Report of the investigation

of the fire on board

the fishing vessel

KINGFISHER II

whilst on passage to recover creels,

5 miles east of North Uist

on 26 April 2004

Marine Accident Investigation Branch
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Carlton House
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Southampton
United Kingdom
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Report No 15/2004
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Extract from

The Merchant Shipping

(Accident Reporting and Investigation)

Regulations 1999 – Regulation 4:

"The fundamental purpose of investigating an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 1999 is to determine its circumstances and the causes with the aim of improving the safety of life at sea and the avoidance of accidents in the future. It is not the purpose to apportion liability, nor, except so far as is necessary to achieve the fundamental purpose, to apportion blame."

NOTE

This report is not written with liability in mind and is not intended to be used in court for the purpose of litigation. It endeavours to identify and analyse the relevant safety issues pertaining to the specific accident, and to make recommendations aimed at preventing similar accidents in the future.

CONTENTS

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

B15	-	A material rated as being capable of containing a fire for 15 minutes
BA	-	Breathing Apparatus
CG	-	Coastguard
EPIRB	-	Electronic Position Indicating Radio Beacon
ETA	-	Estimated Time of Arrival
GPS	-	Global Positioning Satellite
LSA	-	Life Saving Appliance
MaxSea	-	Type of integrated chart/sonar used to locate fish
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
MRSC	-	Maritime Rescue Sub-Centre
MSN	-	Merchant Shipping Notice
RNLI	-	Royal National Lifeboat Institution
SFIA	-	Seafish Industry Authority
SIAS	-	Ship Investigation and Survey Report
UTC	-	Universal Co-ordinated Time
VHF	-	Very High Frequency

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SYNOPSIS

At 0637 UTC on 26 April 2004, MRSC Stornoway received a "Mayday" mobile telephone call from the skipper of the fv *Kingfisher II.* The report indicated the vessel was suffering an engine room fire, off the east coast of North Uist.

Kingfisher II sailed from Stockinish at 0100 on 26 April 2004 to recover her 5 fleets of 90 creels each, off North Uist, and re-shoot them in the South Minch area. Four of the fleets had been recovered and, at about 0635, *Kingfisher II* was steaming at 7 knots to pick up the final fleet. A crew member then reported to the skipper that there was smoke passing through the bulkhead separating the engine room from the accommodation area.

The skipper opened the engine room hatch situated in the wheelhouse. He was immediately confronted by thick acrid smoke but, before closing the hatch again, he did notice an intense glow in the vicinity of the after bulkhead. There was no time to attack the fire, or to report the incident to the coastguard using the VHF radio, because the wheelhouse rapidly filled with smoke, making it untenable. The skipper ordered the crew onto the upper deck. The two crew left the accommodation area, but did not close the hatch. This allowed smoke to continue to enter the wheelhouse. Unclear of the extent of the fire, the skipper ordered the liferaft to be launched. He then attempted to enter the wheelhouse to contact the coastguard by VHF radio, but was prevented from doing so by the intense heat and thick smoke. Realising the fire was beyond his control, the skipper alerted the MRSC using his mobile telephone, stating that the crew were about to enter the liferaft.

A "Mayday" Relay broadcast was initiated by the MRSC. The Barra lifeboat was paged and the coastguard rescue helicopter, G-BIMA, was scrambled. A number of fishing vessels responded to the "Mayday" Relay. The fv *My Girl's Jill* was nearest, arriving on scene at 0715. She immediately recovered *Kingfisher II's* crew and liferaft. The crew were shocked, but uninjured.

My Girl's Jill later went alongside *Kingfisher II* and attempted to fight the fire using her deck wash facilities, but this was soon abandoned. A tow was connected and *Kingfisher II* was towed towards Kallin Harbour, Grimsay, with the helicopter acting as escort. Once outside the harbour, the Barra lifeboat brought *Kingfisher II* alongside for berthing operations, and the helicopter was released. *Kingfisher II* was met by the Highlands and Islands fire brigade, who conducted "dampening down operations" and made the vessel safe.

The fire was probably caused by an electrical defect, which ignited cable insulation, the wooden after bulkhead and the main electrical distribution panel. The area behind the panel was completely destroyed, and there was smoke damage in the engine room, accommodation area and wheelhouse.

Recommendations centre on amendments to the Fishing Vessel Code of Practice for vessels under 12 metres in length, stowage of emergency equipment, and the conduct of risk assessments.

Figure 1

Port side view of the vessel on the slipway at Stornoway

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *KINGFISHER II* AND ACCIDENT

Vessel details

Registered owner	:	Mr R J Maclennan, Great Bernera, Isle of Lewis, Scotland
Fishing No	:	SY56
Port of registry	:	Stornoway
Flag	:	United Kingdom
Type	:	Multi-purpose trawler
Built	:	1991 at Girvan, Scotland
Construction	:	Wood
Length overall	:	11.6m
Gross tonnage	:	12.7
Engine power and/or type	:	85kW, Gardner 6LXB
		Two banks of batteries, each with a capacity of 360 ampere hours. One set for starting the main engine, the second set for vessel services.

Accident details

Time and date	:	0637 UTC + 1, 26 April 2004
Location of incident	:	57° 27'N, 007° 04'W 5 miles east of North Uist
Light conditions	:	Daylight – sunrise 0444 UTC
Persons on board	:	4
Injuries/fatalities	:	None
Damage	:	Engine room wiring system, including distribution panel, destroyed by fire. Engine room after bulkhead burnt through to accommodation area. Engine room, accommodation area, and wheelhouse suffered smoke damage.

1.2 VESSEL HISTORY

1.2.1 *Kingfisher II* was built to the current owner's specifications in 1991 by John Gaff and Sons at Girvan in Ayrshire. The builders have since finished trading and no original drawings are available. Consultants compiled stability information when the vessel was built, and this was carried onboard.

The vessel is registered as a "multi-purpose" trawler, and during her early ownership she fished for both lobsters and crabs. She is currently fitted out to trawl for prawns.

The owner skippered the vessel for the first 4 years. There have been three other skippers since then.

1.2.2 *Kingfisher II* suffered a number of material defects during the few months preceding April 2004. In November 2003, water leakage from the stern area required her to be docked at Girvan for replacement of stern timbers and for the re-alignment of the main engine and gearbox.

Kingfisher II underwent an MCA inspection on 17 November 2003. Four deficiencies were noted and quickly rectified. A copy of the SIAS report is at **Annex A**.

On 21 February 2004, she ran aground off Oban, in the Sound of Luing, whilst returning to Stockinish from Girvan. Further repairs were necessary to the keel and hull planking. Work on electrical equipment was also conducted during this period. The vessel eventually came off the slipway in Girvan on 5 March 2004.

1.3 BACKGROUND TO VOYAGE

1.3.1 *Kingfisher II*'s current skipper was onboard the vessel during the trips to Girvan for repairs, but he did not formally join her until the beginning of April 2004. His three crew joined the following week, and they spent the next 2 weeks preparing the vessel to suit the skipper's requirements.

Because of poor weather, *Kingfisher II* had only spent 3 days at sea prior to the fire, after she landed her catch of prawns on 23 April 2004 at Stockinish in the Isle of Harris.

The vessel sailed again on 26 April to recover the 5 fleets of 90 creels each. Because of poor catches off North Uist, the skipper intended to reposition the creels in the South Minch area, where conditions were more favourable.

1.3.2 Because the skipper was unfamiliar with engine maintenance procedures, he asked for help from the previous skipper. The two main engine fuel filters and the main engine oil filter were changed on 25 April.

1.3.3 Three noteworthy defects were outstanding on departure on 26 April. The auxiliary engine had suffered long term vibration problems, and could not be run. There was an intermittent power supply to the MaxSea plotter, which, reportedly, could be stabilised by moving the electrical supply cables by hand. The main engine water temperature gauge, situated in the wheelhouse, was also faulty.

1.4 NARRATIVE

1.4.1 *Kingfisher II* sailed from Stockinish, with a crew of four, at 0100 on 26 April 2004. She carried a number of spare creels and fish boxes in the creel platform or "catcatcher" situated at her stern. The sea was calm, there was a force 2 to 3 south-easterly wind, and visibility was excellent. It was a pleasant night and, at 0230, the vessel arrived at the first fleet of 90 creels. These were hauled onboard within 20 minutes, without incident.

