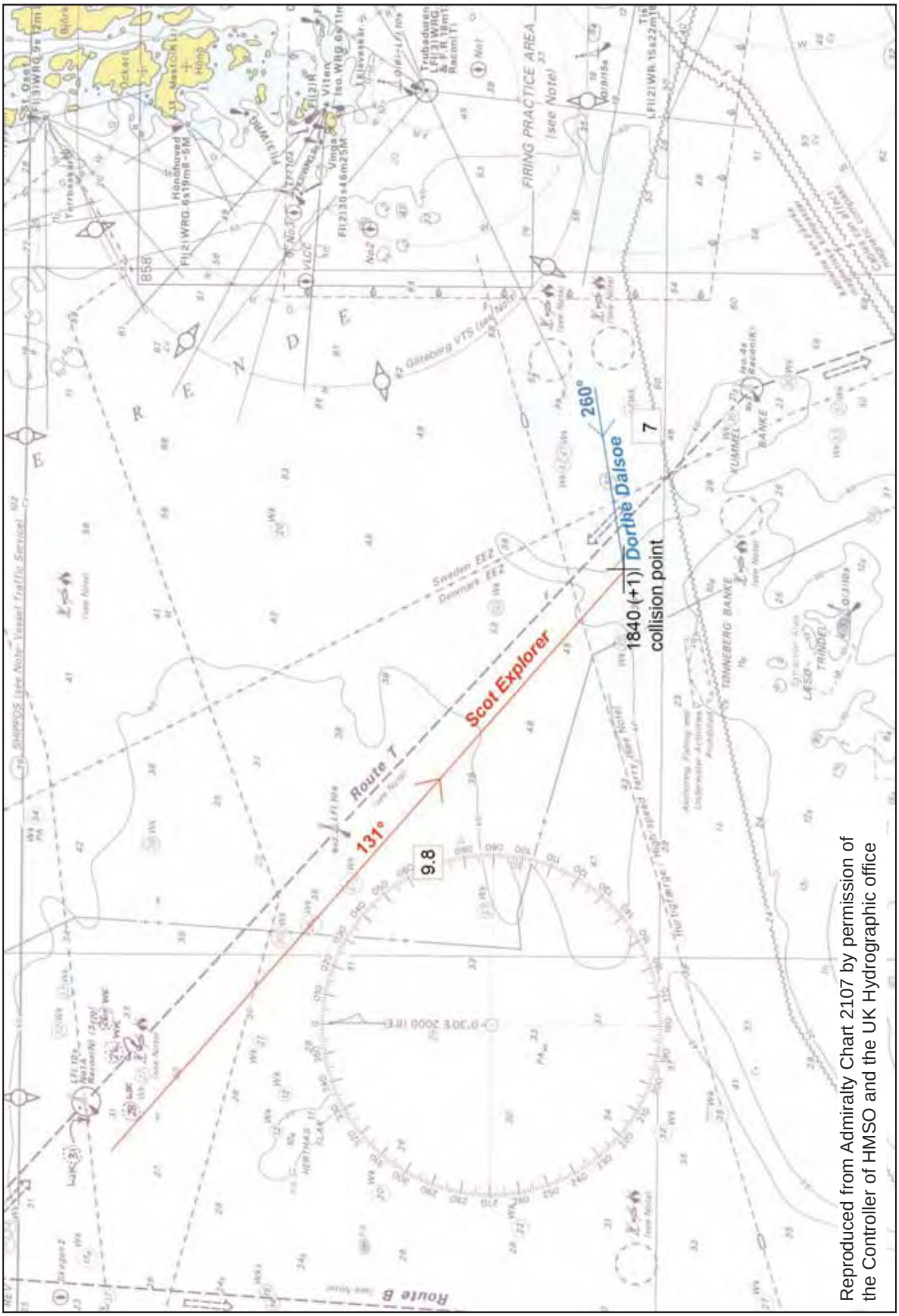
Scot Explorer sailed from Corpach, Scotland on 30 October 2004, for passage to Varburg, Sweden. She was carrying 2107 tonnes of timber logs, of which 226 tonnes was secured on deck. During the evening of 2 November, the ship was transiting Route 'T' in the Kattegat on a course of 131° in autopilot; speed over the ground was 9.8 knots **(Figure 3)**. The chief officer was the OOW. At 1820, he saw a vessel at a long distance on his port bow. The vessel, which was closing, was brightly lit by her white deck lights. A red light was visible above these lights.

The chief officer assessed that the vessel was a fishing vessel, but could not determine her aspect or movement, either visually or by radar. As a precaution, he switched on *Scot Explorer'*s deck lights to help ensure that she could be clearly seen by the approaching vessel. Shortly after, when the fishing vessel was between 3 and 4 miles, the chief officer saw a second red light on the fishing vessel. He assumed this to be her port side navigation light. Based on the sighting of this light, together with inspection of the fishing vessel's relative trail on the radar display, the chief officer assessed that the fishing vessel had altered course to starboard, and would pass at a distance of 3 to 4 cables down the port side.

When the fishing vessel was at a range of between 2.5 and 3 miles, the master arrived on the bridge to take the bridge watch. The chief officer showed him the 1800 position on the paper chart, which was the last plotted position, and also pointed out the fishing vessel, two points off the port bow. The chief officer then went to the mess room for his evening meal.

The master assessed the fishing vessel to be on a reciprocal course and passing between 3 and 4 cables down the port side. He did not think that the vessel was actually engaged in fishing because of her speed, which he estimated to be about 7 knots. There were no other vessels in close proximity. When the fishing vessel was at one mile, the master could see a red light at the top of her masthead, a white masthead light, what he took to be a red sidelight, and deck lights. At this point the master went to the chart table, sited on the port side of the bridge, to monitor the ship's position using the graphical display on a GPS receiver. He then updated the ship's official logbook. After being at the chart table for about 2 minutes, the master looked up and saw the fishing vessel between 30m and 40m off the port bow. He immediately changed to hand steering and applied starboard helm. Seconds later the vessels collided.

Figure 3



Reproduced from Admiralty Chart 2107 by permission of the Controller of HMSO and the UK Hydrographic office

1.2.2 *Dorthe Dalsoe*

Dorthe Dalsoe sailed from Frederikshavn, Denmark at 0300 on 1 November for passage to the fishing grounds in the southern part of the Vinga Rende, where she arrived at 0700 the same morning. She then trawled for prawns, with each tow lasting for about 7 hours. After hauling the fishing gear at 1800 on 2 November, the vessel commenced her return passage to Frederikshavn. Her course was 260° in autopilot, and her speed was 7 knots. There were no radar contacts on either of the two radar displays fitted, which were set to 1.5 and 3 mile range scales. However, the skipper saw a white masthead light about 45° on the starboard bow and at an estimated range of between 4 and 5 miles. The skipper switched off the vessel's green trawling light, and switched on two red lights sited one above the other on the aft masthead. He then joined the deckhand on the shelter deck **(Figure 4)**. The next he knew was when both crew felt a heavy bump as *Dorthe Dalsoe* and *Scot Explorer* collided.

In addition to the two red lights on the aft masthead, the vessel displayed a white light on her foremast, red and green sidelights, a white stern light, and deck lights. The skipper frequently displayed this configuration of lights to indicate that the vessel was 'not under command' when he left the wheelhouse unattended to clean the catch on the shelter deck. It was the skipper's expectation that other vessels would keep out of the way. There were no reported problems with the functioning of the vessel's autopilot.

Figure 4

The shelter deck on board *Dorthe Dalsoe*

1.3 ACTION FOLLOWING THE COLLISION

Following the collision, the skipper of *Dorthe Dalsoe* went to the wheelhouse and engaged the engine astern. He then contacted two other fishing vessels in the vicinity, FN 269 and FN 270 via VHF radio, channel P1. He informed them of the collision and asked for assistance. At 1841, the skipper also informed Lyngby Radio via VHF radio, channel 16.

The master of *Scot Explorer* reduced speed, and sounded the general alarm. The rescue boat was made ready to assist, and the chief officer went forward to check for damage. At 1842, the master contacted *Dorthe Dalsoe* on VHF channel 16, and requested they shift to channel 6. However, there was no further communication between the two vessels because the skipper of *Dorthe Dalsoe* did not speak English, and the master of *Scot Explorer* did not speak Danish. At about 1849, *Scot Explorer* turned to head towards *Dorthe Dalsoe* **(Figure 5)**, and at 1851 Lyngby Radio transmitted a PAN message regarding the collision.

After finding that *Dorthe Dalsoe* was taking in water forward, the skipper took the precautionary measure of releasing the liferaft sited on top of the wheelhouse in case it was needed at short notice. He then tried to make for Osterby, but quickly stopped again when it was evident that the vessel's forward movement increased the water ingress through the damaged bow **(Figure 6)**. Once stopped, *Dorthe Dalsoe* was soon joined by FN 269 and FN270, *Scot Explorer*, and the Danish naval patrol vessel *Storen*. Three pumps were transferred to *Dorthe Dalsoe* from *Storen* and another vessel LRB 19, and at 2010 when two of the pumps were working correctly, *Dorthe Dalsoe* was taken in tow by FN 270. The two vessels arrived in Strandby at 0045 the following morning.

1.4 ENVIRONMENTAL CONDITIONS

The visibility was good and the wind was south-east force 2 to force 4. Sunset was at 1624, evening civil twilight was at 1705, and nautical twilight was at 1753. There was no moon.

