ACCIDENT REPORT

Report on the investigation of

the collision between

Stena Feronia and *Union Moon*

in Belfast Lough

on 7 March 2012

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SERIOUS MARINE CASUALTY REPORT NO 26/2012 November 2012

Pursuant to Regulation 6 of Chapter XI -1 of the International Convention for the Safety of Life at Sea (SOLAS) and the Code of the International Standards and Practices for a Safety Investigation into a Marine Casualty (Casualty Investigation Code) (Resolution MSC.255 (84)), the MAIB has investigated this accident with the co-operation and assistance of the Cook Islands Ministry of Transport. The Flag State's contribution to the investigation is acknowledged and gratefully appreciated.

Extract from

The United Kingdom Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2012 – Regulation 5:

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 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 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, 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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CONTENTS

		Page
GLOSSARY OF ABBREVIATIONS AND ACRONYMS		
SYNOPSIS		**1**
SECTION 1 - FACTUAL INFORMATION		**2**
1.1	Particulars of *Stena Feronia*, *Union Moon* and accident	2
1.2	Narrative	3
1.2.1	Precursor to the accident	3
1.2.2	*Union Moon*'s departure and *Stena Feronia*'s arrival	3
1.2.3	The collision	6
1.2.4	Post-collision	9
1.3	Environmental conditions	10
1.4	*Stena Feronia*	11
1.4.1	General	11
1.4.2	Damage to *Stena Feronia*	11
1.4.3	Stena organisation	11
1.4.4	Manning	11
1.4.5	Master	13
1.4.6	PEC holder	13
1.4.7	Third officer	13
1.5	*Union Moon*	13
1.5.1	General	13
1.5.2	Damage to *Union Moon*	13
1.5.3	Continental Ship Management AS	13
1.5.4	Manning	15
1.5.5	Master	15
1.5.6	Continental Ship Management AS's alcohol policy	15
1.6	Belfast Harbour	16
1.7	Belfast Vessel Traffic Services	16
1.7.1	Level of service	16
1.7.2	Port control officer	16
1.7.3	VTS Manual	16
1.7.4	Training and exercises for port control officers	17
1.8	Belfast Harbour entry and exit requirements	17
1.8.1	Pilotage	17
1.8.2	The fairway buoy	18
1.9	Pilotage exemption	22
1.9.1	Belfast and Birkenhead requirements	22
1.9.2	*Stena Feronia*'s bridge team management	23
1.9.3	The Pilotage Act 1987	23
1.10	Reconstruction	24
1.10.1	Background and limitations	24
1.10.2	Results	24
1.11	International Regulations for Preventing Collisions at Sea 1972 (as amended)	28
1.12	Guidance	28
1.13	Previous/similar accidents	28

SECTION 2 - ANALYSIS **30**

2.1 Aim 30
2.2 Alcohol 30
2.3 The fairway buoy pinch point 31
2.4 The PEC holder status 31
2.5 Action taken by *Union Moon*'s master 32
2.6 Action taken by *Stena Feronia*'s bridge team to avoid collision 32
2.6.1 Collision avoidance requirements 32
2.6.2 The PEC holder 33
2.6.3 The third officer 34
2.6.4 The master 34
2.7 VTS communications 34
2.8 VTS exercises 36
2.9 Post-accident actions 36
2.9.1 *Stena Feronia* 36
2.9.2 *Union Moon* 37

SECTION 3 - CONCLUSIONS **38**

3.1 Safety issues directly contributing to the accident which have resulted in recommendations 38
3.2 Safety issues identified during the investigation leading to recommendations 38
3.3 Safety issues identified during the investigation which have been addressed or have not resulted in recommendations 38

SECTION 4 - ACTION TAKEN 40

SECTION 5 - RECOMMENDATIONS 41

FIGURES

Figure 1 - Chart showing Belfast inner harbour and track of *Union Moon*

Figure 2 - Chart showing Victoria Channel

Figure 3 - Chart showing the area around the fairway buoy

Figure 4 - Damage to *Stena Feronia*

Figure 5 - Damage to *Union Moon*

Figure 6 - Extract from the Admiralty Sailing Directions

Figure 7 - Extract from the Admiralty List of Radio Signals

Figure 8 - Tracks of ships over 50m LOA leaving Belfast

Figure 9 - Tracks of ships over 50m LOA entering Belfast

Figure 10 - First trial manoeuvre

Figure 11 - Second trial manoeuvre

Figure 12 - Third trial manoeuvre

TABLES

Table 1 - Transcript of VDR and VHF radio communications leading up to the collision

Table 2 - Table comparing *Stena Feronia* and *Stena Mersey*

ANNEXES

Annex A - *Union Moon* post-collision checklist

Annex B - *Stena Feronia* post-collision checklist

Annex C - 'Bridge Organisation' section of Northern Marine Management Ltd's safety management system

Annex D - Extract from Continental Ship Management AS's safety management system detailing lookout at night

Annex E - Continental Ship Management AS's alcohol policy

Annex F - Extracts from the Belfast VTS Manual

Annex G - Belfast Harbour's risk assessment concerning the fairway buoy

Annex H - 'Navigation with Pilots' section of Northern Marine Management Ltd's safety management system

Annex I - Section 8 of the Pilotage Act 1987

Annex J - Section 8.4.3 of A Guide to Good Practice on Port Marine Operations

Annex K - Extracts from the International Regulations for Preventing Collisions at Sea 1972 (as amended)

Annex L - Extract from MGN 324 (M+F) Radio: Operational Guidance on the Use of VHF Radio and Automatic Identification Systems (AIS) at Sea

Annex M - Belfast Harbour Notice to Mariners No 20 of 2012

Annex N - Belfast Harbour Notice to Mariners No 17 of 2012

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	-	Able Seaman
AIS	-	Automatic Identification System
ALRS	-	Admiralty List of Radio Signals
ARPA	-	Automatic Radar Plotting Aid
BA	-	British Admiralty
CET	-	Central European Time
COLREGS	-	International Regulations for Preventing Collisions at Sea 1972 (as amended)
CPP	-	Controllable Pitch Propeller
CSM	-	Continental Ship Management AS
DNV	-	Det Norske Veritas
DSC	-	Digital Selective Calling
GT	-	Gross Tonnage
IALA	-	International Association of Marine Aids to Navigation and Lighthouse Authorities
IMO	-	International Maritime Organization
INS	-	Information Service
INSB	-	International Naval Surveys Bureau
kW	-	kilowatt
LOA	-	Length Overall
m	-	metre
MCA	-	Maritime and Coastguard Agency
mg	-	milligram
ml	-	millilitre
µg	-	microgram
nm	-	nautical mile
PCO	-	Port Control Officer
PEC	-	Pilotage Exemption Certificate
PMSC	-	Port Marine Safety Code
PSNI	-	Police Service of Northern Ireland

RNLI	-	Royal National Lifeboat Institution
RoPax	-	Roll on/roll off passenger ferry
s	-	seconds
SMS	-	safety management system
STCW	-	International Convention on Standards of Training, Cetification and Watchkeeping for Seafarers 1978, as amended in 1995 and 1997 (STCW Convention)
t	-	tonne
TOS	-	Traffic Organisation Service
UTC	-	Universal Time, Co-ordinated
VDR	-	Voyage Data Recorder
VHF	-	Very High Frequency
VTS	-	Vessel Traffic Services

Times: All times used in this report are UTC unless otherwise stated

Image courtesy of Megsam999 and Wikipedia

Stena Feronia

Union Moon

SYNOPSIS

At 1858 on 7 March 2012, the outbound general cargo vessel *Union Moon* collided with the inbound ferry *Stena Feronia,* in the vicinity of the fairway buoy that marks the harbour limit of Belfast Harbour. Both vessels suffered major structural damage; however, there were no injuries or pollution and each vessel managed to proceed into port without assistance.

Once alongside in Belfast, both vessels were visited by officers from the Police Service of Northern Ireland, who breathalysed the bridge teams. *Union Moon*'s master was found to have an alcohol level of 123µg of alcohol per 100ml of breath, in breach of the permitted maximum of 35µg of alcohol per 100ml of breath. He was arrested and, on 31 May 2012, was sentenced to 1 year's imprisonment for breaching the Railways and Transport Safety Act 2003.

The investigation found that although *Union Moon*'s master had been under the influence of alcohol and had altered course to port resulting in a collision course with *Stena Feronia*, several other factors contributed to the accident, including:

- A lack of clear guidance regarding traffic flow around the fairway buoy.
- No action taken by the bridge teams of either vessel to prevent a close-quarters situation from developing.
- Action taken on board *Stena Feronia* to avoid collision.
- Sub-standard VHF communications.

Belfast Harbour has reviewed the accident with its Safety, Environmental and Security Committee, harbourmasters, Vessel Traffic Services staff and a representative of the Belfast pilots. It has taken measures to ensure its required radio procedures are followed, and has changed the point at which pilots disembark outbound vessels. As part of its comprehensive review of port operations, which was ongoing at the time of the accident, Belfast Harbour has since laid four new buoys which address the pinch point at the fairway buoy, introduced new routeing advice for mariners approaching Belfast Harbour, updated its Navigational Risk Assessment, and incorporated the findings of this report into its regular programme of Vessel Traffic Services emergency training.

Northern Marine Management Ltd has issued a fleet guidance notice to its masters, reminding them of the importance that all deck officers have a clear understanding of the International Regulations for Preventing Collisions at Sea and of the manoeuvring characteristics of their vessels.

Continental Ship Management AS has, inter alia, reviewed the manning levels of its vessels and issued a circular letter to its fleet to reiterate its instructions on watchkeeping, including the need to ensure the bridge is manned by an additional lookout during the hours of darkness.

Northern Marine Management Ltd has been recommended to amend its safety management system to provide clarity on the roles and responsibilities of the bridge team when a Pilotage Exemption Certificate holder is acting solely as a pilot.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *STENA FERONIA*, *UNION MOON* AND ACCIDENT

SHIP PARTICULARS

Vessel's name	*Stena Feronia*	*Union Moon*
Flag	United Kingdom	Cook Islands
Classification society	DNV	INSB
IMO number	9136022	8416839
Type	RoPax	General cargo vessel
Registered owner	Stena North Sea Ltd	Ersco
Manager(s)	Northern Marine Management Ltd	Continental Ship Management AS
Construction	Steel	Steel
Length overall	186.45m	87.66m
Registered length	169.84m	82.74m
Gross tonnage	21856	1543
Minimum safe manning	19	5

VOYAGE PARTICULARS

Port of departure	Birkenhead	Belfast
Port of arrival	Belfast	Dagenham (intended)
Type of voyage	Short international	Short international
Cargo information	Passengers/freight	2200t stone
Manning	47	6

MARINE CASUALTY INFORMATION

Date and time	7 March 2012 at 1858 UTC	
Type of marine casualty or incident	Serious Marine Casualty	
Location of incident	Belfast Lough	
Place on board	Port side, frames 135-158	Bow
Injuries/fatalities	None	None
Environmental impact	Nil	Nil
Ship operation	On passage	On passage
Voyage segment	Transit	Transit
External & internal environment	South-westerly wind force 3 to 4, sea state moderate, good visibility	
Persons on board	108	6

1.2 NARRATIVE

1.2.1 Precursor to the accident

At 0500 UTC on 7 March 2012, following a short overnight passage from Drogheda, the general cargo vessel *Union Moon* embarked a pilot at the pilot station in Belfast Lough, Northern Ireland. Regardless of where she was operating, the vessel maintained Central European Time (CET), so the pilot boarded as the 12-6 watchkeeping chief officer was handing over to the 6-12 watchkeeping master. *Union Moon* was in ballast, and she was scheduled to load a cargo of 2200t of stone and sail later that evening for Dagenham.

The passage to the berth was uneventful and *Union Moon* was alongside at Barnett Dock by 0600. Once the vessel was secure and cargo operations had started, the chief officer went to his cabin to rest. He was back on the bridge at 1100 to relieve the master who was keeping a cargo watch there.

Meanwhile, on the other side of the Irish Sea, the roll on/roll off passenger ferry (RoPax) *Stena Feronia* was preparing to leave Birkenhead. The vessel had been operating on the Belfast to Birkenhead run for 3 weeks as a replacement for another Stena vessel, *Stena Mersey*, which was in dry dock. *Stena Feronia* was manned by her usual complement of officers and crew. Additionally, a junior master from *Stena Mersey* who held pilotage exemption certificates (PEC) for Belfast and Liverpool, endorsed for *Stena Feronia*, had signed on the vessel as an extra chief officer the previous evening in Belfast. Hereafter known as the PEC holder, the junior master's only duty on board was to act as a pilot within the harbour limits of Belfast and Liverpool.

By 1230, *Stena Feronia* was clear of Liverpool, and the PEC holder left the bridge. His next duty would be the arrival pilotage at Belfast.

In Belfast, loading on *Union Moon* continued throughout the afternoon. Although the master was not on duty, he visited the bridge five or six times during his rest period. He had little interaction with anyone on board during this time and, at some point, started consuming alcohol in his cabin.