Good progress was made with the recovery of the subsequent fleets. During the hours of darkness, the crew noted the electrical breaker for the six deck floodlights tripped on two occasions. The skipper was unconcerned about the apparent power overload, and resolved the problem by resetting the breaker. He also switched off the steaming light to reduce the electrical load.

1.4.2 At 0500, *Kingfisher II* was steaming at about 7 knots, with 10 miles to run to the fifth, and final, fleet of creels. At this time there were about 370 creels onboard. They were distributed around the vessel's stern and extended around to the front of the wheelhouse up to window level. Escape routes, and access to and from the wheelhouse, were severely restricted, as illustrated by **Figures 2 and 3**.

The skipper visited the engine room at about 0610 to conduct a superficial check of the space. Conscious of the faulty wheelhouse engine temperature gauge, he checked the main engine and found it to be running normally. He also checked for leaks on the fuel filter and ensured the ventilation fan was running correctly. He did not specifically look at any other areas in the engine room, and nothing raised his concern before he returned to the wheelhouse.

1.4.3 At approximately 0630, the skipper was sitting on the wheelhouse chair. He was accompanied by one of the crew, who was standing on the wooden engine room hatch situated at the port side of the wheelhouse. The two other crew were just finishing breakfast in the accommodation area, which is also accessed from the wheelhouse. One of them called up to the skipper from the accommodation area and asked whether he had "seen the smoke". He then clarified this statement by saying that smoke was coming into the accommodation area from the engine room through the gap where the main engine exhaust passes through the engine room and accommodation area forward bulkhead, as shown in **Figure 4**. As the vessel was not fitted with a fire detection system, this was the first indication of a potential fire in the engine room.

Figure 2

General view of extent of creel loading

Figure 3

View of creels in the vicinity of the wheelhouse

Figure 4

Main engine exhaust passing through
engine room/accommodation area bulkhead

Reacting quickly to the potential danger, the skipper moved the crew member off the engine room hatch so that it could be opened. Before opening the hatch, he stopped the main engine. The crew did not notice if smoke was discharging from the engine room ventilation terminals because of the creels obstructing their view of the terminals **(Figure 5)**.

One crew member came up from the accommodation area as the skipper prepared to lift the engine room hatch. Kneeling down, the skipper cautiously lifted the hatch. He was almost immediately overcome by the heat and dense smoke, which rapidly escaped into the wheelhouse, but he was able to see a strong glow through the smoke layer. He believed this to be roughly in the centreline, near the bottom floor plates in the vicinity of the after bulkhead **(Figure 6)**.

1.4.4 With the wheelhouse now full of thick smoke, and finding it extremely difficult to breathe, the skipper dropped the engine room hatch and ordered the crew to evacuate the wheelhouse. By that time, the second crew member had also come up from the accommodation area, carrying a dry powder fire extinguisher. Unfortunately, he failed to shut the accommodation hatch, and this allowed more smoke to enter the wheelhouse. However, he did close the wheelhouse door as he made his way into fresh air to join the rest of the crew. Both the skipper and crew recall that there was no loss of electrical power at this time because, despite the wheelhouse being smoke-logged, they were still able to make out the GPS display and could hear the VHF radio transmissions and main engine shut down alarm.

Figure 5

Creel obstruction of engine room vents

Figure 6

Location of the seat of fire

Because of the amount of smoke, and the speed at which the fire had developed, the crew became extremely concerned about the severity of the situation. They could hear the fire burning, and were conscious of the risk posed by the domestic gas bottles stowed aft of the wheelhouse, above the fire. They knew it would be impossible to move them because the creels surrounding the wheelhouse obstructed them. There was no attempt made to use the engine room sprinklers to fight the fire.

The need to alert the CG had intensified. The skipper attempted to re-enter the wheelhouse twice, in an effort to pass the VHF handset through the starboard side wheelhouse window. Both attempts failed because of the dense smoke which was, by that time, described as a "sickly yellow colour and very thick".

1.4.5 Unsure of the true state of the situation, the skipper ordered the liferaft to be launched. The liferaft was stowed on the wheelhouse roof. To reach it, the crew had to scramble over the creels which were stacked to the top of the wheelhouse. The liferaft was then launched and secured to the port forward fairlead of *Kingfisher II*. The lifejackets were stowed down below in the provisions store located in the steering gear compartment, but the crew were unable to retrieve them in preparation to abandon the vessel because dense smoke in the accommodation rendered the store inaccessible. The emergency flares were also not accessible as they were stowed in the smoke-filled wheelhouse.

With dense smoke now coming from the wheelhouse door and from the engine room ventilation terminals at the front of the wheelhouse **(Figure 7)**, the skipper decided to abandon the vessel. At 0637 he managed to contact the CG via his mobile telephone. He was unable to give the CG the precise location of *Kingfisher II*, but estimated his position to be about 5 miles east of Kallin. He was also able to identify a fishing vessel about 1½ miles astern as the fv *My Girl's Jill*. He then asked the CG to contact the other fishing vessel on VHF channel 16 to appraise them of his problem.

1.4.6 At 0640, MRSC Stornoway scrambled the coastguard rescue helicopter G-BIMU and paged the Barra lifeboat. The helicopter was airborne at 0651 and the Barra lifeboat was underway at 0659. At the same time, a "Mayday" relay broadcast was initiated on VHF channel 16. A number of fishing vessels responded and offered assistance. *My Girl's Jill* was nearest to *Kingfisher II* and immediately headed towards her.

As the skipper was about to enter the liferaft, the CG asked whether an EPIRB was carried, and, if so, requested that it be activated. Unsure if one was onboard, the skipper went back towards the wheelhouse to check. As he did so he attempted to open the wheelhouse door, but, once again, was prevented from entering because of the thick smoke. He advised the CG that he believed an EPIRB was not held and said that he was about to abandon the vessel.

Figure 7

Smoke discharge marks from engine room vents

1.4.7 At about 0645 the crew abandoned *Kingfisher II*. Once safely in the liferaft, they cut the securing line allowing the liferaft to drift away from the still burning vessel. Two of the liferaft's red hand held flares were used to attract the attention of *My Girl's Jill* who was clearly looking for the liferaft. The first flare was released shortly after entering the liferaft and the second about 10 minutes later. Once in the liferaft, the mobile telephone signal was lost, so they were unable to communicate verbally with either the CG or with *My Girl's Jill*.

Whilst waiting to be rescued, the crew of *Kingfisher II* noticed that the smoke from the wheelhouse and ventilation terminals was less dense. The skipper now felt that if there was an opportunity, he would like to try to go back onboard and attempt to fight the fire. Meanwhile, *My Girl's Jill*, was making her way towards the liferaft, arriving on scene at 0715.

1.4.8 The rescue helicopter arrived overhead at 0717 and provided updates to MRSC Stornoway as *My Girl's Jill* manoeuvred towards the liferaft.

Shortly afterwards, the crew of *Kingfisher II* were successfully rescued by *My Girl's Jill* and the liferaft recovered. Following agreement between the two skippers, the vessel returned to *Kingfisher II* and secured alongside. Both skippers, and two of the crew members, then transferred to the fishing vessel. The third crew member from *Kingfisher II* remained onboard *My Girl's Jill* to provide information to the CG if required. The skipper of *Kingfisher II* tried to get into the wheelhouse, but once again the smoke and heat prevented entry.

1.4.9 The skipper of *My Girl's Jill* then set up his deck wash system to provide fire-fighting water. He attempted to pour water into *Kingfisher II*'s engine room ventilation terminals, but the creels surrounding the wheelhouse prevented this. Water was then put down one of the engine exhausts but, again, this proved unsuccessful. The skipper finally smashed a window on the port side of the wheelhouse, through which water was poured, in the hope that it would find its way down into the engine room, even though the engine room hatch had been closed after discovering the fire. Throughout this time the other crew members were preparing the tow line.

Water was poured into the wheelhouse area for about 10 minutes without any noticeable reduction in the smoke levels. A short time later, the fire-fighting effort was abandoned in favour of progressing with the tow into Kallin Harbour.

1.4.10 At 0738 *My Girl's Jill* began the tow. The line parted twice during the tow because *Kingfisher II* was yawing badly. The towing line was eventually replaced with a towing bridle arrangement, after which the tow continued without incident.

The rescue helicopter remained overhead throughout the tow until the Barra lifeboat arrived on scene at 0841. The helicopter was then released at 0843. The lifeboat escorted the tow for 20 minutes before securing *Kingfisher II* alongside for the final passage into Kallin Harbour. *Kingfisher II* was berthed alongside Kallin Harbour at 0927, where she was met by the police, coastguard and the Highlands and Islands fire brigade. The CG released the Barra lifeboat at 0944 when *Kingfisher II* was safely alongside.