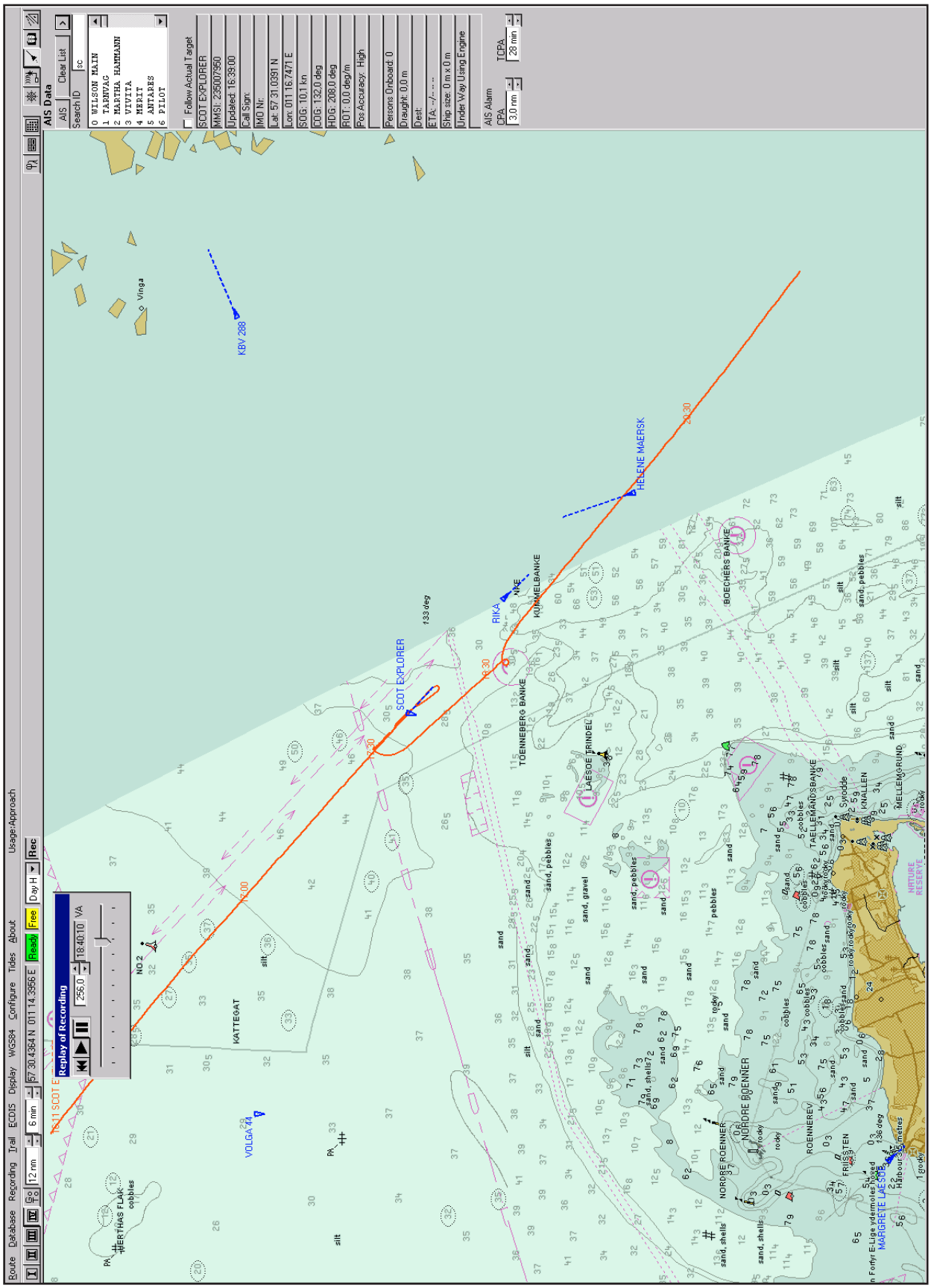
1.5 THE CREWS

1.5.1 *Scot Explorer*

Scot Explorer had a crew of five comprising a British master, a Polish chief officer, a British chief engineer and two Filipino ABs. One of the ABs was nominated as cook.

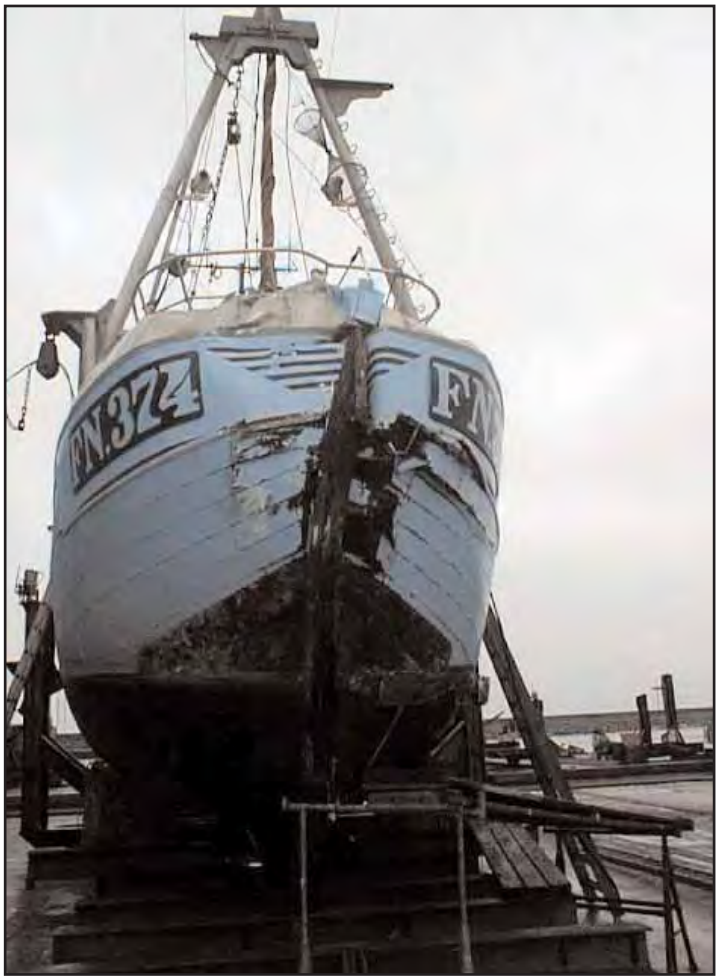
The master first went to sea in 1978 with Crescent Shipping, where he spent 10 years as a second officer. He qualified as a chief officer in 1988, and gained his command endorsement in 1997. In March 2002, the master moved to Intrada Ship Management, where he served successive contracts as master on board *Scot Pioneer* until August 2004. He joined *Scot Explorer* on 22 August 2004.

Figure 5



AIS display showing the track of *Scot Explorer*

Figure 6



Damage to the bow of *Dorthe Dalsoe*

The master worked a pattern of 10 weeks on board, followed by 5 weeks of leave. When at sea, he kept the 6 to 12 watches on the bridge, although the exact timing varied due to the ship's schedule and meals. The master's record of hours of rest for October is at **Annex A**. The master slept in his cabin between 1500 and 1730 during the afternoon of 2 November. He then ate and watched TV in the mess room from 1800 to about 1835. He did not feel tired.

The chief officer first went to sea in 1973 as an AB. He became an officer in 1991 and, although qualifying as a chief officer in 1996, he continued to serve as a second officer until joining Intrada Ship Management in January 2002. While working for Intrada, he had worked on board *Scot Ranger*, *Scot Pioneer*, *Scot Trader*, and had joined *Scot Explorer* on 25 August 2004. The chief officer had previously worked with the master on board *Scot Pioneer*. He kept the 12 to 6 watches on the bridge when at sea.

1.5.2 *Dorthe Dalsoe*

The crew of *Dorthe Dalsoe* comprised the skipper and one deckhand. Neither had any nautical qualifications, or attended any nautical training courses. The skipper was 37 years old and had been fishing for 20 years. He had owned *Dorthe Dalsoe* for 7 years. This was the first time the deckhand had been to sea on board a fishing vessel, and he described himself as a 'tourist' on board. The skipper and the deckhand took turns to sleep while towing. The skipper slept a total of about 8 hours during the trip, all of which was taken in the wheelhouse.

1.6 USE OF RADAR

Scot Explorer was fitted with two bridge radar displays, one of which was a river radar and not used during sea voyages. The radar display in use was a Racal Decca Bridgemaster, sited on the port side of the bridge next to the chart table. When the master relieved the chief officer on the bridge, the display was initially set to the 6-mile range scale but had been reduced to the 3-mile scale before the collision. The display was course up in relative motion, and the master and chief officer had determined the CPA of *Dorthe Dalsoe* using its synthetically produced target trails based on 3 minutes of tracking. The range of the fishing

vessel was estimated based on an assessment of the radar target's position relative to the fixed range rings on the radar display. The Bridgemaster display was equipped with automatic acquisition and tracking, and guard zone facilities, but these were not used. This was the first time the master had worked on board a vessel equipped with a Bridgemaster display, but he was familiar with the use of automatic plotting facilities.

1.7 EMPLOYMENT OF ABLE SEAMEN ON THE BRIDGE OF *SCOT EXPLORER*

It was stated that it was usual practice for an OOW to be accompanied on the bridge by an AB during the hours of darkness. The AB nominated to accompany the chief officer did not go to the bridge after dark on the evening of 2 November because he was having supper. The AB nominated to accompany the master, was also the cook, and was prevented from being on the bridge at the time of the accident by his work in the galley. The AB cook normally worked in the galley between 1000 and 1400, and between 1700 and 1900. His recorded hours of rest for October are at **(Annex B)**. The evening meal on board *Scot Explorer* was routinely taken between 1800 and 1815. The crew acknowledged that it was not always possible for an AB to be on the bridge during darkness, particularly during meal times.

Following an earlier accident involving *Scot Venture*, Intrada Ship Management issued a fleet directive in June 2004 titled *Keeping a Safe Navigational Watch*. With regard to the employment of ABs on the bridge, this stated:

> *The Navigational Watch Rating is to be on the bridge not just during the hours of darkness but as circumstances dictate, i.e. restricted visibility, heavy commercial traffic, concentrations of fishing vessels or pleasure craft and narrow or busy channels.*

1.8 SHIP MANAGEMENT

Intrada Ship Management Limited was formed in 1977 and, at the time of the accident, managed all seven ships owned by Scot Line. All of these vessels were UK flag, and operated chiefly within the short-sea trade carrying timber products between the UK and Scandinavia, spending an average of 2 days on passage and 12 hours in port. The company also chartered two other vessels engaged on similar operations.