1.2.2 *Union Moon*'s departure and *Stena Feronia*'s arrival

At 1600, *Union Moon*'s chief officer gave 2 hours' notice of departure to Belfast Harbour. This information was passed to the pilot who was assigned to take the vessel out that evening. At 1700, with loading now complete, *Union Moon*'s master took the watch and started the pre-departure checks on the bridge. The chief officer went on deck with the able seaman (AB) and cadet, and began to close up the vessel and make her ready for sea.

The pilot boarded *Union Moon* at 1750. On completion of the pilot-master information exchange, the master manoeuvred the vessel off the berth, and then turned and lined her up to exit Barnett Dock **(Figure 1)**. He then handed the con to the pilot, who manoeuvred the vessel into Victoria Channel and began the passage out to sea. The pilot and the master were the only two people on the bridge of *Union Moon*.Just before *Union Moon* reached Beacon 16, the pilot handed the con to the master, and drew his attention to the inbound ferry *Stena Scotia*, which was already in Victoria Channel. He reminded the master to report to Belfast Vessel Traffic Services (VTS) on VHF radio Channel 12 as *Union Moon* passed Beacon 12 and,

Reproduced from Admiralty Chart BA 1752 by permission of the Controller of HMSO and the UK Hydrographic Office

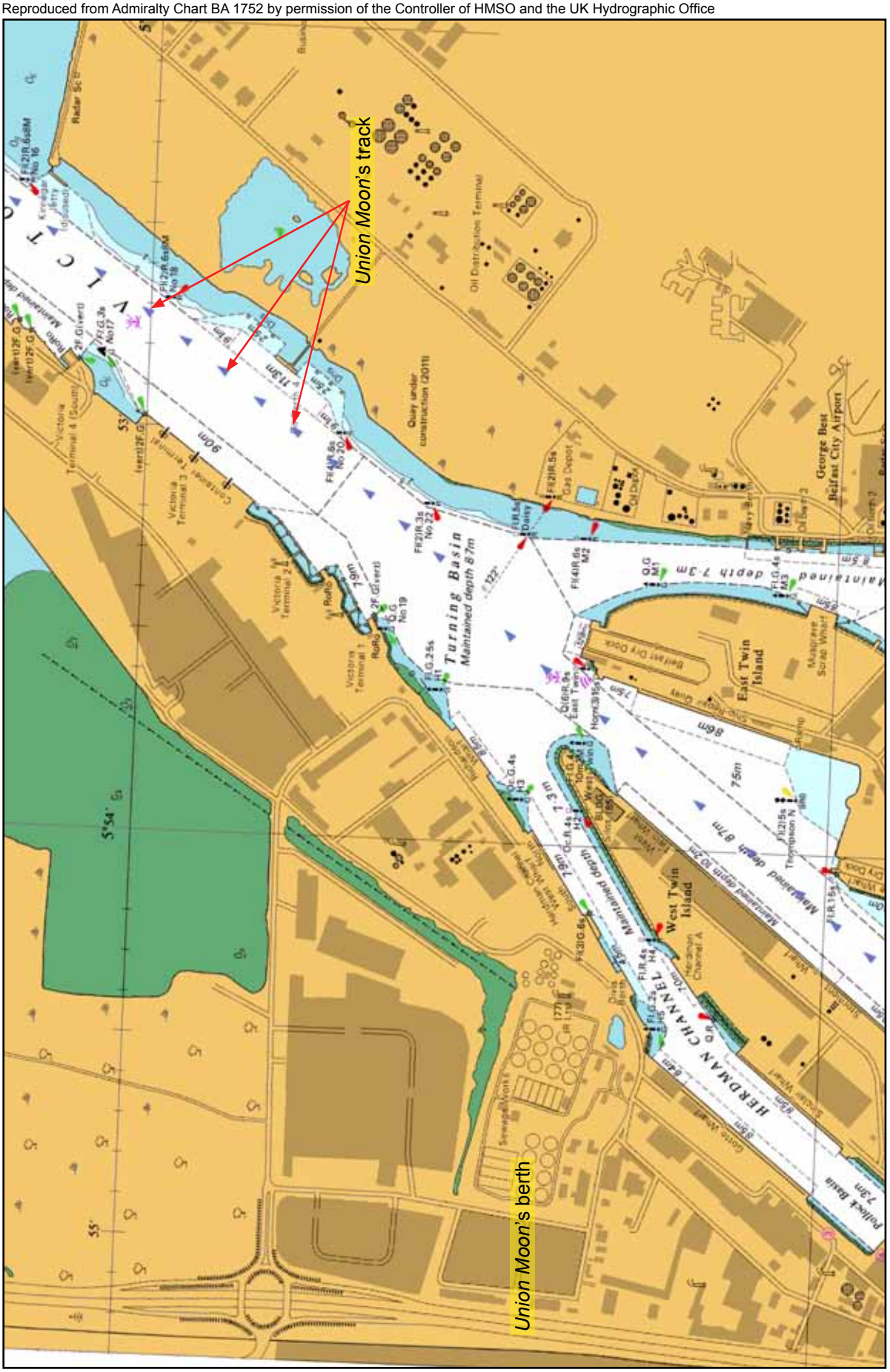


Figure 1: Chart showing Belfast inner harbour and track of *Union Moon*

Reproduced from Admiralty Chart BA 1752 by permission of the Controller of HMSO and the UK Hydrographic Office

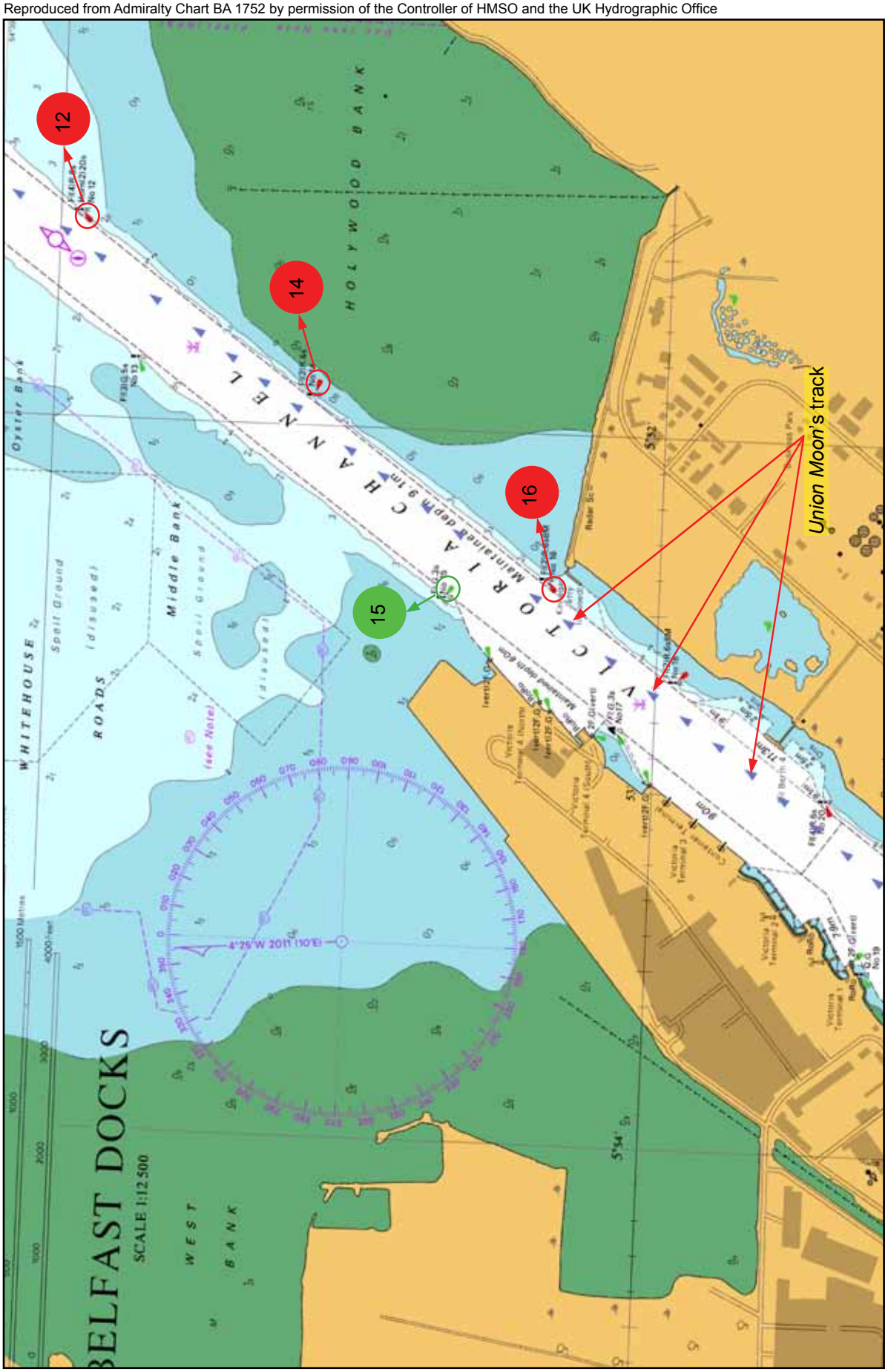


Figure 2: Chart showing Victoria Channel

later, the fairway buoy. The master indicated to the pilot that he was already aware of Belfast Harbour's reporting requirements. The pilot disembarked to a pilot boat at 1820 as the vessel passed Beacon 16 **(Figure 2)**.

At 1821, *Stena Scotia* reported to Belfast VTS that she was passing Beacon 12 inbound. The port control officer (PCO) on duty acknowledged this report and informed *Stena Scotia* that there was one outbound vessel, *Union Moon*, which was approaching Beacon 14. *Union Moon* was actually passing Beacon 15 at that time. No traffic information was passed directly to *Union Moon*, and her master did not communicate with either Belfast VTS or *Stena Scotia*. At 1824, the two vessels passed each other in the vicinity of Beacon 14. *Stena Scotia* was making good a speed over the ground of 13 knots and *Union Moon* was making good a speed over the ground of 8 knots.

At 1826, *Union Moon*'s master reported to Belfast VTS that his vessel was approaching Beacon 12 outbound. The PCO acknowledged the report and informed him that there was no inbound traffic.

Stena Feronia's master came to the bridge at around 1830 to supplement the bridge team of the third officer and watchkeeping AB in advance of the vessel's arrival at Belfast. The PEC holder came to the bridge soon afterwards and the two men spent several minutes discussing the intended manoeuvre and anticipated environmental conditions within the harbour.

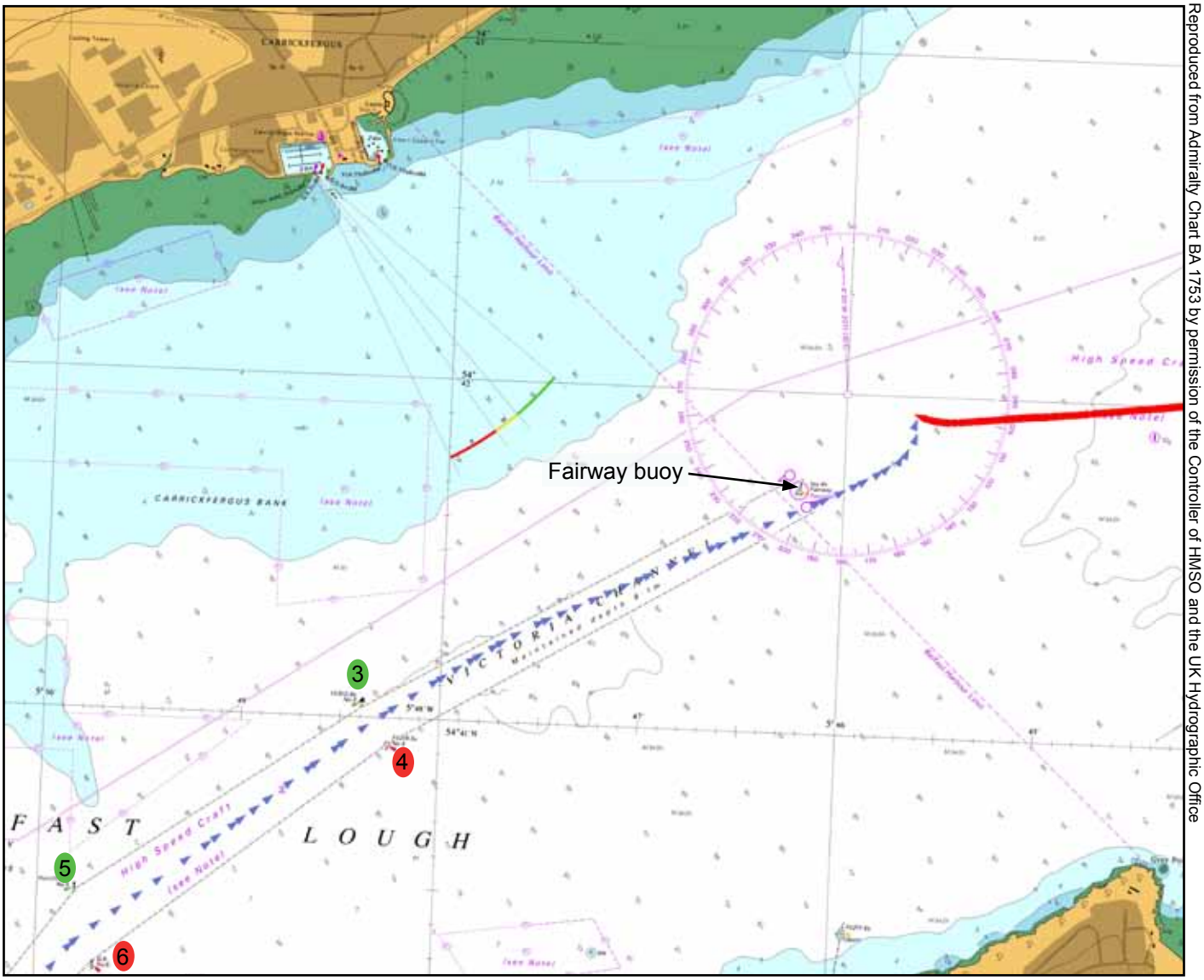
At 1842, the PEC holder called Belfast VTS and gave 15 minutes' notice of *Stena Feronia* reaching the fairway buoy. The PCO gave the ferry permission to proceed inward and informed the PEC holder that there was one vessel outbound, *Union Moon*, which was at Beacon 4. No information was passed to *Union Moon*, which was now 6.7nm from *Stena Feronia*.

