

**06-208** fishing vessel, *Santa Maria II*, engine room fire,  
105 nautical miles west-southwest, L'Esperance Rock,  
Kermadec Island

**10 December 2006**

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## **Report 06-208**

**fishing vessel  
*Santa Maria II***

**engine room fire**

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Kermadec Islands**

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### **Abstract**

On Sunday 10 December 2006 at about 1230, the fishing vessel *Santa Maria II* with a skipper, 4 crew members and a Ministry of Fisheries observer on board was fishing off the Kermadec Islands in Fisheries Management Area 10 when a fire was discovered in the engine room. The skipper issued a distress message while the rest of the crew sealed the engine room and attempted to discharge fire suppressant into the engine room.

As a precautionary measure the crew launched and trailed the liferaft astern of the vessel. Four of the crew boarded the liferaft while the 2 remaining crew monitored the situation from the vessel's afterdeck. After about an hour they thought the fire was out, so the crew in the liferaft re-boarded the vessel and the skipper donned a self-contained breathing apparatus and inspected the engine room. The fire had been extinguished, so the crew started to ventilate the space and restore electrical power.

Maritime Radio acknowledged then relayed the distress message and several vessels responded to the relayed message. The *Santa Maria II*, via the owner, contacted 2 other company vessels in the vicinity which responded allowing the other vessels to be stood down. The *Seawin Emerald* brought the *Santa Maria II* to Tauranga under tow.

Safety issues identified included:

- the standard of safety housekeeping on board the vessel
- the non-standard fitment of fixed fire-fighting equipment
- the standard of surveying provided by safe ship management companies
- the difficulty and confusion surrounding the regulatory certificate and seagoing limit structure

Safety recommendations were made to the Director of Maritime New Zealand to address these issues.



*The Santa Maria II in Tauranga*

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## Abbreviations

|               |  |
|---------------|--|
| ADHF          | advanced deckhand fishing certificate of competency          |
| CO2           | carbon dioxide   |
| EPIRB         | emergency position indicating radio beacon                   |
| FMA           | fisheries management area                                    |
| GIS           | geographic information system                                |
| GPS           | global positioning system                                    |
| GRP           | glass-reinforced plastic                                     |
| kHz           | kilohertz  |
| m             | metre(s)   |
| Maritime NZ   | Maritime New Zealand   |
| MEC4          | marine engineer class 4 certificate of competency            |
| MEC6          | marine engineer class 6 certificate of competency            |
| MFish         | Ministry of Fisheries  |
| mm            | millimetre(s)  |
| NABIS         | National Aquatic Biodiversity Information System             |
| NZOM          | New Zealand offshore master's certificate of competency      |
| NZOM          | New Zealand offshore watchkeeper's certificate of competency |
| SSB           | single side band   |
| SSM           | safe ship management   |
| Survey Nelson | Survey Nelson Limited  |
| UTC           | co-ordinated universal time                                  |

## Glossary

|                           |   |
|---------------------------|---|
| fisheries management area | a defined area of the New Zealand exclusive economic zone used for fisheries management   |
| distress call             | a verbal radio call used to indicate that a ship or aircraft or person is threatened by grave and imminent danger and requires immediate assistance |
| echo sounder              | a device for measuring the depth of water below a vessel's bottom   |
| gross tonnage             | a measure of the internal capacity of a vessel; enclosed spaces are measured in cubic metres and the tonnage derived by formula                     |
| knot                      | one nautical mile per hour  |
| painter                   | a rope at the bow of a boat for securing or for towing purposes   |
| urgency call              | a verbal radio call used to indicate that a ship or aircraft or person has a very urgent message to transmit concerning its safety                  |



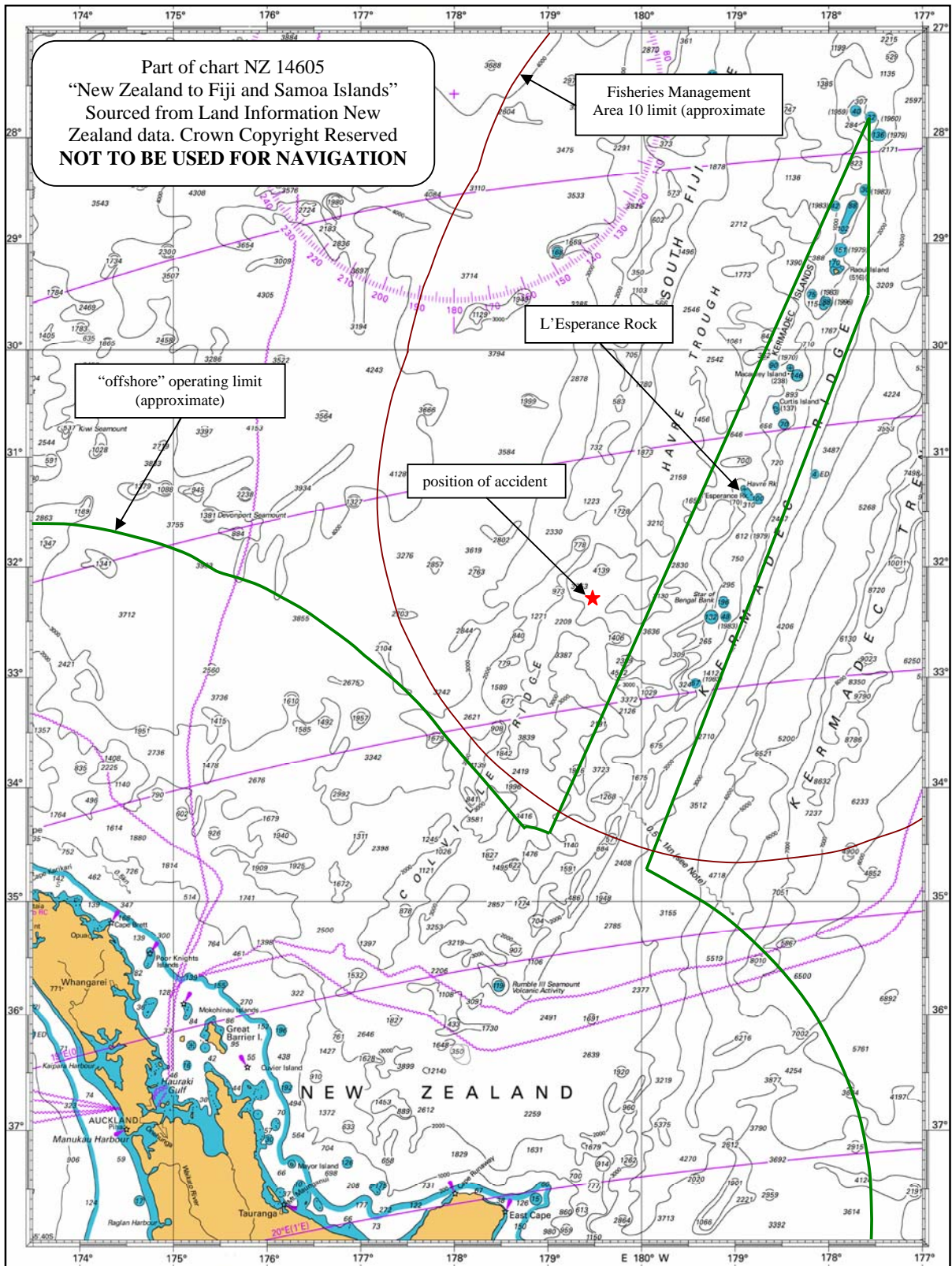
## Data Summary

### Vessel particulars:

|                                |   |
|--------------------------------|---|
| Name:                          | <i>Santa Maria II</i>   |
| Type:                          | Fibre Reinforced Plastic Fishing Ship   |
| Limits:                        | Offshore  |
| Safe ship management:          | Survey Nelson Limited   |
| Length:                        | 28.48 m   |
| Breadth:                       | 4.90 m  |
| Gross tonnage:                 | 74  |
| Built:                         | 1981, Japan   |
| Propulsion:                    | single 6-cylinder in line Daihatsu D518A diesel engine, driving a single fixed pitch propeller through a reversing gearbox. |
| Service speed:                 | 7 knots   |
| Owner/Operator:                | Pescatore Fishing Limited   |
| Port of registry:              | Wellington  |
| Minimum crew:                  | 5   |
| <b>Date and time:</b>          | 10 December 2006 at about 1230 <sup>1</sup>   |
| <b>Location:</b>               | 105 nautical miles west-southwest, L'Esperance Rock,<br>Kermadec Islands.<br>Latitude 32° 17' S Longitude 179° 30' E        |
| <b>Persons on board:</b>       | crew: 5<br>MFish observer: one  |
| <b>Injuries:</b>               | crew: nil<br>passengers: nil  |
| <b>Damage:</b>                 | extensive fire damage to engine room and wiring   |
| <b>Investigator-in-charge:</b> | Captain Iain Hill   |

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<sup>1</sup> Times in this report are New Zealand Daylight Time (UTC + 13 hours) and are expressed in the 24-hour mode



