ACCIDENT REPORT

Report on the investigation into

the collision between the fishing vessels

Sapphire II and *Silver Chord*

resulting in the foundering of *Sapphire II*

off Stornoway, Scotland

12 January 2011

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

Extract from
The United Kingdom Merchant Shipping
(Accident Reporting and Investigation)
Regulations 2005 – Regulation 5:

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

NOTE

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

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

COLREGS	-	The Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996
DGPS	-	Differential Global Positioning System
DSC	-	Digital Selective Calling
EPIRB	-	Electronic Position Indicating Radio Beacon
FISG	-	Fishing Industry Safety Group
GPS	-	Global Positioning System
ILO	-	International Labour Organization
IMO	-	International Maritime Organization
kt	-	knot
kW	-	kilowatt
LOA	-	length overall
m	-	metres
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
MSN	-	Merchant Shipping Notice
nm	-	nautical mile
RNLI	-	Royal National Lifeboat Institution
SAR	-	search and rescue
Seafish	-	Sea Fish Industry Authority
STCW	-	International Convention on Standards on Training Certification and Watchkeeping for Seafarers 1978, amended
UTC	-	Universal Time, Coordinated
VHF	-	very high frequency

Times: All times used in this report are Universal Time, Coordinated (UTC) unless otherwise stated

Photographs courtesy of www.trawlerphotos.co.uk

Figure 1

Silver Chord

Figure 2

Sapphire II

SYNOPSIS

At 1840 on 12 January 2011, the 16.84m prawn trawler *Silver Chord* **(Figure 1)** collided with the 14.99m prawn trawler *Sapphire II* **(Figure 2)**. At the time of the collision, *Sapphire II* was stopped in the water while her skipper, who was operating single-handed, recovered the vessel's fishing gear. *Silver Chord* was making 5.5 knots (kts) as she proceeded towards Stornoway after a day's fishing.

Sapphire II's hull was penetrated and the fish hold quickly started to flood. Her skipper reported the accident to the coastguard, and transferred to *Silver Chord* before *Sapphire II* sank at about 1850. *Silver Chord* was also damaged, but was able to return to Stornoway under her own power. There were no injuries.

The investigation identified a number of factors which contributed to the collision. These included:

- Neither skipper was aware of the proximity of the other vessel despite both vessels displaying navigation lights and deck floodlights, and both vessels being equipped with working radar displays.

- *Silver Chord*'s wheelhouse was left unattended for substantial periods of time before the accident while her skipper and crew worked in a fully enclosed shelter.

- The visibility ahead from *Silver Chord*'s wheelhouse was impaired by the vessel's shelter and deck fittings.

- *Sapphire II*'s skipper had been focused on recovering the fishing gear. His view from the aft working deck was obstructed by the vessel's accommodation and wheelhouse, which prevented him from maintaining a proper and effective lookout. The single-handed operation of *Sapphire II* was therefore inherently unsafe.

This is one of many accidents involving fishing vessels in which leaving the wheelhouse unattended has been a significant contributory factor. Despite Maritime and Coastguard Agency (MCA) and industry initiatives, this behaviour persists among many fishermen as economic and social factors continue to take preference over safety considerations. As leaving a wheelhouse unattended is unavoidable during single-handed operations, the suitability of vessels to be operated in this way must be carefully assessed.

Recommendations have been made to the MCA aimed at ensuring that all vessels are sufficiently manned to ensure their safe operation, and that the current requirements for the visibility from fishing vessels' wheelhouses are met. Recommendations have also been made to the owner/skippers of *Silver Chord* and *Sapphire II* which are intended to improve the safe operation of their vessels in the future.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *SILVER CHORD*, *SAPPHIRE II* AND ACCIDENT

SHIP PARTICULARS

Vessel's name	*Silver Chord*	*Sapphire II*
Flag	United Kingdom	United Kingdom
RSS number	A24061	A13102
Type	Prawn trawler	Prawn trawler
Registered owner	Privately owned	Privately owned
Construction	Wood	Wood
Length overall	16.84m	14.99m
Registered length	16.03m	14.21m
Gross tonnage	78.00t	29.71t

VOYAGE PARTICULARS

Port of departure	Stornoway	Stornoway
Port of arrival	Stornoway	Not applicable
Type of voyage	Day fishing	Day fishing
Manning	3	1

MARINE CASUALTY INFORMATION

Time and Date	12 January 2011 at 1840 UTC	
Type of marine casualty or incident	Very Serious Marine Casualty	
Location of incident	58° 09.93'N 006° 06.01'W 168° Tiumpan Head 5.9'	
Injuries/fatalities	None	None
Damage/environmental impact	Impact damage to port bow and stem post	Vessel lost
Ship operation	On passage	Stowing fishing gear
Voyage segment	Transit	Mid-water
External environment	Wind force 4, good visibility	
Persons on board	3	1

1.2 NARRATIVE

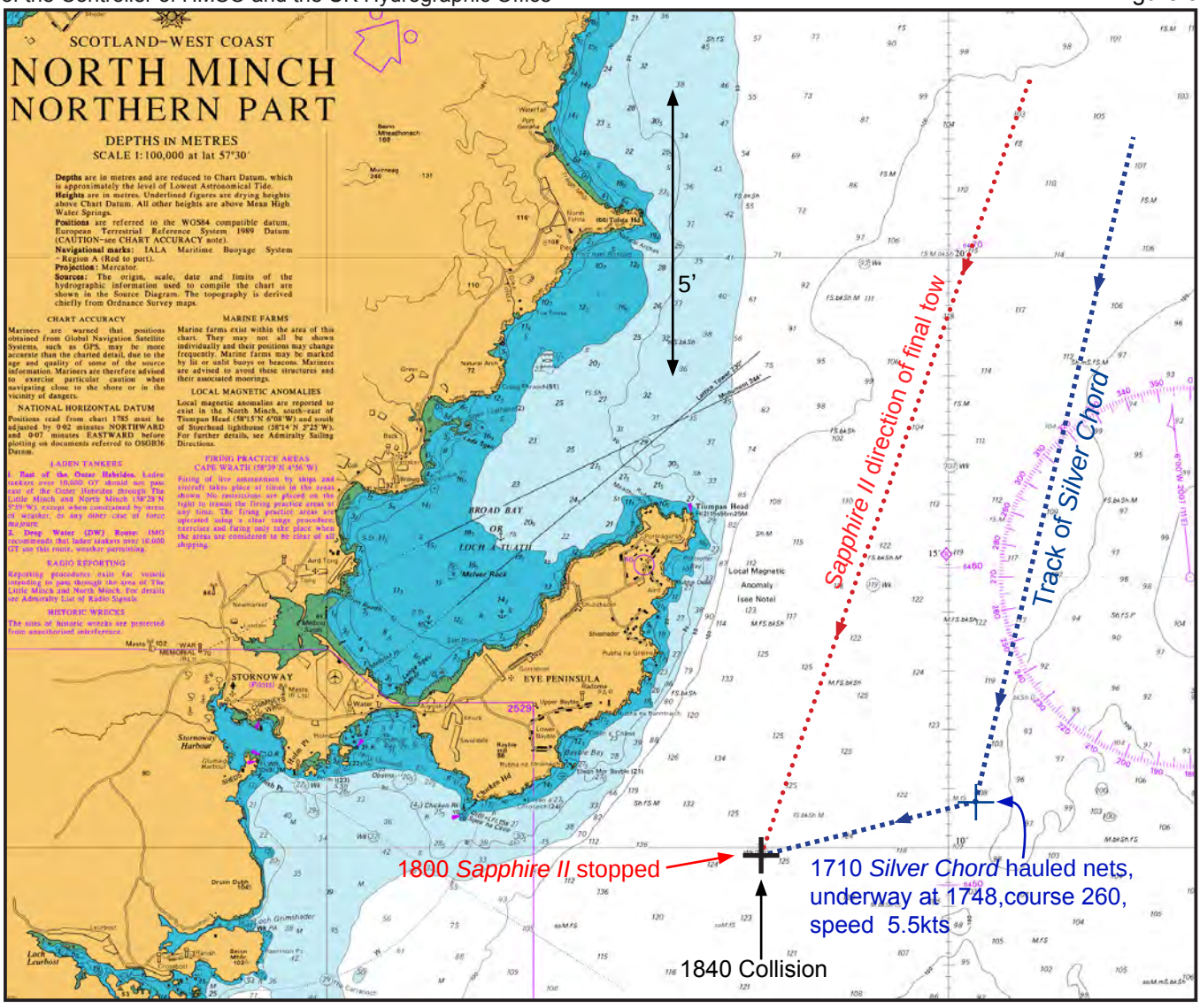
1.2.1 *Sapphire II*

Shortly after 0600 on 12 January 2011, *Sapphire II* **(Figure 2)** sailed from the fish quay in Stornoway with her owner/skipper on board. The skipper shot away the vessel's nets at 0820 and started his first tow of the day. The tow was completed at 1300.