The third officer monitored *Union Moon* visually and on the Automatic Identification System (AIS) but could not acquire her radar echo on the Automatic Radar Plotting Aid (ARPA) due to target swap as the vessel passed close to the channel beacons. The PEC holder then took the con from the third officer and, soon afterwards, ordered the AB to engage hand-steering. *Union Moon* was now making good a speed over the ground of 9 knots, and *Stena Feronia* was making good a speed over the ground of approximately 17 knots.

During the morning in Birkenhead, *Stena Feronia*'s master had been dealing with a passenger complaint that had been received by head office. This had been the subject of much discussion by senior personnel on board and, with senior managers due to visit the vessel the following day, at 1851, the master asked the onboard services manager to meet him in his office to discuss the issue. The master informed the PEC holder that he was going to his office for a few minutes, and the PEC holder confirmed that he was content for him to do so. The master's office was adjacent to the bridge.

1.2.3 The collision

At 1854, the master of *Union Moon* called Belfast VTS and reported that his vessel was passing the fairway buoy outbound **(Figure 3)**.



Reproduced from Admiralty Chart BA 1753 by permission of the Controller of HMSO and the UK Hydrographic Office

Figure 3: Chart showing the area around the fairway buoy

The PCO wished him a good watch; he did not pass any traffic information. However, a little over a minute later, and with growing concern that *Union Moon* was not altering course to starboard as he had anticipated, the PCO called *Union Moon* to inform the master that *Stena Feronia* was the inbound vessel approaching his position and to ask him to confirm that he would *'see this vessel red to red*' **(Table 1)**.

Union Moon's master replied '*I see. Just now I alter my course to port*'.

The PCO then asked *Union Moon*'s master to confirm that he was altering course to port. When he received confirmation from the master to that effect, he advised the master that this would stand his vessel into danger with *Stena Feronia*. At the same, *Stena Feronia*'s third officer, who was monitoring the conversation and watching *Union Moon*, confirmed to the PEC holder that *Union Moon* was altering course to port.

The PCO then called *Stena Feronia*; the PEC holder answered. The PCO asked the PEC holder to call *Union Moon* as the vessel was altering course to port and standing into danger with the ferry. Throughout this VHF radio exchange, the third officer was advising the PEC holder that *Union Moon* was altering course to port and twice told him that the vessel was '*coming to collision*'.

The PEC holder called *Union Moon* and received no response. At 1857, with the third officer once again advising that collision was imminent, the PEC holder ordered the wheel hard to starboard and the third officer to call the master. The master was on the bridge within 10 seconds.

Meanwhile on *Union Moon*, the crew were unaware of the unfolding situation. The chief officer and cadet were in their showers, the AB and chief engineer were in the mess room, and the cook was in the galley. The chief engineer then heard a distinct change in the engine tone and recognised that the propeller had been put full astern. Concerned, he got up from the table and began to climb the stairs up to the wheelhouse to investigate.

Stena Feronia's master quickly assessed that the ferry's stern was swinging towards *Union Moon* at close range, and ordered the wheel hard to port in an attempt to avoid a collision. However, at this point the rate of turn was 75 degrees per minute and the helm order was too late to check the turn to starboard, let alone commence a turn to port. At 1858, less than 20 seconds after *Stena Feronia*'s master had entered the bridge, *Union Moon*'s bow hit the port side of the ferry on a near-perpendicular heading, just forward of amidships.

Key:
VTS: Belfast VTS
UM: *Union Moon*
SF: *Stena Feronia* (bridge VDR conversations in brackets)

Time	From	Content
1855.55	VTS	*Union Moon* - Belfast Harbour Radio Just to confirm, the *Stena Feronia* inward just approaching your position. Can you confirm sir you will see this vessel red to red over?
1856.03	UM	I see. Just now I alter my course to port.
1856.10	VTS	Sir, can you confirm sir again please sir, you say you just altered your course to port over?
1856.18	UM	Sorry, please repeat.(on *Stena Feronia*'s bridge a voice can be heard muttering an expletive)
1856.24	VTS	Sir, can you confirm, did you say you just altered course to port is that correct?
1856.26	UM	Yes to to to to to port, yes is correct.
1856.29	VTS	Yes sir, this will stand you into danger with the *Stena Feronia*. You are standing into danger with the *Stena Feronia*. She is bound to the north side of the fairway buoy over. (on *Stena Feronia*'s bridge the third officer can be heard saying '*She's altering*')
1856.43	UM	I see
1856.47	VTS	*Stena Feronia* – Belfast Harbour radio over (*Stena Feronia*'s third officer continues, '*Very slowly..*(unclear)')

Time	From	Content
1856.50	SF	Harbour radio - *Stena Feronia* (*Stena Feronia*'s third officer says, '*She's already altered course*')
1856.52	VTS	Yes sir, can you speak with *Union Moon*. He has altered course to port and appears to be standing into danger with yourself over. (At the same time *Stena Feronia*'s third officer continues, '*Coming to collision*' then quickly repeats '*Coming to collision*')
1857.00	SF	Yes erm *Union Moon - Stena Feronia* (*Stena Feronia*'s third officer repeats, '*Coming to collision*' The PEC holder replies '*Yes*')
1857.06		(Third officer, '*To the starboard*')
1857.08		(PEC holder, '*Full to starboard*' AB, '*Hard to starboard*')

Table 1: Transcript of VDR and VHF radio communications leading up to the collision

1.2.4 Post-collision

Stena Feronia's master immediately sounded the general emergency signal to summon both passengers and crew to their emergency muster stations. After answering two telephone calls and briefly informing the callers of the situation, he ordered a damage assessment; activated a DSC distress call; ordered a download of the voyage data recorder; and made an initial broadcast to passengers on the public address system. The broadcast advised passengers to muster in warm clothing, with any medication they were taking, and to follow instructions from the crew in readiness for a possible abandon ship. Completed passenger questionnaires received by the MAIB following the collision indicate that passengers felt well-informed by the master and that the crew carried out their emergency duties well.

The PEC holder made VHF radio contact with *Union Moon*, but neither vessel gave any details regarding the extent of damage. He then informed Belfast VTS of the situation.

On *Union Moon*, the chief engineer had barely reached the top of the stairs to the wheelhouse when the collision happened. He saw that the master had been thrown across the console but was uninjured. The chief engineer then went back down the stairs to check the status of the machinery spaces.

No alarm was sounded on *Union Moon*, but the impact had been enough for all on board to realise that there had been a serious incident. Those who had been showering got dressed, and soon all crew members apart from the chief engineer were in the wheelhouse. Although he had received no instruction or signal to do so, the cadet was dressed in an immersion suit and with a lifejacket. The master ordered the chief officer to take the men forward and assess the damage. He did not refer to the company's post-collision checklist **(Annex A)**.

On *Stena Feronia*, the master was receiving reports from the crew that the ferry was holed, but that the damage was above the waterline and there was no ingress of water. This information was passed to both Belfast VTS and Belfast Coastguard, and the distress was downgraded. The master referred to the company post-collision checklist **(Annex B)** as the PEC holder assumed the con and brought the ferry back onto track to enter Belfast Harbour.

At 1917, *Union Moon*'s master requested a pilot to enable him to re-enter Belfast Harbour. The PCO acknowledged the request and asked the master for a damage report on the vessel. The master reported that his vessel was fully operational but had suffered a little damage to her bow. At 1924, the PCO requested that *Union Moon* anchor in a position 2 miles south-east of the fairway buoy and wait for a pilot. Six minutes later, Bangor inshore lifeboat was on scene and informed Belfast VTS that *Union Moon*'s bow was too severely damaged to enable her to anchor. This was confirmed at 1941 when a crewman from the lifeboat boarded the vessel and went forward to get a closer assessment of the ship's condition.

At 2021, a pilot boarded *Union Moon* and conducted a further assessment of her condition. He informed Belfast VTS that he would bring *Union Moon* into port, but only under escort of two tugs.

Stena Feronia was alongside her berth at 2033 and passengers were disembarked some 20 minutes later. Soon afterwards, the bridge team were breathalysed by officers of the Police Service of Northern Ireland (PSNI); all results were negative. The ship then shifted to a repair quay for assessment.

At 2110, *Union Moon* began to make her way into port with two tugs in attendance. The master remained on the bridge. He gave no direction to the crew and no further assessment of damage or possible water ingress was made during the passage back to port. *Union Moon* arrived alongside the repair quay at 2232.

At 2300, PSNI officers boarded *Union Moon* and breathalysed the master. The master's breath test gave a reading of 123µg of alcohol per 100ml of breath. He had taken his last alcoholic drink just before the pilot boarded at 1750. The Railways and Transport Safety Act 2003 permits a maximum level of 35µg of alcohol per 100ml of breath. The master was arrested and taken to Musgrave police station. On 31 May 2012, he appeared at Downpatrick Crown Court and was sentenced to 1 year's imprisonment.

On the day of the accident, none of *Union Moon*'s crew, the pilot who took the vessel out, the RNLI crewman who boarded her after the accident, or the pilot who brought her back into port had noticed that the master was under the influence of alcohol.

1.3 ENVIRONMENTAL CONDITIONS

The collision happened 3½ hours before high water, at which time there was a predicted 0.2 knot of flood tide in the vicinity of the fairway buoy. Weather conditions were fine, with good visibility and a south-westerly wind of 15 to 20 knots. Sunset was at 1813.

1.4 *STENA FERONIA*

1.4.1 General

Stena Line had chartered *Stena Feronia* from a sister company, Stena RoRo, to operate on the Belfast to Birkenhead route while its own ship, *Stena Mersey,* was in dry dock.

Technical management of *Stena Feronia* was provided by Northern Marine Management Ltd, and the vessel operated under the company's safety management system (SMS).

1.4.2 Damage to *Stena Feronia*

Stena Feronia suffered port side shell damage in way of the main deck and water ballast tanks 6 and 7 port **(Figure 4)**. The damage extended from frame 138 to frame 156 and from the main deck up to the fifth side shell longitudinal above the main deck.

Main frames 141, 144, 147, 150 and 153 were severely buckled and the web frames were torn in several locations. The main deck was set in at frame 150. The shell plating in way of water ballast tanks 6 and 7 port was punctured and shell longitudinals significantly set in over an area of approximately 6m by 2m.

The transverse bulkhead at frame 147 was buckled below the main deck over an area approximately 2m by 0.75m. Several side longitudinals were found buckled in this area also.

Repairs to the damage were completed to classification society requirements on 24 March 2012 and the ship sailed for the Baltic Sea the following day.

1.4.3 Stena organisation

Stena AB is the parent company of several brands including Stena Line, Stena RoRo and Northern Marine Management Ltd. Northern Marine Management Ltd was formed in 1983 initially to provide ship management services to various Stena Sphere shipping divisions, but also now provides similar services to external clients.

1.4.4 Manning

Stena Feronia's safe manning certificate required a minimum complement of 19. Her actual manning was 47. The crew were all European nationals and, with the exception of the PEC holder, regularly worked on board the vessel.

The 'Navigation Procedures' section of Northern Marine Management Ltd's SMS **(Annex C)** required that *'there must be, at least, two qualified navigating officers on the bridge when navigating in confined or congested waters, on the approach to and entering and leaving port, and at any other time when the proximity of navigational hazards or traffic density may pose an unacceptable work load on the watchkeeper*'.

The master was required by the SMS to be on the bridge when the ship was: under pilotage (including under a PEC); in restricted visibility, in extreme environmental conditions; in high density traffic; or in or near a traffic separation scheme.

Figure 4: Damage to *Stena Feronia*

1.4.5 Master

Stena Feronia's master had worked for Northern Marine Management Ltd since 1979. He held an STCW II/2 Certificate of Competency and had been in command since 1985. The master had joined *Stena Feronia* around 3 weeks before the accident. It was the first time he had served on the vessel.