**Figure 1**  
**General area of accident**

# 1 Factual Information

## 1.1 Narrative

- 1.1.1 On Thursday 7 December 2006 at about 1600, the fishing vessel *Santa Maria II* departed Auckland for the fishing grounds off the Kermadec Islands. A skipper, 4 crew members and one Ministry of Fisheries (MFish) observer were on board. After sailing, a short safety familiarisation and training exercise was undertaken.
- 1.1.2 On Saturday 9 December at about 2000, the vessel arrived at the fishing grounds and started setting the line. By about 0100 the next day the line was set and its position marked with global positioning system (GPS) beacons. The line was detached from the vessel, the main engine stopped and the vessel drifted whilst the line “soaked” overnight.
- 1.1.3 On Sunday 10 December at about 0900, the main engine was restarted and the vessel set off to retrieve the line. At about 1140, No.5 GPS beacon was located and the crew started retrieving the first section of the line.
- 1.1.4 The skipper who was conning the vessel from the remote helm station on the main deck, estimated the swell to be about 3 to 4m with winds of southeast 30 knots.
- 1.1.5 At about 1205 the first fish were hauled on board. A short time later the engineer left the engine room to assist the other crew on the main deck.
- 1.1.6 At about 1230 the skipper attempted to put the engine control to the ahead position and noticed there was no response from the engine. At about the same time the crew on deck became aware of the smell of smoke. Turning around from their tasks to look astern they saw black smoke billowing from the engine room exhaust vents.
- 1.1.7 The skipper ordered the crew to don their lifejackets and prepare the emergency position indicating radio beacon (EPIRB) and life raft. He then went to the wheelhouse to make a distress call on the single side band (SSB) radio on frequency 4417 kilohertz (kHz). The crew of the fishing vessel *Rebecca Mae* heard the call and relayed it to Maritime Radio at about 1231.
- 1.1.8 The crew of the *Santa Maria II* mustered at the aft end of the vessel, donned their lifejackets and made ready the life raft and EPIRB. The engineer shut down the generator and secured the engine room vent flaps. Once the engineer was satisfied that the engine room was secure and all crew were accounted for, he operated the gaseous fixed fire-fighting system to the engine room by pulling the remote release wire located in the crew mess room.
- 1.1.9 At about 1234 the skipper received a situation update from the engineer and radioed the vessels position to Maritime Radio on SSB 6215 kHz, advising that they were preparing to abandon ship. The skipper then went aft and joined the remainder of the crew. The life raft had been launched and was tied to the stern of the vessel by its painter. During launching the wind had overturned the liferaft, but the crew had managed to right it.
- 1.1.10 The skipper was unable to persuade any of the crew to enter the water and board the life raft, so he jumped into the water and swam over to the life raft and boarded it. Three of the other crew then joined him in the life raft, which remained tethered to the vessel by its painter. The MFish observer and the engineer remained on board, unwilling to leave the vessel until absolutely necessary.
- 1.1.11 The engineer continued to monitor the situation by periodically checking the temperature of the engine room bulkheads and doors with the back of his hand. He did not note an increase in temperature of the engine room bulkheads.

- 1.1.12 At about 1300, the engineer went to the wheelhouse to call Maritime Radio on SSB 6215 kHz. He advised them that the engine room was sealed but they were unsure if the fire-extinguishing system had operated correctly, so they intended to wait for the engine room to cool down. He requested that Maritime Radio try to contact the fishing vessels *Seawin Emerald* and *Rose Louise*, which were believed to be in the area and able to assist.
- 1.1.13 At about 1330, the skipper and 3 crewmen re-boarded the vessel from the life raft. Once back on board, the skipper put on a self-contained breathing apparatus and entered the engine room to check the situation. He satisfied himself that the fire was out, then advised Maritime Radio by SSB radio of this but that the vessel was on battery power and would probably require towing back to port. At about 1345 the skipper downgraded the distress call to an urgency call.
- 1.1.14 The crew then vented the engine room by re-opening the engine room vents and opening the engine room hatches. Once the atmosphere had cleared sufficiently the engineer was able to start a generator to power the engine room fans and assist with the ventilation.
- 1.1.15 Maritime Radio contacted the vessel's owner who organised for the fishing vessels *Rose Louise* and *Seawin Emerald* to divert to assist the *Santa Maria II*. The *Rose Louise* rendezvoused with the *Santa Maria II* at about 2215, and stood by as it was decided not to attempt a tow in the dark due to the prevailing weather conditions.
- 1.1.16 After the *Rose Louise* had arrived on scene the engineer tested the main engine but shut it down due to concern over the amount of fumes entering the engine room. The source of the fumes appeared to be melted debris from the fire that had fallen onto the engine.
- 1.1.17 On Monday 11 December at about 0530, after further cleaning, the main engine of the *Santa Maria II* was started and the vessel conned in search of the fishing line. However, at about 1200 the main engine was again stopped due to concern over fumes being given off causing discomfort to the crew.
- 1.1.18 During the afternoon of 11 December, the *Seawin Emerald* arrived on scene and hauled in the *Santa Maria II*'s fishing gear. A decision was made that the *Seawin Emerald* would tow the *Santa Maria II* to a New Zealand port and the *Rose Louise* was dismissed.
- 1.1.19 At about 2100 the fishing gear had been retrieved and the *Seawin Emerald* took the *Santa Maria II* under tow setting a course for Tauranga at about 5 knots. The MFish observer and one crew member were transferred to the *Seawin Emerald* for the voyage home.
- 1.1.20 On Wednesday 14 December at about 1730, the *Santa Maria II* and *Seawin Emerald* arrived at "A" Buoy off Tauranga. The *Santa Maria II* was then taken under tow by *Lady Kay*, a small harbour tug, and berthed alongside in Tauranga.

## 1.2 Vessel information

- 1.2.1 The *Santa Maria II* was owned and operated by Pescatore Fishing Limited. The vessel was under safe ship management (SSM) with Survey Nelson Limited (Survey Nelson) and certified fit to operate as a New Zealand fishing ship in the Offshore area. Survey Nelson was an approved SSM provider recognised by Maritime New Zealand<sup>2</sup> (Maritime NZ) and had supplied SSM services to the owner of the *Santa Maria II* throughout the vessel's tenure in New Zealand.
- 1.2.2 The vessel was a 28.48 m fishing vessel built in Japan in 1978. It was built to a standard Japanese fishing vessel design and constructed of glass-reinforced plastic (GRP). It had a beam of 4.90 m and a gross tonnage of 74.

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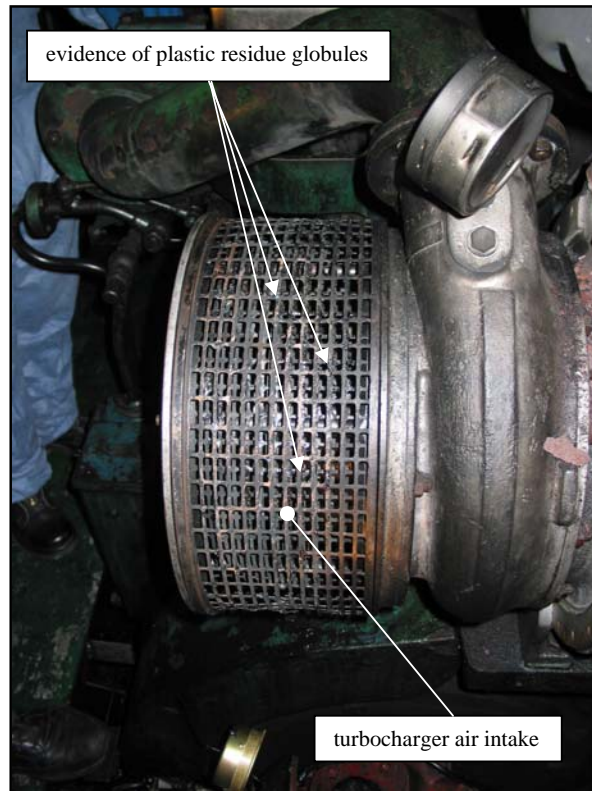
<sup>2</sup> The Maritime Safety Authority's name changed on 1 July 2005 to Maritime New Zealand. The current name Maritime New Zealand and the abbreviation Maritime NZ have been used throughout the report for consistency.

- 1.2.3 The vessel was powered by a 6-cylinder Daihatsu D518A diesel engine which developed 377 kilowatts at 300 revolutions per minute through a reversing gearbox to a single fixed-pitch propeller.
- 1.2.4 The vessel was required to be equipped with fire-fighting and life saving equipment as detailed in Maritime Rules Part 40D Design Construction and Equipment – Fishing Ships. Maritime Rule 40D Appendix 1 paragraph 1.2 Life Saving Appliances and Maritime Rule 40D Appendix 2 paragraph 2.2 Fire Fighting Appliances are copied in Appendix 1 of this report. They list the life saving and fire fighting equipment *Santa Maria II* was required to carry.
- 1.2.5 The engine room space was protected by a fixed fire-suppression installation that used NAF-S-III gas as a suppressant. NAF-S-III extinguished a fire by interfering with the combustion process. The gas was stored under pressure in a single steel cylinder within the engine room space. The system was operated from a remote station positioned on the bulkhead adjacent to the engine room access door in the crew accommodation at the aft end of the vessel. The remote station was connected by a flexible wire to the valve actuating lever on the cylinder. Pulling on the wire swung the actuating valve lever over in an arc which opened a valve and discharged the suppressant gas from the storage cylinder through a piped distribution system to nozzles at various points in the engine room.
- 1.2.6 The NAF-S-III gas cylinder and valve assembly were protected from damage by a cover fabricated from aluminium checker plate fixed to the solid GRP frames with self-tapping screws. Since the installation of the cylinder and valve assembly, the cover had been fixed at varying heights relative to the cylinder and valve, as evidenced by the plethora of screw holes in the adjacent frames.
- 1.2.7 The fire-fighting equipment on board *Santa Maria II* had been examined and serviced by an approved supplier on 24 March 2006; this included a full visual inspection of the fixed fire-suppression system.
- 1.2.8 The vessel was fitted with the standard equipment necessary for navigation and fishing which included:
- a Sauru Keiki magnetic compass
  - a TQM autopilot
  - a JRC JMA 2254 rasterscan radar
  - a JRC JFV 130 colour echo sounder
  - a Furuno GP 50 Mk2 GPS
  - an Icom IC-M710 AUS medium frequency/high frequency transceiver
  - an ICOM very high frequency transceiver
  - a Taiyo ADDF TD-L1100 direction finder
  - a satellite communications package of telephone, email and data transmission.

### **Engine room examination post fire**

- 1.2.9 The Commission inspected the engine room of the *Santa Maria II* after its arrival in Tauranga to try to determine the cause of the fire, and engaged the services of a fire safety officer from the New Zealand Fire Service to assist in the investigation.
- 1.2.10 The engine room had been left virtually undisturbed since the fire, other than the vessel's engineer clearing fire debris away from the main engine air intake during his post-fire attempts at running the main engine. Damage, other than smoke damage, was limited to the aft end of the compartment away from the vessel's generators which were able to be started and provided electrical power after the fire.