At 1325, *Sapphire II* was turned towards the south-south-west and the skipper shot away the nets for a second tow. At about 1800, when the vessel was approximately 3 miles off the coast **(Figure 3)**, the skipper adjusted the vessel's heading to about 140° to put the wind on the starboard quarter in preparation for recovering the fishing gear. He then put the engine into neutral and switched on the fore deck floodlights. *Sapphire II*'s navigation lights and lights to indicate that she was engaged in trawling were already on. The skipper could see the lights of other vessels on the horizon to the north-east but he was unable to identify them.

Reproduced from Admiralty Chart BA 1785 by permission of the Controller of HMSO and the UK Hydrographic Office

Figure 3



Extract of Chart BA 1785 showing the tracks of *Silver Chord* and *Sapphire II*

The skipper left the wheelhouse to go to the working deck. He recovered 400m of trawl wire, unclipped the trawl doors, brought the spreaders inboard, moved the net forward over the bag hatch, and released the catch into the hopper. During this period, the skipper frequently moved between the winch controls under the whaleback **(Figure 2)** and the stern. By about 1830, the skipper had recovered the net, and was standing on the starboard quarter of the aft deck ready to bring the dog rope inboard when, at 1840, he felt an impact and heard a massive thud forward.

1.2.2 *Silver Chord*

At 0630 on 12 January 2011, the prawn trawler *Silver Chord* **(Figure 1)** sailed from Stornoway for a day's fishing. On board were her owner/skipper and two deckhands. The first tow took place between 0830 and 1230; during this time, the skipper took the opportunity to get some rest while the two deckhands took turns keeping a watch in the wheelhouse.

A second tow was conducted between 1315 and 1700, following which, the skipper stopped *Silver Chord* in the water and the net was hauled. The process took longer than usual because the net was tangled. However, by 1748 the net had been recovered and *Silver Chord* began steaming back to Stornoway on a heading of 260° at 5.5kts **(Figure 3)**. The vessel's navigation lights and her aft floodlights were on; it is not known if her all-round green and white trawling lights were also lit. The skipper intended to pass 1 mile to the south of Chicken Rock, which was his preferred route into Stornoway when approaching from the east.

Once *Silver Chord* began making way, the skipper engaged the autopilot. As he did so, he scanned the horizon ahead and noticed another fishing vessel, which he recognised as *Kaylana*, between 2 and 3 miles off the starboard bow, which was also heading back to Stornoway. The radar display was set to the 3-mile range scale and the only target seen by the skipper was that of *Kaylana*.

The skipper then left the wheelhouse to help the two deckhands sort the catch in the fully enclosed shelter. He returned to the wheelhouse on four or five occasions to check on the whereabouts of *Kaylana* but he did not see any other vessels or targets on the radar display.

At approximately 1840, a heavy impact was felt by the skipper and the deckhands while working under the shelter, and *Silver Chord* came to a sudden halt.

1.3 ABANDONMENT, RESCUE AND DAMAGE

After hearing the thud caused by the collision, *Sapphire II*'s skipper immediately ran forward from the starboard quarter of the aft deck, and saw *Silver Chord* embedded in the port bow at the waterline. He immediately opened the fish hold hatch and saw that this compartment was flooding rapidly. The skipper was concerned that the bilge pumps would not cope with the rate of water ingress. He rushed to the wheelhouse and, at 1842, he informed Stornoway coastguard on very high frequency (VHF) radio channel 16 that *Sapphire II* had been in a collision and was taking in a lot of water. The coastguard immediately tasked a search and rescue (SAR) helicopter and the Stornoway-based lifeboat to assist.

Meanwhile, *Silver Chord*'s skipper ran to the wheelhouse and saw the bow of his vessel embedded into the port bow of *Sapphire II*. The skipper was shocked, but he immediately put the engine control to astern until *Silver Chord'*s stem came clear. He then searched for damage; the two deckhands continued to sort the catch inside the shelter.

On returning to the deck, *Sapphire II*'s skipper saw that the fish hold was now almost half-filled with water and that *Silver Chord* had manoeuvred clear. He tried to contact *Silver Chord* on VHF channel 6 but there was no response. He then attracted the attention of *Silver Chord*'s skipper by shouting a request for *Silver Chord* to manoeuvre towards *Sapphire II*'s stern and be ready to take him off. This was heard by *Silver Chord*'s skipper, who manoeuvred his vessel accordingly.

As *Silver Chord* closed, the skipper of *Sapphire II* felt his vessel's stern rising and realised that she was about to founder. He quickly picked up his mobile phone and tobacco from the wheelhouse and stepped across onto *Silver Chord*'s deck.

At 1850, the bow of *Sapphire II* began to submerge and rotate to port. Simultaneously, the vessel's stern rose into the air and the vessel quickly foundered. Seconds later, the vessel's inflated liferaft and her Emergency Position Indicating Radio Beacon (EPIRB) surfaced. A transmission from the EPIRB was received by Falmouth coastguard soon afterwards.

At 1851, *Sapphire II'*s skipper informed Stornoway coastguard that he was on board *Silver Chord* and that *Sapphire II* had foundered. The coastguard instructed *Silver Chord'*s skipper to stay on scene until the helicopter and the lifeboat arrived. The skipper conducted further checks for damage and found water entering the fore peak. However, the water level was being contained by the vessel's pumps.

The SAR helicopter arrived on scene at 1904 followed soon after by the lifeboat. At 1922, a portable pump and an Royal National Lifeboat Institution (RNLI) crewman were transferred from the lifeboat to *Silver Chord* to assist with the efforts to control the flooding in the fore peak. The lifeboat then recovered *Sapphire II*'s liferaft and EPIRB.

Silver Chord returned to Stornoway at slow speed in order to minimise the rate of water ingress forward. She berthed safely alongside in Stornoway at 2040. On her arrival, local police breathalysed both skippers, but no trace of alcohol was found.

On 14 January 2011, *Silver Chord* was taken out of the water and inspected. The hull was damaged in way of the stem bar on both port and starboard sides around the boot topping area. On the port side, two planks had been damaged **(Figure 4)** and the hull had been penetrated at the waterline in way of the fore peak space. On the starboard side there was evidence of impact damage, but no penetration of the hull.

Figure 4

Damage to *Silver Chord*'s port bow

1.4 ENVIRONMENTAL CONDITIONS

The wind was west-south-west force 4. Nautical twilight[1] had occurred at 1743, and at the time of the accident it was a dark but clear evening. Visibility was in excess of 15 miles and the predicted tidal stream was setting south-south-west at 0.4kt.

1.5 CREW EXPERIENCE, QUALIFICATIONS AND WORKING PATTERN

1.5.1 *Sapphire II*

Sapphire II's skipper had worked in the fishing industry for 25 years. He lived locally and had owned S*apphire II* for 7 years. The vessel had predominantly trawled the waters around Stornoway since her purchase.

The skipper had completed the mandatory courses in safety awareness, first-aid, fire-fighting and sea survival training, and had voluntarily obtained a Sea Fish Industry Authority (Seafish) skipper's certificate for fishing vessels of less than 16.5m length operating further than 20 miles from a safe haven. He was not familiar with the contents of the various guidance provided by the MCA to the fishing industry through its Marine Guidance Notes (MGN).