The company's DOC was issued by the MCA in September 2002, and an Interim SMC for *Scot Explorer* was issued by Germanischer Lloyd on behalf of the MCA on 30 August 2004. The ship's DP was one of the company's technical superintendents. He was also the DP for the other vessels owned by Scot Line and managed by Intrada. The crewing manager, who was a qualified master, conducted the company's internal navigational audit of its vessels.

1.9 DETERMINATION OF MANNING LEVELS

1.9.1 The ship owners and managers

Formerly *Bornrif, Scot Explorer* was purchased and renamed by Scot Line on 31 August 2004. The ship changed from the Netherlands to the UK flag on the same day. The vessel had been acquired to help meet the company's increasing share of freight market volume. The company reported that it had experienced difficulty in obtaining a vessel of this type due to the limited number of secondhand vessels available, and the delivery forecasts for new builds typically being in the region of 3 years. Before purchasing *Scot Explorer*, Scot Line had chartered her on consecutive voyage charters since April 2004.

When operating under the Netherlands flag, the minimum crew permitted by her safe manning document was five, which was the maximum number the vessel was able to accommodate in separate cabins. However, the master's cabin was equipped with two bedrooms.

Intrada Ship Management was uncertain whether the MCA would give approval for *Scot Explorer* to be operated with a crew of five, which was fewer than its other vessels. Before completing the purchase, the company submitted a provisional application for a Safe Manning Document to the MCA on 8 June 2004, in order to seek its views on the matter. The application proposed a minimum crew of five, in line with the accommodation available. Had the application been rejected by the MCA, the company reported that it would have investigated other options, including approaches to other Administrations. It did not, however, state this as a possible course of action when forwarding its original application to the MCA.

Despite observing that the vessel had operated efficiently with five crew when on charter, and the company was aware that many of its competitors operated vessels with fewer crew, Intrada had reservations about operating the vessel with a crew of only five. Consequently, it decided to review the situation after the ship had been running for three months. Prior to the purchase of *Scot Explorer*, her designated master had been reluctant to accept command when initially offered because of the differences in manning levels compared to *Scot Pioneer*. When in command, he had discussed the limited accommodation available with the DP and crewing manager after being invited to take an additional chief engineer to sea for familiarisation. It had been agreed by the master and the DP, that if operating with a crew of five was not successful, the number of crew would be increased to six. The DP had researched the cost of modifying the accommodation accordingly. Immediately following the collision, the master stated that the operation of *Scot Explorer* was labour intensive, and that a third AB would be of benefit, particularly when working cargo.

1.9.2 The principles of safe manning

The principles of safe manning are laid out in IMO Resolution A.890 (21) **(Annex C)** and SOLAS Chapter V, Regulation 14. It is not mandatory for flag administrations to adhere to these guidelines, but where they are followed, responsibility for the application of these principles rests with the ships' owners and managers, with responsibility for approval falling to the relevant administration. Guidance on the application of these principles is provided by the MCA in MSN 1767(M), which also contains guidance on hours of rest and watchkeeping. It also provides guidance on the numbers of certified deck and engineer officers appropriate to the sizes of ships, tonnages and trading areas. It does not provide specific guidance regarding the number of ratings to be carried. With regard to consultation, the MSN states:

> *Owners and operators should consult with the master, seafarers' representatives and the MCA (where appropriate) on their proposed manning levels.*

1.9.3 The Safe Manning Document

The Safe Manning Document for *Scot Explorer* **(Annex D)** was issued by the MCA on 26 August 2004. It approved the vessel to be operated with a crew of five within the area bounded by:

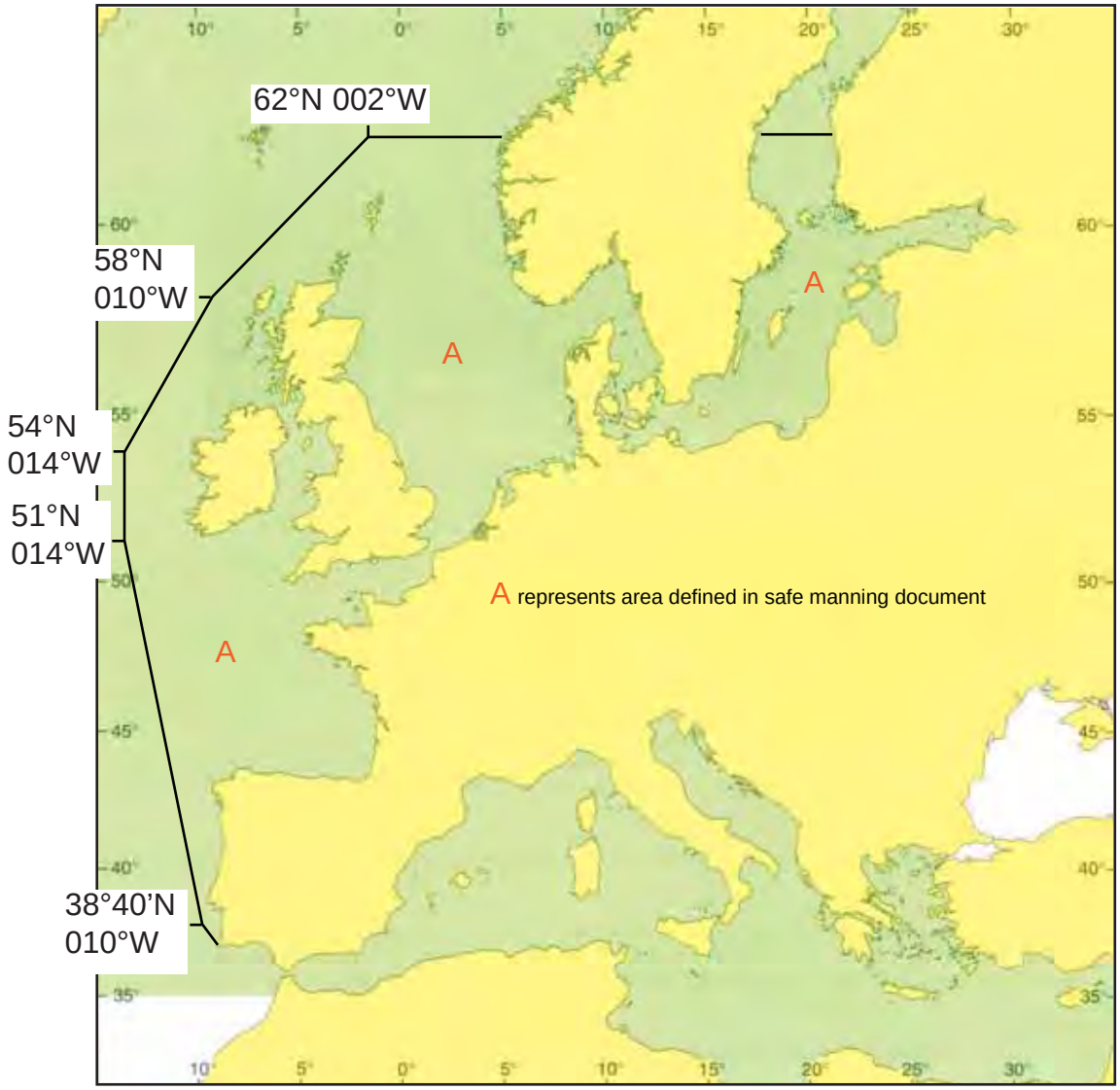
> *a line from a point on the Norwegian coast in latitude 62° North to a point 62° North 02° West; thence to a point 58° North 10° West; thence to a point 54° North 14° West; thence to a point 51° North 14° West; thence to a point 38° 40' North 10° West; thence to Cape St Vincent including the Baltic Sea*.

This area is shown at **Figure 7**. When operating outside this area, the ship was required to carry an additional OOW (deck) and a second engineer.

The Safe Manning Document for *Scot Venture*, a 2594grt, UK flagged vessel managed by Intrada and operating in the same trading area, required her to carry a crew of seven when operating in the same area. This comprised a master, a chief officer, a chief engineer, a motorman, two ABs and a cook. *Scot Pioneer,* which was 1587grt, and had been the master's previous command within the company, had a minimum crew of six, including three ABs.

In 2004, the MCA installed a database of all UK registered vessels which allowed comparison of vessels of similar size and operation. This facilitated greater consistency when issuing Safe Manning Documents. However, the MCA stated that it was difficult to modify Safe Manning Documents already approved. It also stated that it did not consider it practical to require owners to modify accommodation in order to implement the principles of safe manning. Some owners had removed their vessels from the UK register following the MCA's rejection of their safe manning proposals.

Figure 7



Area defined in the safe manning document

1.10 STCW 95 – REST PERIODS AND LOOKOUT

The provisions of STCW 95 include a mandatory code regarding manning and operational matters. The code addresses watchkeeping at sea and sets out certain principles to be observed in keeping a navigational watch, including the keeping of a lookout. Relevant parts of the text read as follows:

Regulation VIII/1

"Each Administration shall, for the purpose of preventing fatigue;

1. *establish and enforce rest periods for watchkeeping personnel; and*

2. *require that watch systems are so arranged that the efficiency of all watchkeeping personnel is not impaired by fatigue and that duties are so organised that the first watch at the commencement of a voyage and subsequent relieving watches are sufficiently rested and otherwise fit for duty.*

Section A-VIII/1

1. *All persons who are assigned duty as officer in charge of a watch…shall be provided a minimum of 10 hours rest in any 24 hour period.*

2. *The hours of rest may be divided into no more than two periods, one of which shall be at least 6 hours in length.*

The requirements for rest periods laid down in paragraph 1 and 2 need not be maintained in the case of an emergency or drill or in any other overriding operational conditions.