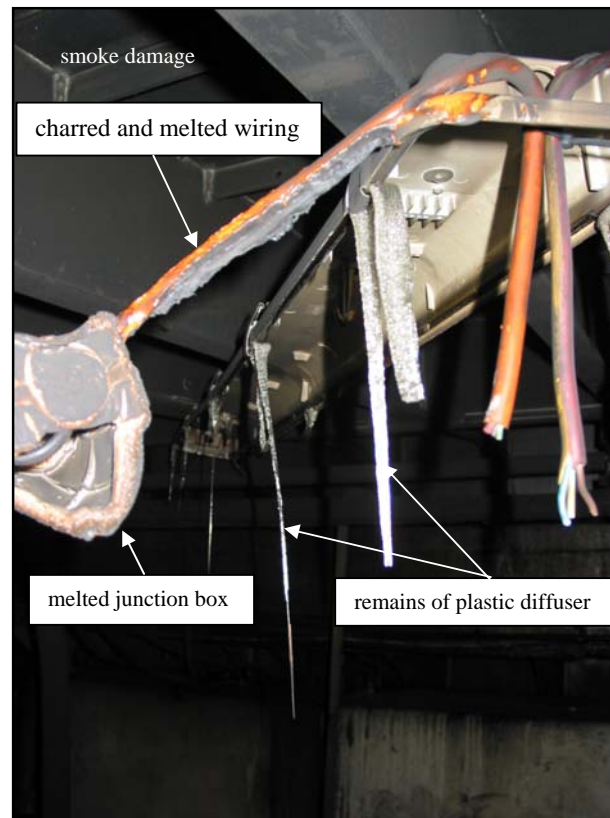
- 1.2.11 An inspection of the engine and the surrounding area did not reveal an obvious seat of the fire, nor any evidence that a fire had occurred other than that of heat damage to plastic material and fittings above the engine, plus a thick layer of soot throughout the upper levels of the engine room.



**Figure 2**  
**Turbocharger air intake showing melted plastic globules**

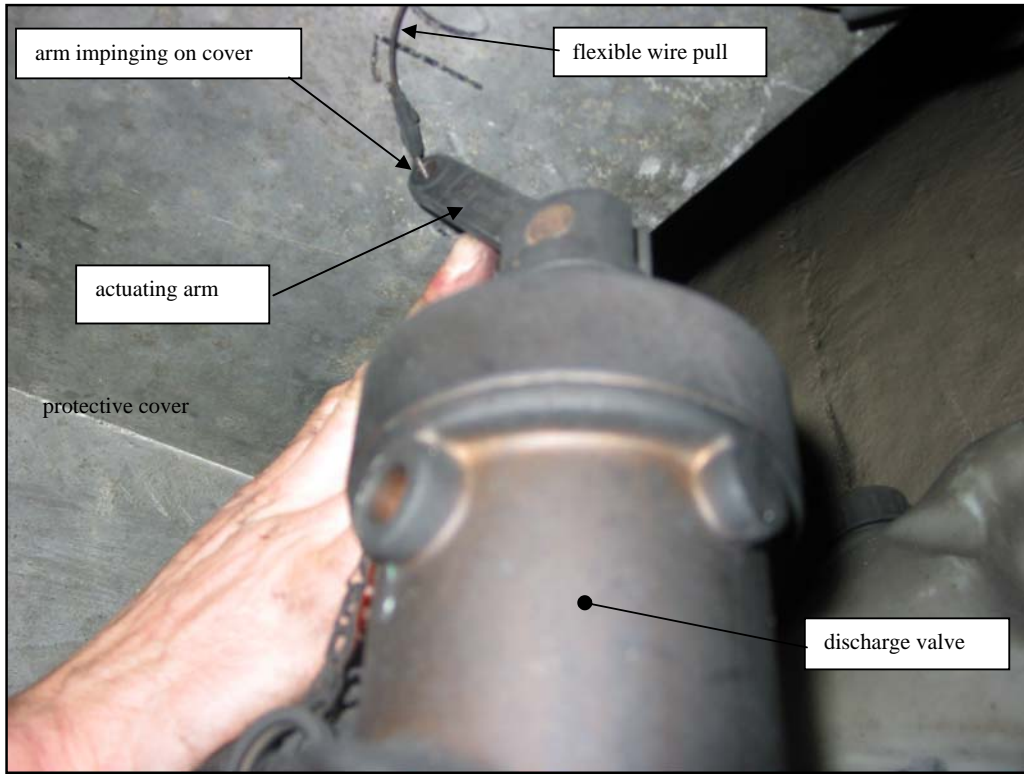
- 1.2.12 Inspection of the area around the turbocharger revealed:
- small globules of plastic on the air intake
  - a small pool of plastic directly below the turbocharger
  - a melted plastic container wedged between the engine and the tank top walkway forward of the turbocharger
  - the plastic diffuser on the fluorescent light above the engine forward of the turbocharger was missing
  - the plastic diffuser on the fluorescent light above the turbocharger aft of the engine had melted and dripped onto the deck below (see Figure 3)
  - the plastic filter “glass” on the fuel line, from the day tank to the fuel pump, on the bulkhead adjacent to the turbocharger had deformed under the heat and had ruptured, discharging about 650 litres of diesel into the bilges.
- 1.2.13 Inspection of the general engine room area showed:
- there was a pair of plastic wet-weather over-trousers that had been hung over the rail at the entrance to the engine room; these had been severely damaged by the fire
  - the fuel line linking the daily use tank to the fuel filter and main engine was fitted with a stop valve before the filter; this was able to be closed remotely from a cupboard located in the accommodation by means of a flexible wire pull to the valve. The wire ran at a height of about 50millimetres across the deck in the engine room. Where the wire passed

through the bulkhead to the accommodation it passed through a small-diameter tube. This wire had, at some time in the past, broken and had been repaired by knotting (see Figure 6). The knot was unable to pass through this tube, so the valve could not fully shut remotely. At the time of the inspection a steel rod about 40mm diameter and 600mm in length was lying across the wire further hindering movement

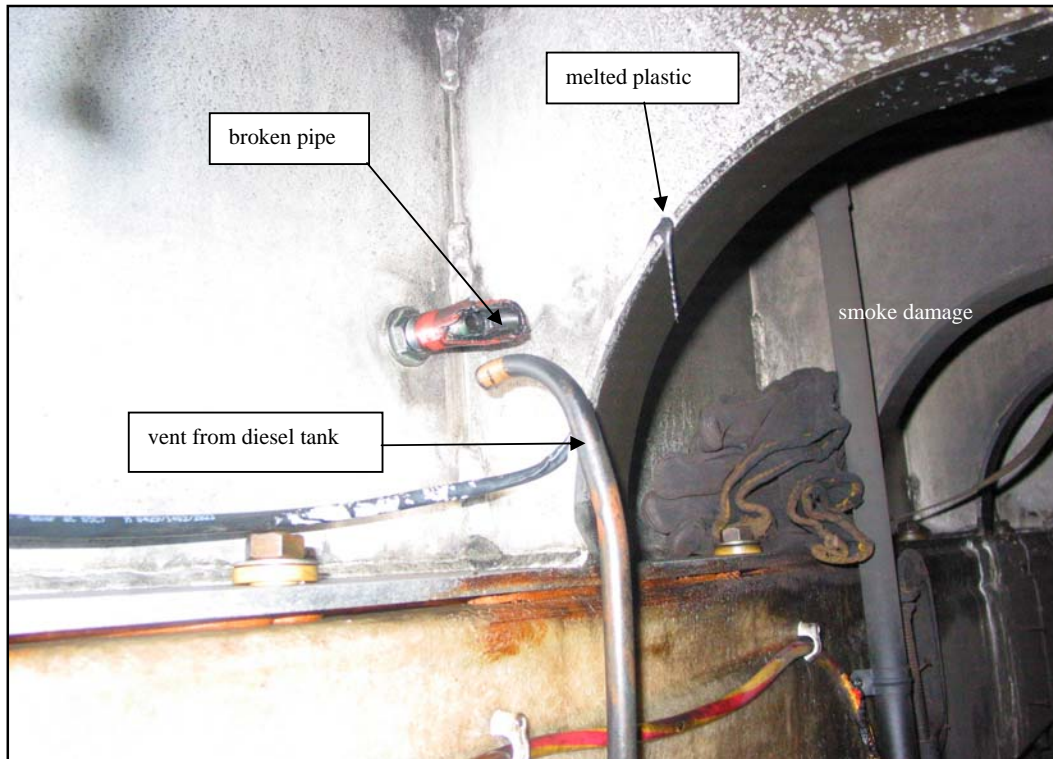


**Figure 3**  
**Light fitting aft of the main engine showing melted diffuser and burnt wiring**

- where the hydraulic pipes from the hydraulic pump, located aft of the main engine, ran forward to the line winch they were routed across the deckhead of the engineroom. These lines had been insulated using what appeared to be household foam rubber pipe insulation; the insulation was soaked in hydraulic fluid from an undetected leak in the pipes. The insulation was charred and brittle in the region above the turbocharger from the effects of the fire
- the cylinder and actuating valve for the fixed fire-suppression system were located on the port side of the engine room at entry level. On removing the checker plate cover to inspect the cylinder and valve the full contents of the gas cylinder were released into the engine room. Investigation revealed that the cover, at some time in the past, had been secured in place too low to allow the actuating lever to complete its arc of travel, the lever coming to rest wedged against the cover at the lever's highest point of travel (see Figure 4). Removal of the cover allowed the lever to move sufficiently to discharge the gas
- there were numerous plastic containers, aerosol cans and rags throughout the engine room. Some had been securely stowed away but the majority were unsecured in various parts of the engine room
- located by the main engine at tank top level was an open 20-litre plastic container full of diesel which was used for soaking and washing the main engine air filters



**Figure 4**  
**Fire-suppressant gas actuator arm impinging on protective case**



**Figure 5**  
**Broken vent connection between diesel oil tank and deck penetration**



- the gauge glass for the hydraulic oil tank was not fitted correctly. A length of fibre-braided plastic hose covered a gap in the top joint. The bottom joint was taped together presumably to stop leakage
- the vent from the diesel oil daily use tank was connected to the deck penetration with a length of what appeared to be garden hose. This hose had either melted from the heat of the fire or prolonged exposure to diesel fumes or worn through from vibration (see Figure 5). The tank therefore vented into the engine room
- neither of the generators located in the forward part of the engine room were fitted with guards over the drive belts.