Sapphire II usually trawled for prawns during daylight hours, returning to port during darkness. It was the skipper's usual practice to employ foreign deckhands to help on board between March and October, when the days were long. However, he tended to operate his vessel single-handed during the winter, mainly due to the limited daylight available, but also because of a difficulty in employing reliable deckhands locally. Other than holiday periods, *Sapphire II* generally operated 7 days a week.

After a 3 week break from fishing over the Christmas and New Year period, the skipper had resumed his daily fishing routine on 10 January 2011. He had worked for about 13 hours on both 10 and 11 January 2011, and had slept well at home on both nights.

1.5.2 *Silver Chord*

Silver Chord's skipper had worked in the fishing industry for 30 years and had owned a number of boats. He had held a class 2 skipper's Certificate of Competency since 1988 and had completed the mandatory courses in safety awareness, first-aid, fire-fighting, and sea survival. The skipper was unaware of the guidance provided by the MCA in its MGNs.

The vessel's deckhands were two of a group of three Latvians who had been employed on a share basis since about 2004. They worked 2 months on and 1 month off, allowing one person at a time to take leave. All three deckhands had completed medical, fire-fighting and sea survival training in Latvia that complied with the International Maritime Organization's (IMO) Standards on Training Certification and Watchkeeping (STCW). They had also attended a Seafish safety awareness training course.

[1] Nautical twilight is when the sun is 12 degrees below the horizon. At the beginning or end of nautical twilight, under good atmospheric conditions and in the absence of other illumination, general outlines of ground objects may be distinguishable, but detailed outdoor operations are not possible, and the horizon is indistinct.

The skipper had owned *Silver Chord* since 2008 and the vessel had predominantly been operating on a daily basis out of Stornoway. The skipper lived locally and was extremely familiar with the surrounding waters. The vessel operated 5 days a week, usually laying alongside over the weekends. The skipper firmly believed that assisting the deckhands during deck operations or when sorting the catch, whenever possible, helped to promote a good team spirit and to justify the share system.

Like *Sapphire II*, *Silver Chord* had also resumed fishing on 10 January 2011 following a 3 week break over the festive period. The skipper and crew had also worked for about 13 hours on 10 and 11 January 2011. The skipper had achieved good quality sleep following both days of fishing.

1.6 WHEELHOUSE EQUIPMENT

1.6.1 *Sapphire II*

Navigation equipment fitted in *Sapphire II*'s wheelhouse included two differential global positioning system (DGPS) receivers, two Global Positioning System (GPS) compasses, a chart plotter, a radar display (with 'ship's head up' selected), an autopilot, and a VHF Digital Selective Calling (DSC) radio. A hand-held VHF radio was also carried. All of the equipment was working correctly.

1.6.2 *Silver Chord*

Navigation equipment fitted in *Silver Chord*'s wheelhouse included a radar display (ship's head up) with automatic tuning, and manual gain and clutter controls **(Figure 5)**, a chart plotter, three GPS receivers, an autopilot and a VHF radio, all of which were working correctly.

Figure 5

Silver Chord's radar on the 3nm range scale

The view ahead of the vessel from the steering position sited on the centreline of the wheelhouse was partially obstructed by the vessel's shelter and deck fixtures, which were fitted in the late 1980s **(Figures 6** and **7)**.

Figure 6

Silver Chord - shelter and deck fittings

Figure 7

Silver Chord - view of wheelhouse from forward

1.7 SURVEY AND CERTIFICATION

Sapphire II was inspected by the MCA on 5 May 2010 to confirm her compliance with Merchant Shipping Notice (MSN) 1813 (F) (The Fishing Vessel Code of Practice for the Safety of Small Fishing Vessels) applicable to vessels under 15m in length (Under 15m Code). No defects or deficiencies were recorded.

Silver Chord was inspected by the MCA to confirm compliance with MSN 1770 (F) The Code of Safe Working Practice for the Construction and Use of 15m (LOA) to less than 24m (L) Fishing Vessels (15m-24m Code) on 8 January 2010. No defects or deficiencies were identified and the vessel was re-issued with a United Kingdom Fishing Vessel Certificate on 14 January 2010.

1.8 MERCHANT SHIPPING (DISTRESS SIGNALS AND PREVENTION OF COLLISIONS) REGULATIONS 1996 (COLREGS)

The COLREGS are applicable to *'all vessels on the high seas and in all waters connected therewith, navigable by seagoing vessels'* and include:

Rule 2 – Responsibility

> *'Nothing in these rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these rules*…'

Rule 5 – Lookout

> *'Every vessel shall at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in 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

> *'Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist*.
>
> *Proper use shall be made of radar equipment if fitted and operational, including long range scanning to obtain early warning of the risk of collision and radar plotting or equivalent systematic observations of detected objects'*.

1.9 GUIDANCE

1.9.1 Safe navigational watch

In February 2006, the MCA published MGN 313 (F) *Keeping a Safe Navigational Watch on Fishing Vessels* **(Annex A)** following several investigations into collisions, groundings and near misses involving fishing vessels. The MGN provides fishermen

with advice and guidance on arrangements for a safe navigation watch, navigation, navigation equipment, duties and responsibilities, and lookout requirements. The MGN includes:

'the wheelhouse must not be left unattended at any time'

'two people should be on watch during the hours of darkness'

'the person in charge of the navigational watch should not undertake any other duties that would interfere with the safe navigation of the vessel'

'It may not be possible to rely on every give way vessel to keep clear. It is therefore vital to monitor the movement of ALL traffic'

'It is strongly recommended that any automatic pilot fitted should incorporate a watch alarm…A watch alarm should be fitted on board ALL vessels where there may be one person on navigational watch'

'keep the watch in the wheelhouse, which should never be left unmanned'

'It is absolutely essential that a proper lookout is kept at all times. Casualties to fishing vessels, resulting in the loss of life continue to occur because of the lack of a lookout…The lookout must give full attention to keeping a proper lookout and no other duties should be undertaken which could interfere with the task'.

1.9.2 Wheelhouse visibility

MGN 314 (F) – *Wheelhouse Visibility Onboard Fishing Vessels* **(Annex B)** provides guidance on the minimum standards considered acceptable for visibility from a fishing vessel wheelhouse.

For new vessels including those constructed on or after 23 November 2002 and covered by the Code of Safe Working Practice for the Construction and Use of 15m LOA to less than 24m Registered Length Fishing Vessels, the view of the sea surface under all conditions of draught, trim and deck cargo should:

'be visible no more than 90 metres ahead from the steering position (under the bow) (see diagram A in Annex III) and;

take in an arc from forward of the bow to at least 10 degrees on either side under all draught, trim and deck cargo conditions.'

MGN 314 (F) advises that for vessels constructed before 23 November 2002, the person steering the vessel from the main wheelhouse control position should have a clear view ahead, and that the view should be obstructed as little as possible. Where this requirement cannot be met, the MGN advises that an acceptable standard of visibility might be achieved by:

- Lowering of the whaleback or shelter
- Fitting permanent ballast to trim the vessel down by the head
- Raising the wheelhouse
- Fitting a transparent observation dome in to the wheelhouse deck head.

1.10 WORK IN FISHING CONVENTION

The International Labour Organization (ILO) has recognised that fishing is a hazardous occupation and has adopted Convention 188 – Work In Fishing (ILO C188)[2] which requires minimum requirements for work on board, conditions of service, accommodation and food, occupational health and safety, medical care and social security, to be determined and implemented.

Article 8 of the convention requires that a skipper has responsibility for:

> *(d) ensuring compliance with safety of navigation, watchkeeping and associated good seamanship standards.*

Article 13 of the convention also includes:

> *Each member shall adopt laws, regulations or other measures requiring that owners of fishing vessels flying its flag ensure that:*
>
> *(a) their vessels are sufficiently and safely manned for the safe navigation and operation of the vessel and under the control of a competent skipper.*

The UK is working towards implementation of the convention, which it expects to be able to ratify in 2013.