1.4.11 The fire brigade entered the accommodation area wearing BA, and dampened down the wooden forward bulkhead that had been partially burnt through. They then entered the engine room, where the timber after bulkhead and the insulation from numerous electrical cables were found to be smouldering. The firefighters dampened these areas down and finally made the area safe by cutting the battery cables, effectively disconnecting all power supplies.

The fire brigade finally declared the vessel safe at 1050.

1.4.12 Following agreement with the MCA that the vessel could sail during daylight, *Kingfisher II* was fitted with emergency electrical supplies and replacement LSA, and she sailed from Kallin Harbour on 5 May for Stornoway. She arrived at Morrison Engineering Ship Repairers at midday on 6 May.

1.4.13 The repairs to *Kingfisher II* were completed on 21 June 2004. Following successful sea trials, the vessel was handed back to the owner.

1.5 CREW PARTICULARS

The skipper had been at sea for 8 years. He had served a one year apprenticeship in a small fuel supply vessel before transferring to the fishing industry. He had worked with the current owner for about 3 years. He had attended the mandatory fire-fighting, sea survival and first-aid courses and planned to attend a safety awareness course in May 2004. He held no other formal fishing industry qualifications.

The other three crew had attended the mandatory sea survival, first-aid and fire-fighting courses. None held any additional fishing industry related qualifications.

1.6 GENERAL DESCRIPTION OF VESSEL

1.6.1 General arrangement

The general arrangement of *Kingfisher II* is at **Figure 8**. The vessel is an 11.6 metre multi-purpose wooden fishing vessel fitted out for prawn fishing. The hull is divided from forward, into the fore peak store, fish hold, vivier tank, engine room, a four berth accommodation arrangement which provides access to the steering compartment aft, the port side of which forms a dry provisions store.

An aluminium wheelhouse sits on a slightly raised deck area and provides access to both the engine room and accommodation area. There are no emergency escape arrangements from either the engine room or accommodation area.

The accommodation area is fitted with a sink, refrigerator and gas boiler providing hot water. The gas bottles are situated at the after bulkhead of the wheelhouse, with spare bottles normally stowed on the forecastle.

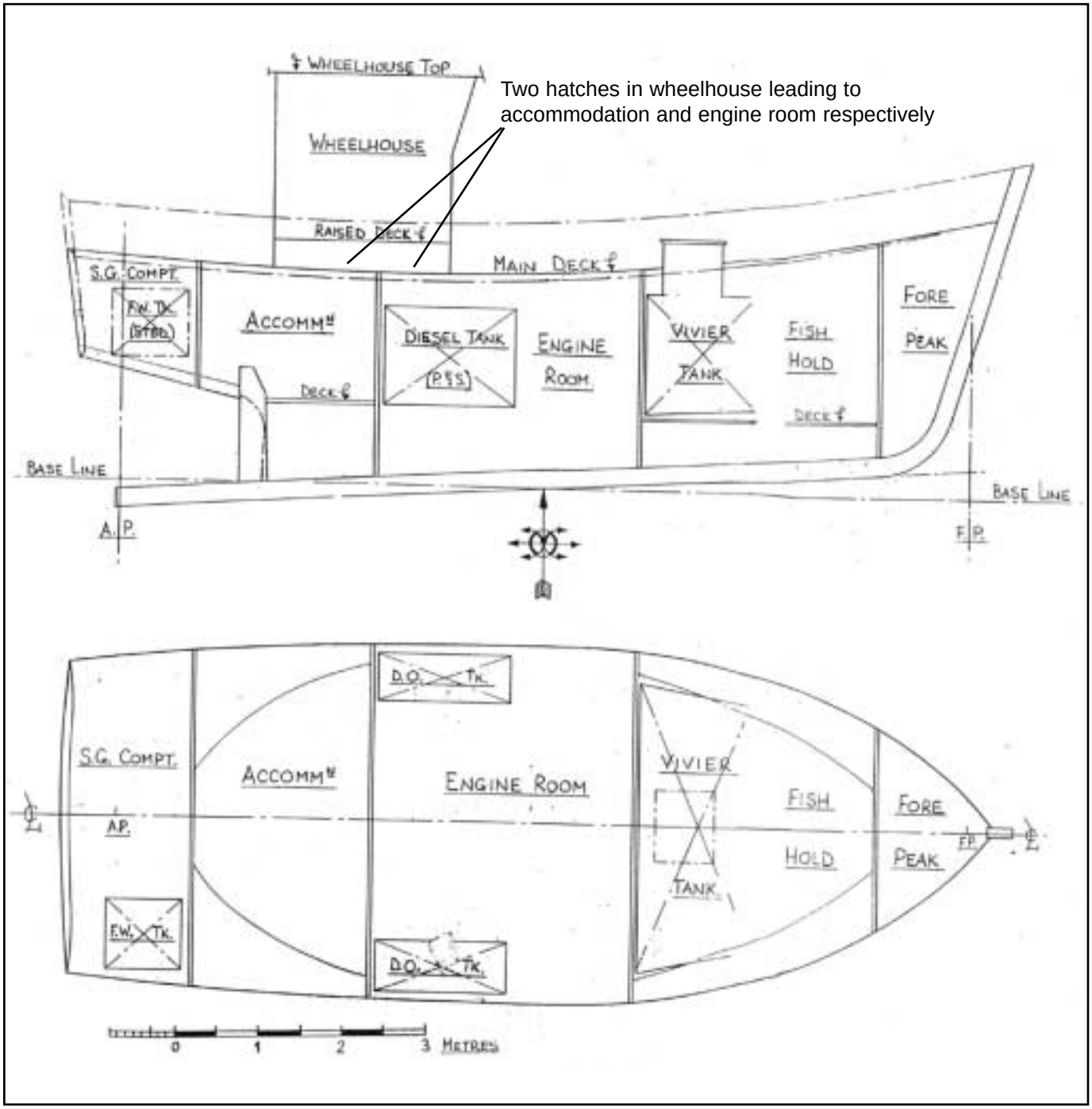
1.6.2 Machinery

The vessel is fitted with a Gardner 6LXB, 85.00 kW diesel engine driving a fixed pitch propeller through a reversing, reduction gearbox. A deck machinery hydraulic pump is driven off the main engine, and a selector valve can be made to engage a hydraulically-driven salt water pump that supplies fresh salt water to the vivier tank. Whilst in harbour, a Petter, single cylinder auxiliary diesel engine, is also arranged to drive the vivier tank hydraulic-powered salt water pump.

1.6.3 Wheelhouse

A single main engine control console is fitted in the centre of the wheelhouse. Main engine stop, high bilge level and calor gas alarms are also fitted. A MaxSea fish location plotter, GPS, radar display, VHF radio installation and autopilot system completes the outfit.

Figure 8



General layout of *Kingfisher II*

1.6.4 Fire-fighting equipment

The full outfit of portable fire-fighting equipment, comprising extinguishers and fire blankets, is held in the wheelhouse, engine room and accommodation area.