3. *…the minimum period of 10 hours may be reduced to not less than 6 consecutive hours provided that any such reduction shall not extend beyond two days and not less than 70 hours rest are provided each seven day period.*

Section A-VIII/2.Part 3

1. *The duties of the lookout and helmsperson are separate and the helmsperson shall not be considered to be the lookout while steering, except in small ships where an unobstructed all-round view is provided at the steering position and there is no impairment of night vision or other impediment to the keeping of a proper lookout. The officer in charge of the navigational watch may be the sole lookout in daylight provided that on each such occasion:*

   a. *the situation has been carefully assessed and it has been established without doubt that it is safe to do so;*

   b. *full account has been taken of all relevant factors, including, but not limited to:*

      - *state of weather,*
      - *visibility*
      - *traffic density*
      - *proximity of dangers to navigation*
      - *the attention necessary when navigating in or near traffic separation schemes; and*

   c. *assistance is immediately available to be summoned to the bridge when any change in the situation so requires*

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

As the skipper of *Dorthe Dalsoe* had only 8 hours sleep, taken in the wheelhouse when towing, during the 38 hours before the accident, it is probable that he was feeling some effects of fatigue. The quantity of sleep was insufficient, and its quality was poor. However, in view of the fact that it was his normal practice to leave the wheelhouse unattended when cleaning the catch, it is difficult to determine the extent to which the effects of fatigue might have influenced the skipper's decision-making in this respect.

Assuming that the recorded hours of rest **(Annex A)** for the master of *Scot Explorer* are accurate, these exceed the minimum required by STCW 95 and MGN 1767 (M). Additionally, as the master had also slept for 2.5 hours in the afternoon, did not feel tired, and was active on the bridge after taking over the watch, there is no evidence to indicate that his performance was affected by fatigue.

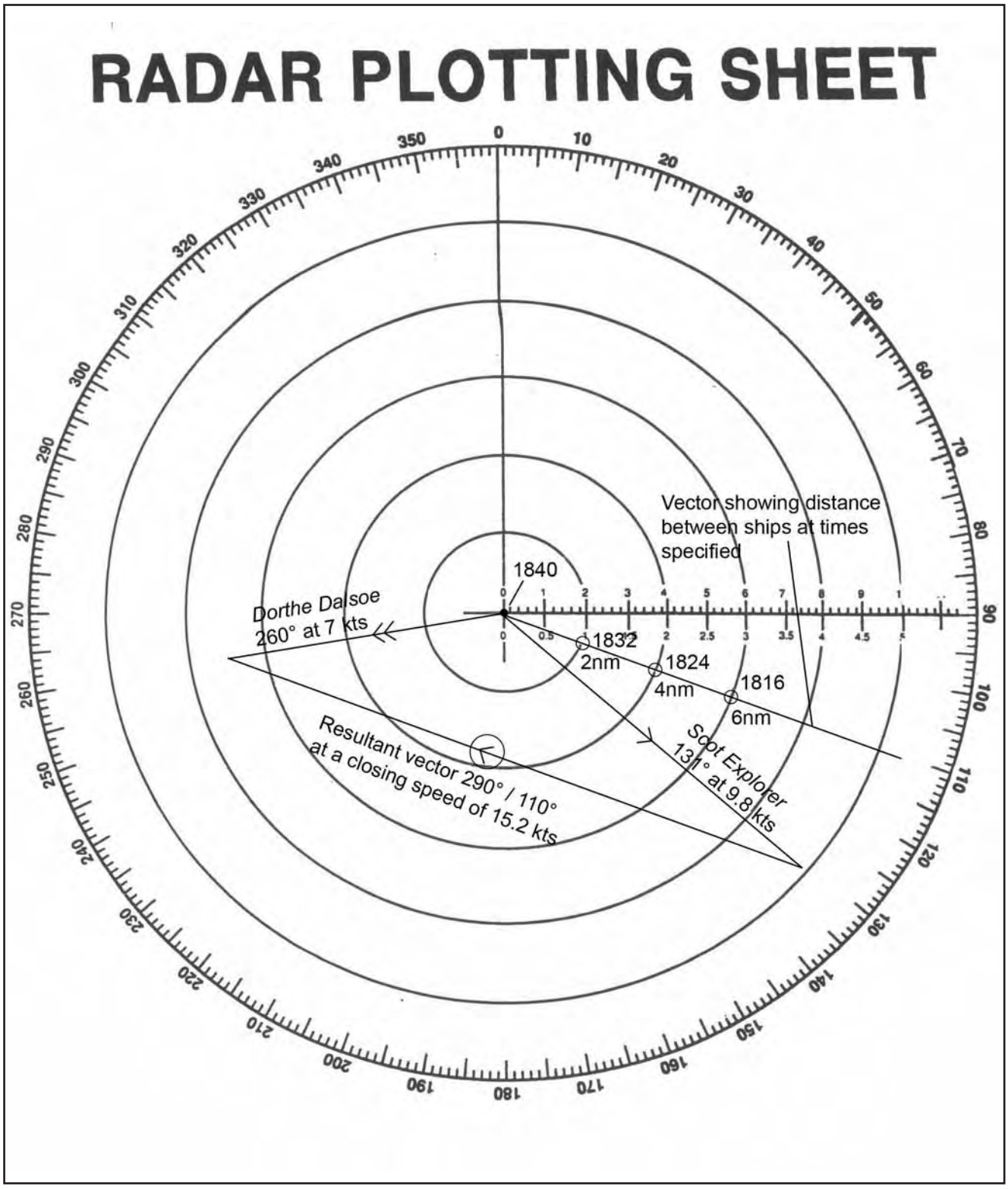
2.3 INTERPRETATION OF THE SITUATION

Figure 8 is a plot based on the stated courses and speeds of *Scot Explorer* and *Dorthe Dalsoe*. This shows that *Dorthe Dalsoe* closed *Scot Explorer* from a bearing of 110° with a relative closing speed of 15.2 knots. This correlates with the assessment that she was two points on the port bow when the master of *Scot Explorer* took over the watch.

The course and speed of *Scot Explorer* have been verified by AIS data **(Figure 5)**. Similar data is not available for *Dorthe Dalsoe*, and it is possible that the fishing vessel altered course when the vessels were in close proximity due to a malfunction of her autopilot. However, as the skipper of *Dorthe Dalsoe* was not in a position to detect or notice such a malfunction, and the master of *Scot Explorer* was not observing the vessel at the time, there is no eye witness evidence to corroborate this possibility. Also, given that there had been no previous problems experienced with the autopilot on board *Dorthe Dalsoe*, its malfunction is considered to have been unlikely.

It is therefore most probable that both vessels had been on steady courses throughout the build up to the collision.

Figure 8



Radar plot based on the vessels' course and speed

2.4 WATCHKEEPING PRACTICES ON BOARD *DORTHE DALSOE*

A vessel “not under command” is defined in the COLREGS (Rule 3f), and results from an “exceptional circumstance” which prevents a vessel from being able to manoeuvre to avoid other ships. This is normally interpreted as unforeseen and unplanned events such as machinery breakdowns. The cleaning of a fishing vessel’s catch is neither unforeseen, nor unplanned, nor does it affect manoeuvrability. *Dorthe Dalsoe* was therefore not a vessel “not under command” and, as she was also not “engaged in fishing” (Rule 3 d), she was a “power driven vessel” (Rule 3b). As such, given the disposition and movement of the two vessels, she was required to keep clear of *Scot Explorer* in accordance with rules 15 and 16 of the collision regulations **(Annex E)**.

The lights displayed by *Dorthe Dalsoe* to indicate that she was “not under command” were also not in accordance with the requirements of the COLREGS (Rule 27a). The display of a white masthead light forward was additional to the requirements, and was a potential source of confusion to other vessels. It was therefore not surprising that both the chief officer, and the master of *Scot Explorer*, were not only unable to identify the lights exhibited as being for a vessel “not under command”, but also misidentified one of the red lights on the aft mast as a sidelight.

When the skipper left the wheelhouse and went to the shelter deck, from where he had virtually no external visibility, he could not maintain a proper lookout, or determine if a risk of collision existed. Although the COLREGS require these obligations to be met by every vessel, regardless of status or condition, such obligations were either not understood by the skipper, or were ignored by him. This was emphasised by the fact that the skipper went to the shelter deck even though he was aware that *Dorthe Dalsoe* was approaching Route “T” and the masthead light of *Scot* Explorer was seen closing on the starboard bow. Had the skipper increased the range set on his radar displays as required by COLREG Rule 7, this would have provided him with the information required to determine the CPA of *Scot Explorer*, and the risk of collision.

It is evident that the skipper’s knowledge and application of the COLREGS was poor. His categorisation of *Dorthe Dalsoe* as being “not under command” was erroneous, but was probably seen as a convenient measure, which the skipper thought justified the abrogation of his duties towards other vessels while preparing his catch for landing. The skipper’s decisions to move to the shelter deck, and to display what he considered to be lights indicating that the vessel was not under command, in the expectation that other vessels would keep out of his way, were significant contributory factors to this collision.

2.5 WATCHKEEPING PRACTICES ON BOARD *SCOT EXPLORER*

2.5.1 Assessment of risk of collision

As the closing speed was 15.2 knots and the collision occurred at 1840, the distance between the two vessels must have been about 5 miles when *Dorthe Dalsoe* was first sighted at 1820. From this point, the chief officer and then the master determined her CPA and the risk of collision from her visual aspect, based on their interpretation of the navigation lights seen, and from a visual inspection of the synthetic trail behind her echo on the radar display. Their resulting assessments were incorrect.

As discussed earlier, the lights displayed by *Dorthe Dalsoe* were potentially confusing. It was therefore not surprising the deck officers of *Scot Explorer* mistook one of the red lights at the aft masthead to be a port navigation light. As a result, they assumed they were seeing a port bow aspect and that the fishing vessel would pass down their port side. This was not the case. Given the courses of the two vessels, *Scot Explorer* must have been around 60° on the starboard bow of *Dorthe Dalsoe*. This is supported by her skipper's sighting of a white masthead light about 45° on the starboard bow before he left the wheelhouse. The deck officers on board *Scot Explorer* might have realised the error in their assumption had they seen the fishing vessel's green starboard side navigation light. It is not certain why they did not, but it is probable that the green light was not readily discernible among the bright white deck lights.