1.11 RISK ASSESSMENT

1.11.1 *Silver Chord*

To comply with a requirement of the 15m-24m Code to undertake a health and safety risk assessment, the skipper completed a Seafish '*Fishing Vessel Safety Folder'* in December 2009. The crew had signed the folder to indicate that they had read its contents. The risks associated with the following activities and areas were assessed: boarding the vessel, general work on deck, shooting and hauling, trawling, catch handling, fouled gear, wheelhouse operations, galley, accommodation, and engine room.

With regard to the hazard of leaving the wheelhouse unattended, a booklet accompanying the safety folder advised:

> *'Skippers should ensure that an adequate lookout is kept at all times and that the vessel can be controlled to respond to any situation. Watchkeepers should not leave the wheelhouse unattended…'*

Of the 83 hazards identified in the folder, '*leaving the wheelhouse unattended*' was the only hazard for which the skipper had not included a suitable control measure **(Annex C)**. It was assessed as:

- Likelihood - very unlikely - 1
- Severity - Very harmful - 3
- Risk factor - 3[3]

[2] http://www.ilo.org/ilolex/cgi-lex/convde.pl?C188

[3] Take action but subject to it being reasonable and as sensible as possible

1.11.2 *Sapphire II*

The skipper of *Sapphire II* was required by the Under 15m Code to undertake health and safety risk assessments, but these did not have to be written down. The skipper had identified that the risks associated with sailing single-handed were greatly increased, and had implemented several control measures, including a mechanical catch handling system, designed to reduce the time and risks of operating single-handed on deck. However, he had not identified the hazard of leaving the wheelhouse unattended when working on deck with the vessel underway, and therefore had not put appropriate control measures in place.

1.12 PREVIOUS ACCIDENTS

1.12.1 MAIB database statistics

Tables 1 and **2** show that since 1996, 19 of the 94 fishing vessels less than 24m in length that were involved in a collision had no-one in the wheelhouse. Eight of the collisions occurred during darkness, ten during daylight and one during twilight. Between 2002 and 2010, 5 fishing vessels under 24m grounded without a watchkeeper being in the wheelhouse.

1.12.2 Previous accidents and recommendations

In 2002, the MAIB conducted a preliminary examination into a collision between two fishing vessels, *Aspire* and *Maricos*. A contributory factor to the accident was that the shelter on *Aspire* restricted the watchkeeper's visibility when looking directly ahead. Consequently, the MCA was recommended to:

> *'Include the problem of poor visibility from the wheelhouse in its ongoing review of survey procedures and risk assessment for fishing vessels'.*[4]

The circumstances of the collision and the recommendation were discussed at a Fishing Industry Safety Group (FISG) technical sub-group meeting, but it was concluded that no further action would be taken as appropriate guidance was already in place.

In 2006, the MAIB investigated the grounding and subsequent foundering of the fishing vessel *Greenhill*[5] during which the vessel's two deckhands died. A causal factor to the grounding was that the wheelhouse was left unattended while the skipper and deck crew worked on the catch within the confines of the shelter.

The MAIB investigation report recommended the FISG to:

> *'Explore ways of improving the standard of watchkeeping on fishing vessels, giving emphasis to the importance of not leaving the wheelhouse unattended when at sea'.*

The recommendation resulted in the development and implementation of a Navigation Watchkeeping Course administered by Seafish, which has subsequently developed into 2 and 5 day courses leading to skippers' certificates for fishing vessels under 16.5m in length operating within and outside 20nm respectively. To date, over 1000 fishermen have attended the 2-day course and 1500 have attended the 5-day course.

[4] MAIB Recommendation 2003/130. Dated 30/01/09.

[5] http://www.maib.gov.uk/publications/investigation_reports/2006/greenhill.cfm

Following the completion of a parallel and separate criminal investigation into the deaths of the deckhands, *Greenhill*'s skipper was convicted of manslaughter and was sentenced to 12 months imprisonment.

Table 1 - Number of collisions involving two or more fishing vessels between 1996 and 2010

Year	Fishing vessels under 24m	Fishing vessels 24m or over	Total fishing vessels	Collisions
1996	7	3	10	5
1997	8	2	10	5
1998	6	5	12	6
1999	4	0	4	2
2000	9	3	12	6
2001	10	2	12	6
2002	8	2	10	5
2003	6	2	8	4
2004	2	2	4	2
2005	12	2	14	7
2006	2	0	2	1
2007	8	0	8	4
2008	7	1	8	4
2009	4	0	4	2
2010	1	1	2	1
Total	**94**	**25**	**120**	**60**

Table 2 - Number of collisions involving two or more fishing vessels between 1996 and 2010 (where one vessel had an unattended wheelhouse)

Year	Collisions to fishing vessels under 24m	Collisions to fishing vessels 24m or over	Total Collisions
1996	3	2	3
1997	0	0	0
1998	3	1	3
1999	0	0	0
2000	2	1	2
2001	2	1	2
2002	3	0	3
2003	1	0	1
2004	1	0	1
2005	2	0	2
2006	0	0	0
2007	0	0	0
2008	2	0	2
2009	0	0	0
2010	0	0	0
Total	**19**	**5**	**19**

Note: In tables 1 and 2, some collisions may have involved a merchant vessel or were *between* fishing vessels under 24m and 24m or over

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 THE COLLISION

When *Sapphire II*'s engine was stopped at about 1800, *Silver Chord* was heading directly towards her. However, although a risk of collision now existed, neither vessel's skipper detected the other vessel visually or by radar despite good visibility; both vessels were equipped with working radars, and in addition to displaying the required navigation lights, they had both illuminated their decks with floodlights. Consequently, neither skipper was prompted into taking any avoiding action, and *Silver Chord* ran into *Sapphire II* 40 minutes later.

The damage sustained by *Sapphire II* was caused by the impact with *Silver Chord*'s stem post, which stood proud of the hull planking. *Sapphire II* foundered quickly, within 10 minutes of the collision; the flooding in her fish room, the largest compartment within the vessel, was therefore rapid and could not have been contained by the skipper alone. His decision not to enter the fish room, but to inform the coastguard and make preparations to abandon the vessel, was sensible and entirely justified given the circumstances.

The skipper of *Silver Chord* reacted quickly to the situation and was able to establish that his own vessel had not sustained significant damage. However, in the immediate aftermath of the accident, the seaworthiness of his own vessel and the extent of any damage on *Sapphire II* would have been uncertain; it would therefore have been prudent for the skipper to have utilised the crew of his vessel to help manage the consequences of the collision rather than allowing them to continue processing the catch in the shelter.

2.3 FATIGUE

The skippers of both vessels had resumed fishing on 10 January 2011 after a 3 week break over the Christmas and New Year holiday period. Both had worked for about 13 hours on each of the 2 days before the accident. Although such long hours might be considered to be tiring, both skippers returned to port overnight and had slept well at home. Therefore, it is highly unlikely that the skippers' decision-making or actions were influenced by the effects of fatigue.

2.4 LOOKOUT

2.4.1 *Silver Chord*

Silver Chord was 3.6nm from *Sapphire II* when *Sapphire II* stopped to recover her fishing gear. Although this was beyond the range of visibility required for the navigation and trawling lights displayed by *Sapphire II* (3 miles for the white masthead light and 2 miles for the other lights), the vessel's bright deck floodlights would probably have been visible from a greater distance. With a height of eye of

approximately 3.15m, the skipper's visible horizon was 3.8 miles. Therefore, it is likely that *Sapphire II* could have been seen from *Silver Chord*'s wheelhouse as she started to head back towards Stornoway.

However, because of the restricted view ahead from the wheelhouse **(Figure 8)**, the skipper's view of *Sapphire II* could have been obscured by the shelter or the deck fittings, particularly during the early stages of the passage. Nevertheless, as the distance between the vessels reduced, *Sapphire II's* lights would inevitably have become brighter and more apparent. Therefore, notwithstanding the partially obstructed view ahead, the skipper's visual lookout during his periodic visits to the wheelhouse in the 52 minutes from leaving the fishing grounds, was not effective.