1.4.6 PEC holder

The PEC holder also held an STCW II/2 Certificate of Competency and was employed by Stena Line as a junior master. He usually worked on board *Stena Mersey* on the Belfast to Birkenhead route, and had gained a PEC for Belfast in August 2010 and for Liverpool in July 2011. He had joined *Stena Feronia* the previous day in Belfast and had executed the ship's outbound pilotage in Belfast, and the inbound and outbound pilotage in Liverpool, prior to the collision.

1.4.7 Third officer

The third officer held an STCW II/1 Certificate of Competency and had worked on *Stena Feronia* for 1 year. He had rejoined the vessel following a period of leave, 5 days before the accident.

1.5 *UNION MOON*

1.5.1 General

Union Moon traded between European ports. She had carried cargo from Antwerp to Drogheda between 1 and 5 March and arrived at Belfast on 7 March to load a cargo of stone destined for Dagenham.

1.5.2 Damage to *Union Moon*

Union Moon's damage was limited to the forward part of the vessel. The port side bow area above the forecastle store deck, from forward to frame 136, including the bulwark, side shell and internals, forecastle deck plating, and the access trunking to the store, were missing. The remaining structure, including the port hawse pipe and the port paint store cage, was crushed and set aft to about frame 135 **(Figure 5)**. The missing bow section was found on board *Stena Feronia* **(Figure 4)**.

The starboard bow area above the forecastle store deck, including the forecastle deck, bulwark, side shell plating and internals, and hawse pipe, was crushed and set aft to about frame 135. The bow shell plating below the forecastle store deck, in way of the fore peak tank, was also crushed and set aft to frames 135 and 136.

The port anchor and a small amount of chain were lost. One fluke of the starboard anchor was also lost.

1.5.3 Continental Ship Management AS

Formed in 1984 and based in Norway, Continental Ship Management AS (CSM) operated a fleet of six general cargo vessels which traded around the Baltic and Mediterranean Seas and North-West Europe.

Figure 5: Damage to *Union Moon*

1.5.4 Manning

Union Moon's safe manning certificate required a minimum complement of five crew. However, she also carried an additional deck cadet, which increased the actual manning to six. All crew on board were Polish.

The master and chief officer shared a watch pattern of 6 hours on duty and 6 hours off duty. The rest of the crew - chief engineer, AB, ordinary seaman/cook and cadet - generally followed a day work routine with some watchkeeping duties for the cadet and AB. According to the watch plan posted on the bridge, the AB and cadet should have been following a watch pattern of 6 hours on duty and 6 hours off duty.

It was a requirement of CSM's SMS that there should be at least two people on the bridge while navigating during the hours of darkness **(Annex D)**. The watchkeeper could be assisted by another officer or cadet, or a watchkeeping rating. There was no watch alarm fitted on the bridge.

A comparison of the previous 30 days' hours-of-rest records with the periods when the ship was at sea during the hours of darkness, identified that the bridge was regularly manned by a lone watchkeeper at night.

1.5.5 Master

The master held an STCW II/2 Certificate of Competency, which was limited to vessels below 3000GT. He had served on general cargo ships since 1981, the last 10 years of which he had been in command. He had been master of *Union Moon* for 3 years.

1.5.6 Continental Ship Management AS's alcohol policy

CSM's alcohol policy was that no one on board should ever have a blood alcohol content exceeding 50mg of alcohol per 100ml of blood **(Annex E)**. This is less than the Railways and Transport Safety Act 2003 limit of 80mg of alcohol per 100ml of blood. The company indicated in its SMS that it monitored compliance with the policy by carrying out pre-employment, random and post-accident tests for the presence of alcohol.

Although the SMS stated that the master was authorised to carry out random breath tests, *Union Moon* did not carry a breathalyser and the company relied on an independent company to carry out testing on its behalf.

Drug and alcohol testing was carried out once on *Union Moon* in the 12 months prior to the accident. All six crew members tested negative for both drugs and alcohol. *Union Moon*'s master at the time of the accident was not the same master who was on board at the time of the testing.

Before signing on a CSM vessel, crew members were given a copy of the company's policy statement and rules, and signed a declaration to indicate they had read and fully understood the contents. This was then kept by the manning agent. *Union Moon*'s master had signed such a declaration on 28 February 2012.

1.6 BELFAST HARBOUR

Belfast Harbour is Northern Ireland's principal port, handling around 17 million tonnes of cargo and 5,500 vessels each year. It operates as a trust port. Trust ports are independent statutory bodies, governed by their own local legislation and run by independent boards for the benefit of stakeholders. Unlike private company ports, they have no shareholders, so all the surpluses from port operations are put back into the port. The day-to-day operation of Belfast Harbour is managed by a senior executive team, who report to the Board of Commissioners.

1.7 BELFAST VESSEL TRAFFIC SERVICES

1.7.1 Level of service

Belfast's VTS provided the traffic organisation service (TOS) level of service within the inner harbour and Victoria Channel, and an information service (INS) outside the channel.

The International Maritime Organization (IMO) defines a TOS as a service to prevent the development of dangerous maritime traffic situations and to provide for the safe and efficient movement within the VTS area. This service provides essential and timely information to assist the onboard decision-making process.

The IMO defines an INS as a service to ensure that essential information becomes available in time for onboard decision-making. This service does not participate in onboard decision-making.

1.7.2 Port control officer

The PCO who was on duty at the time of the accident had worked at Belfast Harbour for nearly 6 years. Prior to joining port control, he had worked for 20 years in various roles within the fishing industry and had also served with the Royal National Lifeboat Institution for 10 years.

1.7.3 VTS Manual

Belfast Harbour had produced a VTS Manual **(Annex F)** for its port control staff giving guidance in the form of standard operating procedures. The manual included sections on traffic management, communications, log keeping and watchkeeping responsibilities.

The manual required PCOs to provide traffic information:

- When requested by any vessel.
- As soon as practicable after a vessel had acknowledged its traffic clearance, whether arriving or departing.
- When a vessel had reached a reporting point.
- At any time that a potential traffic conflict had been identified.

The manual also gave guidance on issuing warnings. It advised that a PCO may give a warning to a vessel if it was apparent that she was standing into danger. This was normally to be done when it was evident that a vessel should take action in response to a circumstance identified by the PCO; examples given included the danger of collision.

An example of a warning message was given in the manual, along with an instruction that the warning should be preceded by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) recognised message marker '*WARNING*', include the words '*from my equipment*' and be given in a clear, concise manner so that the mariner was in no doubt as to what was causing the alarm. The PCO did not use this message marker or follow the warning message format in the communications prior to the collision, nor was there a prompt for him to use this message format readily available in the control room for him to refer to.

1.7.4 Training and exercises for port control officers

IALA's Recommendation V-103 sets the international standard for the training and certification for VTS personnel. The PCO had attended a full 10-week V-103 course to qualify to this standard when he joined port control, and he had been given refresher training in 2009. Belfast Harbour PCOs had also attended a bespoke 1-week course on a simulator that replicated the port of Belfast and typical shipping movements within its waters.

Belfast Harbour maintained a record of emergency exercises that had been undertaken by its PCOs. Historically, the exercises had been held weekly, but for a number of reasons very few had been held in the previous 12 months. The routine conduct of exercises was reintroduced in December 2011 with the intention of holding them on a monthly basis. However, the following 2 months were missed due to workload issues, and the exercise scheduled for March 2012 had not been held prior to the accident.

Training exercises tested the PCOs' reactions to the aftermath of major events such as explosion, collision or major pollution but did not assess their handling of the build-up to such an event, for example the close-quarters situation that develops before a collision occurs.

1.8 BELFAST HARBOUR ENTRY AND EXIT REQUIREMENTS

1.8.1 Pilotage

Pilotage was compulsory for vessels over 75m length overall (LOA) not carrying a PEC holder. Pilots normally boarded vessels at the designated pilot boarding place 1nm to the north-east of the fairway buoy; pilots on outbound vessels between 75m and 100m LOA were instructed to disembark at Beacon 12. However, on 7 March 2012, *Union Moon*'s pilot disembarked at Beacon 16.

Following the accident, the harbourmaster instructed that pilots on vessels between 75m and 100m LOA should remain on board until Beacons 5 and 6 are reached. Pilots on larger vessels were required to remain on board until Beacons 3 and 4. At the time of the accident, Belfast Harbour was conducting a comprehensive review of port operations that included pilotage and buoyage.

1.8.2 The fairway buoy

There was no requirement for a vessel to pass the fairway buoy close on the port side either inbound or outbound. However, publications available to the mariner, to prepare a passage plan to or from Belfast, suggest otherwise:

- The Admiralty Sailing Directions **(Figure 6)** and the Belfast VTS Manual state that vessels are required to report to the port radio when passing the fairway light buoy.

- Symbology on both the Admiralty chart and in the Admiralty List of Radio Signals shows the reporting points with directional arrows suggesting that the buoy should be left to port **(Figure 7)**.

The AIS tracks of vessels over 50m LOA, entering and leaving Belfast over a 5-month period between 1 November 2011 and 31 March 2012, show that the vast majority of ships leaving the port pass to the south of the buoy and leave it on their port side **(Figure 8)**. Vessels entering the port pass either side of the buoy with no clear trend either way **(Figure 9)**.

The position 1nm to the east of the fairway buoy was identified as a pinch point in a 2009 risk assessment that was appended to the Belfast Pilotage Manual **(Annex G)**. One recommendation from the risk assessment was to consider moving the fairway buoy to the south-east to avoid the tendency for inbound ferries to pass south of the fairway buoy as a result of ensuring adequate clearance from the jetties located on the north side of Belfast Lough **(Figure 8)**. Inbound ferries are required to carry a PEC holder or embark a pilot, both of whom have local knowledge and would be familiar with the option of passing on either side of the fairway buoy. Changes to buoyage were under consideration as part of Belfast Harbour's ongoing review of port operations.

Arrival information

Notice of ETA
7.120
Vessels should call the port radio and advise their intentions on entering Belfast Lough for any reason, or on anchoring in the Lough, and also before departing from or manoeuvring within the port. Vessels are also required to report to the port radio when passing Fairway Light-buoy and No 14 Light-beacon. See also *Admiralty List of Radio Signals Volume 6 (1)*.

Outer Anchorages
7.121
Safe anchorages, according to draught, are available in Belfast Lough. For details see 7.85.
Small vessels may anchor in Sea Park Anchorage

Figure 6: Extract from the Admiralty Sailing Directions

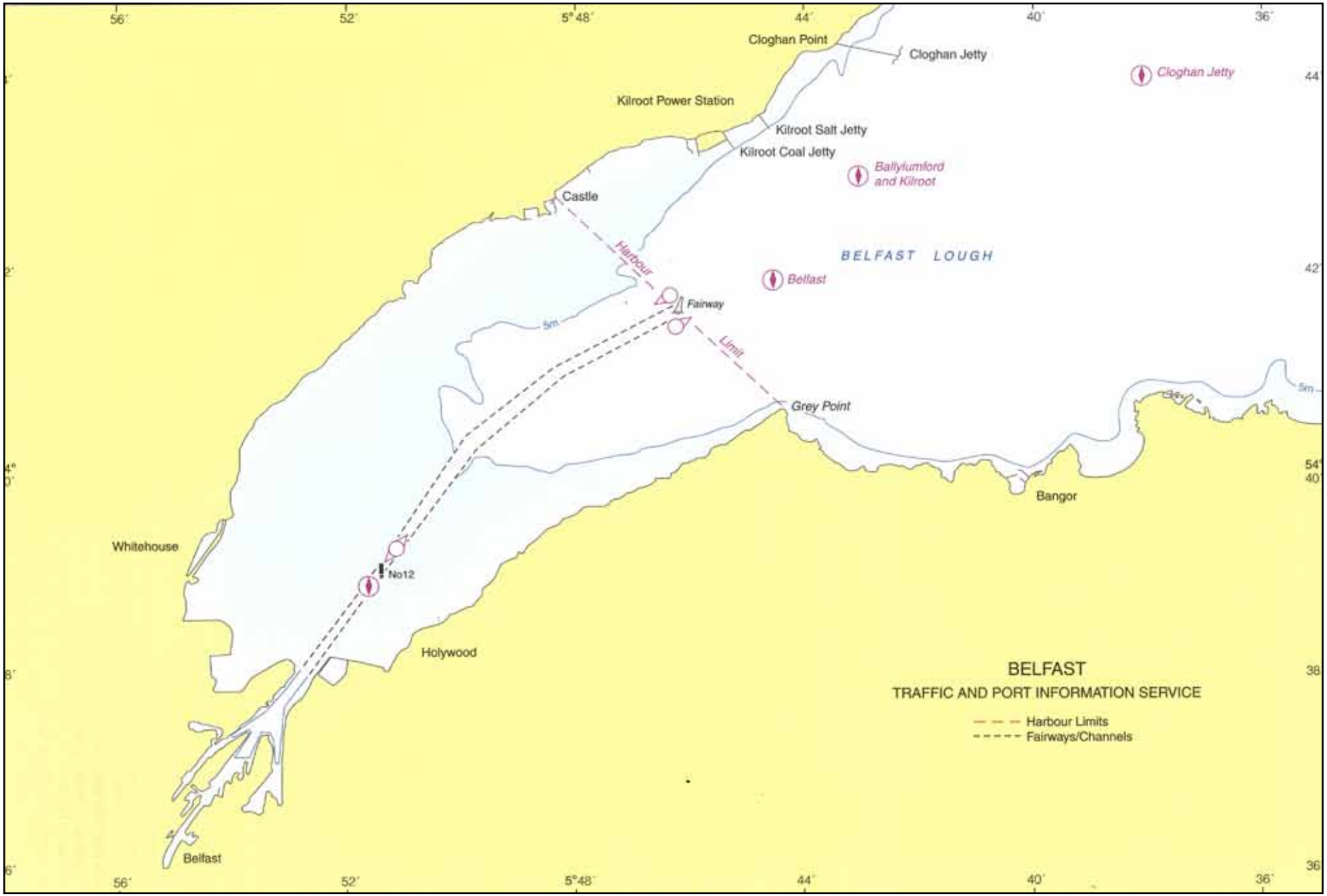


Figure 7: Extract from the Admiralty List of Radio Signals

Reproduced from Admiralty Chart BA 1753 by permission of the Controller of HMSO and the UK Hydrographic Office