The assessment that *Dorthe Dalsoe* was a fishing vessel, but was not engaged in fishing, although correct, was potentially hazardous given the way the information provided by the radar was used to estimate her speed. However, many fishing vessels display lights and shapes to indicate that they are engaged in fishing when on passage, and it is not surprising that many seafarers are becoming increasingly sceptical of their validity. While the assessment made by the master would have been made by many of his peers in similar situations, it is dangerous to make such an assumption.

2.5.2 Use of radar

If the radar had been used to its full potential, it is highly probable that the confusion caused by the configuration of the fishing vessel's navigation lights would have been resolved in time for successful avoidance action to have been taken. Visual inspection of *Dorthe Dalsoe*'s radar target trail would only have given an approximation of her CPA, and would have relied on the judgment of the master and chief officer to visually extend the trail past the origin of the radar display. Also, as a target trail is initially lost following a change in range scale, the master's reduction of the radar range would have inevitably further reduced the accuracy of this method until the trail had sufficient time to re-build.

Errors in the assessment of the CPA might also have resulted from the use of a smaller range scale than intended. The master considered that *Dorthe Dalsoe* was at one mile when he went to the chart table. The vessels were closing at 15.2 knots, which would have given an interval of almost 4 minutes to the

collision. However, if the master was only at the chart table for 2 minutes before the collision occurred, it follows that *Dorthe Dalsoe* must have initially been at a distance of only 5 cables. It is possible that the master was at the chart table for a longer period than he recollects, but it is equally possible that he reduced to the 1.5 mile range scale, rather than the 3 mile range scale. If this were the case, the use of the fixed range rings to measure distance would have caused the master to double not only the distance of *Dorthe Dalsoe*, but also her estimated CPA.

Had more of the radar's facilities, such as automatic plotting, electronic bearing line, and variable range marker been used, a more accurate assessment of the CPA of *Dorthe Dalsoe*, and therefore risk of collision, would have been possible. The monitoring of the fishing vessel's bearing by radar would have also given a reliable indication in this respect.

2.5.3 Acceptance of CPA

An estimated passing distance of between 3 to 4 cables does not provide much of a safety margin considering the accuracy of the methods available to determine CPA, and the possibility of unpredictable movement due to mechanical failure or human behaviour. Notwithstanding the master and chief officer's incorrect determination of the heading and CPA of *Dorthe Dalsoe*, given that there were no other vessels in the vicinity, there was no reason why the chief officer or master could not have taken early action to provide a greater margin of safety. Had they done so, the risk of collision would have been considerably reduced.

2.5.4 Lookout

When two vessels are in close proximity, it is usual for an OOW to monitor the situation carefully, at least until the other vessel has passed her CPA. In this case, the master's preoccupation with routine administration distracted him from this important task. He did not monitor *Dorthe Dalsoe* from the time when he moved to the chart table until seconds before the collision. Consequently, because he was alone on the bridge, and had not utilised the radar guard zone facility, he was ignorant of the approaching danger. Had a proper lookout been maintained, the likelihood of collision would probably have been detected in time for successful avoiding action to be taken.

2.6 EMPLOYMENT OF RATINGS AS LOOKOUT

Contrary to the requirements of STCW 95 and the Intrada Ship Management Fleet Circular issued in June 2004, which require an additional lookout to be on the bridge during the hours of darkness, the chief officer and master kept their watches alone during the evening of 2 November. With *Scot Explorer* operating in northern Europe in winter with only two ABs available, the difficulty experienced in providing an additional lookout during the extended hours of darkness was understandable, particularly during meal times. However, there

was no apparent reason why the conflicting duties of the AB could not have been resolved by better management of the meal times on board. There was certainly no reason why he could not have at least accompanied the chief officer for the hour between evening civil twilight and the start of supper. The fact that he did not, possibly reflects the low priority given to the importance of providing an additional lookout in relation to other duties.

Many bridge watchkeepers interviewed by the MAIB in recent years have considered that the employment of deck ratings on the bridge as an additional lookout was a waste of time, even during darkness or in busy shipping areas. In many cases where they are used, their presence is seen as a token gesture aimed at meeting regulatory requirements at the expense of deck maintenance and other tasks. Others simply prefer to keep watches alone. In this case, had the AB been on the bridge and not in the galley, he would have been available to assist the master in monitoring the *Dorthe Dalsoe*. A trained and properly briefed lookout would also have been well placed to quickly alert him to the approach of the fishing vessel.

Until OOWs understand and appreciate the contributions to ship safety a properly trained and briefed additional lookout can make, the positive impact of any regulatory requirements regarding their use will be considerably reduced.

2.7 SAFE MANNING

The principles of safe manning contained in IMO Resolution 890(21), although comprehensive, are not prescriptive or mandatory, and converting them into a set number of persons on a particular ship requires many subjective assessments to be made by vessels' owners and managers, and the approving Administrations. When assessing the number of deck ratings required, among the basic requirements and duties which need to be considered are: deck maintenance; cargo loading and discharge; mooring arrangements; bridge manning, particularly the requirement for additional lookout; emergency response; and even catering arrangements. All of which need to be completed within the number of hours an individual is allowed to work by the requirements of STCW 95, and for UK ships, MSN 1767.

Examination of the recorded hours of rest of the AB employed in the galley **(Annex B)**, shows that he was able to rest about 12 hours each day. However, this only appears to reflect his 0600 to 1200 and 1800 to 2400 watch pattern. It does not take into account the hours he typically had to work in the galley in addition to his routine watches, namely 1200-1400 and 1700-1800. During the latter half of October, he would therefore have only been able to rest for a total of 9 hours in each 24-hour period. Consequently, it is apparent that in order to fulfil his duties as lookout during darkness, cook, and general deckhand employed on maintenance and cargo handling, the AB in question was not able to achieve the minimum hours of rest required. Had a third deck rating been carried, this would have been less likely, and the provision of a lookout on the bridge would have been much easier to arrange during meal times.

Intrada had managed ships similar to *Scot Explorer* for a number of years, and was experienced in the demands placed on its vessels and their crews. Its decision to purchase the vessel was made against a background of an increasing share of the market volume, difficulties in acquiring suitable ships of similar size and type, knowledge of its competitors operating ships with fewer crew, and a positive impression of the ship when under charter. However, the company's approach to the MCA for provisional approval for a minimum crew of five before purchase, and its decision to initially operate the ship for a trial period after purchase, indicate that the company had doubts about operating the ship with fewer crew than on its other vessels. Given the hours required to be worked by the AB cook, and the difficulties experienced in providing an additional lookout, these doubts were justified. It was unfortunate that these concerns were not taken into account before the manning proposal was submitted to the MCA.

Owners and ship managers have a responsibility to propose safe manning levels. At the same time, they are also under commercial pressure to keep manning costs down. In recent years, manning costs have largely been kept in check via automation, advances in technology, and the employment of lower paid seafarers from developing economies. However, the pressure to drive the cost of manning down further has caused many owners and managers to reduce the manning levels on board ships to as low as possible, with 'safe manning' increasingly becoming synonymous with 'maximum manning'.

The failure of Administrations to check this downward movement has resulted in 'safe manning' levels becoming 'unsafe'. This is evident, not only from the inability of the regulatory requirements regarding the minimum hours of rest and the provision of additional lookout to be met on board *Scot Explorer*, but also from many similar deficiencies highlighted in other MAIB investigations. A further important consequence is that many ships, including *Scot Explorer*, have been built with limited accommodation. This was problematic for Intrada in its search for a suitable vessel, and will inevitably have a bearing on the determination of safe manning levels in many ships in future years.

Administrations are obliged to ensure that the proposals of ship owners and managers are reasonable, otherwise the requirement for approval is meaningless. However, Administrations have their own financial and political pressures, which interfere with this process. In this case, although the ship manager did not state that it would approach another Administration if its proposed manning for *Scot Explorer* was not generally accepted, the MCA was conscious that this was a likely course of action. Consequently, it had to decide whether to allow the vessel to trade between the UK and Scandinavia with fewer crew than similar vessels within the same company, or to lose the ship to another Administration, as had happened on other occasions. By approving the ship's operation with a crew of five within defined geographical constraints,

which was acceptable to the ship manager, the MCA was able to put the ship on its register and had some control on her operation. Had the ship been flagged with another Administration, as she had been previously, she would have still been a regular visitor to the UK, but the influence of the MCA would have been restricted to Port State Inspections. It is considered that the majority of Administrations would have taken similar action to that of the MCA.

Given the commercial pressures on ship owners and managers, and their ability to move between competing Administrations, the downward pressure on manning levels is likely to continue to have a detrimental effect on safety unless action is taken to address the subjective manner in which safe manning levels are determined. Notwithstanding the limitations of ships' accommodation, and extant approvals for sister vessels and ships of similar size and operation, this can only realistically be achieved via prescriptive measures regarding the number of officers and ratings to be carried. Such prescription needs to be applied by all Administrations, or to all ships operating within a geo-economic area such as the European Union.