Figure 8

Silver Chord - view ahead from the steering position

Similarly, as *Silver Chord*'s radar was set to the 3-mile range scale, the radar target of *Sapphire II* would also have been displayed from about 1807 onwards. This was also not seen by the skipper. As *Sapphire II* was on a steady or near steady bearing on the ship's head throughout, it is possible the radar target of *Sapphire II* might have been occasionally obscured by the radar ship's head marker. However, it is highly unlikely to have been completely obscured each time the skipper visited the wheelhouse.

2.4.2 *Sapphire II*

From the time *Sapphire II* stopped in the water at 1800 until being struck by *Silver Chord* 40 minutes later, *Sapphire II*'s skipper had been moving around his vessel's upper deck. Although he would have had several opportunities to see *Silver Chord,* he did not because he was focused on recovering his vessel's fishing gear and stowing the catch. Moreover, as the skipper was standing on the starboard quarter of the aft deck from about 1830, his view of *Silver Chord* during the final mile of her approach would have been obstructed by his vessel's accommodation and wheelhouse **(Figure 1)**.

2.5 KEEPING A SAFE NAVIGATIONAL WATCH

2.5.1 *Silver Chord*

Although *Silver Chord*'s skipper periodically returned to the wheelhouse before the collision, he was predominantly working within the enclosed shelter. A lookout was therefore not maintained as required by the COLREGS. However, in leaving his wheelhouse unattended, the action of *Silver Chord*'s skipper was not dissimilar to action taken by many of his peers.

Between 1996 and 2010, 19 collisions between fishing vessels occurred where the wheelhouse of at least one of the vessels was unattended **(Table 2)**. This represents over 30% of the total number of collisions between fishing vessels during the same period **(Table 1)**. These tables show a slow downward trend in the number of collisions between fishing vessels since 2006, particularly those fishing vessels less than 24m in length, which might be attributable to better standards of watchkeeping. However, the gradual reduction in numbers of UK fishing vessels over this period is also likely to be a factor.

There are numerous reasons for skippers leaving wheelhouses unattended. In this case, *Silver Chord*'s skipper ignored his own risk assessment and left the wheelhouse to help his crew in order to promote a team spirit. Other skippers are known to have left their wheelhouses because they felt it necessary to supervise the crew or to reduce the time the crew needed to work once their vessels were secured alongside. An inability to recruit sufficient, reliable crew and deliberate decisions to reduce crew numbers to save costs are also factors that can lead skippers to decide to leave the wheelhouse unmanned at sea. The deaths of two deckhands who died following the foundering of *Greenhill*, and the subsequent imprisonment of her skipper for manslaughter, and now the loss of *Sapphire II*, clearly highlight the potential consequences of this imprudent and dangerous practice.

It is disappointing that initiatives to improve the safety of the navigation watch on board fishing vessels through published guidance, risk assessments and voluntary training courses appear to have had little impact. Indeed, neither the skipper of *Silver Chord* nor of *Sapphire II*, both of whom held certificates of competency, were even familiar with the contents of the MGNs issued by the MCA.

2.5.2 *Sapphire II*

Sapphire II was engaged in fishing, and other vessels including *Silver Chord* were required to keep clear. This did not absolve her skipper from his responsibility to keep a proper lookout, or from taking avoiding action if required, even though *Sapphire II* was also stationary. However, he was unable to maintain a safe navigational watch because he was working alone and had to leave the wheelhouse to recover his fishing gear. The limited view from areas of the working decks, and the need for the skipper to concentrate on his deck-oriented tasks meant that the lookout maintained was sporadic and did not comply with the COLREGS. The single-handed operation of *Sapphire II* was therefore inherently unsafe.

Sapphire II was significantly larger in size and different in construction to most of the hundreds of UK fishing vessels that are operated single-handed. Many of these vessels fish using creels or pots, and are typically 10m or less in length and fitted with only a small wheelhouse or 'cuddy'. Consequently, unlike on board *Sapphire II*, it is normally possible for their lone skippers to maintain an effective lookout even when shooting or hauling the gear.

2.5.3 Safe Manning Levels

There are currently no regulations that require minimum levels of safe manning to be determined and adhered to on board UK fishing vessels. It is up to each owner and skipper to decide on the manning levels required prior to each trip. In this case, the skipper's decision was driven by the availability of reliable crew. In other cases, commercial pressures undoubtedly have a bearing. This is at variance with the system used on merchant vessels, where minimum safe manning levels are approved by the relevant flag state after taking into account all aspects of vessels' operations.

For small commercial vessels, MGN 280 (M) – *Small Vessels in Commercial Use for Sport or Pleasure, Workboat and Pilot Boat – Alternative Construction Standards* specifies conditions for operating single-handed **(Annex D)**. The MGN states:

> *In some cases, because of the size and arrangement of the vessel, the Certifying Authority may deem the vessel not to be suitable for single handed operations. In all cases where single handed operations are carried out, the owner/managing agent and the skipper should be satisfied that it is safe to do so. The vessel's certificate should show that it is suitable for 'single handed' operations.*

The adoption by the United Kingdom of ILO C188, and its expected transposition into national regulation, will provide an opportunity to ensure that the commercial factors which influence the manning of fishing vessels are not allowed to jeopardise their safe operation. It also provides an opportunity to align manning requirements for UK fishing vessels with vessels in other sectors, such as small commercial craft operations. Furthermore, the circumstances of this collision clearly demonstrate that the design of a vessel, and the ability to maintain a proper and effective lookout at all times, are among the key factors to be considered when meeting the convention's requirement of ensuring that a fishing vessel is *sufficiently and safely manned for safe navigation*.

2.6 WHEELHOUSE VISIBILITY

Following the addition of the shelter and deck equipment to *Silver Chord* in the 1980s, the visibility from the wheelhouse when looking forward was reduced considerably **(Figures 6, 7** and **8)**. The visibility of the sea surface ahead (and therefore the distance obscured) from the mid-point of the centreline bridge window was calculated to be 415m, and from the eye line when seated in the wheelhouse chair it was 193m. These distances greatly exceeded the 90m maximum stipulated in MGN 314 (F) for vessels built after 2002 **(Annex B)**.

MGN 314 (F) advises skippers of vessels such as *Silver Chord*, which were built before November 2002, and do not have a clear view ahead, to conduct a risk assessment and identify control measures to minimise the effect of any obstructions. The absence of any control measures in this context on board *Silver Chord* strongly indicates that such an assessment has either never been conducted, or that the solutions available were considered to be impractical or too expensive. It is also evident that the restricted visibility from the wheelhouse had not been identified as a deficiency during the vessel's 5-yearly inspections.

Silver Chord is one of many UK fishing vessels that have had structural changes such as the addition of shelters, which have adversely impacted on visibility from the wheelhouse. Some of these vessels have been further modified as suggested in MGN 314 (F) in order to mitigate this condition. However, a number of vessels similar to *Silver Chord* and *Aspire* (Section 1.12.2) continue to operate without a clear view ahead. Although *Silver Chord* had operated safely for over 20 years, this collision clearly shows that unless the requirements of MGN 314 (F) are adhered to by fishing vessel owners and skippers, and enforced by MCA surveyors, restricted fields of view, from within the wheelhouse, will continue to feature as causal factors in future accidents.

SECTION 3- CONCLUSIONS

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

1. Neither skipper was aware of the proximity of the other vessel. [2.2]

2. *Silver Chord*'s skipper's visual assessment of the navigational situation and use of radar during his periodic visits to the wheelhouse in the 52 minutes from leaving the fishing grounds, was not effective. [2.4.1]

3. The view from where *Sapphire II*'s skipper was standing on the starboard quarter of the aft deck was obstructed by the vessel's accommodation and wheelhouse. [2.4.2]

4. *Silver Chord*'s skipper was predominantly working within the enclosed shelter, and therefore a continuous lookout was not maintained. [2.5.1]

5. It is disappointing that attempts to improve the safety of the navigation watch on board fishing vessels, through published guidance, risk assessments and voluntary training courses, appear to have had little impact. [2.5.1]

6. As *Sapphire II*'s skipper was unable to keep a proper and effective lookout while recovering the fishing gear, the single-handed operation of *Sapphire II* was inherently unsafe. [2.5.2]

3.2 OTHER SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION ALSO LEADING TO RECOMMENDATIONS

1. There are currently no regulations requiring minimum levels of safe manning to be determined and adhered to on board UK fishing vessels. [2.5.3]

2. Unless the requirements of MGN 314 (F) are adhered to by fishing vessel owners and skippers, and enforced by MCA surveyors, restricted fields of view, from within the wheelhouse, will continue to feature as causal factors in future accidents. [2.6]

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

1. The shelter added to *Silver Chord* in the 1980s and the fitting of deck equipment onto the shelter in the 1980s, adversely affected the visibility ahead from the wheelhouse, but no mitigating measures had been adopted. [2.6]

SECTION 4– ACTIONS TAKEN

4.1 THE SKIPPER OF *SILVER CHORD*

Has significantly improved the forward facing visibility from the wheelhouse steering position by fitting a raised observation compartment on the centreline of the wheelhouse deck head.