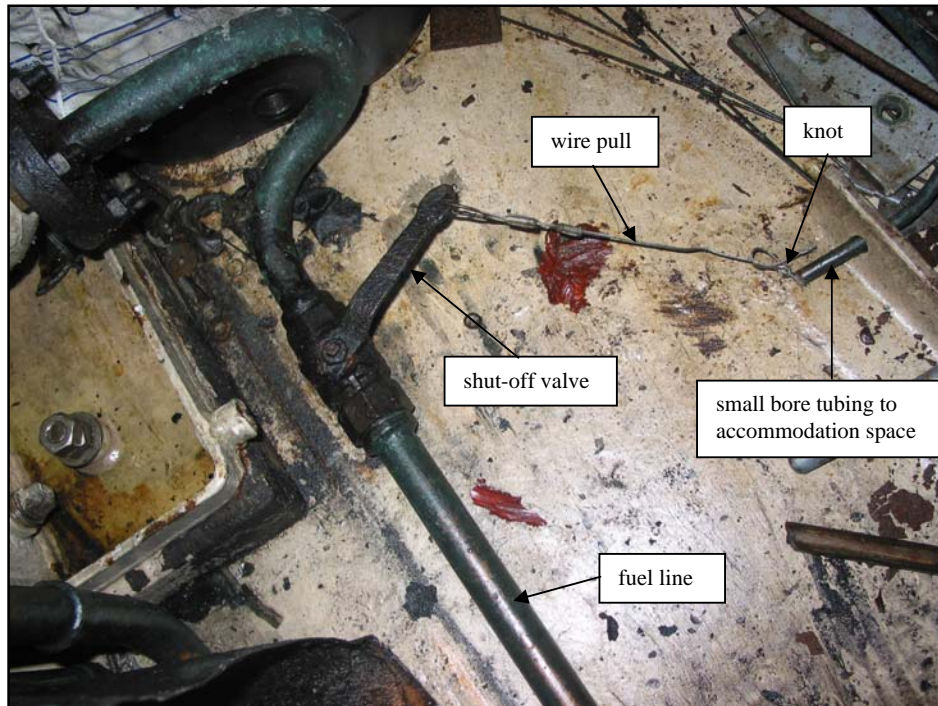
1.2.14 The fire safety officer stated in his report that the conditions:

indicated a small fire burning for sufficient time to increase the heat in the engine bay to a temperature high enough to melt light fittings and plastic containers in the engine room confines. Whatever was burning generated dense smoke, and was totally consumed in the combustible process, leaving little or no evidence of a fire seat.

Indications are that either a plastic container or parts of a plastic light fitting has fallen on the engine in the area of the turbocharger. Ignition would have been from the hot turbocharger or engine exhaust, the plastic item possibly being held against the turbocharger by the force of the air being taken into the engine rather than falling to the deck.

### 1.3 Damage

1.3.1 The *Santa Maria II* sustained extensive smoke damage to the entire engine room, minor damage to the electrical circuitry and minor damage to the main engine turbine and casing.



**Figure 6**  
**Emergency diesel fuel shut-off valve showing knotted wire pull**

### 1.4 Personnel information

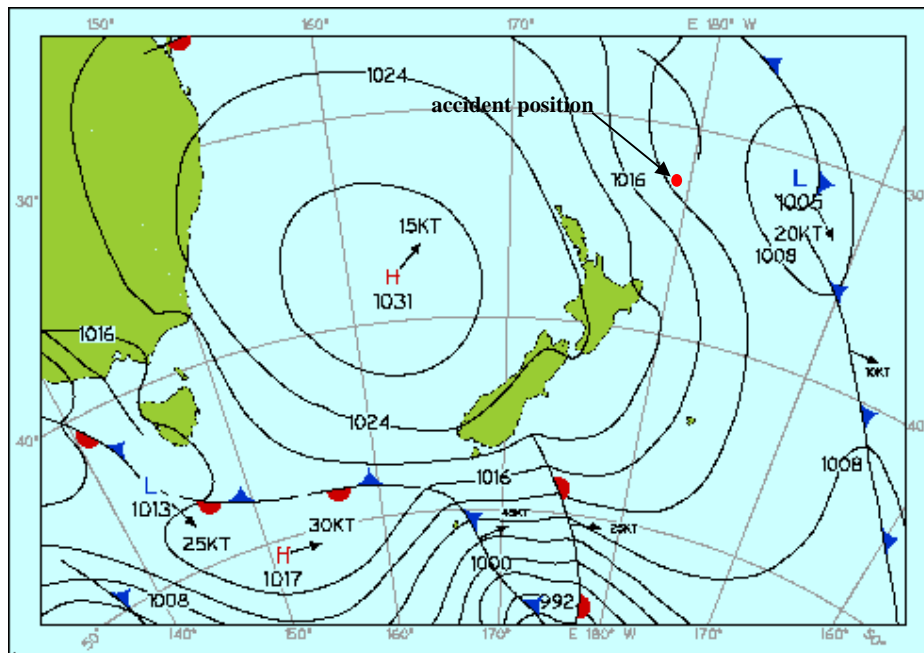
1.4.1 The skipper of the *Santa Maria II* had started his fishing career in 1989 and slowly worked up through the ranks in the fishing industry in New Zealand and Australia. He held a New Zealand

coastal master's certificate of competency and a New Zealand second class diesel trawler engineer's certificate of competency. He also held an Australian skipper grade 3 certificate of competency. He had been working for Pescatore Fishing Limited for the previous 2 months and an associate Australian company for 3 months prior to that.

- 1.4.2 The mate/engineer of the *Santa Maria II* started his seagoing career in 1986 and had worked exclusively for New Zealand companies since then. He held a New Zealand offshore master's certificate of competency and a New Zealand marine engineer class 6 certificate of competency. He had been the skipper of the *Santa Maria II* previously for about 18 months.
- 1.4.3 One of the crew of the *Santa Maria II* held a New Zealand qualified fishing deckhand certificate of competency; the other 2 members of the crew did not hold any maritime qualification.
- 1.4.4 The MFish observer on the *Santa Maria II* had worked as a fishing catch observer since 1994; he had accumulated about 1200 sea days as an observer on board various fishing boats. He held no maritime qualification.
- 1.4.5 The role of an MFish observer on board was to collect information on the catch, the types of and amounts of fish caught and incidental non-fish by-catch which is anything that is not fish such as seabirds, seals and turtles that may be caught on the lines. The observer would also scrutinise the vessel's books to ensure that they were up to date and completed correctly. The information gleaned was used by MFish and by other agencies such as the Department of Conservation and the National Institute of Water and Atmospheric Research.

## 1.5 Climatic conditions

- 1.5.1 The weather at the time of the accident was described by those on board as being grey and overcast with a 30- to 40-knot south-westerly wind. The swell was described as being between 3 and 4 m, also from a southerly direction.



**Figure 7**  
**Mean sea level analysis synoptic chart for about the time of the fire.**

## 1.6 Organisational and management information

- 1.6.1 The *Santa Maria II* had been brought into New Zealand from Japan in late August early September 1994. Maritime NZ issued the vessel with a New Zealand tonnage certificate and a certificate of survey as fit to ply as a New Zealand Fishing Ship Class X. To comply with the New Zealand regulations current at the time, in early 1995 a 16-kilogramme or larger carbon dioxide (CO<sub>2</sub>) fire extinguisher was fitted in the engine room.
- 1.6.2 As part of new legislation, Maritime Rules Part 21 Safe Ship Management (SSM) Systems came into force in 1997. The SSM system was based on the established International Safety Management system, but was modified for domestic commercial ships. Part 21 was supported by an included New Zealand Safe Ship Management Code, which outlined how a SSM system should be implemented. Since 2001, Maritime NZ has been preparing a revised Part 21, but it had still to be circulated for comment at the time of writing. In 2005, it produced a Safe Ship Management Code of Practice, which set down requirements and responsibilities of participants in the system.
- 1.6.3 The philosophy of the SSM system was for owners and operators to take responsibility for their own safety and to develop their own safety management system in conjunction with their chosen SSM provider. At the time of writing there were 7 general SSM companies and one company that administered its own in-house SSM system. Part 21 provided a broad standard format of what was required of the industry
- 1.6.4 On 20 January 1998 the *Santa Maria II* entered the SSM system with Survey Nelson as an existing ship after being inspected and found to comply with Maritime Rule 21.13(2).
- 1.6.5 On 17 December 1998, the *Santa Maria II* was issued with an International Voyage Certificate, by Maritime NZ, for a single voyage to Australia for the purpose of being sold to Australian interests.
- 1.6.6 On 2 December 1999, the *Santa Maria II* suffered an electrical fire whilst moored to the public wharf in Mooloolaba, Queensland. The fire severely damaged the vessel's wheelhouse. Repairs to the vessel included construction of a new wheelhouse, the installation of a fixed fire-suppression installation in the engine room and the removal of the large CO<sub>2</sub> extinguisher. The fire-suppression system was installed to comply with the Australian Uniform Shipping Laws Code section 11: Fire Appliances.
- 1.6.7 In early May 2003, the *Santa Maria II* returned to New Zealand ownership and was surveyed, by Survey Nelson, to enter the SSM system under Maritime Rule 21. The ship was required to comply with all relevant Maritime Rules in force at the time. A fit for purpose certificate was issued on 11 May 2003.
- 1.6.8 On or about 28 July 2003, the *Santa Maria II* was re-registered under Maritime Cook Islands registry and left the New Zealand SSM system.
- 1.6.9 On or about 10 January 2004, the *Santa Maria II* returned to New Zealand and was again surveyed, by Survey Nelson, to enter the SSM system and was issued with a fit for purpose certificate for New Zealand Coastal limits and a SSM certificate on 19 January 2004. The fit for purpose certificate was updated to Offshore area on 15 March 2004 and the SSM certificate was updated on 5 August 2004 for a new owner. On 5 April 2005, the *Santa Maria II* underwent a major survey while docked in Nelson.

1.6.10 From 15 March 2004, three fit for purpose certificates were issued as shown below:

| Date          | Type           | Area     | Manning requirements  |
|---------------|----------------|----------|---|
| 15 March 2004 | Fishing vessel | Offshore | Coastal Master<br>1 OFDH [possibly meant to be QFDH qualified fishing deckhand]<br>1 crew<br>(4 in total) |
| 30 April 2005 | Fishing vessel | Offshore | NZOM<br>MEC6<br>ADHF (advanced deckhand fishing)<br>(min 3)   |
| 28 March 2006 | Fishing vessel | Offshore | NZOM<br>MEC6<br>ADHF<br>(min 3)   |

None of the above fit for purpose certificates stipulated the correct manning requirements.