SECTION 3 - CONCLUSIONS

3.1 FINDINGS

1. Although the quantity of sleep achieved by the skipper of *Dorthe Dalsoe* was insufficient, and its quality was poor, it is difficult to determine the extent to which the effects of fatigue might have influenced his decision-making. [2.2]

2. There is no evidence to indicate that the performance of the master of *Scot Explorer* was affected by fatigue. [2.2]

3. Given the courses and speeds of the two vessels, *Dorthe Dalsoe* closed *Scot Explorer* from a bearing of 110° with a relative closing speed of 15.2 knots. There is no evidence to indicate that *Dorthe Dalsoe* changed course when the vessels were in close proximity due to malfunction of her autopilot. [2.3]

4. *Dorthe Dalsoe* was a 'power driven vessel' not 'a vessel not under command' and, given the disposition and movement of the two vessels, she was required to keep clear of *Scot Explorer* in accordance with rules 15 and 16 of the collision regulations. [2.4]

5. The lights displayed by *Dorthe Dalsoe* to indicate that she was "not under command" were not in accordance with collision regulations, and the display of a white masthead light forward was a potential source of confusion to other vessels. [2.4]

6. When the skipper left the wheelhouse and went to the shelter deck from where he had virtually no external visibility, he could not maintain a proper lookout, or determine if a risk of collision existed. [2.4]

7. The decisions of the skipper of *Dorthe Dalsoe* to move to the shelter deck, and to display what he considered to be lights indicating that the vessel was not under command, in the expectation that other vessels would keep out of his way, were significant contributory factors to this collision. [2.4]

8. The assessments of the master and chief officer of *Scot Explorer* with regard to the CPA and risk of collision with *Dorthe Dalsoe*, which were based on their interpretation of the navigation lights seen, and from a visual inspection of the synthetic trail behind her echo on the radar display, were incorrect. [2.5.1]

9. It is probable that the fishing vessel's green starboard light was not seen by the crew of *Scot Explorer* because it was not readily discernible among the bright white deck lights. [2.5.1]

10. Many fishing vessels display lights and shapes to indicate that they are engaged in fishing when on passage, and it is not surprising that many seafarers are becoming increasingly sceptical of their validity. [2.5.1]

11. Had more of the radar's facilities on board *Scot Explorer*, such as automatic plotting, electronic bearing line, and variable range marker been used, a more accurate assessment of the CPA of *Dorthe Dalsoe*, and therefore risk of collision, would have been possible. [2.5.2]

12. The radar guard facility was not being utilised. [2.5.4]

13. Notwithstanding the incorrect determination of the heading and CPA of *Dorthe Dalsoe*, given that there were no other vessels in the vicinity, there was no reason why the chief officer or master of *Scot Explorer* could not have taken early action to provide a greater margin of safety. [2.5.3]

14. Had the master of *Scot* Explorer maintained a proper lookout, the likelihood of collision would probably have been detected in time for successful avoiding action to be taken. [2.5.4]

15. There was no apparent reason why the conflicting duties of the ABs on board *Scot Explorer* could not have been resolved by better management of the meal times on board. The fact that this was not done, possibly reflects a low priority given to the importance of an additional lookout. [2.6]

16. Had the AB been on the bridge of *Scot Explorer* and not in the galley, he would have been available to assist the master in monitoring *Dorthe Dalsoe*, and would have been well placed to quickly alert him to the approach of the fishing vessel. [2.6]

17. Until OOWs understand and appreciate the contributions to ship safety an additional lookout can make, the positive impact of any regulatory requirements for their use, will be considerably reduced. [2.6]

18. In order to fulfil his duties as, bridge lookout during darkness, cook, and general deckhand employed on maintenance and cargo handling, the AB in question on board *Scot Explorer* was not able to achieve the minimum hours of rest required. [2.7]

19. Given the hours required to be worked by the AB employed in the galley of *Scot Explorer,* and the difficulties experienced in providing an additional lookout, the doubts of the ship manager regarding the ship's manning level were justified. [2.7]

20. The failure of Administrations to check the downward movement of manning levels has resulted in 'safe manning' levels becoming 'unsafe'. [2.7]

21. The detrimental effects on safety, of the downward movement of manning levels, can only be relieved via prescriptive requirements regarding the number of officers and ratings to be carried. Such prescription needs to be applied by all Administrations, or to all ships operating within a geo-economic area such as the European Union. [2.7]

SECTION 4 - ACTION TAKEN

The Marine Accident Investigation Branch:

- In its Bridge Watchkeeping Study published in July 2004, the MAIB recommended that the MCA take the conclusions of the study forward to the IMO with the aim of reviewing:

  2004/206 - The guidelines on safe manning to ensure that all merchant vessels over 500grt have a minimum of a master plus two bridge watchkeeping officers, unless specifically exempted for limited local operations as approved by the Administration.

  2004/207 – The requirements of STCW 95 to change the emphasis with respect to the provision of a designated lookout to ensure that a lookout is provided on the bridge at all times, unless a positive decision is taken that, in view of daylight and good visibility, low traffic density and the vessel being well clear of navigational dangers, a sole watchkeeper would be able to fulfil the task.

  2004/208 – The requirements of STCW 95 so that a bridge lookout can be more effectively utilised as an integral part of the bridge team.

- In its report of the investigation of the grounding of *Jackie Moon* on 1 September 2004, the MAIB recommended the MCA to:

  Ensure that when conducting port state control inspections on ships with only two bridge watchkeeping officers, the hours of work and rest are carefully scrutinised, and where a surveyor considers that the regulatory rest requirements have not been met because of inadequate manning, serious consideration be given to detention of the vessel.

The Maritime and Coastguard Agency:

- In response to the MAIB recommendation 2004/206, the MCA has arranged an independent survey into safe manning levels across Europe. The survey will include levels of manning according to vessel size and types required by different European administrations, and also a study of accident investigations where levels of manning might have been an influence. The study is programmed for completion by July 2005 and, depending on its outcome, a report will be sent to the IMO through the STCW sub-committee. The MCA also stated its intention to request that the issue of safe manning be placed on the work programme of the IMO MSC.
- In response to MAIB recommendations 2004/207 and 208, the MCA intends to issue guidance on the use of lookouts in an MGN, and to take the recommendations forward to the IMO STCW sub-committee.

The Danish Maritime Authority:

- The Danish Maritime Authority has stated its intention to promulgate the lessons learned from this, and similar accidents, to the Danish fishing industry, on completion of a study currently in progress.

Intrada Ship Management Ltd:

- After purchasing another vessel, *Scot Carrier,* on 8 December 2004, the company manned the vessel with a crew of six, although she had been approved by the MCA to operate with a crew of five.

- The accommodation on board *Scot Explorer* was modified to provide an additional cabin. A third AB has been employed on board since 17 December 2004.

- A Fleet Circular dated 10 November 2004 was issued to all its masters regarding the use of bridge lookouts, and the need to give as much sea room as possible to other vessels, particularly fishing vessels **(Annex F)**.

SECTION 5 - RECOMMENDATIONS

The Maritime and Coastguard Agency is recommended to:

2005/153 Maintain the priority given to the recommendations made in the MAIB Bridge Watchkeeping Study, and the report of the investigation into the grounding of *Jackie Moon,* with the aim of reducing the incidence of inadequate manning of ships in the short-sea trade, and improving the standard of lookout on all merchant vessels.

The International Chamber of Shipping is recommended to:

2005/154 Highlight to its national ship owner associations that this was yet another accident which could have been prevented had a dedicated lookout been on the bridge during the hours of darkness. Further, to re-emphasise procedures as outlined in its publication *Bridge Procedures Guide* with specific reference to:

- All available navigational equipment being used to its full potential.
- Larger CPAs to be allowed for.
- The need for bridge watchkeepers to determine passing distances as accurately as possible.

Marine Accident Investigation Branch
June 2005

ANNEX A

The recorded hours of rest - master of *Scot Explorer*

Intrada Ships Management Limited

RECORD OF SEAFARERS DAILY HOURS OF REST

Name	Time>	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
	Date	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	00:00	
Rank MASTER	1						MEW																			
	2									JOINED																
Month OCTOBER 2024	3																									
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1 There shall be a minimum of 10 hours rest in any 24 hour period.
There shall be a minimum period of 77 hours rest in any 7 day period.
The maximum interval between consecutive rest periods shall be 14 hours.

2 The Master may require a seafarer to work any hours necessary for the immediate safety of the ship.(After which the seafarer shall be provided with an adequate rest period.)
Drills will be conducted to minimise the disturbance of rest periods and not to induce fatigue.

Signed

A record of seafarers daily hours of rest will be maintained by the Master or a person authorised by the Master.

Monthly Total

ANNEX B

The recorded hours of rest - AB(cook) of *Scot Explorer*

0620 - 1200 - 1800 - 2400

RECORD OF SEAFARERS DAILY HOURS OF REST

ame	Time>	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
	Date	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	00:00	
ank	1										Medical															3
	2											Overtime														6
onth	3																									18
	4																									12
	5																									12
There shall be a minimum of 10 hours rest in any 24 hour period. There shall be a minimum period of 77 hours rest in any 7 day period. The maximum interval between consecutive rest periods shall be 14 hours.	6									Telephone																10
	7									Rectified																10
	8									Overtime																16
	9																									12
	10																									12
	11										Cook															16
	12																									12
	13																									12
	14																									13
	15									Overtime																10
	16																									12
	17																									12
	18																									10
The Master may require a seafarer to work any hours necessary for the immediate safety of the ship.(After which the seafarer shall be provided with an adequate rest period.) Drills will be conducted to minimise the disturbance of rest periods and not to induce fatigue.	19																									12
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record of seafarers daily hours of rest will be maintained by the Master or a person authorised by the Master.

Monthly Total

ANNEX C

IMO Resolution A890(21) and annexes

INTERNATIONAL MARITIME ORGANIZATION

IMO

E

ASSEMBLY
21st session
Agenda item 9

A 21/Res.890
4 February 2000
Original: ENGLISH

RESOLUTION A.890(21)
adopted on 25 November 1999

PRINCIPLES OF SAFE MANNING

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety and the prevention and control of marine pollution from ships,

RECALLING ALSO Article 28(a) of that Convention which requires the Maritime Safety Committee to consider, *inter alia*, the manning of seagoing ships from a safety standpoint,

NOTING that safe manning is a function of the number of qualified and experienced seafarers necessary for the safety of the ship, crew, passengers, cargo and property and for the protection of the marine environment,

RECOGNIZING the importance of the requirements of the pertinent IMO instruments as well as those adopted by ILO, ITU and WHO relevant to maritime safety and protection of the marine environment,

MINDFUL of the provisions of SOLAS regulation V/13 with respect to the issue of an appropriate safe manning document or equivalent as evidence of minimum safe manning,

BEING AWARE that the ability of seafarers to maintain observance of these requirements is dependent upon their continued efficiency through conditions relating to training, hours of work and rest, occupational safety, health and hygiene and the proper provision of food,

BELIEVING that international acceptance of broad principles as a framework for administrations to determine the safe manning of ships would materially enhance maritime safety and protection of the marine environment.