SECTION 5 - RECOMMENDATIONS

The **Maritime and Coastguard Agency** is recommended to:

2011/133 Ensure, when introducing regulation to implement the requirements of International Labour Organization Convention 188, that both vessel design and the ability or otherwise to keep a proper and effective lookout from the working deck, are identified as key factors for determining that a fishing vessel is sufficiently manned for her safe navigation and operation.

2011/134 Ensure its surveyors verify during survey and/or inspection that the field of visibility from fishing vessel wheelhouses complies with the criteria laid down in MGN 314 (F) and, where necessary, owners are directed to take action to ensure that adequate visibility is afforded.

The **owner/skipper of *Silver Chord*** is recommended to:

2011/135 Improve the safe operation of his vessel by:

- Keeping the wheelhouse manned at all times when at sea
- Familiarising himself with the guidance available regarding keeping a safe navigational watch on board fishing vessels.

The **owner/skipper of *Sapphire II*** is recommended to:

2011/136 Carefully consider the risks associated with single-handed fishing operations before undertaking this activity on board any vessel he owns or skippers in the future. Particular attention should be given to maintaining a safe navigational watch at all times.

October 2011
Marine Accident Investigation Branch

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

MGN 313 (F) Keeping a Safe Navigational Watch on Fishing Vessels

Maritime and Coastguard Agency

MARINE GUIDANCE NOTE

MGN 313 (F)

KEEPING A SAFE NAVIGATIONAL WATCH ON FISHING VESSELS

Notice to all Owners, Operators, Skippers, and Crews of Fishing Vessels

This note supersedes MGN84(F) and should be read in conjunction with MSN1781(M+F) Distress Signals and Prevention of Collisions, MGN266 (F) Guidance on the Interpretation of SOLAS Chapter Five for Fishing Vessels, MGN 137 (M+F) Look-out During Periods of Darkness and Restricted Visibility and MGN 202 (M+F) Navigation in Fog.

Summary

This notice explains the need to maintain a proper navigational watch at all times.
Key points.

- Watches must be kept by competent people;
- A Proper lookout should be kept at all times;
- Check the vessels position by all available means;
- The activities of all other vessels in the area should be monitored;
- Sufficient rest should be taken before a watch.

1. Introduction/ Background

1.1 Investigations into collisions, groundings and near misses involving fishing vessels have continued to show that poor watchkeeping is a major cause. In many cases one or more of the following were important factor(s):

- An unqualified or inexperienced person in charge of the watch;
- Only one person on the watch (regardless of whether a watch alarm was fitted);
- A poor lookout and/or radio watch being kept;
- Distraction by TV in the wheelhouse;
- Divided command;
- Fatigue, alcohol, prescription drugs or a combination of any of these.

2. What are the Arrangements of a Safe Navigational Watch?

2.1 Even where there is no statutory requirement for certificated officers, it is still essential that watchkeepers are always experienced, capable, and have been instructed in their duties. This is especially vital if you are making a landfall, navigating close to the coast, in restricted visibility, severe weather conditions or in areas where there is dense traffic.

2.2 While deciding the composition of the watch the following factors should be taken into account:

- The wheelhouse must not be left unattended at any time;
- The weather conditions, visibility and time of day. Although the size of the crew and the wheelhouse may not permit a continuous two person watch, two people should always be on watch during the hours of darkness and in poor weather conditions;
- The proximity of navigational hazards and any other hazards which may require additional navigational duties to be undertaken;
- The use and operational condition of navigational aids such as radar, echo sounder, automatic pilot, and position-fixing equipment(s).
- Any unusual demands on the navigational watch that may arise as a result of fishing operations.

3. Fitness for Duty

3.1 Both the skipper and the watchkeepers should take full account of the quality and quantity of rest taken when determining fitness for duty. Particular dangers may exist when the watchkeeper is alone. It is all too easy to fall asleep, especially while sitting down in an enclosed wheelhouse. Watchkeepers should ensure they remain alert by moving around frequently, and ensuring good ventilation.

4. Navigation

4.1 The Merchant Shipping (Safety of Navigation Regulations) requires that all voyages are planned, taking into account any relevant information, and courses should be checked before departure.

4.2 It is important that watch keepers maintain a close watch on their own vessel and always know the position, speed and course steered. Most groundings occur when the position is not being monitored and the watchkeeper thinks that the vessel is in safe water.

4.3 The watchkeeper should be aware of the location, operation and limitation of all safety and navigational equipment on board.

4.4 The person in charge of a navigational watch should not undertake any other duties that would interfere with the safe navigation of the vessel.

4.5 Unfortunately it may not be possible to rely on every give-way vessel to keep clear. It is therefore vital to monitor the movement of ALL traffic. Remember that a vessel engaged in fishing does not always have the right of way. In restricted visibility, even with gear extended, a fishing vessel has no special privileges.

4.6 Domestic radios, cassette players and television sets and other recreational items should never be used in the wheelhouse when they will distract a watchkeeper from their duties. The proper place for such items, especially television sets, is in the accommodation.

5. Navigational Equipment

5.1 Watchkeepers should make effective use of all available navigational equipment and not hesitate to use the helm, engines and sound signals. The radar should be used as an aid. There is no substitute for keeping a good visual lookout.

5.2 It is strongly recommended that any automatic pilot fitted should incorporate a watch alarm. It is a good practice to extend the installation of a watch alarm to vessels not fitted with automatic pilot. A watch alarm should be fitted on board ALL vessels where there may be one person on navigational watch. The watch alarm will not only alert the watchkeeper but also other member(s) of the crew. However, a watch alarm should not be relied upon exclusively.

5.3 Over-reliance on video plotters has been a factor in several recent collisions and groundings. Using an electronic system does not remove the need for proper passage planning and navigation, using appropriately scaled paper charts.

5.4 Assessments or assumptions based on video plotters alone are dangerous and unreliable. A video plotter used for fishing purposes is not adequate for safe navigation.

5.5 If a video plotter is used, it is imperative to be aware of its limitations and a cross-check should always be made about the accuracy of your position, course and speed. Equipment of this type may be used as an aid to navigation, but it cannot replace the fundamental need to maintain a visual lookout.

5.6 Information, charts, routes and waypoints may be stored for future reference. However, stored data should always be checked and used with caution, especially if transferred between vessels. The data should be applicable to the vessel's specific condition and voyage, and always kept up to date.

5.7 Electronic magnetic compasses may be unsuitable for use within a steel wheelhouse.

5.8 Groundings have been caused by the improper functioning of this equipment linked to an auto-pilot. When a heading reference is required for navigational equipment such as an auto-pilot or radar, it is recommended that a transmitting magnetic compass (rather than an electronic magnetic compass) be fitted.

6. Navigational Duties and Responsibilities

6.1 The person in charge of the watch should:

- keep watch in the wheelhouse, which should never be left unmanned;
- continue to be responsible for the navigation of the vessel, despite the presence of the skipper, until it is mutually agreed that the skipper has taken over;
- notify the skipper when in any doubt as to what action to take in the interest of safety;
- not hand over to someone who is obviously not capable of taking over the watch. If there is any doubt the skipper should be advised accordingly;
- on taking over a watch establish the vessel's estimated or actual position and confirm the intended track course and speed. Any danger(s) to navigation which is likely to be encountered during the watch should be noted;
- maintain a proper log of all movements and activities during the watch that relate to the navigation of the vessel.