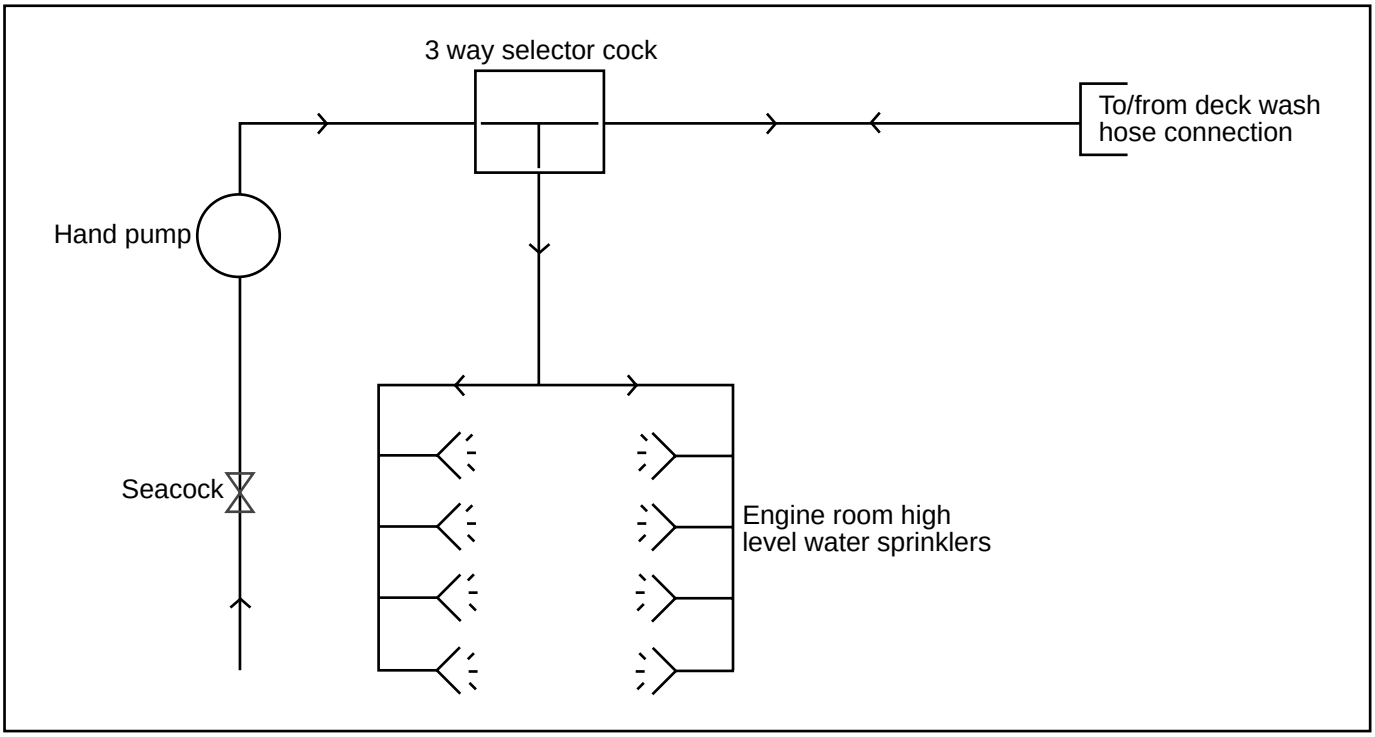
A water sprinkler system is fitted throughout the engine room. The deck wash hand-pump, situated externally on the wheelhouse after bulkhead, provides sea water to the system. The pump takes its suction through a section of flexible corrugated pipe and a sea cock situated in the dry provisions store of the steering gear compartment. A selector cock at the pump discharge allows water to be discharged to the deck wash outlet, or to the engine room sprinkler system. Water can also be provided from the deck wash outlet to the engine room sprinklers. The system and selector cock arrangement is shown at **Figures 9 and 10** respectively.

It was usual practice for the selector cock operating handle to be stowed in the accommodation area.

1.6.5 Lifesaving apparatus

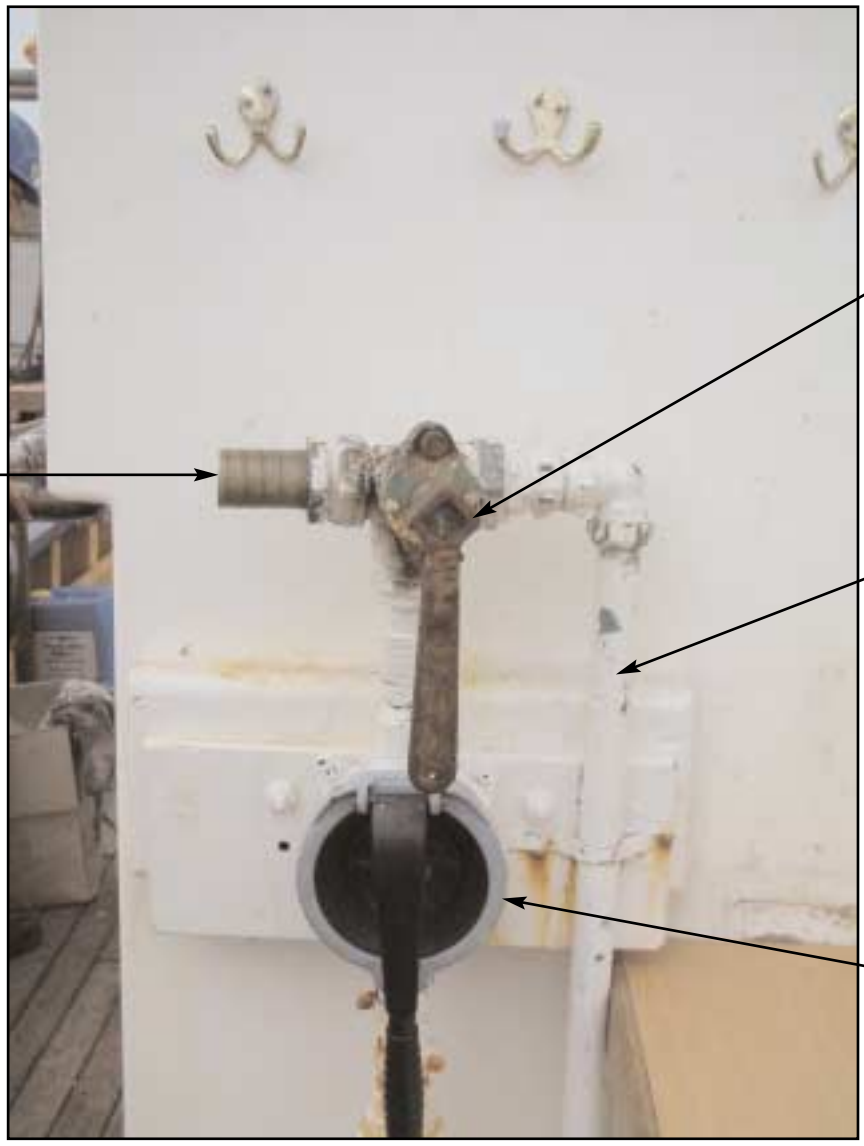
A single, 4-man liferaft is located on the wheelhouse roof and is secured using a hydrostatic release unit. Two lifebuoys are located on railings adjacent the port side of the wheelhouse. All crew are in possession of personal lifejackets, and these are stowed in the dry provisions store situated in the steering gear compartment. Three parachute and two hand-held flares are carried, as is one buoyant smoke signal.

Figure 9



Deck wash and engine room high level sprinkler arrangement

Figure 10



Deck wash pump and selector valve

1.7 ELECTRICAL CHARGING AND DISTRIBUTION SYSTEM

1.7.1 General description

No original electrical circuit drawings are available from either the owner or from any of the electrical contractors who had completed work prior to the fire. A drawing of the replacement system, which is considered to be very similar to the original configuration, is at **Figure 11**.

Kingfisher II is fitted with a main engine-driven alternator, and a main engine belt-driven “transmotor”. The output from these units is 24 volts, 100 amps and 24 volts, 60 amps respectively. The alternator is configured to charge the service batteries which then provide power to the vessel’s services through a battery isolation switch and fused distribution panel situated on the after bulkhead of the engine room. A further set of switches is located in the wheelhouse. These control individual services. The service batteries are also used to start the auxiliary engine under normal circumstances.