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its seventy-first session,

1. ADOPTS the Principles of safe manning, the Guidelines for the application of principles of safe manning and the Guidance on contents and model form of minimum safe manning document, set out respectively in Annexes 1, 2 and 3 to the present resolution;

2. RECOMMENDS that Governments, in establishing the minimum safe manning levels for ships flying their countries' flag, observe the Principles set out in Annex 1 and take into account the Guidelines set out in Annex 2;

3. URGES Governments to ensure that minimum safe manning documents contain, as a minimum, the information given in Annex 3;

4. URGES FURTHER Governments, when exercising port State control functions under international conventions in force with respect to foreign ships visiting their ports, to regard compliance with such documents as evidence that such ships are safely manned;

5. REQUESTS the Maritime Safety Committee to keep this resolution under review;

6. REVOKES resolution A.481(XII).

ANNEX 1

PRINCIPLES OF SAFE MANNING

1 The following principles should be observed in determining the minimum safe manning of a ship:

.1 the capability to:

.1.1 maintain safe navigational, engineering and radio watches in accordance with regulation VIII/2 of the 1978 STCW Convention, as amended, and also maintain general surveillance of the ship;

.1.2 moor and unmoor the ship safely;

.1.3 manage the safety functions of the ship when employed in a stationary or near-stationary mode at sea;

.1.4 perform operations, as appropriate, for the prevention of damage to the marine environment;

.1.5 maintain the safety arrangements and the cleanliness of all accessible spaces to minimize the risk of fire;

.1.6 provide for medical care on board ship;

.1.7 ensure safe carriage of cargo during transit; and

.1.8 inspect and maintain, as appropriate, the structural integrity of the ship; and

.2 the ability to:

.2.1 operate all watertight closing arrangements and maintain them in effective condition, and also deploy a competent damage control party;

.2.2 operate all on-board fire-fighting and emergency equipment and life-saving appliances, carry out such maintenance of this equipment as is required to be done at sea, and muster and disembark all persons on board; and

.2.3 operate the main propulsion and auxiliary machinery and maintain them in a safe condition to enable the ship to overcome the foreseeable perils of the voyage.

2 In applying such principles, Administrations should take proper account of existing IMO, ILO, ITU and WHO instruments in force which deal with:

.1 watchkeeping;

.2 hours of work or rest;

.3 safety management;

.4 certification of seafarers;

.5 training of seafarers;

.6 occupational health and hygiene; and

.7 crew accommodation.

3 The following on-board functions, when applicable, should also be taken into account:

.1 ongoing training requirements for all personnel, including the operation and use of fire-fighting and emergency equipment, life-saving appliances and watertight closing arrangements;

.2 specialized training requirements for particular types of ships;

.3 provision of proper food and drinking water;

.4 need to undertake emergency duties and responsibilities; and

.5 need to provide training opportunities for entrant seafarers to allow them to gain the training and experience needed.

ANNEX 2

GUIDELINES FOR THE APPLICATION OF PRINCIPLES OF SAFE MANNING

1 Introduction

1.1 These guidelines should be used in applying the principles of safe manning set out in Annex 1 to this resolution to ensure the safe operation of, and the prevention of pollution from, ships to which article III of the 1978 STCW Convention, as amended, applies.

1.2 The Administration may retain or adopt arrangements which differ from the provisions herein recommended and which are especially adapted to technical developments and to special types of ships and trades. However, at all times the Administration should satisfy itself that the detailed manning arrangements ensure a degree of safety at least equivalent to that established by these guidelines.

2 Hours of work or rest

2.1 Every company is obliged to ensure that the master, officers and ratings do not work more hours than is safe in relation to the performance of their duties and the safety of the ship. The same responsibility is placed on the master in relation to the members of the ship's complement. Manning levels should be such as to ensure that the time and place available for taking rest periods are appropriate for achieving a good quality of rest. Further guidance about fitness for duty is contained in section B-VIII/1 of the STCW Code.

2.2 A record of the actual hours of work performed by the individual seafarer should be maintained on board, in order to verify that the minimum periods of rest required under relevant and applicable international instruments in force have been complied with.

3 Determination of minimum safe manning levels

3.1 The purpose of determining the minimum safe manning level of a ship is to ensure that its complement includes the grades/capacities and number of persons required for the safe operation of the ship and the protection of the marine environment.

3.2 The minimum safe manning level of a ship should be established taking into account all relevant factors, including the following:

.1 size and type of ship;

.2 number, size and type of main propulsion units and auxiliaries;

.3 construction and equipment of the ship;

.4 method of maintenance used;

.5 cargo to be carried;

.6 frequency of port calls, length and nature of voyages to be undertaken;

.7 trading area(s), waters and operations in which the ship is involved;

.8 extent to which training activities are conducted on board; and

.9 applicable work hour limits and/or rest requirements.

3.3 The determination of the minimum safe manning level of a ship should be based on performance of the functions at the appropriate level(s) of responsibility, as specified in the STCW Code, which include the following:

.1 navigation, comprising the tasks, duties and responsibilities required to:

.1 plan and conduct safe navigation;

.2 maintain a safe navigational watch in accordance with the requirements of the STCW Code;

.3 manoeuvre and handle the ship in all conditions; and

.4 moor and unmoor the ship safely;

.2 cargo handling and stowage, comprising the tasks, duties and responsibilities required to:

.1 plan, monitor and ensure safe loading, stowage, securing, care during the voyage and unloading of cargo to be carried on the ship;

.3 operation of the ship and care for persons on board, comprising the tasks, duties and responsibilities required to:

.1 maintain the safety and security of all persons on board and keep life-saving, fire-fighting and other safety systems in operational condition;

.2 operate and maintain all watertight closing arrangements;

.3 perform operations, as appropriate, to muster and disembark all persons on board;

.4 perform operations, as appropriate, to ensure protection of the marine environment;

.5 provide for medical care on board the ship; and

.6 undertake administrative tasks required for the safe operation of the ship;

.4 marine engineering, comprising the tasks, duties and responsibilities required to:

.1 operate and monitor the ship's main propulsion and auxiliary machinery and evaluate the performance of such machinery;

.2 maintain a safe engineering watch in accordance with the requirements of the STCW Code;

.3 manage and perform fuel and ballast operations; and

.4 maintain safety of the ship's engine equipment, systems and services;

.5 electrical, electronic and control engineering, comprising the tasks, duties and responsibilities required to:

.1 operate the ship's electrical and electronic equipment; and

.2 maintain the safety of the ship's electrical and electronic systems;

.6 radiocommunications, comprising the tasks, duties and responsibilities required to:

.1 transmit and receive information using the radio equipment of the ship;

.2 maintain a safe radio watch in accordance with the requirements of the ITU Radio Regulations and the 1974 SOLAS Convention, as amended; and

.3 provide radio services in emergencies;

.7 maintenance and repair, comprising the tasks, duties and responsibilities required to:

.1 carry out maintenance and repair work to the ship and its machinery, equipment and systems, as appropriate to the method of maintenance and repair used.

3.4 In addition to the factors and functions in paragraphs 3.2 and 3.3, the determination of the minimum safe manning level should also take into account:

.1 the management of the safety functions of a ship at sea when not under way;

.2 except in ships of limited size, the provision of qualified deck officers to ensure that it is not necessary for the master to keep regular watches by adopting a three-watch system;

.3 except in ships of limited propulsion power or operating under provisions for unattended machinery spaces, the provision of qualified engineer officers to ensure that it is not necessary for the chief engineer to keep regular watches by adopting a three-watch system;

.4 the maintenance of applicable occupational health and hygiene standards on board; and

.5 the provision of proper food and drinking water for all persons on board, as required.

3.5 In determining the minimum safe manning level of a ship, consideration should also be given to:

.1 the number of qualified and other personnel required to meet peak workload situations and conditions, with due regard to the number of hours of shipboard duties and rest periods assigned to seafarers; and

.2 the capability of the master and the ship's complement to co-ordinate the activities necessary for the safe operation of the ship and the protection of the marine environment.

4 Responsibilities of companies

4.1 The Administration may require the company responsible for the operation of the ship to prepare and submit its proposal for the minimum safe manning level of a ship in accordance with a form specified by the Administration.

4.2 In preparing a proposal for the minimum safe manning level of a ship, the company should apply the principles, recommendations and guidelines contained in this resolution and should be required to:

.1 make an assessment of the tasks, duties and responsibilities of the ship's complement required for its safe operation, for protection of the marine environment, and for dealing with emergency situations;

.2 make an assessment of numbers and grades/capacities in the ship's complement required for its safe operation, for protection of the marine environment, and for dealing with emergency situations;

.3 prepare and submit to the Administration a proposal for the minimum safe manning level based upon the assessment of the numbers and grades/capacities in the ship's complement required for its safe operation and for protection of the marine environment, justifying the proposal by explaining how the proposed ship's complement will deal with emergency situations, including the evacuation of passengers, where necessary;

.4 ensure that the minimum safe manning level is adequate at all times and in all respects, including meeting peak workload situations, conditions and requirements, and is in accordance with the principles, recommendations and guidelines contained in this resolution; and

.5 prepare and submit to the Administration a new proposal for the minimum safe manning level of a ship in the case of changes in trading area(s), construction, machinery, equipment or operation and maintenance of the ship, which may affect the safe manning level.

5 Approval by the Administration

5.1 A proposal for the minimum safe manning level of a ship submitted by a company to the Administration should be evaluated by the Administration to ensure that:

.1 the proposed ship's complement contains the number and grades/capacities of personnel to fulfil the tasks, duties and responsibilities required for the safe operation of the ship, for protection of the marine environment and for dealing with emergency situations; and

.2 the master, officers and other members of the ship's complement are not required to work more hours than is safe in relation to the performance of their duties and the safety of the ship and that the requirements for work and rest hours, in accordance with applicable national regulations, can be complied with.

5.2 The Administration should require a company to amend a proposal for the minimum safe manning level of a ship if, after evaluation of the original proposal submitted by the company, the Administration is unable to approve the proposed composition of the ship's complement.