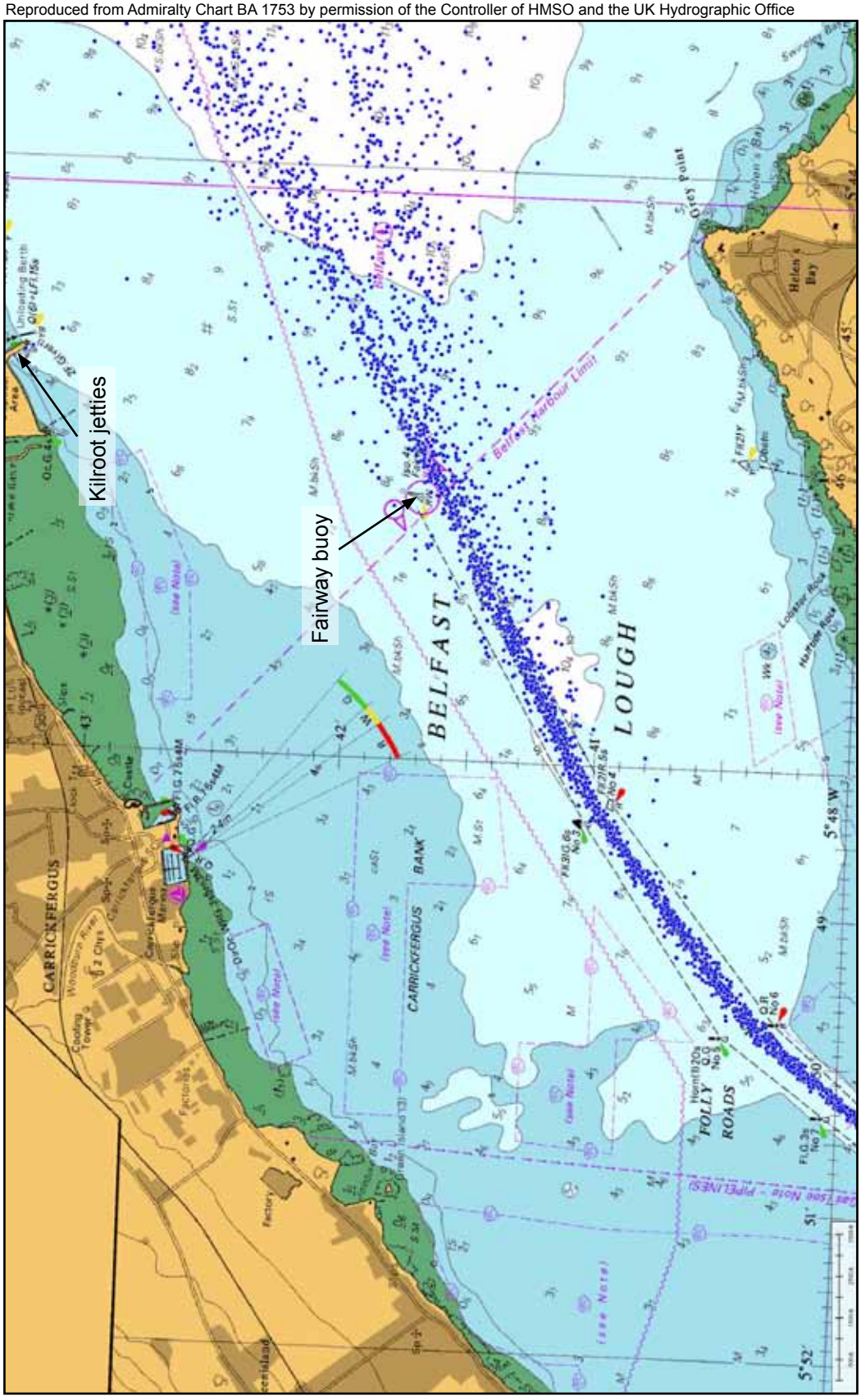


Figure 8: Tracks of ships over 50m LOA leaving Belfast

Reproduced from Admiralty Chart BA 1753 by permission of the Controller of HMSO and the UK Hydrographic Office

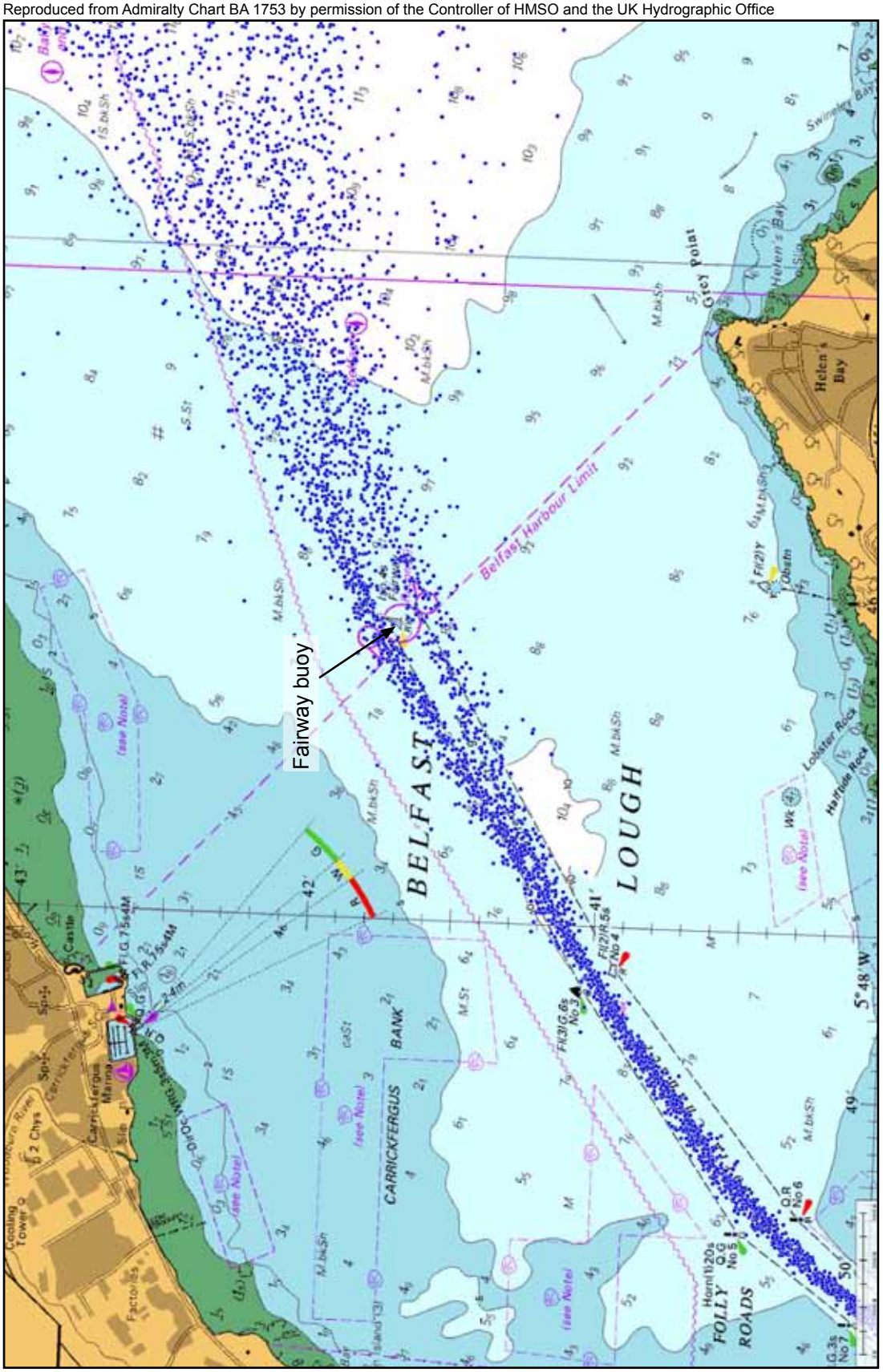


Figure 9: Tracks of ships over 50m LOA entering Belfast

1.9 PILOTAGE EXEMPTION

1.9.1 Belfast and Birkenhead requirements

Stena Feronia was similar to *Stena Mersey* **(Table 2)**, in terms of dimensions and characteristics, and so prior to transferring the ferry to cover the Belfast to Birkenhead route, Northern Marine Management Ltd had requested Belfast and Liverpool harbourmasters to each endorse *Stena Mersey* PEC holders' certificates for *Stena Feronia*.

Particulars	***Stena Feronia***	***Stena Mersey***
Type	RoPax	RoPax
Built	Visentini, Italy	Visentini, Italy
Year	1997	2005
LOA	186.0m	186.4m
Beam	25.6m	25.6m
Draught (max)	6.4m	6.6m
Gross Tonnage	21,856 tonnes	27,510 tonnes
DWT	7,762	7,000
Speed	20 knots	24 knots
Main Engines	2 x Wartsila 7800kW	2 x MAN/B&W 10800kW
Total Output	15600kW	2 x 10800kW
Propellers	2 x CPP	2 x CPP
Bowthrusters	1 x 1100kW, 2 x 680kW	2 x 1300kW
Rudders	2	2
Lane Metres	2150 (plus 100 cars)	2245
Passengers	340	980
Cabins	72 (285 berths)	121 (480 berths)

Table 2: Table comparing *Stena Feronia* and *Stena Mersey*

Liverpool harbourmaster endorsed *Stena Mersey*'s PEC holders' certificates, adding *Stena Feronia* with no requirement for further validation. Belfast harbourmaster endorsed the certificates on the condition that each PEC holder signed onto *Stena Feronia* as a chief officer and underwent one additional check ride under the supervision of a Belfast pilot.

The PEC holder had carried out the required Belfast check ride the previous evening when he joined the vessel. In Birkenhead, Northern Marine Management Ltd required that an inbound and outbound check ride be carried out under the supervision of the master.

1.9.2 *Stena Feronia*'s bridge team management

Stena Feronia's master was clear in his mind that the PEC holder was there to cover only the role of the pilot, and would not be involved in any of the day-to-day activities of the designated chief officer.

He assumed that his officers were familiar with Section 3.5.2 of the SMS, 'Navigation with Pilots' **(Annex H)**, regarding the carriage of pilots, and did not brief them specifically on the role of the Stena PEC holder either prior to *Stena Feronia* taking over the route or at any point subsequently.

Section 3.5.2 stated, '*If the master or Officer of the Watch becomes unsure of the pilot's actions or intentions he should seek clarification and, if still in doubt, take such necessary actions to ensure the safety of the vessel and, in the case of the Officer of the Watch, immediately afterwards inform the master*'.

The investigation found that the third officer was clear on his responsibilities when the ship was under pilotage in accordance with Section 3.5.2 of the SMS. However, he did not have the same clarity on his role with the PEC holder, who was employed by Stena and usually served as a junior master on another of the company's vessels.

1.9.3 The Pilotage Act 1987

Section 8 (1) of the Pilotage Act 1987 requires an applicant for a pilotage exemption certificate in a UK port to be the bona fide master or first mate of the vessel **(Annex I)**.

In accordance with Section 8.4.3 of A Guide to Good Practice on Port Marine Operations **(Annex J)**, to be a bona fide master or first mate the applicant must de-facto hold that position on the vessel and, in the case of the first mate, be assigned to take command in the event of the master being indisposed.

1.10 RECONSTRUCTION

1.10.1 Background and limitations

The MAIB reconstructed the accident on a ship simulator to explore what action could have been taken by *Stena Feronia* to successfully avoid a collision.

Recorded data from the AIS of both ships, *Stena Feronia*'s voyage data recorder, and Belfast VTS were used for the reconstruction. *Union Moon*'s course and speed were extrapolated from the last known point before impact to assess the position to which she may have continued if avoiding action by *Stena Feronia* had been effective.