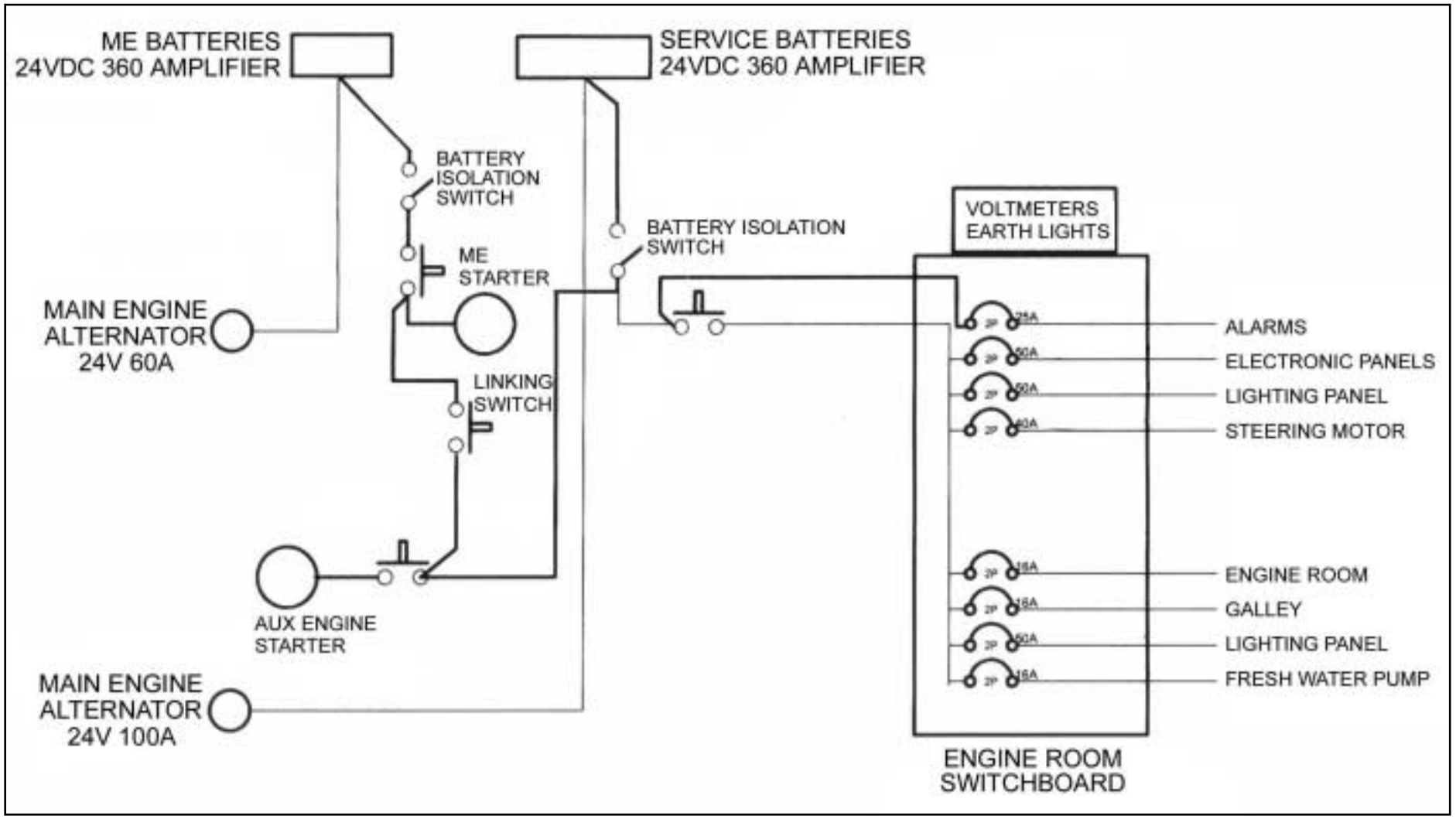


Figure 11

Electrical charging and distribution system

The “transmotor” is used to charge the main engine batteries, which are configured to start the main engine through a battery isolation switch.

A linking switch is fitted to allow the main engine to be started using the service batteries and the auxiliary engine to be started using the main engine batteries under fault conditions.

1.7.2 Electrical system maintenance

A number of nylon block connectors were fitted around the vessel. Some of these were adjacent to the domestic water heater. **Figure 12** clearly illustrates the hazard.

During the repairs after the fire, a number of electrical faults were found that required rectifying. Contractors discovered and repaired earth faults to the bilge alarm switches and bilge pump. They also found that the earth bonding arrangement to the vessel’s anodes was in poor condition, and these were replaced. The MaxSea plotter and autopilot were checked and found to be working satisfactorily, although the skipper later identified power supply problems with the MaxSea plotter (see paragraph 1.3).

A positive earth fault was also found on the alternator when it was running. The problem was resolved by replacing the alternator with an exchange unit.

Figure 12

Example of block connector use and exposed wiring

1.8 EXTENT OF FIRE DAMAGE

1.8.1 Electrical equipment damage

The fire damage to the electrical cabling situated on the after engine room bulkhead was extensive. The insulation from all the cables was completely burnt away. The nylon ties securing the cables to the vertical and horizontal cable trays were also destroyed, causing the cables to collapse haphazardly at floor plate level.

The steel clad plastic distribution panel, situated close to the top of the after bulkhead, had been completely destroyed. Panel connectors and clamps were virtually the only recognisable distribution panel components. Examples of the engine room electrical cable and distribution panel damage are at **Annex B**.

1.8.2 Structural damage

The after engine room bulkhead was constructed from 15mm tongue and groove pine timber, which had no obvious fire retardant properties. The fire caused deep charring to the lower section of a vertical stiffener adjacent to the vertical cable tray leading to the electrical distribution panel. The charring pattern widened from about 150cm at the deep charring point, to about 1.2m at its widest point – behind the distribution panel.

There was extensive damage in way of the metal clad, plastic electrical distribution board. This was situated high on the bulkhead and just to starboard of the centreline. A large portion of the bulkhead (approximately 1.2m^2 and about the size of the distribution panel) in this area had burnt completely away, opening the bulkhead to the accommodation area.

Examples of fire damage to the engine room after bulkhead are shown at **Annex C**.

1.8.3 Smoke damage

The wheelhouse, accommodation area and engine room suffered varying degrees of smoke damage.

1.9 REPAIR DETAILS

The repairs were undertaken by Morrison Engineering of Stornoway and their sub-contractors. Work included the removal of all damaged electrical equipment in the engine room, replacement of heat-affected flexible pipes and reinstatement of approximately 50 per cent of the engine room after bulkhead. The latter was cladded with fire retardant material on both the engine room and accommodation sides. The engine room was completely re-wired and replacement electrical components fitted.

The wheelhouse was fitted with a complete suite of new electronic equipment comprising a MaxSea plotter, autopilot, radar display and VHF radio installation.

The accommodation area was fitted out with a new cooker, gas water heater, sink unit, replacement linings, cupboards and trim.

A domestic gas leak detector and fire detection system was also installed, although neither of these had been previously fitted.

1.10 RISK ASSESSMENTS AND ANNUAL SELF-CERTIFICATION

1.10.1 Risk assessments

Paragraph 4.4 of MSN 1756(F) - The Fishing Vessels Code of Practice for the Safety of Small Fishing Vessels under 12 metres in length states that:

"*The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 came into force on 31 March 1998. Under those regulations employers are required to make a suitable and sufficient assessment of the risks to the health and safety of workers arising in the normal course of their activities or duties. Guidance on these regulations and on the principles of risk assessment is contained in a Marine Guidance Note (currently 20 M+F)".*

Only after the fire, was the owner aware of the requirement and processes involved in conducting a risk assessment, and after he attended the SFIA sponsored, Safety Awareness Course in May 2004.

Since purchasing *Kingfisher II*, the owner had only visited the vessel occasionally and tended to leave safety improvements and maintenance requirements to the skipper's discretion. The owner readily funded safety-related improvements when requested by the skipper, but otherwise had little involvement in the day to day operation of the vessel.

1.10.2 Self-certification

Paragraphs 5.5 to 5.12 of MSN 1756(F) - The Fishing Vessels Code of Practice for the Safety of Small Fishing Vessels under 12 metres in length also describes the MCA inspection process and related owner's responsibilities. A copy is provided at **Annex D**.

Again, the owner was not aware of his responsibilities for self-certification to ensure the vessel's risk assessment was up to date, and that the safety equipment had been properly maintained.

Discussions with the CG inspector who conducted the vessel's survey in November 2003, indicated that no checks were made on the self-certification documentation.

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 CAUSE OF THE FIRE

2.2.1 Initial investigation examined the possibility of fuel or oil leaks as being the cause of the fire. However, all piping systems were found to be leak free, the hydraulic tank, main engine sump and gearbox oil levels were also normal. There was no evidence of past leakage, and none was reported by the crew. Therefore, this possibility was discounted.

2.2.2 It is most probable that the fire was of electrical origin but, unfortunately, the nature of the fire damage, in particular the mass of burnt wiring on the engine room after bulkhead, made it impossible to determine the exact cause.

2.2.3 The nature and extent of the charring on the aft engine room bulkhead indicated the fire started in the engine room rather than the accommodation area. The crew member who initially reported the smoke coming into the accommodation area through the gap surrounding the main engine exhaust supports this conclusion (see paragraph 1.4.3).

2.2.4 Probable cause of fire

There are two potential seats of the fire. The first, in the distribution panel situated high on the after bulkhead just to starboard of the centreline. This possibility is dismissed because the accommodation area lights were on when the wheelhouse was evacuated. In addition, the GPS and MaxSea plotter were seen to be functioning and the main engine shut down alarm was heard by the skipper when he attempted to re-enter the wheelhouse. If the fire started in the distribution panel, these facilities would have been lost at the outset.