- 1.6.11 The current SSM certificate had been issued, by Survey Nelson on 27 April 2006 after an audit on 27 March 2006 and subject to satisfactory periodic inspections and audits, would remain valid until 28 April 2009.
- 1.6.12 An integral part of the SSM system is the provision of a vessel-specific safety management manual which is to be verified by the SSM Company. The requirements for the safety management manual are contained in Appendix 2. When inspected on board the *Santa Maria II* the manual stated that the vessel's limits were Coastal and the manning required NZOM, MEC6 and ADHF (min 3).
- 1.6.13 All of the surveys and audits carried out in New Zealand from early May 2003 onward acknowledged that the vessel was fitted with a fixed fire-suppression system. One of the audits carried out since early May 2003 had been by Maritime NZ; the remaining surveys and audits had been carried out by an SSM company surveyor.
- 1.6.14 For a vessel to be able to fish within the exclusive economic zone of New Zealand the vessel's owner, operator or charterer had to hold an annual catch entitlement for the species of fish that it intended to target and an area in which it was allowed to catch this entitlement. *Santa Maria II*'s owner, operator or charterer had been granted a catch in Fisheries Management Area (FMA) 10 which surrounded the Kermadec Islands (see Figure 1). Penalties for fishing outside the FMA were severe and were rigidly enforced by MFish. Members of the fishing industry took specific notice of these regulations.
- 1.6.15 In July 1994 MFish launched its National Aquatic Biodiversity Information System (NABIS) which was a "geospatial data management (GIS) tool" that added layers of information to a base map of land and sea showing at a glance all information relating to a particular geographic area. This included particular relevant information for fisheries managers including
- distributions of commercial species of finfish and invertebrates
  - quota management, fisheries management and statistical areas
  - commercial catch information

This information was made freely available to all by means of the internet, and was easy to understand being in a graphical format.

## 1.7 Legislation

- 1.7.1 Maritime Rule Part 20, which came into force on 1 February 1998, defined the different operating limits for vessels. Those limits determined the standards to be applied to ships, their equipment, and the qualifications and number of persons crewing those ships.

1.7.2 Maritime Rule Part 20 stated in general that:

The 200 nautical mile limit around the North and South Islands (including Stewart Island) and the Chatham Islands plus a bulge south and north, to take in the Auckland Islands and the Kermadec Islands respectively, has been set as “offshore” limits. “Offshore” limits will apply to larger ships engaged in the New Zealand coastal trade, fishing ships, and other miscellaneous ship types meeting maritime rule requirements for that limit.

and in particular that:

“Offshore limits” means the area not more than 200 miles from the coast of the North Island or the South Island or Stewart Island or any of the islands in the Chatham Island group; and includes the area enclosed by the 12 mile New Zealand territorial limit around the Auckland Island group; and inside the following two lines commencing at the position 27°49'S, 177°34'W; the line bearing 204° to the New Zealand 200 mile limit the line bearing 180° for 100 miles then 201° to the New Zealand 200 mile limit.

1.7.3 Maritime Rules part 31C Crewing & Watchkeeping of Fishing Vessels, which came into force on 1 February 2001, required that for a fishing vessel of length more than 20 m but less than 30 m operating in the offshore area there should be a minimum of 4 crew comprising:

- master NZOM certificate or equivalent
- mate New Zealand offshore watchkeeper (NZOW) certificate, or equivalent
- deckhand ADHF certificate, or equivalent
- chief engineer marine engineer class 4 (MEC4) certificate, or equivalent.

A table of equivalent certificates was also given within the rule as shown below:

| Certificate required | Equivalent certificates that are acceptable   | Conditions under which equivalents are acceptable   |
|----------------------|---|---|
| NZOM                 | Mate deep sea fishing vessel  | Limited to within 100 miles of the coast  |
|                      | New Zealand coastal master  |   |
|                      | Master small home trade ship  |   |
|                      | Skipper coastal fishing vessel  |   |
| NZOW                 | NZOM or equivalent  |   |
|                      | Master river ship   |   |
| ADHF                 | Qualified fishing deck hand   | Must have at least 3 months fishing vessel sea service in a deck capacity outside the inshore area, endorsed by the director on the certificate and must hold NZQA unit standard 12304 (Seamanship) |
|                      | Local launch operator or equivalent but marine engineering qualification not required |   |
|                      | Advanced deckhand   |   |
|                      | Integrated rating   |   |
| MEC 4                | Able bodied seaman certificate  | Must have at least 3 months fishing vessel sea service in a deck capacity outside the inshore area, endorsed by the director on the certificate   |
|                      | Marine engineer class 2 (fishing)   |   |
|                      | First class diesel trawler engineer   |   |
|                      | First class coastal motor   |   |

1.7.4 Maritime Rules 40D Design, Construction and Equipment – Fishing Ships: Fire Appliances, which came into force on 1 February 2000, states:

40D.5 Additional safety equipment

The owner and master of any ship that is provided with any -

- (a) life saving appliances additional to those required by rule 40D.37; or
- (b) fire appliances additional to those required by rule 40D.64; or
- (c) radio communications equipment additional to that required by rule 40D.68; or
- (d) navigation lights, shapes and sound signals additional to those required by Part 22; or
- (e) navigation equipment additional to that required by Part 45 -

must ensure that such additional appliances and equipment meet the applicable standard required by this Part, and are well maintained and in good working order.

40D.64 General

- (1) The owner and the master of any ship must ensure that fire appliances are provided in accordance with the requirements of Appendix 2.
- (2) The owner and the master of any ship must ensure that the ship's fire appliances comply with the performance standards prescribed in Part 42B.
- (3) The owner and the master of any ship must ensure that the ship's fire appliances are maintained, inspected, and serviced in accordance with the requirements of Part 42B.
- (4) The master of any ship must ensure that all fire appliances on board the ship are –
  - (a) in good working order; and
  - (b) ready for immediate use; before the ship commences a voyage and at all times during any voyage.

1.7.5 Maritime Rules 42B.3 Safety Equipment - Fire Appliances Performance Standards; Application which came into force on 1 February 2001 stated:

- (1) Subject to rule 42B.3(2), Part 42B applies to fire appliances that are installed or intended to be installed on any New Zealand ship, if maritime rules-
  - (a) require the ship to be provided with that type of fire appliance; and
  - (b) require that type of fire appliance to meet the requirements of Part 42B.
- (2) Part 42B does not apply to a fire appliance that -
  - (a) was placed on a ship before 1 February 2001, as required by the legislation in force at the time of its placement; and
  - (b) complies with the applicable standard for that appliance prescribed by the legislation in force at the time of its placement on the ship; and
  - (c) remains fit for purpose to the satisfaction of a surveyor.

Maritime Rule 42B.20(10) Fixed Gas Fire-Extinguishing Systems; General stated:

Pressure containers required for the storage of fire extinguishing medium must be located outside protected spaces in accordance with rule 42B.20(13).

The legislation in place prior to 1 February 2001 concerning the sighting of pressurised fire-extinguishing medium was contained in the Shipping (Fixed Gas Fire Extinguishing Systems) Notice 1989, which stated in the schedule:

(10) Except as otherwise permitted by clause 3(1), 3(2) and 3(3) of this Performance Standard, pressure containers required for the storage of fire extinguishing medium shall be located outside protected spaces in accordance with clause 1(12) of this Performance Standard.

## 2 Analysis

- 2.1 The skipper and crew took fast and decisive action when they discovered the fire on board. They quickly readied the emergency equipment and life raft and alerted the authorities to their plight. The familiarisation and training that they had undertaken at the beginning of the voyage were fresh in their minds and allowed them to react quickly and efficiently to the situation.
- 2.2 From the evidence available it was not possible to establish conclusively where the fire started, but the most likely cause was either one of the plastic diffusers from the fluorescent strip lights dislodging and falling onto the turbocharger casing next to the air intake, or a plastic container of some description falling from a level above the turbocharger onto the turbocharger casing next to the air intake. The turbocharger casing reaches temperatures well above the ignition points of many substances, especially the plastics found in the engine room. The temperature can be near to that found in the combustion cylinders.
- 2.3 The engine room was unattended at the time of the fire, the engineer having gone to the foredeck to assist the remainder of the crew in landing the catch of fish. There was a moderate swell running at the time of the accident which combined with the wind waves from a 30-knot wind would have induced a rolling and pitching motion in the vessel sufficient to start movement in any unsecured items around the vessel.
- 2.4 Ships' engine rooms are inherently prone to fire due to there being numerous sources of ignition, fuel and hydraulic oils circulating under pressure. It is imperative that sources of oil leaks be remedied and that no other sources of fuel are left unsecured or unprotected at any time; if practicable, they should be removed from the engine room.
- 2.5 The inspection of the engine room when the vessel arrived in Tauranga showed that the general standard of "housekeeping" was not high, and the engineer seemed unaware of the associated risks of leaving a considerable amount of material unsecured in an unattended engine room. The engineer may have been lulled into a false sense of security that nothing was going to move if the voyage to the fishing grounds was relatively calm and uneventful. This accident highlights the need for mariners to be vigilant in "housekeeping" matters at all times, regardless of the weather conditions. Vibration alone can cause items to move.
- 2.6 The action of closing the vents to the engine room would have assisted in smothering the fire or at least stopping it spreading. The evidence suggests the fire was finally extinguished due to the combustible material at the seat of the fire having been totally consumed. Had more combustible material been in the vicinity, or the diesel fuel ignited, the fire and possibly the outcome would have been far more serious. As well as closing the vents an attempt to close the emergency fuel shut-off should have been made so as to reduce the amount of fuel available to the fire.
- 2.7 As the diesel in the day tank heated it would have expanded, forcing diesel vapour out of the vent pipe, and also liquid diesel if the temperature had increased sufficiently. As the pipe was venting directly into the engine room there was an increased risk of the contents of the tank feeding the fire from above.
- 2.8 The diesel fuel filter ruptured as a result of the fire and the diesel fuel from the day tank drained into the engine room bilges where it could have been ignited by the fire. Normally the engineer could under these circumstances have attempted to close the valve between the tank and the filter using the remote pull, but the knot joining the broken ends of the wire would have jammed in the small bore tube before the valve was completely closed. It was not established how long the remote pull wire had been in that state. The wire should have been replaced when it broke. Whoever tied the knot in it instead did not fully understand or recognise its function. The quick closing of the valve remotely had obviously not been tested by ship staff or surveyor since the wire had parted.