7. Look-out

7.1 It is absolutely essential that a proper look-out is kept at all times. Casualties to fishing vessels, resulting in loss of life, continue to occur because of the lack of a look-out. In addition to assessing the situation and risk of collision, stranding and other navigation dangers, the duties of the look-out should include the detection of other vessel(s) and/or aircraft in distress, shipwrecked persons, wrecks and debris, plus anything out of the ordinary.

7.2 The look-out must give full attention to keeping a proper look-out and no other duties should be undertaken which could interfere with that task. The duties of the look-out and helmsman are separate and the helmsman is not considered to be the look-out while steering except where an unobstructed all round view is provided and there is no impairment of night vision or other impediment. The watchkeeper may be the sole look-out during daylight hours provided that it is safe to do so and assistance is immediately available.

8. Weather Conditions

8.1 The watchkeeper should take early action to notify the skipper when adverse changes in the weather could affect the safety of the vessel, including the possibility of icing occurring.

9. Navigation with Pilot Embarked

9.1 The presence of a pilot on board does not relieve the skipper or watchkeepers from their duties and obligations. The skipper and pilot should exchange information regarding navigational procedures, local conditions and, the vessel's characteristics. The skipper should co-operate closely with the pilot. An accurate check of the vessel's position and movement should be maintained.

Further Information

Further information on the contents of this Notice can be obtained from:

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Annex B

MGN 314 (F) Wheelhouse Visibility Onboard Fishing Vessels

Maritime and Coastguard Agency

MARINE GUIDANCE NOTE

MGN 314 (F)

Wheelhouse visibility onboard Fishing Vessels

Notice to all Owners, Builders, Designers, Skippers and Crews of Fishing Vessels.

This notice should be read in conjunction with MGN 313 Keeping a Safe Navigational Watch on Fishing Vessels, MSN 1781The Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996 and supersedes MGN188 (F)

Summary

This note explains the minimum standards that are acceptable for views from the wheelhouse of a fishing vessel.

This Note gives guidance on:

- Wheelhouse visibility requirements for all fishing vessels;
- A modified assessment of forward visibility obscured by bow structures for use on "new vessels" of less than 45 metres in length;
- The effects on "existing vessels" of under 45 metres length;
- Annex I gives requirements for New Vessels constructed on or after 1 July 1998;
- Annex II gives requirements for existing vessels;
- Annex III gives advice on assessing forward visibility.

1. Introduction/ Background

1.1 A vessels safety can depend upon being able to see ahead. All vessels are required to keep a proper look out to avoid collisions and avoid dangerous situations developing.

1.2 A clear view in all directions is preferred, but it is essential to be able to see ahead, and especially directly ahead. Although these are simple principles, they can often be at odds with a vessel's design and layout.

1.3 For the purposes of this note:

- *Length* means the Registered Length;
- A new vessel is a vessel where the keel was laid or at a similar stage of construction on or after 1st July 1998; and
- An existing vessel is one that is not a new vessel.

2 Basic principals of visibility

2.1 When manoeuvring and to enable watch keepers to see objects in the water at close range, the view forward should be obstructed as little as possible by bow structures. The main position for steering and control of engines is the wheelhouse; therefore visibility is measured from the steering position.

2.2 All New fishing vessels should have a clear view ahead from the steering position. The MCA recommends owners of existing vessels comply as closely as practicable with the visibility standards for “new” vessels as set out in Annex I of this notice.

3 Alternative Arrangements for Improving Visibility

3.1 When assessing minimum standards of visibility, the direct view from the steering position should be used. If visibility is reduced then a risk assessment should be carried out and risk control measures put in place to minimise these.

3.2 The use of a forward lookout, periscopes and other “artificial” projection methods may improve vision around obstructions. However these methods are not accepted as “stand alone” solutions for the reasons given below:

3.3 Use of forward lookout is recommended good practice, to help the watchkeeper, in:

- situations of restricted visibility;
- when entering or leaving harbour; or
- in conditions of heavy vessel traffic.

3.4 The use of periscopes can:

- block the helmsman’s normal view forward and impair the watchkeeper’s view from other wheelhouse windows;

- make identification of navigation lights and other aids to navigation difficult. (Light intensity and colour can be altered when viewed through the equipment.)

4. The Effects of Bow Height and Vessel Trim

The positioning or movement of relatively small weights such as ice and fishing gear can easily reduce visibility standards below the acceptable minimum. Therefore when assessing forward visibility obscured by the bow, the vessels operational trim in normal seagoing conditions should be used. The guidance in Annex III can be used to establish in the view is adequate.

Further Information

Further information on the contents of this Notice can be obtained from:

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ANNEX I

1 Visibility standards for new vessels of less than 45 metres in length

1.1 For new vessels including those constructed on or after the 23rd November 2002 and covered by the Code of Safe Working Practice for the Construction and Use of 15m LOA to less than 24m Registered Length Fishing Vessels, the view of the sea surface under all conditions of draught, trim and deck cargo should:

1.2 be visible no more than 90 metres ahead from the steering position (under the bow) (see diagram A in Annex III) and;

1.3 take in an arc from forward of the bow to at least 10 degrees on either side under all draught, trim and deck cargo conditions.

2 Visibility standards for new vessels of 45 metres in length or more:

2.1 This includes those constructed on or after the 1st January 1999 and covered by the Fishing Vessels (EC Directive on Harmonised Safety Regime) Regulations 1999 as amended.

2.2 The view of the sea surface should not be obscured by any more than two ship lengths, (or 500 metres whichever is less) forward of the bow and to 10^{o} on either side irrespective of the vessels trim.

2.3 The horizontal field of vision from the steering position shall extend over an arc of not less than 225 degrees, that is from right ahead to not less than 22.5 degrees behind the beam on either side of the vessel.

2.4 Fishing gear or other obstructions outside the wheelhouse forward of the beam which obstruct the view of the sea surface from the steering position and create blind sectors in the horizontal field of vision should meet the following requirements:

- no single blind sector should be greater than an arc of 10 degrees;
- the total arc of blind sectors should not exceed 20 degrees;
- clear sectors between the blind sectors shall be at least 5 degrees;
- in the view described in paragraph 1 above, each individual blind sector should not exceed 5 degrees.

2.5 Observers on each bridge wing should have a horizontal field of vision which shall extend over an arc of at least 225 degrees. Visibility should therefore be from at least 45 degrees on the opposite bow through to right ahead and then to right astern through 180 degrees on the same side of the vessel.

2.6 The main steering position should have a horizontal field of vision extending over an arc from right ahead to at least 60 degrees on each side of the vessel.

2.7 The vessel's side should be visible from the bridge wing.

2.8 The height between the lower edge of the wheelhouse front windows and the bridge deck shall be kept as low as possible. In no case shall the lower edge present an obstruction to the forward view.

2.9 Assuming a person with an eye height of 1800mm above the deck at the steering position, and the vessel pitching in heavy sea, the upper edge of the wheelhouse front windows shall allow a forward view of the horizon.

2.10 Framing between the wheelhouse windows shall be kept to a minimum and not installed immediately in front of any workstation.

2.11 Forward windows shall be inclined from the vertical, top out, at an angle of not less than 10 degrees and not more than 25 degrees. This helps prevent reflections.

2.12 Polarised or tinted windows should not be fitted.

2.13 At all times, regardless of weather conditions, at least two of the forward windows shall provide a clear view, and in addition, depending on the wheelhouse configuration, an additional number of windows shall be able to provide a clear view.

2.14 Note that paragraphs 1 and 2 above may be followed:

- where the watch is normally kept from a chair at the steering position, from that position;
- with a single steering position, up to 1 metre on either side of that position;
- with two steering positions, in the wheelhouse or bridge wings within those positions; or
- with wandering lead steering control, within the functional length of the lead.

ANNEX II

1 Visibility Standards for existing vessels

1.1 Existing vessels of 45 metres or more in length shall, where practicable, comply with Annex I of this guidance. However, owners will not be required to make structural alterations or to supply equipment that would be necessary in order to satisfy those standards.