The second possibility is at the site of the deep charring, at the bottom of the centreline vertical wooden stiffener, just above the floor plates. This probability is supported by the skipper's evidence. When he opened the engine room hatch, following the report of smoke in the accommodation area, he noticed a glow, low down and in the vicinity of the centreline of the after bulkhead (see paragraph 1.4.3).

It is possible that a defect in an electrical component resulted in a cable rating being exceeded, causing it to break down the cable insulation. If this cable was among the bunch situated in the vicinity of the lower part of the after bulkhead, smouldering was likely, and this would explain the deep char in this area.

The wooden bulkhead or cable insulation would have eventually ignited, causing the fire to “track” up the bunched wiring attached to the bulkhead and into the plastic distribution panel.

Once the fire had reached the distribution panel, the plastic components would have quickly ignited. The fire would have been partially contained within the steel cladding of the panel, causing it to intensify and burn through the bulkhead at the upper level.

2.2.5 Bulkhead material standards

Regulations applicable to this vessel do not require the bulkhead to have any fire resistant properties, or for it to be gas tight. Vessels built under the SFIA regulations, or under their grant arrangements, require that the bulkhead should be fitted with B15 standard material that would withstand fire temperatures enabling it to remain intact and limit heat transfer for 15 minutes.

It would clearly be desirable to have bulkheads separating engine rooms, and for accommodation areas to be made gas tight. This would prevent smoke contamination of the adjacent spaces as a result of an engine room fire.

2.3 ACTIONS OF THE CREW

2.3.1 Discovery of the fire

The initial actions taken by the skipper once the smoke had been reported, were broadly correct.

His decision to shut down the main engine, in case its high-pressure fuel system was feeding the fire, was fully justified. There were no navigational hazards, and there was a chance that a leak from the engine fuel system was also the original fire fuel source.

Closing the engine room hatch immediately the thick smoke filled the wheelhouse was also the correct course of action.

2.3.2 Unfortunately, the last crew member to evacuate the accommodation area failed to close the access hatch. Closing the hatch would have helped to contain the smoke. This should have been an instinctive action, and is clearly covered on the fire-fighting training course which he attended.

The open hatch allowed the wheelhouse to continually fill with smoke, forcing the skipper to abandon the space and denying him the use of the VHF radio and the emergency flares. It was fortunate that he was able to alert the CG using his mobile telephone. However, mobile telephone signal reception in this area is notoriously unreliable, so it would have been quite possible for the CG, and other vessels, to have been unaware of the emergency situation.

The crew were aware of the additional danger of explosion posed by the domestic gas bottles situated above the fire. Fire boundary starvation, in this case the removal of the gas bottles, is a fundamental part of fire-fighting discipline. However, the large number of creels stowed in the area meant that the crew were unable to move the gas bottles, and thereby remove the risk of explosion.

2.3.3 Fire/smoke detection equipment

The vessel was not required to be fitted with fire/smoke detection equipment. When the fire was discovered it was already well advanced. The accommodation area had begun to fill with smoke and the crew had to evacuate quickly. When the skipper opened the engine room hatch he noticed a glow in the engine room, and the wheelhouse was immediately filled with smoke.

Had smoke detection equipment been fitted, it is possible that an attempt could have been made to extinguish the fire before the build up of smoke made entry into the engine room impossible.

2.3.4 Ventilation isolation

No attempt was made to stop the engine room ventilation fan. Therefore, up to the point of loss of electrical power, the fan would have been feeding air to the fire. Neither was an attempt made to close off the engine room vents at the front of the wheelhouse, which were obstructed by numerous creels. The vents were not fitted with dedicated flaps, and although access was difficult, efforts could have been made to block these, by other means, to prevent air being supplied to the fire.

2.3.5 Use of engine room water sprinklers

One of the most effective methods of extinguishing fires without putting individuals at unnecessary risk is to activate remotely operated fixed fire-fighting systems.

The hand pump supplying the engine room sprinkler system and deck wash and the associated selector cock were situated on the port after external bulkhead of the wheelhouse. Unfortunately, access to the system was completely blocked by the large number of creels stowed in the vicinity of the wheelhouse. Even if access could have been made, the skipper and crew were unfamiliar with the operation of the system. It was also found that the selector cock was seized through lack of operation and maintenance.

Badly maintained fire-fighting equipment, such as this, renders effective fire-fighting improbable, and increases the chances of serious injury and loss of life.

2.3.6 Vessel abandonment

The decision to launch the liferaft in preparation for the possibility of abandoning the vessel, was a sensible precaution. The skipper judged the situation to be beyond his control and took the safest action by ordering the crew to enter the liferaft.

Unfortunately, they were unable to don their lifejackets as these were stowed in the dry provisions store in the steering gear compartment. The store was inaccessible because of the dense smoke in the accommodation.

It would have been preferable for the lifejackets to have been stowed in a more accessible location, such as a dedicated box or container fitted on the deck or on the top of the wheelhouse. The October 2001 MAIB report into the explosion onboard the fv *Fleur de Lys* also recommended that lifejackets should be stowed on the open deck to enable easy access.

2.3.7 Attempts to fight the fire after the crew returned onboard

When the crew returned to *Kingfisher II*, the fire was already diminishing. The smoke levels and noise had much reduced, probably because the fire had used up most of the available oxygen. The process of putting water through the wheelhouse broken window would have also had the effect of boundary cooling the area.

It was noted during the investigation, that when it was raining, water found its way through the engine room deckhead caulking into the engine room. It is possible that some of the boundary cooling water leaked into the engine room and dampened down the fire. However, use of the sprinkler system would have been the far more effective method of fire-fighting, had it been maintained, was accessible and had the crew been familiar with its use.

2.4 EMERGENCY DRILLS

2.4.1 All crew members were up to date with their mandatory training courses, which included fire-fighting training.

Despite the crew having never worked together, no emergency drills had been conducted, and none of the crew had ever been involved in a drill whilst working on fishing vessels. It is noted that MSN 1756(F) – The Fishing Vessels Code of Practice for the Safety of Small Fishing Vessels under 12 metres in length – as amended, does not require skippers to conduct emergency drills.

However, only by conducting drills are individuals able to build on the basic knowledge gained during their mandatory training courses. Drills help to ensure that actions in emergency situations become instinctive, and improve the chances of individual and vessel survivability.

2.5 SKIPPER'S KNOWLEDGE OF THE VESSEL

2.5.1 The investigation indicated that the handover of the vessel to the skipper, when he first joined the vessel, was extremely limited. His knowledge of the vessel's systems and equipment was poor and this severely hampered his ability to manage the vessel safely.

2.5.2 Clearly it was the skipper's responsibility to be fully familiar with the vessel's emergency equipment, and, when asked by the CG, he should have been immediately aware that an EPIRB was not carried on board his vessel.

2.6 ELECTRICAL SAFETY ISSUES

2.6.1 It was evident that standards of electrical workmanship onboard *Kingfisher II* were variable. For example, there was widespread use of nylon connector blocks in the circuits. Whilst these are useful for temporary repairs, they should not be used as a permanent solution for connecting cables, especially if they are exposed. Electrical cables left bare in connectors substantially increase the risk of electrical failure and heating, particularly in the harsh engine room environment.

Various exposed wires were seen, and whilst there might have been no power to these cables, they should have been correctly insulated to prevent the risk of electrical shock through inadvertent re-connection. The earthing straps on both sets of batteries were also noted to be in poor condition.

2.6.2 Other indicators of poor electrical discipline included the tripping of the deck floodlighting circuit. This occurred twice prior to the fire and during earlier fishing trips. The procedure of just resetting the tripped breaker may well have masked a bigger problem. The action of routinely switching off the masthead steaming light to reduce the breaker load suggests that the system was operating at the breaker power limit.

The intermittent MaxSea plotter power supplies, and the procedure to adjust the cable to make the necessary connection, also suggests more should have been done to engage a qualified electrician to investigate electrical defects.

2.7 CREEL LOADING

2.7.1 The large number of creels that were stowed on deck at the time of the fire had a significant and detrimental effect on the safety of the vessel and her crew. A simple risk assessment on the consequences of loading so many creels, should have identified the following:

- The creels severely impeded/prevented escape from the wheelhouse in an emergency.
- General safe movement around the deck was impeded.