- 2.9 The reason the fire-suppressant gas did not flood into the engine room was because the actuating lever on the valve could not complete its arc of rotation before jamming against the protective cover. The person who pulled the remote release would not have known that the cylinder had not discharged, nor would they have had any means of checking that the gas had discharged as the cylinder was located in the space it was protecting. The skipper and crew were rightly cautious as to whether the gas had discharged and continued to monitor the situation for some time before re-entering the engine room.
- 2.10 The slight movement of the protective cover as it was removed allowed the actuating valve to travel far enough to allow the gas to escape. The protective cover had been replaced at some time at a height too low to allow free movement of the actuating lever.
- 2.11 The aluminium cover over the fire-suppressant gas cylinder could not be adequately secured in place at a set height above the cylinder and valve assembly. This was evident from the numerous holes that had been made in the framing by self-tapping screws.
- 2.12 Had the fire-suppressant gas cylinder been located outside the space that it was designed to protect, as required by New Zealand regulations, any member of the crew would have been able to check if the valve had operated correctly and if required manually discharge the gas. If the pressurised cylinder had been located in a space that was on fire and the fire heated the cylinder, causing the gas to over-pressurise the cylinder, there would have been the risk of a boiling liquid expanding vapour explosion. Such an explosion can be extremely hazardous as it can completely destroy the storage cylinder and project fragments over the surrounding area probably seriously damaging the vessel.

### **Survey and audit**

- 2.13 The vessel was surveyed and audited 6 times between May 2004 and March 2006 so as to comply with the New Zealand regulations for SSM. Each of the SSM survey reports noted that the vessel was fitted with a fixed fire-extinguishing system; however, none of the surveys appears to have compared the installation to the standards applicable at the time.
- 2.14 The owner of the vessel had the responsibility of ensuring that the vessel complied with all relevant regulations and was responsible for presenting the vessel ready for audits, surveys and entry into the SSM system. In this context the owner, the SSM Company and the regulator responsible for monitoring the performance of the SSM Company all had a joint responsibility to ensure that the vessel was fit for purpose.
- 2.15 A reasonable expectation would be that any initial survey for a new or new to the system ship would be thorough, would test the ship for total compliance with the rules, and would pick up any unsafe engineering and operational practices.
- 2.16 The owner could reasonably have expected recognised surveyors from a SSM company to have sufficient expertise and knowledge of the requirements to highlight most major deficiencies. Conversely it was reasonable for the SSM Company to expect the owner to have an understanding of the regulations and to have ensured that their vessel was compliant before presenting the vessel for survey. Yet the ship operated in the system for nearly 2 years, through 5 surveys without identification of a major non-conformance with the Rules that affected the fire-fighting capability in the event of an engine room fire. This factor together with several examples of poor engineering practices and poor “housekeeping” meant the *Santa Maria II* was operating at a high level of risk.

### **Manning and operating limits**

- 2.17 After the fit for purpose certificate was issued in May 2004, there appeared to be confusion over the correct manning of the vessel for the limits within which it was allowed to operate. This may have resulted in the ship safety manual requiring an NZOM certificate to fish in Coastal limits when a coastal master’s certificate would have sufficed. It may also have resulted in the



fit for purpose certificate requiring a minimum of 3 crew in the Offshore area when in fact 4 were required, including an NZOW certificate. Also the fit for purpose certificate required a lower grade of engineering certificate, MEC6, than the required minimum of a MEC4. These discrepancies should have been picked up during at least one of the surveys or audits carried out by the SSM company or Maritime NZ

- 2.18 Further confusion may also have resulted from inspection of the ship safety manual which stated that the ship was limited to the Coastal area but still required an NZOM certificate on board. From the revision date at the bottom of the page of the manual, it was clear that the manual had not been updated since March 2004. The manning requirements and the operating limits had been changed no fewer than 3 times, which was evidence that the issue had been scrutinised several times yet at no time had the designated manning and operating limits been correct. The discrepancies in the manual should have been picked up at one of the audits of the system that had taken place since the issue of the manual.
- 2.19 On the particular voyage of the accident the skipper held a coastal master's certificate which would have allowed him to fish in the Offshore area up to 100 nautical miles off the coast. The mate held the correct certificate, an NZOM, which would allow the vessel to fish in the Offshore area. However, at the time of the accident the *Santa Maria II* had been fishing in the Unlimited area and so neither of the certificates was suitable. Both the skipper and the mate held MEC6 certificates or equivalent, both of which did not comply with the requirements for fishing in the Offshore area let alone the Unlimited area. The lack of the correct certification for the area did not affect the outcome of the accident from a navigation aspect but, had a member of the crew had the correct higher engineering certification they would have understood the associated risks in the engine room better than a lesser qualified engineer.
- 2.20 The owner of the *Santa Maria II* owned or had interests in several fishing boats and associated companies and it is unlikely that he and his representative were unaware of the regulatory designated limits and manning requirements contained in the Maritime Rules and their interaction with the MFish areas and regulations.
- 2.21 However, there were several Maritime Rules that covered the requirements for vessels engaged in different businesses in the designated areas and the associated manning levels and certificates required. This made the regulations complex and difficult to follow, especially when certain caveats had been "grandfathered" in from previous regulations so as not to disadvantage anyone.
- 2.22 In the Commission's Marine Occurrence Report 04-212, fishing vessel *Iron Maiden*, foundering, off Pandora Bank, 16 August 2004, the Commission commented on the lack of clarity regarding the manning of fishing vessels and the confusion about the extent of certain limits. The Commission recommended (recommendation 028/05) to the Director of Maritime NZ that he:

in order to reduce confusion and the possibility of misinterpretation, develop a policy to rationalise and simplify the current maritime rules concerning the crewing and watchkeeping requirements for non-SOLAS vessels, and the limits in which they operate.

The Director of Maritime NZ replied at the time that:

Maritime Rules 31B and C are currently being amended. MSA is prepared to accept this recommendation, provided suitable funding is obtained in its 06/07 rules bid to extend this work.

Unfortunately, funding was not available to extend the work and the information available from Maritime NZ at the time of writing was that although work had been done on the manning qualifications, a high priority for a funding application for a fundamental review of the qualifications structure and the seagoing limits was to be made for the funding year 2008/09. Safety recommendation 028/05 is considered to be equally applicable in this case, so although

the recommendation is not reiterated here the Commission still concludes that this recommendation is of high importance, and will remain open.

- 2.23 As the funding to carry out the review of the qualifications and limits structure will not be available for some time an effective and interim alternative may be for Maritime NZ to work with MFish to make use of NABIS to incorporate the relevant maritime limit boundaries as layers on the charts within NABIS.
- 2.24 Since publishing its report on the *Iron Maiden*, the Commission has investigated 9 other occurrences during which non-compliance with Maritime Rules was identified for the vessels involved, and in some cases these were contributory to the occurrence. The non-compliances ranged from crewing levels and qualifications to ship construction and equipment. The Commission has also received, during several investigations, anecdotal evidence that the problem with crewing could be widespread and in part related to a shortage of appropriately qualified crew. The Commission has also received anecdotal evidence that SSM companies in some cases might not be enforcing total compliance with the Rules because the cost of total compliance could potentially render a maritime operation financially unviable with the potential loss of business, or in some cases operators had threatened to take their custom to other SSM providers.
- 2.25 The Commission has no objective evidence that this has been happening, or if it has, how widespread the problem is, but the SSM system has been set up with the inspectorate function being performed by private companies competing for maritime clients. Such a system creates the risk of safety standards being compromised for commercial gain, resulting in a decline in standards across the industry. This risk could be mitigated by random independent vessel inspections by the regulator, but this is essentially doubling up on the function, usually at a cost to the operator.
- 2.26 Similar concerns have been raised in 2 separate reports following reviews of the SSM system. The first review was carried out in February 2000 by Pacific Marine Management Limited; the second review was carried out during the middle of 2002 by Thompson Clarke Shipping Pty. Limited.
- 2.27 In 2005 Maritime NZ commissioned an independent review of the fishing industry to determine the extent of compliance with Part 40D. The study was carried out confidentially and involved surveys of 58 boats built before 2000, 29 boats of 6 to 12 m in length and 29 boats of 12 to 24 m in length. Maritime NZ received the completed review in July 2006. As part of the review the authority extrapolated the number of boats could have been similarly non-compliant using a total fishing boat population of 820; those figures are shown below in brackets after the percentage (note that not all 820 boats were required to meet all the parts of Part 40D). Thirty parts of the Rules were inspected against and the following parts had high non-compliance results:
- watertight bulkheads had a non-compliance rate of 69% (306 boats)
  - bulwarks and guardrails had a non-compliance rate of 65% (531 boats)
  - freeboard had a non-compliance rate of 62% (342 boats)
  - inlets and discharges had a non-compliance rate of 59% (491 boats). The surveyor noted that outlets that were not fitted with non-return valves caused the greatest risk in this area
  - hatchways had a non-compliance rate of 50% (404 boats)
  - bilge systems had a non-compliance rate of 43% (353 boats). Assessed as a moderate threat due to cross-over and flooding possibilities
  - water freeing had a non-compliance rate of 40% (325 boats). The systems that were non-compliant either were fitted with locking arrangements or had sliding shutters

Other significant non-compliance items were:

- stability had a non-compliance rate of 26% (155 boats)
- life-saving appliances had a non-compliance rate of 17% (139 boats), but the surveyor noted that there was a high rate of lifesaving equipment being tied down or hindered from deployment by other equipment.

2.28 The survey results indicated that all fishing boats of less than 24 m that were inspected were non-compliant with at least one component of Part 40D.

2.29 In response to the review results Maritime NZ initiated a project to develop policies to improve compliance with Part 40D, including improvement in the consistency of surveys, inspections and audits carried out by the SSM companies. At the time this report was published this project had reached the stage where the proposed amendments to the Rule had been drafted and circulated to SSM company surveyors for comment. The amendments were then going to be presented to boat builders and naval architects prior to taking them to the Part 40D working group then releasing the amendments for public consultation.

2.30 The results of this review were of some concern to the Commission because they showed that the SSM system was not robust and was contributing to an unsatisfactory level of safety within the commercial small-boat fleet.