The choice of model available to replicate *Stena Feronia* was limited. It was decided that the closest match was one that had similar dimensions but a slightly larger turning circle than the ferry – the rationale being that if collision could be avoided on a ship with a larger turning circle than *Stena Feronia*, then the ferry herself should have been able to avoid it.

The time between *Union Moon*'s master initially informing Belfast VTS that he was altering course to port, and the PEC holder ordering the wheel hard to starboard, was 65 seconds. The collision happened 41 seconds after that.

1.10.2 Results

The first trial considered *Stena Feronia* going hard to starboard at the point when *Union Moon*'s master first informed Belfast VTS that he was altering course to port (1856.03s).

Altering course at this point resulted in *Stena Feronia* passing at a distance of some 200m ahead of *Union Moon* **(Figure 10)**.

The second trial considered *Stena Feronia* going hard to starboard at the point when *Union Moon*'s master confirmed to Belfast VTS that he was altering course to port. This was 23 seconds later than the alteration in the first trial (1856.26s).

Altering course at this point resulted in *Stena Feronia* passing at a distance of approximately 50m ahead of *Union Moon* **(Figure 11)**.

A third trial considered *Stena Feronia* going hard to starboard at the point when *Stena Feronia*'s third officer first announced that he could see *Union Moon* was altering course to port. It was at this same time that Belfast VTS was informing *Union Moon*'s master that his actions were standing him into danger with the inbound ferry. This was 8 seconds later than the alteration in the second trial (1856.34s).

Altering course at this point resulted in the ferry passing ahead of *Union Moon* by only a few metres **(Figure 12)**.

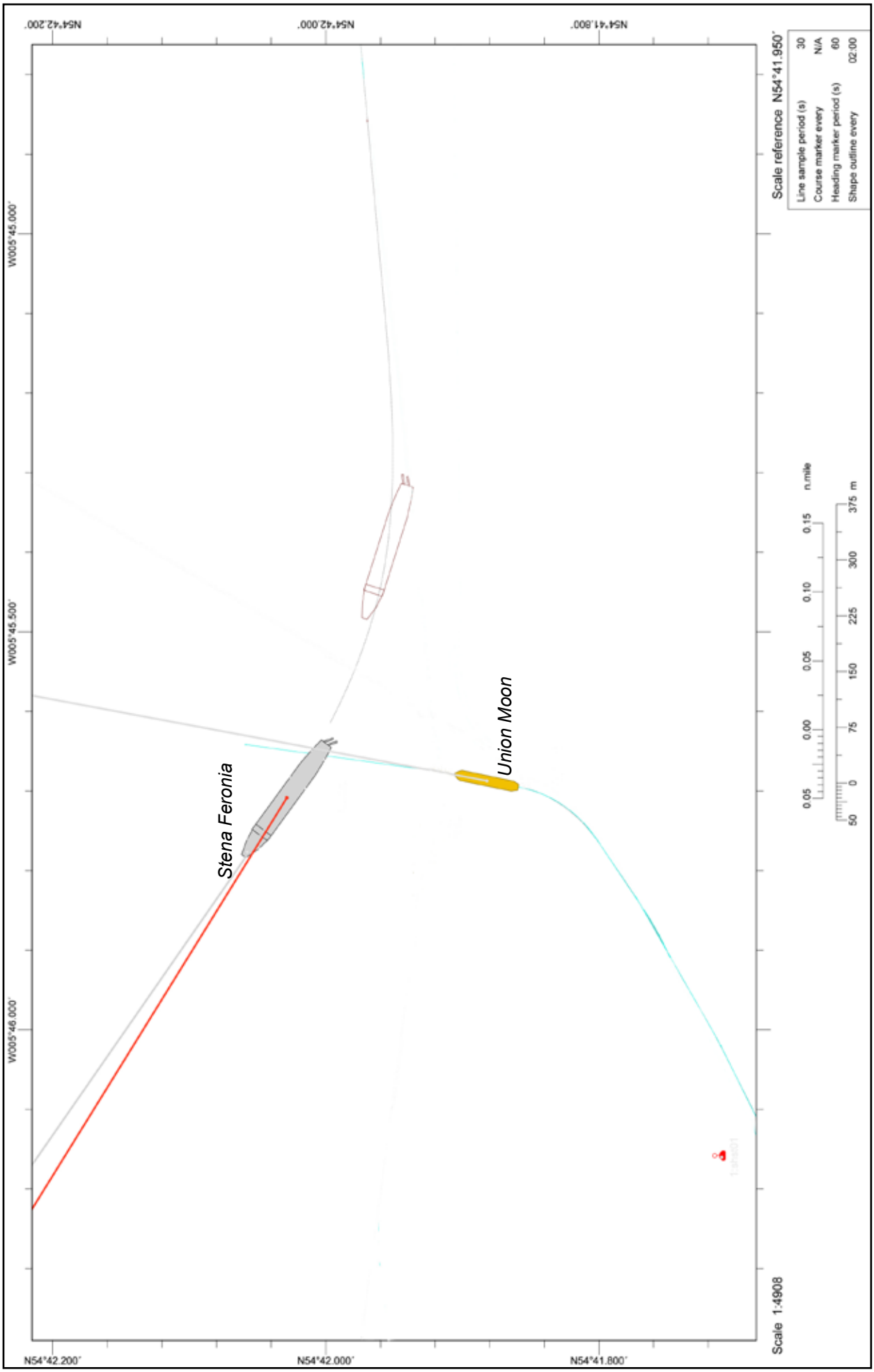


Figure 10: First trial manoeuvre

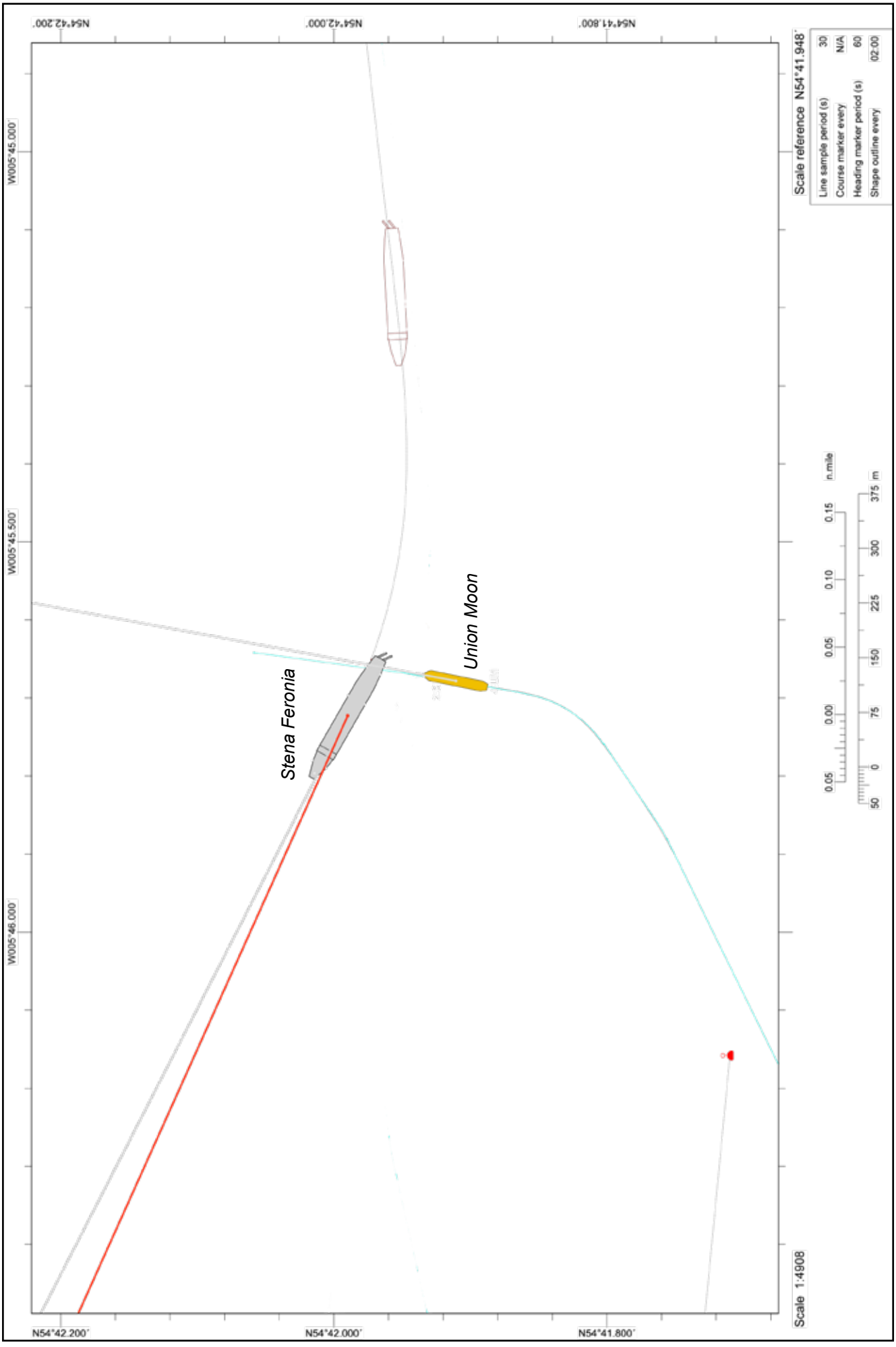


Figure 11: Second trial manoeuvre

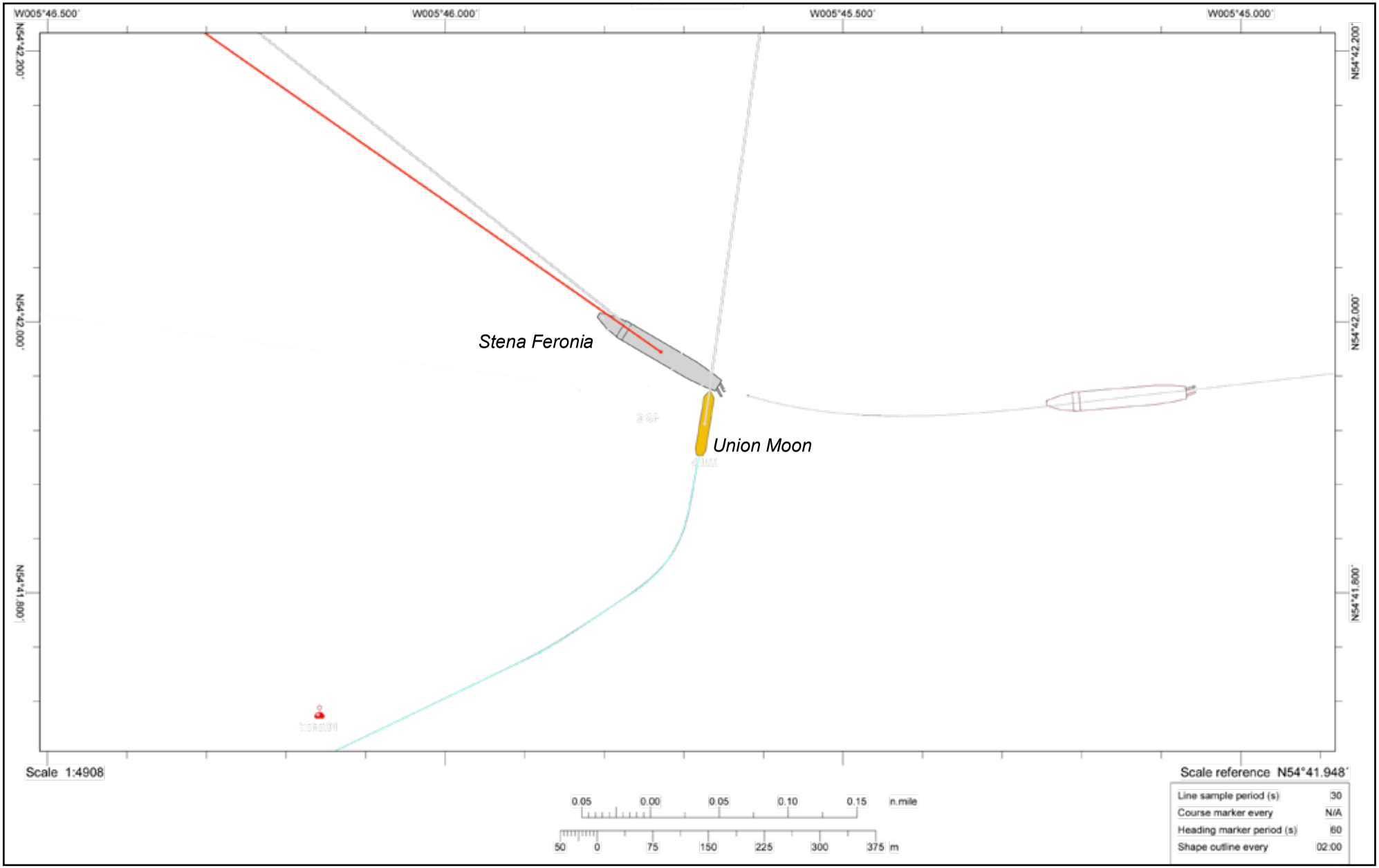


Figure 12: Third trial manoeuvre

1.11 INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA 1972 (AS AMENDED)

Regulations **(Annex K)** referenced in the Analysis section are:

- Rule 2 - Responsibility
- 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.