1.2 Existing vessels of less than 45 metres or more in length shall be so constructed that the person steering from the main wheelhouse control position has a clear view ahead and if fitted with power operated steering has a clear view ahead from the principal steering station.

1.3 Vessels should be designed and constructed to provide the person in control of navigating the vessel with good all-round visibility. The view, especially ahead, should be obstructed as little as possible. This applies to every foreseeable operating condition for which the vessel is designed, having particular regard to trim.

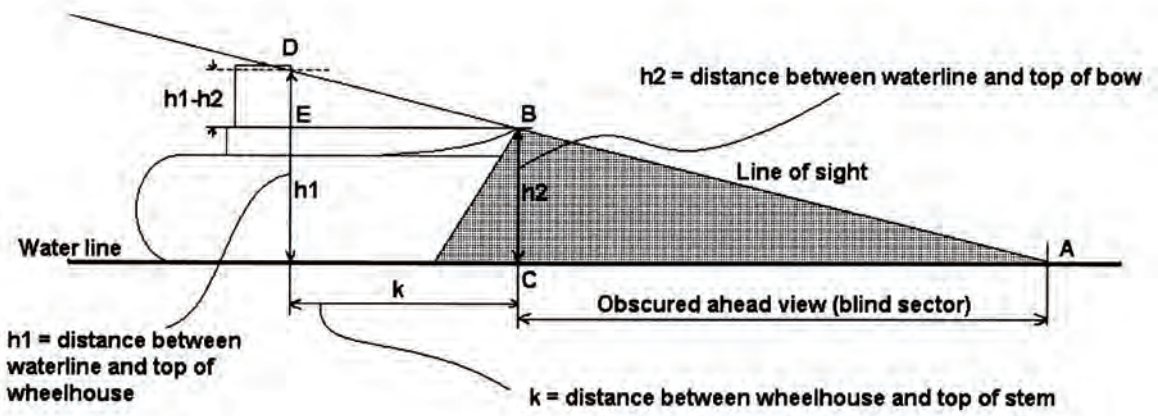
1.4 It is the owner's and skipper's responsibility to ensure that the vessel is fit to proceed to sea in compliance with paragraph 1.2; however, provided there are no new modifications that impair visibility from the wheelhouse, owners will not be required to make structural alterations or to supply equipment that would be necessary in order to satisfy those standards.

1.5 Where compliance with paragraph 1.2 cannot be achieved, there are a number of acceptable options that either alone or in combination, will help achieve an acceptable standard of visibility:

- Lowering of the whaleback or forward shelter. (Should be practical and should not compromise safety or the protection of the crew.)
- Fitting permanent ballast to trim the head. (In some cases only a small added-weight is required to get the bow down.)
- Raising the wheelhouse. (There are already successful examples of this type of modification.)
- Raising the steering position by incorporating an all-round, transparent dome in the wheelhouse deckhead. (A cost effective method most useful when manoeuvring in the close confines of a harbour. The dome should be able to maintain a clear forward-facing view regardless of the weather conditions.
- Alternatively, vessels will be considered satisfactory through achieving full compliance with the standards for new vessels (see Annex I).

Where options concerning structural changes are contemplated the overall effect on the vessels stability should be considered.

THE ASSESSMENT OF FORWARD VISIBILITY OBSCURED BY THE BOW
Diagram A



TRIANGLES ABC & BDE ARE SIMILAR

$AC = \frac{h2 \times k}{(h1 - h2)}$ = obscured ahead view

Note: On wooden vessels the stem post blind sector can be ignored and the bow height (h2) taken as the edge of the whaleback at no more than 5º from the centreline.

Examples for a registered length of 24 metres

AC = obscured ahead view which must be less than 90 metres
(or for vessels of 45 metres or more in length two ships lengths, or 500 metres whichever is the lesser).

Sample 1)

$AC = \frac{4.8 \times 10}{(5.0 - 4.8)} = \frac{48}{0.2}$ = 240 metres

Greater than 90m and therefore unacceptable.

Sample 2)

$AC = \frac{4.5 \times 5}{(5.0 - 4.5)} = \frac{22.5}{0.5} =$ 45 metres

Less than 90m and therefore acceptable.

Annex C

Silver Chord - Risk assessment of wheelhouse operations

How likely that harm may occur (L)		How harmful (H)	
1	Very unlikely	1	Slightly harmful
2	Unlikely	2	Harmful
3	Likely	3	Very harmful

Risk Factors (L x H)		
1	-	No action is needed
2	-	Can be tolerated, but make sure that it does not become worse
3/4	-	Take action but subject to it being reasonable and sensibly possible
6	-	Must be attended to, you must reduce the risk
9	-	Cannot be accepted and work/activity must not continue

Standard Risk Assessment Form			ALL VESSELS			
Activity or area	Possible hazards	Possible Consequences	L	H	LxH	Control measures necessary with respect to your vessel
Fouled Gear/Gear Mending	Leaning over the rail to reach	Falling overboard	1	3	3	Correct PPE to be used
	Gear suddenly frees	Falls resulting in injury or man overboard	1	3	3	Crew to be made aware of danger.
	Frayed wires	Lacerated hands	1	2	2	Correct PPE should be worn.
	Angle grinders	Eye injuries Electric shock	1	3	3	Correct PPE should be worn, ensure circuit breaker.
	Lifting of heavy items	Serious injuries	1	3	3	Make sure straps are in good condition.
	Inadequate tools	Frustration, delays, accidents	2	2	4	Make sure crew aware of correct place of necessary tools
Wheelhouse Operations	Falling asleep on watch	Vessel loss, deaths	1	3	3	Person taking watch to have plenty of rest and not tired.
	Leaving the wheelhouse unattended	Vessel loss, deaths	1	3	3	
	Inexperience	Vessel loss, deaths	1	3	3	Skipper must ensure that the experience and training of watch keeper is sufficient for all possibilities.
Galley	Inexperienced persons	Burns, scolds, cuts, fire	1	2	2	Training and instruction to any inexperienced person.
	Cluttered working areas	Trips and falls	1	3	3	Keep all working area clear
	Slippery floor	Slips	1	3	3	Ensure galley has non slip mat and kept clean
	Lack of hygiene	Food poisoning, Disease	1	3	3	Ensure all areas are kept clean
	The condition of LPG (Calor gas) equipment	Explosion, fire, vessel loss, deaths	1	3	3	Check condition regularly check alarms are working
Other						

Assessment Date ..... Review Date ..... Review Date .....

Signature ..... Signature ..... Signature .....

Annex D

Extract from MGN 280 (M) Small Vessels in Common Use for Sport or Pleasure, Workboat and Pilot Boat - Alternative Construction Standards

7. Single Handed Operations

7.1 The MCA does not recommend single handed operations. Vessels operating under this Code, other than those engaged as Pilot Boats or in any other business which involves the transfer of personnel at sea, may be operated single handed providing that the person operating the vessel complies fully with the minimum requirements for a skipper (appropriately qualified for the operating area) and the following conditions:-

.1 the area of operation is restricted to Area Category 3, 4, 5 or 6 in conditions of favourable weather and subject to favourable official weather forecasts for the area throughout the period of operation; and

.2 the duration of the voyage should not exceed 8 hours; and

.3 the vessel is not operated single handed in conditions of restricted visibility; and

.4 an acceptable lifejacket is worn at all times by the skipper; and

.5 no overside working takes place whilst the vessel is being operated single handed; and

.6 details of the time and point of departure, voyage plan and the Expected Time of Arrival (ETA) of every single handed voyage are left with a suitable person ashore and that person is notified of the safe arrival on completion of each voyage; and

.7 communication should be made with a person ashore or with a vessel in company at regular agreed intervals; and

.8 on all open sportsboats, inflatable craft and RIBS, engine kill-cords should be fitted and used at all times.

7.2 In some cases, because of the size and arrangement of the vessel, the Certifying Authority may deem the vessel not to be suitable for single handed operations. In all cases where single handed operations are carried out, the owner/managing agent and the skipper should be satisfied that it is safe to do so. The vessels certificate should show that it is suitable for "single handed" operations.

Marine Accident Report

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