2.31 On 2 April 2007, a safety recommendation was made to the Director of Maritime Safety in Marine Occurrence Report 05-212, to:

undertake a full review of the Safe Ship Management system and make changes to ensure the system promotes and effectively regulates a safe and sustainable maritime industry consistently throughout New Zealand.

On 24 July 2007, the Director of Maritime NZ replied:

MNZ constantly monitors the SSM system, which has been formally reviewed three times since its introduction in 1998. Each review, by independent bodies external to MNZ, found that the philosophy behind the system was sound, and since the system was introduced safety statistics in all commercial maritime sectors have improved. While feedback from the industry indicates solid support for the intent of the system MNZ considers that there is still room for improvement in how the system is implemented and delivered by MNZ and SSM companies.

In line with our continuous improvement policy, a review of the SSM system has been identified as the key strategic priority for MNZ in its 2007-2010 Statement of Intent. MNZ has commenced a programme of work to enhance the sustainability and effectiveness of the SSM system by:

- 1 Ensuring that the regulatory framework supporting SSM is robust and appropriate by reviewing the maritime rules that govern its operation. A draft discussion document summarising proposed changes to Maritime Rules Part 21 (Safety Management Systems) and Part 46 (Surveys, Certification and Maintenance) is due for public release in late 2007;
- 2 Complementing existing guidance material (Health and Safety: A Guide; FishSAFE Health and Safety Guidelines; various leaflets) with additional material including a comprehensive resource to support owners in the development of their SSM systems, specific fatigue management material, and health and safety guidelines for passenger and non-passenger operations. This additional material is being progressively released through until December 2007 in association with targeted training material;
- 3 Increasing the amount and quality of formal and informal training and education that is available to all those working in the system, including MNZ and SSM Company staff, surveyors, owners and operators. This training will be supported by the development of a mentor network

utilising experienced industry participants to provide support and advice to their peers;

- 4 Reviewing the current capacity and quality of service delivery by both MNZ and SSM Companies in the area of SSM and comparing this with requirements in order to identify and address necessary areas for improvement;
- 5 Allocating additional resources to the SSM team within MNZ to allow for more responsive contact with industry and other stakeholders, along with the provision of personalised assistance where required to owners and operators; and
- 6 Structured auditing by MNZ of SSM service providers.

This work is being actively progressed and monitored within MNZ. It is also intended to establish an external consultative group to ensure that all industry and other stakeholders remain fully involved with, and aware of, the programme as it is developed and implemented.

In view of this response no further safety recommendation covering this aspect has been made in this report. However, the results of the programme of work will be monitored through the Commission's recommendation status report instead.

- 2.32 There was no correlation between the designated MFish fisheries and quota management areas which were based on New Zealand's exclusive economic zone and the geographical areas where the fish were to be found and Maritime NZ's vessel and certificate areas of operation. Although this was an acceptable practice as both MFish and Maritime NZ had differing requirements and objectives, it could have lead to further confusion for the skipper of a fishing vessel.

### **3 Findings**

- 3.1 The *Santa Maria II* sustained a fire in the engine room when a plastic object, most probably a container or light diffuser, fell onto the hot turbocharger casing and ignited. The fire extinguished due to a combination of the crew closing down the compartment and the combustible material being consumed by the fire.
- 3.2 The fixed fire-suppression system did not work because a cover had been installed over the valve actuating handle that prevented it completing the firing action. The fire-suppression system should have been installed outside the engine room where it could have been operated manually.
- 3.3 The fixed fire-suppression system installation did not comply with Maritime Rules despite having undergone 5 audits and inspections in the previous 2 years by the SSM Company and one audit by Maritime NZ.
- 3.4 The effects of the fire could have been substantially reduced had the fixed fire-suppression system worked.
- 3.5 The standard of "housekeeping" and maintenance on board in the engine room was such that there was a substantially increased risk of a fire occurring.
- 3.6 The skipper and crew on board did not hold the correct qualification for the area in which they were fishing, nor was the boat certified to operate in that area. The Maritime Rules were difficult to correlate between maritime limits and the maritime certificate structure and did not necessarily correlate to the Ministry of Fisheries, FMAs. Further confusion was added as neither the fit for purpose certificate nor the ship safety manual had the correct manning requirements or had similar manning requirements on each document. However, some of the confusion could have been removed if any one of the audits or surveys had noted and rectified the inconsistencies in the documented manning levels.

3.7 The SSM system was not robust enough to detect or rectify:

- the incorrect crewing level on *Santa Maria II*
- a non-compliant fixed fire-suppression system
- several unsafe engineering solutions for repair and maintenance.

## 4 Safety Actions

4.1 Since the accident Maritime NZ has implemented the following actions:

- Published articles in “Seafood New Zealand” and “Safe Seas Clean Seas” alerting the fishing industry to its awareness of vessels operating beyond their assigned operational limits and crewed by persons without appropriate qualifications.
- Written to the owners of 12 fishing vessels that have been issued with MFish high seas permit to fish in the Unlimited area, and reminded them that the vessels had not been certified by Maritime NZ to operate beyond the Offshore limit.
- Issued a media release stating that it was to work with MFish and the fishing industry to target operators of smaller fishing vessels who operate outside the legal limit of their qualifications. This followed the conviction of a skipper of a fishing vessel for operating outside the limits of his qualification.
- To aid Maritime NZ in gaining empirical evidence of the number of vessels operating outside their limits, requested that all routine surveillance flights carried out by the Royal New Zealand Air Force be tasked with surveillance of New Zealand commercial fishing vessels.

## 5 Safety Recommendations

5.1 On 14 November 2007, the Commission recommended to the Director of Maritime NZ that she:

- 5.1.1 Review the qualifications structure and the seagoing limits so as to ensure that the intent of the Commission’s recommendation 028/05 (see below) is upheld. (037/07)
- 028/05 In order to reduce confusion and the possibility of misinterpretation, develop a policy to rationalise and simplify the current maritime rules concerning the crewing and watchkeeping requirements for non-SOLAS vessels, and the limits in which they operate.
- 5.1.2 Considers, when undertaking recommendation 037/07, incorporating the details of the maritime limits boundaries for both vessels and competence certificates into the Ministry of Fisheries (MFish) geospatial data management (GIS) tool “National Aquatic Biodiversity Information System” (NABIS) so as to provide an accurate illustration of the relationship between the MFish and Maritime NZ regulations. (038/07)
- 5.1.3 As a matter of urgency conduct a special inspection of *Santa Maria II* and other vessels owned or operated by the owner to ensure that they fully comply with all relevant Maritime Rules with particular attention to ensure that all fire-fighting equipment on board, especially fixed fire-suppressant systems, comply with New Zealand regulations. (039/07)
- 5.1.4 Inspect a sample of other vessels under Survey Nelson Limited’s safe ship management system to measure what their level of compliance with the Maritime Rules is, and take whatever measures are deemed appropriate. (040/07)
- 5.1.5 By the most appropriate means ensures that all skippers and crew members within the safe ship management system are advised and instructed on the importance to

safety of good “housekeeping” within engine room spaces and that all repairs and modifications should be carried out using appropriate materials to the satisfaction of a safe ship management surveyor. (041/07)

5.1.6 By the most appropriate means ensure that all marine surveyors employed by safe ship management companies’ are fully aware of their obligations under Maritime Rules Part 21 Safe Ship Management Systems to carry out work with due care and diligence in accordance with the requirements of the Maritime Rules. (042/07)

5.2 On 15 November 2007, the Director of Maritime New Zealand replied:

**Recommendation 037/07**

Maritime NZ has already identified this matter as a priority item within its action plans for the 2008/2009 year. This recommendation is acceptable to Maritime NZ.

**Recommendation 038/07**

This recommendation is acceptable to Maritime NZ.

**Recommendation 039/07**

This recommendation is acceptable to Maritime NZ which is expected to be completed in the 2008 year.

**Recommendation 040/07**

This recommendation is acceptable to Maritime NZ which is expected to be completed in the 2008 year.

**Recommendation 041/07**

This recommendation is acceptable to Maritime NZ which is expected to be completed in the 2008 year.

**Recommendation 042/07**

This recommendation is acceptable to Maritime NZ which is expected to be completed in the 2008 year.

Approved on 14 November 2007 for publication

Hon W P Jeffries  
**Chief Commissioner**

# Appendix 1

## Life Saving Appliances

### 1.2 Offshore Limit Ships

The requirements in Appendix 1.2 apply to ships that do not proceed beyond offshore limits.

| ITEM   | REQUIREMENTS  |
|--|---|
| Survival craft -<br>(comprising lifeboats and liferafts) | <p>Every ship of 24 metres or more in length must be provided with survival craft that have sufficient aggregate capacity to accommodate on each side of the ship the total number of persons onboard.</p> <p>Survival craft must be either -</p> <p>(a) lifeboats complying with rules 42A.6 and 42A.7; or</p> <p>(b) liferafts complying with rules 42A.11 and 42A.12; or</p> <p>(c) a combination of such lifeboats and liferafts.</p> <p>Every ship of less than 24 metres in length must be provided with one or more liferafts complying with rules 42A.11 and 42A.12 of sufficient aggregate capacity to accommodate the total number of persons the ship is carrying. If 16 or more persons are carried, the number of liferafts provided must not be less than 2.</p> <p>Every liferaft must be provided with float free arrangements which provide for the liferaft to be released automatically in the event of the ship sinking. Any hydrostatic release unit used in float-free arrangements must comply with rule 42A.8</p>   |
| Rescue boats   | <p>Every ship of 45 metres or more in length must be provided with a rescue boat complying with rule 42A.15, unless the ship is provided with a lifeboat that fulfils the requirements for a rescue boat and is capable of being recovered after a rescue operation.</p> <p>The number of lifeboats or rescue boats that are carried on a ship of 45 metres or more in length must be sufficient to ensure that when the total number of persons on board abandon ship not more than 9 liferafts need be marshalled by each lifeboat or rescue boat.</p>  |
| Lifebuoys  | <p>Sufficient lifebuoys complying with rule 42A.17 must be strategically placed around the ship on each side so that the distance between lifebuoys is minimised. The lifebuoys must be accessible for immediate use at all times.</p> <p>Every ship of 75 metres or more in length must be provided with at least 8 lifebuoys.</p> <p>Every ship of 45 metres or more in length but less than 75 metres must be provided with at least 6 lifebuoys.</p> <p>Every ship of 24 metres or more in length but less than 45 metres must be provided with at least 4 lifebuoys, except that when carrying less than 8 persons only one such lifebuoy per 2 persons need be carried provided there is a minimum of 2 such lifebuoys on board.</p> <p>Every ship of less than 24 metres in length must be provided with at least 2 lifebuoys.</p> <p>On every ship of 45 metres or more in length, at least half the number of lifebuoys referred to above must be provided with self - igniting lights.</p> <p>On every ship of 45 metres or more in length, at least 2 of the lifebuoys provided with self -igniting lights must, where practicable, be provided with self -activating smoke signals. Such lifebuoys must be capable of quick release from the navigating</p> |