1.12 GUIDANCE

The Bridge Procedures Guide states, '*Effective bridge resource and team management should eliminate the risk that an error on the part of one person could result in a dangerous situation*'.

MGN 324 (M+F) Radio: Operational Guidance on the Use of VHF Radio and Automatic Identification Systems (AIS) at Sea **(Annex L)** was issued by the Maritime and Coastguard Agency (MCA) following a number of casualties where the misuse of VHF radio had been established as a contributory factor. It advised that, '*Valuable time can be wasted whilst mariners on vessels approaching each other try to make contact on VHF radio instead of complying with the Collision Regulations*'. The Bridge Procedures Guide offers similar advice.

The Bridge Procedures Guide also provides a sample post-collision checklist, including an action to '*Offer assistance to other ship*'. This was included in both *Union Moon*'s and *Stena Feronia*'s post-collision checklists.

Article 98 of the United Nations Convention on the Law of the Sea (UNCLOS) following a collision, requires the master to '*render assistance to the other ship, its crew and its passengers and, where possible, to inform the other ship of the name of his own ship, its port of registry and the nearest port at which it will call.*'

1.13 PREVIOUS/SIMILAR ACCIDENTS

This accident was one of four major collisions that happened over a 4-month period from December 2011 that have been subject to an investigation by the MAIB. The others were as follows:

- In December 2011, the UK registered container vessel *Hyundai Discovery* and the Panamanian registered container vessel *ACX Hibiscus* collided at the end of the traffic separation scheme to the east of Singapore.
- In March 2012, the UK registered general cargo vessel *Seagate* and the Liberian registered reefer *Timor Stream* collided approximately 25nm north of the Dominican Republic.

- Also in March 2012, the Dutch registered reefer container vessel *Spring Bok* and the Maltese registered LPG carrier *Gas Arctic* collided 6nm south of Dungeness.

Recent accidents where alcohol has been deemed to be a contributory factor are as follows:

- In February 2011, the UK registered feeder container vessel *K-Wave* ran aground 13 miles east of Malaga. The bridge was unmanned at the time of the grounding, but 4 hours earlier had been the venue for a birthday party for one of the officers.

- In August 2011, the Antigua and Barbuda registered container vessel *Karin Schepers* grounded on the Cornish coast, UK, while on passage from Cork to Rotterdam. The subsequent investigation found that the master had probably been taking alcohol prior to falling asleep on watch.

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 ALCOHOL

Union Moon's master was recorded as being 3½ times over the legal limit for alcohol more than 5 hours after he had taken his last alcoholic drink, and 4 hours after the accident. His performance would have been adversely affected at the time of the collision.

CSM had an alcohol policy and had invested in a programme of random testing. However, neither was a sufficient deterrent for *Union Moon*'s master, whose condition was unnoticed by the crew, the pilots and the RNLI crewman.

Union Moon's master may be considered to be a rogue individual and the circumstances of this case the exception rather than the norm. However, had the two ships not collided that night, there is no reason to believe that the master's alcohol level on that night or any other would have been detected. He may have continued this and subsequent contracts routinely operating under the influence of alcohol.

The reason for *Union Moon*'s master not taking action to avoid a close-quarters situation with *Stena Feronia* and, instead, altering course to port resulting in a collision course with *Stena Feronia* cannot be determined with any certainty as the master's recollection of events is poor.

It is possible that the master misunderstood the PCO's warning about *Stena Feronia* as an instruction to turn to port (discussed further at Section 2.7); he might have misunderstood the situation and decided that an alteration of course to port was the best course of action; or he might simply have misinterpreted his obligation in accordance with COLREG Rule 15. Whatever the case, his consumption of alcohol, prior to *Union Moon*'s departure, adversely affected his performance and contributed to his actions.

For any mariner to be in charge of a navigational watch while intoxicated, is unacceptable; the robust action taken by the Belfast authorities to punish the master of *Union Moon* for his reckless behaviour was entirely appropriate. This is the third marine casualty in 13 months in UK waters and/or involving UK registered vessels where alcohol consumption by the bridge watchkeepers concerned was contributory. Fortunately, none of the accidents resulted in harm to the crews concerned or damage to the environment, but it can only be a matter of time before a more serious accident occurs if this trend continues. There appears to be a small minority of mariners who appear not to understand, or perhaps choose to ignore, the risks to life and the environment that excessive consumption of alcohol can pose. Sadly, the entrenched attitudes of such individuals mean that they are unlikely to be swayed by the contents of a report such as this and therefore the imposition of severe penalties whenever such behaviour is detected may be the only way that such individuals will begin to recognise the folly of their actions.

2.3 THE FAIRWAY BUOY PINCH POINT

Union Moon could have safely left Victoria Channel at any time after passing Beacons 5 and 6, and then taken a more easterly heading, thereby avoiding any potential traffic conflict at the fairway buoy. However, publications available to the chief officer when passage planning, suggested that the fairway buoy should be passed close by and on the port side.

Had the pilot disembarked later in Victoria Channel, he might have been in a position to identify that *Stena Feronia* and *Union Moon* would meet at the fairway buoy and, in conjunction with VTS, could have advised the master to leave the channel early. Such action would have been in accordance with Rule 2(a) of the COLREGS. The new pilot disembarkation points assigned following the accident should address this.

Stena Feronia's bridge team recognised that a close-quarters situation was developing with *Union Moon,* but expected *Union Moon* to alter course to starboard once she had passed the fairway buoy. Although this was a reasonable expectation, no confirmation had been requested or received to that effect. A precautionary measure would have been to confirm *Union Moon*'s intentions directly or through Belfast VTS on being notified at 1842 that *Union Moon* was outbound at Beacon 4. Alternatively, *Stena Feronia*'s bridge team had the option of taking action to avoid a close-quarters situation developing in the vicinity of the fairway buoy by altering course and/or speed. Again, such action would have been in accordance with Rule 2(a) of the COLREGS.

The pinch point at the fairway buoy was identified in a risk assessment that was written at the beginning of 2009 and appended to the Belfast Pilotage Manual. While some of the recommendations made in that risk assessment had been addressed, analysis of the AIS tracks of ships entering and leaving Belfast over a 5-month period between 1 November 2011 and 31 March 2012, confirms that the pinch point remained at the time of the accident.

2.4 THE PEC HOLDER STATUS

The PEC holder was not the bona fide master or first mate of *Stena Feronia*. Having signed on as extra chief officer, he was not assigned to take command of the ship in the event of the master being indisposed. Although his PEC for Belfast had been endorsed for *Stena Feronia*, Section 8(1) of the Pilotage Act 1987 required him to be signed on *Stena Feronia* as the bona fide master or first mate for him to function in the capacity of a PEC holder.

However, Northern Marine Management Ltd's SMS made no specific reference as to how a PEC holder, who was not part of the normal ship's complement, should be integrated into the bridge team. In this case, the PEC holder was viewed by the master as being equivalent to a qualified pilot and that, in accordance with Section 3.5.2 of the SMS, the third officer had his and the company's authority to overrule any decision the PEC holder made. The same would not have been true had the PEC holder been signed on *Stena Feronia* as the bona fide chief officer.

2.5 ACTION TAKEN BY *UNION MOON*'S MASTER

By 1855, *Union Moon* had passed the fairway buoy and there was a risk of collision with *Stena Feronia*. This was a crossing situation with *Stena Feronia* on the starboard side of *Union Moon*. Therefore, in accordance with Rule 15 of the COLREGS, *Union Moon* was required to keep out of the way of *Stena Feronia* and to avoid crossing ahead of her.

An appropriate action would have been for *Union Moon*'s master to alter course to starboard and/or reduce speed. Instead, he altered course to port, which resulted in his vessel being placed on a collision course with *Stena Feronia*.

Had *Union Moon*'s master had a second person on watch with him, it is likely that *Stena Feronia* would have been detected earlier and brought to the master's attention – prompting him to take early and substantial action in accordance with Rule 16 of the COLREGS. A second person on the bridge may also have questioned the master's decision to alter course to port, providing him with the opportunity to take alternative action to prevent a collision.

Such action would have accorded with the advice provided in the Bridge Procedures Guide that '*Effective bridge resource and team management should eliminate the risk that an error on the part of one person could result in a dangerous situation*'.

Despite CSM's SMS instructing that *Union Moon*'s bridge should be manned by two people during the hours of darkness, it was regularly the case that the bridge was manned by either the master or the chief officer alone. Operating without a watch alarm fitted on the bridge ran the risk of the lone watchkeeper falling asleep undetected, with the obvious risks to navigation such an event would pose.

Having decided to alter course to port, *Union Moon*'s master should have indicated his intended manoeuvre by sounding two short blasts on the whistle in accordance with Rule 34(a) of the COLREGS. This might have alerted *Stena Feronia*'s bridge team to the fact that *Union Moon* was altering course to port before it became visually apparent.

When *Union Moon*'s master recognised that a collision with *Stena Feronia* was imminent, he applied astern propulsion. This action accorded with the spirit of Rule 8(e) of the COLREGS but was taken too late to prevent the collision.

2.6 ACTION TAKEN BY *STENA FERONIA*'S BRIDGE TEAM TO AVOID COLLISION

2.6.1 Collision avoidance requirements

As *Union Moon* was required by Rule 15 of the COLREGS to keep out of the way, *Stena Feronia* was required by Rule 17(a)(i) to maintain her course and speed. However, as soon as it became apparent that *Union Moon* was not taking appropriate action, *Stena Feronia* was at liberty to take action to avoid collision by her manoeuvre alone in accordance with Rule 17(a)(ii). This remained an option until collision could not be avoided by the action of *Union Moon* alone, at which point *Stena Feronia* was required by Rule 17(b) to take such action as would best aid to avoid collision.

2.6.2 The PEC holder

Stena Feronia's bridge team expected *Union Moon* to alter course to starboard once she had cleared Victoria Channel and passed the fairway buoy. When this did not happen there should have been little doubt that a risk of collision existed, and an appropriate reaction would have been for the PEC holder to sound five short and rapid blasts on the whistle in accordance with Rule 34(d) and then alter course to starboard.

The delay in the PEC holder taking action in accordance with Rule 17(a)(ii) can be attributed to the following:

- The PEC holder heard the PCO talking with *Union Moon*'s master on VHF radio and asking him to confirm a port-to-port passing with *Stena Feronia*;

- The PEC holder subsequently heard the PCO advising *Union Moon*'s master that an alteration of course to port would stand his vessel into danger with *Stena Feronia*; and

- The PEC holder anticipated that collision could still be avoided by *Union Moon*'s master taking corrective action following his alteration of course to port.

As the trial manoeuvres simulated by the MAIB show (Section 1.10.2), action by *Stena Feronia* alone during the conversation between the PCO and *Union Moon*'s master – in accordance with the provisions of Rule 17 (a)(ii) – would have been sufficient to avoid collision, but the passing distance would have been small.

However, once the PEC holder had been informed by the third officer that *Union Moon* was, in fact, in the process of altering course to port, action by *Stena Feronia* alone would have been unlikely to avoid a collision as shown by the third trial manoeuvre. In such circumstances, the PEC holder should have immediately taken such action as would best avoid a collision, and also sounded five short and rapid blasts to alert the bridge team on *Union Moon*. Such action might have prompted *Union Moon*'s master to take earlier corrective action. Instead, the PEC holder responded to the PCO's VHF radio call to *Stena Feronia* and then, at the PCO's request, attempted to communicate with *Union Moon*'s master by VHF radio.

At 1857, having received no response from *Union Moon*, the PEC holder concluded it was necessary for *Stena Feronia* to take action to avoid collision in accordance with Rule 17(b). However, his order for the wheel to be placed hard to starboard was executed too late to prevent the collision.

The simulation trials indicated that the collision could have been avoided had the PEC holder ordered hard to starboard wheel at any time up to when the third officer initially informed him that *Union Moon* was in the process of altering course to port. The fact that the PEC holder opted not to do so indicates a lack of precautionary thought.

Given the close proximity of *Union Moon* and *Stena Feronia*'s manoeuvring characteristics, the fact that the PEC holder did not take avoiding action until a further 34 seconds had passed, indicates that he didn't appreciate the limited time available in which he had to act before collision became inevitable. A further

contributing factor is likely to have been his distraction in choosing to respond to the PCO's VHF radio call and then attempting to communicate with Union Moon's master by VHF radio. Such action was contrary to the advice provided in MGN 324(M+F).

2.6.3 The third officer

In accordance with Northern Marine Management Ltd's SMS, the third officer could have taken the con from the PEC holder (who was effectively acting as a pilot) and ordered the wheel hard to starboard at an earlier stage to ensure the safety of the ship. However, the PEC holder was a junior master on another of the company's ships, wore the company uniform and had signed on as an extra chief officer. As a result, the third officer was less clear on his responsibilities than he would have been had a conventional pilot been engaged.