5.3 The Administration should only approve a proposal for the minimum safe manning level of a ship and issue accordingly a minimum safe manning document if it is fully satisfied that the proposed ship's complement is established in accordance with the principles, recommendations and guidelines contained in this resolution, and is adequate in all respects for the safe operation of the ship and for the protection of the marine environment.

5.4 The Administration may withdraw the minimum safe manning document of a ship if the company fails to submit a new proposal for the ship's minimum safe manning level when changes in trading area(s), construction, machinery, equipment or operation and maintenance of the ship have taken place which affect the minimum safe manning level.

5.5 The Administration should review and may withdraw, as appropriate, the minimum safe manning document of a ship which persistently fails to be in compliance with rest hours requirements.

ANNEX 3

GUIDANCE ON CONTENTS AND MODEL FORM OF MINIMUM SAFE MANNING DOCUMENT

1 The following information should be included in the minimum safe manning document issued by the Administration specifying the minimum safe manning level:

.1 a clear statement of the ship's name, port of registry, distinctive number or letters, IMO number, gross tonnage, main propulsion power, type and trading area and whether or not the machinery space is unattended;

.2 a table showing the number and grades/capacities of the personnel required to be carried, together with any special conditions or other remarks;

.3 a formal statement by the Administration that, in accordance with the principles and guidelines set out in Annexes 1 and 2, the ship named in the document is considered to be safely manned if, whenever it proceeds to sea, it carries not less than the number and grades/capacities of personnel shown in the document, subject to any special conditions stated therein;

.4 a statement as to any limitations on the validity of the document by reference to particulars of the individual ship and the nature of service upon which it is engaged; and

.5 the date of issue and any expiry date of the document together with a signature for and the seal of the Administration.

2 It is recommended that the minimum safe manning document be drawn up in the form corresponding to the model given in the appendix to this Annex. If the language used is not English, the information given should include a translation into English.

ANNEX D

Scot Explorer - Safe Manning Document

Maritime and Coastguard Agency

SAFE MANNING DOCUMENT FOR A UNITED KINGDOM REGISTERED SEA-GOING SHIP

EXPLANATORY NOTES

1. A Safe Manning Document is a mandatory requirement under the Merchant Shipping (Safe Manning, Hours of Work and Watchkeeping) Regulations 1997.
2. The Maritime and Coastguard Agency hereby states that in its view the ship named in this document will be considered to be safely manned within the meaning of the Merchant Shipping Act 1995 provided that when going to sea the ship has not less than the number and grades of personnel shown in the following table and that the special conditions, where inserted, are observed. The manning assessment takes into account the Principles of Safe Manning contained in IMO Resolution A890 (XXI).
3. Nothing in this certificate invalidates any provision as regards the carriage of certificated personnel as prescribed in:
   a) the Merchant Shipping (Training and Certification) Regulations 1997;
   b) the Merchant Shipping (Certification of Ships' Cooks) Regulations 1981;
   c) the Merchant Shipping (Ships' Doctors) Regulations 1995; and
   d) the Merchant Shipping (Radio Installation) Regulations 1998.

1 PARTICULARS OF APPLICANT

This certificate is valid only in relation to the particulars of the ship shown and the nature of the service stated in the application dated 08/06/2004 *completed by* INTRADA

2 PARTICULARS OF THE SHIP

Name of ship	SCOT EXPLORER		
Port of Registry	ROCHESTER	*Official Number*	909266
Type of ship	GENERAL CARGO	*IMO Number*	9137193
Gross tonnage (gt)	1882	*Registered power (kW)*	749
Type of manning system	INTERDEPARTMENTAL FLEXIBILITY		
Special conditions	SEE SCHEDULE OVERLEAF		

3 PERSONNEL - NUMBERS TO BE CARRIED

Capacity	*N-C **	*Unlimited*	*Capacity*	*N-C **	*Unlimited*
Master	1	1	*Chief Engineer*	1	1
Chief Mate	1	1	*Second Engineer*	-	1
OOW (Deck)	-	1	*OOW (Engineer)*	-	-
Rating (Deck) Grade 1	2	2	*Rating (Engine)*	-	-
Rating (Deck) Grade 2	-	-		-	-
Cook	-	-		-	-
Doctor	-	-		-	-
			Total (minimum number of crew to be carried)	5	7

** N-C - Near-coastal - within 150 miles from a safe haven in the UK or 30 miles from a safe haven in Eire*

Signature | *Date* 26 August 2004

For and on behalf of the Maritime and Coastguard Agency | *File reference* MC 049/048/0479

Seafarer Standards Branch, Spring Place, 105 Commercial Road,

THE MARITIME AND COASTGUARD AGENCY

SCHEDULE FOR THE SAFE MANNING DOCUMENT ISSUED TO:
SCOT EXPLORER
26 August 2004

1. A lone watchkeeper must not attend the machinery spaces unless a suitable watch alarm is fitted and operational or an alternative system is in place.

2. This document is valid only whilst the UMS classification remains valid and the UMS control system is fully operational.

3. Hours of Work: The requirements of MSN 1767 or any subsequent amendment must be complied with.

4. The Chief Engineer should hold as a minimum a SMEOL (Senior Marine Engine Operator License)

5. The Second Engineer need not be carried for voyages within the area bounded by a line from a point on the Norwegian coast in latitude 62° North to a point 62° North 02° West; thence to a point 58° North 10° West; thence to a point 54° North 14° West; thence to a point 51° North 14° West; thence to a point 38° 40' North 10° West; thence to Cape St. Vincent including the waters of the Baltic Sea.

6. The OOW (Deck) need not be carried for voyages within the area bounded by a line from a point on the Norwegian coast in latitude 62° North to a point 62° North 02° West; thence to a point 58° North 10° West; thence to a point 54° North 14° West; thence to a point 51° North 14° West; thence to a point 38° 40' North 10° West; thence to Cape St. Vincent including the waters of the Baltic Sea.

EXAMINER
26 August 2004

ANNEX E

Applicable collision regulations

Applicable Collision Regulations

The following are extracts of the rules of the International Regulations for Preventing Collisions at Sea (1972) (COLREGS) as amended:

Rule 3 – Definitions:

(b) The term "power-driven vessel" means any vessel propelled by machinery.

(d) The term "vessel engaged in fishing" means any vessel fishing with nets, lines, trawls or other fishing apparatus which restrict manoeuvrability, but does not include a vessel fishing with trolling lines or other fishing apparatus which do not restrict manoeuvrability.

(f) The term "vessel not under command" means a vessel which through some exceptional circumstance is unable to manoeuvre as required by these Rules and is therefore unable to keep out of the way of another vessel.

Rule 5 – Look-out

Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate to the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

Rule 7 – Risk of collision

(b) *Proper use shall be made of radar equipment fitted and operational, including long-range scanning to obtain early warning of collision and radar plotting or equivalent systematic observation of detected objects.*

(c) Assumptions shall not be made on the basis of scanty information, especially scanty radar information.

Rule 15 – Crossing situation

When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel.

Rule 16 – Action by give way vessel

Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear.

Rule 18 – Responsibilities between vessels

Except where rules 9,10 and 13 otherwise require:

(a) A power-driven vessel underway shall keep out of the way of:

(i) a vessel not under command;

(ii) a vessel restricted in her ability to manoeuvre;

(iii) a vessel engaged in fishing;

(iv) a sailing vessel.

Rule 26 – Fishing Vessels

(c) *A vessel engaged in fishing, other than trawling, shall exhibit:*

(i) two all-round lights in a vertical line, the upper being red and the lower white, or a shape consisting of two cones with apexes together in a vertical line one above the other;

(ii) when there is outlying gear extending more than 150 metres horizontally from the vessel, an all round white light or a cone apex upwards in the direction of the gear;

(iii) when making way through the water, in addition to the lights prescribed in this paragraph, sidelights and a stern light.

Rule 27 – Vessels not under command or restricted in their ability to manoeuvre.

(a) *A vessel not under command shall exhibit:*

(i) two all-round red lights in a vertical line where they can best be seen;

(ii) two balls or similar shapes in a vertical line where they can best be seen;

(iii) when making way through the water, in addition to the lights prescribed in this paragraph, sidelights and a stern light.

ANNEX F

Intrada Ship Management Fleet Circular dated 10 November 2004

Intrada Ships Management Limited **Fleet Circular**

Issue Number: **FC – 28**

Issue Date: **10 November 2004**

To: **Masters**

Subject: **Navigational Watches**

Earlier this month a Scotline vessel was involved in a minor collision with a fishing boat, fortunately without injury and only minor damage.

However the potential for a more serious incident cannot be ignored.

The visibility was very good and traffic light, the Master who was on watch had sent the lookout down for his evening meal leaving himself alone on the bridge.

Our internal investigation has found that the presence of a lookout would have had little effect on the outcome of this incident, which was caused by a sudden alteration of the fisherman's course across our vessel's head. It seems probable that there was nobody in the wheelhouse of the trawler but proving this may be difficult. Our findings were endorsed by the P+I Clubs own investigation, however, the Master was in contravention of our Fleet Directive B-Deck-2 and it has once again brought Scotline to the attention of the MAIB and our insurers.

Knowing the unpredictable nature of fishing vessels we believe the Master should have given the fishing vessel a wider berth.

This is the second incident this year that has brought bridge watch keeping practices on our vessels into question. Intrada Ships Management Limited does not condone and will not tolerate lone bridge watch keepers at night. Therefore I must instruct that all Masters and bridge watch keeping officers re-visit Fleet Directive B-Deck-2 and act accordingly. Lookouts are to be used as necessary and as much sea room as is practicable must be given to other vessels especially fishermen.

The matter is now in the hands of the MAIB who will be conducting an investigation, the consequences of which may be far reaching.

Finally, please do not say it won't happen to me and ignore this circular, two Masters have now found to their cost that it can. Is it worth the worry and stress?

Please confirm that you have received, read and understood this Fleet Circular by signing and returning one copy to Romford Office. The other copy is to be filed on board in your FC file.

Signed Master	**M/V Scot**