|   |   |
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|   | <p>bridge.</p> <p>On every ship of 24 metres or more in length, at least one lifebuoy on each side of the ship must be fitted with a buoyant lifeline and at least one lifebuoy on each side of the ship must be fitted with a self - igniting light.</p> <p>On every ship of less than 24 metres in length at least one lifebuoy must be fitted with a buoyant line and one lifebuoy must be fitted with a self igniting light.</p> <p>Lifebuoys fitted with a buoyant line must not have self –igniting lights.</p> |
| Lifejackets                               | Every ship must be provided with one lifejacket that complies with rule 42A.19 and that has a buoyancy of at least 100 Newtons, for each person on board.   |
| Flares                                    | Every ship must be provided with 6 rocket parachute flares, and 2 buoyant smoke signals.<br>Rocket parachute flares and buoyant smoke signals must comply with rule 42A.22 and rule 42A.24 respectively.  |
| Line throwing appliance                   | Every ship of 30 metres or more in length must be provided with one line throwing appliance complying with rule 42A.30.   |
| Immersion suits and anti - exposure suits | Every ship that proceeds south of latitude 48° South must be provided with -<br>(a) one immersion suit complying with rule 42A.25 for each person assigned to crew the rescue boat; and<br>(b) one anti-exposure suit complying with rule 42A.26 for every person that does not have an immersion suit.   |



## Fire Fighting Appliances

2.2 Ships of 45 metres or more in length but less than 60 metres in length and ships of 24 metres or more in length but less than 45 metres in length that proceed beyond the coastal limit

The requirements in Appendix 2.2 apply to the following ships to which this Part applies -

- (i) of 45 metres or more in length but less than 60 metres in length; and
- (ii) of 24 metres or more in length but less than 45 metres in length that proceed beyond the coastal limit.

| ITEM   | REQUIREMENTS   |
|--|--|
| Automatic fire alarm and fire detection systems  | Every ship to which rule 40D.52(1) applies that -<br>(a) is constructed of combustible materials; or<br>(b) a surveyor considers a fire risk due to -<br>(i) the appreciable amounts of combustible materials used in the construction of accommodation spaces, service spaces and control stations; and<br>(ii) the size of those spaces; and<br>(iii) their arrangement; and<br>(iv) their location relative to control stations; and<br>(v) where applicable, the flame -spread characteristics of the installed furniture<br>must have an automatic fixed fire alarm and fire detection system, complying with rules 42B.4 to 42B.8 inclusive, installed.  |
| Fire pumps                                       | The minimum number and type of fire pumps, complying with rule 42B.61, to be fitted must be as follows -<br>(a) one power pump, that is not dependent upon the main machinery for its motive power; or<br>(b) one power pump that is driven by main propelling machinery, provided that the propeller shafting can be readily disconnected, or provided that a controllable pitch propeller is fitted.<br>Where the pump required by paragraphs (a) or (b) is situated in a space containing oil-fired boilers or internal combustion type propelling machinery, an emergency fire pump must be fitted outside such spaces. If the emergency fire pump is power driven it must comply with rule 42B.61(6) and the power source must also be outside such spaces.   |
| Fire main, fire hydrants, fire hoses and nozzles | Fire hydrants must be positioned so as to allow easy and quick connection of fire hoses and so that at least one jet of water can be directed into any part of the ship that is normally accessible during navigation. Where more than 1 hydrant is required to provide the number of water jets to meet this requirement a fire main, complying with rule 42B.63 must be provided.<br>The jet of water required must be from a single length of fire hose. In addition to the hydrants required above, a machinery space of category A must be provided with at least one hydrant complete with fire hose and dual purpose nozzle. This fire hydrant must be located outside the space and near the entrance. A fire hose complying with rule 42B.64 must be provided for every required fire hydrant. At least one spare fire hose complying with rule 42B.64 must also be provided.<br>Each fire hose must be provided with couplings and a jet/spray nozzle complying with rule 42B.65.<br>All hose connections must be of the same type i.e. inter - connectable. |
| Portable fire extinguishers in control           | A sufficient number of portable fire extinguishers complying with rule 42B.57 must be provided in control stations and   |

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| <p>stations and accommodation and service spaces</p>  | <p>accommodation and service spaces to ensure that at least one extinguisher of a type appropriate to the class of fire anticipated in a space is readily available for use in any part of such spaces. The total number of portable fire extinguishers in these spaces, however, must not be less than 3.</p> <p>For every two portable fire extinguishers of the same type there must be provided one spare charge or a replacement extinguisher of the same type.</p>   |
| <p>Fire extinguishing appliances in machinery spaces - fixed fire extinguishing systems, foam extinguisher, portable fire extinguishers</p> | <p>Spaces containing oil fired boilers, fuel oil units or, in ships of 45 metres or more in length, internal combustion machinery having a total power output of not less than 750 kW must be provided with one of the following fixed fire extinguishing systems -</p> <ul style="list-style-type: none"> <li>(a) a pressure water spraying system complying with rules 42B.23 to 42B.26 inclusive; or</li> <li>(b) a gaseous fire-extinguishing system complying with rules 42B.20 to 42B.22 inclusive; or</li> <li>(c) a fire extinguishing system using high expansion foam complying with rule 42B.31; or</li> <li>(d) other fire-extinguishing system approved by the Director.</li> </ul> <p>Where the engine and boiler rooms are not entirely separated from each other, or if fuel oil can drain from the boiler room into the engine room, the combined engine and boiler rooms must be considered as one compartment.</p> <p>Where a fixed fire extinguishing system is fitted it must be controlled from a readily accessible position outside the machinery space that is not likely to be cut off by a fire in the protected space.</p> <p>Ships that –</p> <ul style="list-style-type: none"> <li>(i) are constructed mainly or wholly of wood or fibre reinforced plastics; and</li> <li>(ii) are fitted with oil-fired boilers or internal combustion machinery; and</li> <li>(iii) have a deck of wood or fibre reinforced plastic in way of the machinery space –</li> </ul> <p>must be provided with one of the above fixed fire extinguishing systems.</p> <p>Ships having machinery spaces not protected by a fixed fire extinguishing system must be provided with a non -portable foam fire extinguisher complying with rule 42B.53 with at least 45 litres capacity, or other non-portable fire extinguisher with equivalent classification and rating acceptable to a surveyor.</p> <p>Where the size of the machinery spaces makes this provision impracticable, the surveyor may accept an additional number of portable fire extinguishers complying with rule 42B.57 which are suitable for extinguishing oil fires.</p> <p>In all machinery spaces of category A, at least 2 portable fire extinguishers complying with rule 42B.57 of a type suitable for extinguishing oil fires, must be provided. Where such spaces contain machinery that has a total power output of not less than 250 kW, at least 3 such extinguishers must be provided. One of the portable fire extinguishers must be located near the entrance to the space.</p> <p>Firefighter's outfit At least two fire crew outfits complying with rule 42B.66 must be carried. Their stowage and location must be to the satisfaction of a surveyor.</p> <p>Signage Signs complying with rule 42B.69 must be provided to identify all fire fighting appliances and their location.</p> |

## Appendix 2

Each vessel shall have a Safety Management Manual. This manual shall be specific to the ship, shall be verified by the SSM Company and shall contain-

- 1) A page to record the signatures of skipper and crew confirming they have read and understood the contents of the manual, unless the SSM Company has approved an alternate means of confirmation.
- 2) Details of operating limits of the vessel in case the operating limits on the valid SSM Certificate do not give sufficient detail (eg safe havens).
- 3) Details of skipper and crew qualifications. These details shall state the total number of crew to be carried for each operating limit, passenger numbers and qualifications of skipper and crew for the operating limits mentioned.
- 4) The vessel owner's responsibility.
- 5) The skipper's responsibility.
- 6) The full name, address, phone/fax/e-mail details of the, owner nominated, Contact Person.
- 7) The maintenance plan. This plan may be in any form (hard copy or electronic) and may be maintained at a location approved by the SSM Company. The maintenance plan shall contain:
  - a) The maintenance required to maintain the vessel in a fit for purpose condition.
  - b) The maintenance required to maintain the vessel compliant with all applicable maritime and marine protection rules.
- 8) A record of safety equipment which is specific to the ship and has been approved by the SSM Company.
- 9) Hazard Identification and risk management plan.
- 11) The following documents are required to be held in the Safety Management Manual unless the SSM Company has specified an alternate location:
  - a) A copy of the last inspection and audit reports conducted by the SSM Company.
  - b) A copy of corrective actions given to the vessel following the most recent audit of the vessel.
  - c) A copy of the last inspection report of the radio inspector/surveyor if applicable.
  - d) A copy of the qualifications of the skipper and crew.
  - e) A copy of the Compass Adjuster's last report if applicable.
  - f) The International Tonnage Certificate or a copy if the vessel requires this certificate.
  - g) The Loadline Certificate or a copy if the vessel requires this certificate.
  - h) A copy of the valid membership document issued by the SSM Company.
  - i) A copy of the vessel's certificate of Registry/Registration, if applicable, unless the Safety Management Manual has clearly specified an alternate location.
  - j) A copy of the vessel's safe crewing certificate if applicable.
  - k) A copy of any exemption certificates issued to the vessel.
  - l) A copy of the document stating maximum permissible freeboard mark (for fishing vessels only).

- 12) Details of systems for:
- c) safe navigation;
  - d) safe working on deck and in the engineroom and any other work space;
  - e) ensuring employers of seafarers discharge their responsibilities in accordance with the requirements of The Health and Safety in Employment Act 1992;
  - f) appropriate and effective emergency response;
  - g) effective maintenance of machinery and equipment;
  - h) appropriate training;
  - i) for documentation.
  - j) conducting audits and reviews of the safety management system.







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