- Access to safety equipment was restricted, especially the liferaft, engine room sprinkler system, emergency bilge pump blanking plates and the engine room ventilators.
- Access to the domestic gas bottles was restricted, preventing these from being moved in an emergency.
- Possible adverse effects on stability of the vessel.

Had the full set of five fleets been recovered as planned, raising the number of creels stowed on board from 370 to 460, then the above problems would have been further compounded.

2.7.2 It was also noted that on this occasion, a number of plastic fish boxes were stowed in the "catcatcher". On previous voyages the boxes were stowed in the hold. Had this been the case, additional creels could have been stowed in the "catcatcher", which would have reduced the number of creels stowed elsewhere and improved safe access around the deck.

Fortunately, at the time of the fire, the weather conditions were good. The crew were able to scramble up the creels at the after end of the vessel and over the wheelhouse roof to get to the liferaft which was secured at the port bow. Had the sea state been worse, and the creels been wet, safe evacuation would have been less likely, especially as the crew were unable to access their lifejackets.

2.8 RISK ASSESSMENT AND SELF-CERTIFICATION

The owner had completed neither a risk assessment nor a self-certification process as discussed at paragraph 1.10.

2.8.1 Risk assessment

Had a competent and thorough risk assessment been conducted, it is probable the risks associated with operating *Kingfisher II* could have been substantially reduced. Notably, those identified at paragraphs 2.7.1, 2.7.2 and:

- stowage of lifejackets in an inaccessible position.
- stowage of sprinkler system selector cock handle.

2.8.2 Self-certification

Had the owner conducted self-certification, it would have prompted him to review the risk assessment to ensure that it was current, and some of the shortcomings identified in this report might well have been avoided.

In addition, the requirement for the owner to formally certify that the safety equipment carried on board *Kingfisher II* was suitably maintained, might well have prompted closer scrutiny of the onboard maintenance procedures. This, in itself, would have ensured that the vessel and crew were more prepared to deal with an emergency situation.

2.9 FATIGUE

The crew were well rested prior to sailing on 26 April, having spent the previous 3 days in port. Fatigue was not identified as a contributory factor in this accident.

2.10 MAIB REPORT OF FISHING ACCIDENT DATA

Conscious of the high incidence of accidents involving fishing vessels, the MAIB conducted an analysis of the frequency and causes of accidents in the fishing industry. The findings were published in July 2002 in the "Report on the Analysis of Fishing Vessel Accident Data 1992 – 2000".

These include:

- Lack of training to deal with emergency situations
- Lifejackets in inaccessible positions
- Lack of safety culture
- Poor maintenance
- Lack of appreciation of the risks.

Many of the safety issues raised in the report replicate those in the *Kingfisher II* accident investigation.

SECTION 3 - CONCLUSIONS

3.1 CAUSE OF THE FIRE

The fire was probably caused by an electrical equipment defect resulting in an increased current being drawn which exceeded the cable rating. This then caused the cable insulation to break down. It is likely that either the adjacent engine room after wooden bulkhead, or cable insulation, eventually ignited, causing the fire to "track" up the bunched wiring attached to the bulkhead to the plastic distribution panel.

Once the fire reached the distribution panel, the plastic components quickly ignited. The fire would have been partially contained within the steel cladding of the panel, causing it to intensify and burn through the bulkhead at the upper level.

3.2 SAFETY ISSUES

The following safety issues have been identified by the investigation. They are not listed in any order of priority:

1. There was extensive use of electrical block connectors, evidence of exposed wires and intermittent supply problems. [2.6.1, 2.6.2]

2. The large number of creels loaded on deck limited access to and from the wheelhouse, and restricted escape in an emergency. The creels also restricted safe movement around the deck, impinged on the ability to operate emergency equipment and prevented the removal of gas bottles stowed adjacent to the fire. [2.3.2, 2.7]

3. The vessel was not fitted with a fire/smoke detection system, which is not required by regulations. [2.3.3]

4. The last crew member to vacate the accommodation space failed to shut the hatch, thus preventing smoke containment. As a result, the wheelhouse was filled with dense smoke, and could not be entered, either to use the VHF radio set or to recover the emergency flares. [2.3.2]

5. When the crew were preparing to abandon the vessel, the smoke-filled accommodation prevented them from retrieving their lifejackets from the provision store in the steering gear compartment. [2.3.6]

6. The engine room after bulkhead was made from tongue and groove timber, which had no obvious fire retardant properties and was not gas tight. [2.2.5]

7. Risk assessments had not been completed on the vessel's operations and the owner of *Kingfisher II* was unaware of the requirement to conduct these. [2.8.1]

8. No self-certification procedures had been conducted, which would have validated any risk assessment, and confirmed that the safety equipment had been correctly maintained. There was no evidence that the MCA checked that self-certification had been conducted. [2.8.2]

9. The engine room sprinkler system was badly maintained and inoperable. The crew were unfamiliar with its use. [2.3.5]

10. Despite the crew having never worked together before, no emergency drills had taken place, nor were any planned. Regulations do not require drills to be undertaken. [2.4.1]

11. The skipper's knowledge of the vessel and equipment was poor, which affected his ability to operate the vessel safely. [2.5.1, 2.5.2]

SECTION 4 - ACTIONS TAKEN

4.1 MODIFICATIONS AND REPAIRS

The owner of *Kingfisher II* arranged for one smoke and one thermal detector head to be fitted in both the engine room and accommodation area.

These modifications were incorporated as part of the post-fire repair work.

The engine room, wheelhouse and accommodation were completely rewired to the latest standards.

4.2 ENGINE ROOM BULKHEAD

The engine room/accommodation bulkhead has been partially renewed in way of the fire damage and cladded with material to B15 standard.

4.3 MAIB FISHING ACCIDENT REPORT

A fishing accident summary report on the accident **(Annex E)** was issued in July 2004 providing recommendations to skippers and the fishing industry on:

- stowage location for lifejackets.
- fitting of smoke/fire detection systems.
- providing safe access to emergency equipment.
- the benefits of conducting emergency drills.
- the benefits of conducting risk assessments and self-certification.

SECTION 5 - RECOMMENDATIONS

The owner of *Kingfisher II* is recommended to:

2004/246 Conduct a risk assessment of the operation of his vessels in accordance with MSN 1756(F) – The Fishing Vessel Code of Practice for the Safety of Small Fishing Vessels under 12 metres in length. Particular attention should be given to the risks associated with carrying large numbers of creels, especially with respect to keeping escape routes and access to emergency equipment clear.

2004/247 Establish self-certification procedures in accordance with MSN 1756(F) – The Fishing Vessel Code of Practice for the Safety of Small Fishing Vessels under 12 metres in length.

The Maritime and Coastguard Agency is recommended to:

2004/248 In its current work in defining future Standards of Training, Certification and Watchkeeping (Fishing), specify qualifications and training requirements for fishing vessel skippers.

2004/249 Consider with the fishing industry how best to improve understanding of the risk assessment process and requirement, and how to effectively monitor compliance.

2004/250 To examine the quality of "Code" inspections to ensure that risk assessment and self-certification procedures are followed and to identify defects which may affect the safety of the vessel and crew.

Marine Accident Investigation Branch
November 2004

ANNEX A

SIAS report dated 17 November 2003

SIAS

UK & DT Inspection/Survey Details

Ship Details

Ship ID 54618 **Next ID** **Group ID** 7266

Ship Name KINGFISHER

IMO Number 0000000 **Official Number** B12336

FV Number SY56 **Call Sign**

Ship Type F2 - Fishing Vessel - Wood

Flag 670 - UNITED KINGDOM

Class. Society 0 - NONE

Owner R J MacLennan, 2 Hacklete, Great Bernera

Year of Build 1991 **UK Class Code** X

Kw 85 **Dead Weight**

Length(m) 11.58 **Gross Tonnage** 12.7

Inspection Details

Marine Office Glasgow

Inspection Date 17/11/2003 **Input Date** 26/11/2003

Detained? N **Release Date**

Country UNITED KINGDOM

Place Stornoway

Inspection Type Targeted **Inspected at Sea?** N

MACRIS Codes

Comments inspected @ Stockinish, Harris

Ship Actions

Inspection has no ship actions

Survey Details

Inspection has no surveys

Certificate Details

Inspection has no certificates

Deficiency Details

Code	Surveyor's Description	Regulation Ref	Relates to survey?	Actions
620	service liferaft & fit HRU		I	17

720	service extinguishers	I	17
720	replace ER foam extinguisher	I	17
1550	all round white light inoperable	I	17

Return to main menu Back

ANNEX B

Examples of engine room electrical cable
and distribution panel damage

Remnants of distribution box

ANNEX C

Examples of fire damage to the engine room after bulkhead

Views from accommodation area

Views from engine room

ANNEX D

Extract of MSN 1756(F) - The Fishing Vessels Code of Practice
for the Safety of Small Fishing Vessels under 12 metres in length
(Paragraphs 4.4 to 5.12)

Risk Assessment

4.4 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 came into force on 31 March 1998. Under those regulations employers are required to make a suitable and sufficient assessment of the risks to the health and safety of workers arising in the normal course of their activities or duties. Guidance on these regulations and on the principles of risk assessment is contained in a Marine Guidance Note (currently MGN 20 M+F).