Stena Feronia's master could have held a briefing clarifying the role of the PEC holders prior to his ship taking the Belfast to Birkenhead route. The third officer might then have been clear that the PEC holder was a pilot within the meaning of section 3.5.2 of the SMS and as such, the officers had the master's and, indeed, the company's authority to overrule any decision he made.

The third officer's statement of '*to the starboard*' 2 seconds before the PEC holder ordered the wheel hard to starboard suggests that he might have been at the point of taking the con from the PEC holder. It is possible that he would have taken the con from the PEC holder earlier had he been told that he had the authority to do so. However, there is no evidence to suggest that he had recognised a need to do so until it was too late to prevent a collision.

2.6.4 The master

According to Northern Marine Management Ltd's SMS, *Stena Feronia* was not operating in a condition that required the master to be on the bridge. Although the PEC holder had taken the con, the ship had not entered an area for where a PEC holder was required. However, the master's decision to leave the bridge to talk with the onboard services manager at a time when his ship was effectively under pilotage and approaching the harbour limit of Belfast, with a converging outbound vessel, was unwise.

Had he not left the bridge, the master might have recognised a need to intervene earlier and have taken effective avoiding action. On being summoned to the bridge, he was quick to assess the situation and took appropriate action in an unsuccessful attempt to prevent the collision.

2.7 VTS COMMUNICATIONS

Two vessels closing on the fairway buoy from opposite directions was not an unusual event and normally resulted in them passing without incident. In this case, a close-quarters situation had developed to the extent that there was a risk of collision, with *Union Moon* being the give-way vessel.

The PCO was quick to perceive that, on passing the fairway buoy, *Union Moon*'s master had not altered course to starboard as he had anticipated, and did not hesitate to question the master's intentions, confirm his action and convey this

to *Stena Feronia*. However, *Union Moon*'s master, being under the influence of alcohol, not having English as his first language, and not being familiar with the colloquial terminology frequently used within the port, might have misinterpreted the PCO's message "*…can you confirm sir you will see this vessel red to red…*" as an instruction to alter course to port.

On receiving confirmation from *Union Moon*'s master that he was altering course to port, a warning message that followed the VTS Manual's instructions would have been more effective in conveying the urgency of the situation, for example:

> *'Union Moon, this is Belfast Port Control.*
>
> *WARNING – from my equipment you are standing into danger with Stena Feronia*
>
> *ADVICE – take immediate action.*
>
> *Over'*

The urgency of the situation could have been reinforced by quickly following up with a message directed to *Stena Feronia* such as:

> *'Stena Feronia, this is Belfast Port Control.*
>
> *WARNING – from my equipment Union Moon is altering course to port and you are standing into danger of collision.*
>
> *ADVICE – take immediate action.*
>
> *Over.'*

Warning messages given in this short, sharp format achieve three things:

- They immediately gain the attention of those involved and anyone else keeping a listening watch on that VHF radio channel.
- They encourage the recipients of the message to take prompt action, rather than engage in lengthy VHF radio conversations.
- They decrease the likelihood of a misunderstanding arising through use of language.

Had the PCO broadcast these messages, it would have reinforced any concerns that the officers on board *Stena Feronia* were having, and might have prompted the PEC holder to take avoiding action sooner. As it was, the PCO called *Stena Feronia*, requesting that the bridge team make radio contact with *Union Moon* directly – a request that the PEC holder followed, distracting him and possibly delaying him from taking avoiding action.

The PCO informed *Stena Scotia* and *Stena Feronia* of *Union Moon*'s movement in recognition of a potential traffic conflict when they respectively reported to Belfast VTS. However, no traffic information was passed to *Union Moon* at these times, nor was traffic information passed to *Union Moon*'s master when he reported passing the fairway buoy. This was contrary to the instructions provided in the VTS Manual.

Although *Union Moon*'s master was under the influence of alcohol, had he received earlier traffic information about *Stena Feronia*, he might have been more alert to the proximity of the inbound ferry and the potential risk of collision.

2.8 VTS EXERCISES

VTS training exercises were sporadic, and focused on testing a PCO's reactions to major events such as explosion, collision or major pollution. The absence of exercises relating to the build-up to such an event resulted in the PCO being unpractised in dealing effectively with the development of a close-quarters situation and risk of collision in line with the requirements of the VTS Manual.

Had the scenario of 7 March 2012 been played out in an exercise, it is reasonable to assume that the post-exercise discussion would have recognised the need for PCOs to follow the guidance regarding warning messages. It may also have identified the value in having a sample warning message posted in a conspicuous place next to the VHF radio in the port control tower, to serve as a prompt for the PCOs when required.

2.9 POST-ACCIDENT ACTIONS

2.9.1 *Stena Feronia*

Stena Feronia's master is commended for his immediate post-collision actions concerning the welfare of the crew and passengers on board his own ship. He was quick to raise the alarm both internally and externally, and passengers questioned after the event felt well-informed throughout.

He arranged for immediate checks to be carried out and an assessment of the seaworthiness of the ferry was soon ascertained. He continued to monitor the safety of his ship and those on board until she was safely alongside her berth. However, apart from an initial VHF radio contact by the PEC holder, *Stena Feronia* proceeded into port without further communication with *Union Moon*'s master as to whether or not he needed assistance from the ferry.

Stena Feronia's master might have been reassured that the accident had happened on the edge of the harbour limit, that radio communications with the port and coastguard were effective, and therefore assistance would be on scene soon. However, his decision to proceed without first communicating with *Union Moon* was contrary to Article 98 of UNCLOS and Northern Marine Management Ltd's post-collision checklist.

Had *Union Moon* suffered more serious consequences of the collision, the absence of immediate support from *Stena Feronia* might have resulted in an unnecessary risk to life.

2.9.2 *Union Moon*

Following the collision, *Union Moon*'s master did not communicate with *Stena Feronia*, and did not offer to render assistance. This omission was contrary to Article 98 of UNCLOS and CSM's post-collision checklist. Had the extent of the structural damage to *Stena Feronia* been lower on the hull, resulting in water ingress, she might have been the vessel in greater need of assistance.

Furthermore, the action he took after the collision to establish the safety of his own ship and crew was inadequate and did not follow the guidance in CSM's post-collision checklist.

The master did not sound the general alarm. Consequently, although the crew came to the bridge having felt the impact, the majority of them were unprepared to abandon ship had it been necessary.

The master ordered the chief officer to assess the damage at the forward end of the vessel and report back. Once it was ascertained that *Union Moon* was not in danger of foundering, no further inspection of the damage was ordered by the master. This initial damage assessment was made while the vessel was stopped in the water. Once *Union Moon* started making way into port, continuous monitoring of the damaged area should have been undertaken to ensure that her motion did not cause water ingress to areas of the ship that initially had seemed unaffected.

Given *Union Moon*'s master's prior experience, his actions following the collision are indicative of the impairment that alcohol intoxication can have on both judgment and ability.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT WHICH HAVE RESULTED IN RECOMMENDATIONS

None.

3.2 OTHER SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION LEADING TO RECOMMENDATIONS

1. Northern Marine Management Ltd's SMS made no specific reference as to how a PEC holder, who was not part of the normal ship's complement, should be integrated into the bridge team. [2.6.3]

2. It is possible that the third officer would have taken the con from the PEC holder earlier had he been told that he had the authority to do so. [2.6.3]

3.3 SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION WHICH HAVE BEEN ADDRESSED OR HAVE NOT RESULTED IN RECOMMENDATIONS

1. *Union Moon'*s master's consumption of alcohol, prior to *Union Moon*'s departure, adversely affected his performance and contributed to his actions. [2.2]

2. CSM had a clear alcohol policy and had invested in a programme of random testing. However, neither was a sufficient deterrent for *Union Moon*'s master. [2.2]

3. Had the pilot disembarked later in Victoria Channel, he may have been in a position to identify that *Stena Feronia* and *Union Moon* would meet at the fairway buoy and, in conjunction with VTS, could have advised the master to leave the channel early. [2.3]

4. Publications available for passage planning suggested that the fairway buoy should be passed close by and on the port side. [2.3]

5. Analysis of the AIS tracks of ships entering and leaving Belfast over a 5-month period between 1 November 2011 and 31 March 2012, confirms a pinch point at the fairway buoy. [2.3]

6. Had a second person been on *Union Moon*'s bridge, *Stena Feronia* might have been detected earlier and *Union Moon*'s master's decision to alter course to port might have been avoided or challenged. [2.5]

7. Despite CSM's SMS instructing that *Union Moon*'s bridge should be manned by two people during the hours of darkness, it was regularly the case that the bridge was manned by either the master or the chief officer alone. [2.5]

8. The PEC holder is likely to have been distracted in choosing to respond to the PCO's VHF radio call and then attempting to communicate with *Union Moon*'s master by VHF radio. [2.6.2]

9. The PEC holder's decision not to take avoiding action in accordance with Rule 17 (a) (ii) indicates a lack of precautionary thought. [2.6.2]

10. Given the close proximity of *Union Moon* once she had passed the fairway buoy, and *Stena Feronia*'s manoeuvring characteristics, the PEC holder lacked appreciation of the limited time available in which he had to act to avoid collision. [2.6.2]

11. The decision by *Stena Feronia*'s master to leave the bridge to talk with the onboard services manager at a time when his ship was effectively under pilotage and approaching the harbour limit of Belfast, with a converging outbound vessel, was unwise. [2.6.4]

12. Had the PCO broadcast warning messages with appropriate message markers, and in the format required in the Belfast VTS Manual, it might have prompted both *Union Moon*'s master and the PEC holder to take avoiding action sooner. [2.7]

13. The PCO requested that *Stena Feronia*'s bridge team make radio contact with *Union Moon* directly, thereby distracting the PEC holder and possibly delaying him from taking avoiding action. [2.7]

14. The PCO did not provide sufficient traffic information to *Union Moon* in accordance with the VTS Manual. [2.7]

15. The lack of VTS training exercises meant the PCO was not well practised in dealing effectively with the development of a close-quarters situation and risk of collision in accordance with the requirements of the VTS Manual. [2.8]

16. After the accident, neither *Union Moon*'s master nor *Stena Feronia*'s master checked to see if the other vessel required assistance, contrary to their respective checklists and Article 98 of UNCLOS. [2.9]

17. Once *Union Moon* started making way into port following the collision, no further inspection of damage was ordered by her master. [2.9.2]

18. *Union Moon*'s master did not sound the general alarm. Consequently, although the crew came to the bridge having felt the impact, the majority of them were unprepared to abandon ship had it been necessary. [2.9.2]

SECTION 4 - ACTION TAKEN

The **Police Service of Northern Ireland** and the **Maritime and Coastguard Agency** have:

- Conducted a joint investigation into the accident, resulting in *Union Moon*'s master being prosecuted for breaching the Railways and Transport Safety Act 2003, Section 58 of the Merchant Shipping Act and Rule 5 of the International Regulations for Preventing Collisions at Sea 1972 (as amended). The master received a 1 year custodial sentence.

Belfast Harbour has:

- Reminded its VTS operators of the requirement for message markers and posted an aide-mémoire at the VTS workstation.

- Reviewed the accident with its Safety, Environmental and Security Committee, harbourmasters, VTS staff and a representative of the Belfast pilots.

- Laid four new buoys in the approaches to Belfast Harbour which address the pinch point issue identified. New routeing advice for mariners approaching Belfast Harbour has been circulated by Belfast Harbour Notice to Mariners No20 of 2012 **(Annex M)** and a note to the United Kingdom Hydrographic Office.

- As part of its review of port operations, updated its Navigational Risk Assessment and is presently undertaking a review of its Marine Safety Management System against this new assessment.

- Incorporated the findings of this report into its regular programme of VTS emergency training and is in discussions with the provider of VTS refresher training on simulator-based exercises.

- Changed its Pilotage Directions with regard to Inner Pilotage (Belfast Harbour Notice to Mariners No17 of 2012) **(Annex N)**.

Northern Marine Management Ltd has:

- Issued a fleet guidance note to the masters of all of its ships, describing the circumstances of the accident and reminding them of the importance that all deck officers should have a clear understanding of the COLREGS and of the manoeuvring characteristics of their vessels.

Continental Ship Management AS has:

- Reviewed the manning levels of its vessels and has found no reason to increase them.

- Issued a circular letter to its fleet reminding masters and navigating officers of the company's watchkeeping requirements, including the need to ensure that the bridge is manned by an additional lookout while the vessel is being navigated during the hours of darkness.

- Taken a management decision to thoroughly check watchkeeping practices during the company's next scheduled internal SMS audit.

SECTION 5 - RECOMMENDATIONS

Northern Marine Management Ltd is recommended to:

2012/149 Amend its SMS to make clear the roles and responsibilities of the bridge team when conducting pilotage with a PEC holder who is not part of the normal ship's complement and is performing an act of pilotage.

Marine Accident Investigation Branch
November 2012

Safety recommendations shall in no case create a presumption of blame or liability

Marine Accident Report

INVESTORS IN PEOPLE