4.5 A risk assessment is intended to be a careful examination of what, in the nature of operations, could cause harm, so that decisions can be made as to whether enough precautions have been taken or whether more should be done.

4.6 The assessment should first identify the hazards that are present and then establish whether a hazard is significant and whether it is already covered by satisfactory precautions to control the risk, including consideration of the likelihood of the failure of those precautions that are in place.

4.7 It is not a requirement of the Merchant Shipping and Fishing Vessels (Health and Safety at Work Regulations) 1997 that risk assessments be written. **Nevertheless, the MCA strongly recommends that such assessments be written**. An example of a suitable standard of written risk assessment is included in the Fishing Vessel Safety Folder developed by and available from Seafish, which also provides pro-forma guidance on fishing vessel risk assessment, both generally and in relation to particular modes of fishing.

5. Compliance Procedures and Inspections

New Vessels

5.1 New fishing vessels, with a registered length of less than 12 metres, (defined as those for which a keel was laid or construction or lay-up was started after 1 April 2001) must comply with the Construction Standards issued by Seafish or an equivalent standard recognised by MCA prior to commencement of construction. A certificate showing compliance with the Seafish standards or an equivalent standard must be issued by the construction standard authority.

5.2 To operate a new vessel under the Code the owner must complete a health and safety risk assessment, the vessel must have been inspected by MCA and an Inspection Form issued, and a compliance certificate must have been issued by the construction standard's authority. Thereafter, the vessel must maintain compliance with The Code.

Existing Vessels

5.3 The owner of every existing fishing vessel with a registered length of less than 12 metres must ensure that the vessel complies with the checklist of requirements appropriate to the length and construction of the vessel, that a health and safety risk assessment has been completed, and that a self-certification declaration has been completed.

5.4 One month before the Code comes into effect the MCA will write to owners of all existing fishing vessels with a registered length of less than 12 metres explaining the action to be taken on entry into force of the Code.

All Vessels

Inspections

5.5 A vessel may be inspected by the MCA at any time to check compliance with Code requirements. On satisfactory completion of the inspection an Inspection Form will be issued. If deficiencies are found which necessitate follow-up visits, fees will be charged to the owner in accordance with the MCA fee regulations applicable at the time of the follow-up visit.

Annual Self-Certification

5.6 Within 1 month of the anniversary of the vessel's registration, the owner (or other competent person employed by the owner) must inspect the vessel to confirm that the safety equipment carried on board the vessel has been suitably maintained, that the safety and other specified equipment continues to comply with the checklist of safety equipment appropriate to the length and construction of the vessel. The health and safety risk assessment must also be checked to ensure that it remains appropriate to the vessel's fishing method and operation. If there has been a change of fishing method or of operational practice since the previous health and safety risk assessment was completed, the assessment should be revised accordingly.

5.7 On completion of these annual checks, the owner should sign a self-certification declaration confirming that the vessel complies with the Code, and retain the declaration for inspection purposes.

Change of ownership

5.8 Risk assessments of the vessel are particular to each employer. When a vessel is sold, the new owner must complete, or arrange the completion of, a new risk assessment and self-assessment in accordance with paragraph 5.6.

Penalties

5.9 A vessel that is found, in the course of inspection, not to have been equipped, the safety equipment properly maintained, assessed and self-certificated in accordance with the Code will be liable to detention by the MCA. An owner whose vessel fails to comply with the Code or who makes a false declaration may be liable to prosecution. A skipper who fails to operate the vessel in accordance with the Code may be liable to prosecution.

Appeal Procedures

5.10 If an owner is dissatisfied with an inspection and agreement cannot be reached with the person who carried out the inspection, the owner may refer the matter to the Principal Marine Surveyor (Fishing Vessels) in the Region where the vessel was inspected.

5.11 Should the above procedure fail to resolve the disagreement, the owner may refer the matter to the Head of Maritime Operations at MCA headquarters, and, if necessary, to the MCA Chief Executive who will ensure the complaint is looked into thoroughly.

5.12 If an owner is still not content with the way in which the complaint has been handled by the MCA, a request may be made for it to be referred to an adjudicator who is independent of the MCA.

ANNEX E

MAIB Fishing Accident Report dated July 2004

MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

FISHING ACCIDENT REPORT

Engine Room Fire in an 11.6 metre Wooden Creel Boat

In the early morning on a fine day in April 2004, a coastguard station received a “Mayday” mobile telephone call from the skipper of a wooden creel boat. The skipper reported that the engine room was on fire and that the crew were taking to the liferaft.

At the time of the accident there were about 370 creels stowed onboard the fishing vessel, with a further 90 due to be recovered. The creels were stowed in the “cat catcher” and around the wheelhouse, severely restricting personal access/egress and making movement about the boat precarious, especially in an emergency. The creels also prevented access to the deckwash pump and associated engine room water sprinkler selector valve, bilge emergency pumping arrangements and domestic gas bottle stowage.

All had been normal until a crew member reported smoke entering the accommodation from the engine room. Because the vessel was not fitted with a smoke/fire detection system there was no prior warning, and therefore there was no chance to fight the fire in the early stages.

The skipper opened the engine room hatch situated in the wheelhouse. He was confronted by thick acrid smoke that immediately filled the wheelhouse, making the area untenable, and there was no time to attack the fire. The two crew evacuated the accommodation area via the wheelhouse, but the accommodation hatch was left open, allowing the wheelhouse to continually fill with smoke. This prevented the skipper from using the VHF radio to report the emergency to the coastguard, and from using the emergency flares that were stowed in the wheelhouse.

Unclear of the extent of the fire, the skipper believed it to be beyond his control. His fears worsened because he could not move flammable gas bottles that were stowed on deck above the fire, this was due to the number of the creels in the area. He ordered the boat to be abandoned. The liferaft was launched, and the crew embarked without their lifejackets as these were stowed in an area that was now inaccessible due to the smoke.

Fortunately, a nearby trawler picked up the four crew from the liferaft. They were shocked but otherwise uninjured. The vessel was later towed safely into harbour where the local fire brigade extinguished the fire.

The crew had been together for about two weeks prior to the accident. Their knowledge of the vessel's emergency equipment, including the engine sprinkler system, was superficial. There had been no discussions on what to do in an emergency, and no drills had been conducted and none were planned.

On this occasion the crew were extremely lucky. The outcome could so easily have been different had the weather been poor, and had the liferaft failed to inflate correctly and a mobile telephone signal not be obtained.

All the evidence suggests that the cause of the fire was an electrical defect that ignited cable insulation and, subsequently, the main electrical distribution panel and the wooden bulkhead between the engine room and accommodation area.

Recommendations

Owners and skippers of UK fishing vessels under 15 metres are recommended to:

1. Encourage the use of "constant wear" lifejackets whilst on deck. When not in use, these, and normal inflatable lifejackets, should be stowed in a location that will always be accessible on evacuation. Consideration should be given to providing an upper deck stowage close to an evacuation route.

2. Consider fitting a smoke/fire detection and alarm system in the engine room and accommodation areas to improve the chances of investigating and tackling a fire in the early stages of its development.

3. Be aware of the dangers of excessive deck loading that restricts access to:
   - evacuation routes and safe passage across deck areas.
   - lifesaving apparatus.
   - emergency equipment, including bilge pumping arrangements, remote fixed fire-fighting facilities and volatile and explosive materials that may require removal in the event of a fire.

4. Encourage the routine conduct of drills so that actions in an emergency become instinctive, thus improving the chances of survivability.

5. Carefully consider, and take into account, the above recommendations when conducting risk assessments and self certification as required by the regulations.

July 2004